Global Tuberculosis Control 2008 SURVEILLANCE PLANNING FINANCING





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Cover design by Chris Dye. The disintegration of the Union of Soviet Socialist Republics in 1991 had dire consequences for the control of tuberculosis. From 1992, the number of cases reported to WHO continued to decline in western and central European countries (lower series) but increased steeply in the newly independent states (upper series). This resurgence was probably due to failures in tuberculosis control, but also to other biological, social and economic factors influencing transmission of infection and susceptibility to disease (see Section 1.8.2). The cover image shows the bifurcation in European case notifications layered on a colour-saturated image of stains used in sputum-smear microscopy, including carbol fuchsin and methylene blue.

Designed by minimum graphics Printed in Switzerland

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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
ART	antiretroviral therapy
BMU	basic management unit
BPHS	basic package of health-care services
BRAC	Bangladesh Rural Advancement
	Committee
CAREC	Caribbean Epidemiology Centre
CDC	Centers for Disease Control and
	Prevention
CHW	community health worker
CPT	co-trimoxazole preventive therapy
CTBC	community-based TB care
DoH	Department of Health
DOT	directly observed treatment
DOTS	the internationally recommended
	strategy for TB control
DRS	drug resistance surveillance or survey
DST	drug susceptibility testing
EMR	WHO Eastern Mediterranean Region
EMRO	WHO Regional Office for the Eastern
	Mediterranean
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 IUATLD
GDF	Global TB Drug Facility
GDP	gross domestic product
GHW	General health worker
GLC	Green Light Committee
Global Plan	The 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
IEC	information, education, communication

IHC	Integrated HIV Care (a programme of the Union)
IPT	isoniazid preventive therapy
ISAC	Intensified support and action in
	countries, an emergency initiative to
	reach targets for DOTS implementation by
	2005
ISTC	International standards for tuberculosis
HCA	care
JICA	Japan International Cooperation Agency
KAP	knowledge, attitudes and practice
LACEN	Brazilian public health laboratories
LGA	local government area
LHW	lady health workers
LQAS	Laboratory quality assurance services
MDG	Millennium Development Goal
MDR	multidrug resistance (resistance to, at
	least, isoniazid and rifampicin)
MDR-TB	multidrug-resistant tuberculosis
MoH	Ministry of Health
NAP	national AIDS control programme or
	equivalent
NGO	nongovernmental organization
NRHM	National Rural Health Mission
NRL	national reference laboratory
NTP	national tuberculosis control programme
NII	or equivalent
DAUO	Dan American Health Organization
	Drastical Approach to Lung Health
PAL	Practical Approach to Lung Health
PAIH	Health
PHC	primary health care
PhilTIPS	Philippine Tuberculosis Initiatives for the Private Sector
PPM	public-private or public-public mix
SEAR	WHO South-East Asia Region
SEARO	WHO Regional Office for South-East Asia
SINAN	Brazilian national disease information
onnin	system
SOP	standard operating procedures
SRLN	supranational reference laboratory network
SUS	Unified Health System for Brazil
SWAp	sector-wide approach
TB	tuberculosis
TBCAP	Tuberculosis Control Assistance Program
	Ioint United Nations Programme on UIV/
UNAIDS	AIDS

UNDP	United Nations Development Programme
UNHCR	United Nations High Commission for
	Refugees
UNITAID	international facility for the purchase of
	drugs to treat HIV/AIDS, malaria and TB
the Union	International Union Against Tuberculosis
	and Lung Disease
USAID	United States Agency for International
	Development
VCT	voluntary counselling and testing for HIV
	infection
WHO	World Health Organization
WPR	WHO Western Pacific Region
WPRO	WHO Regional Office for the Western
	Pacific
XDR-TB	TB due to MDR strains that are also
	resistant to a fluoroquinolone and
	at least one second-line injectable
	agent (amikacin, kanamycin and/or
	capreomycin)

# Summary

Tuberculosis (TB) is a major cause of illness and death worldwide, especially in Asia and Africa. Globally, 9.2 million new cases and 1.7 million deaths from TB occurred in 2006, of which 0.7 million cases and 0.2 million deaths were in HIV-positive people. Population growth has boosted these numbers compared with those reported by the World Health Organization (WHO) for previous years. More positively, and reinforcing a finding first reported in 2007, the number of new cases per capita appears to have been falling globally since 2003, and in all six WHO regions except the European Region where rates are approximately stable. If this trend is sustained, Millennium Development Goal 6, to have halted and begun to reverse the incidence of TB, will be achieved well before the target date of 2015. Four regions are also on track to halve prevalence and death rates by 2015 compared with 1990 levels, in line with targets set by the Stop TB Partnership. Africa and Europe are not on track to reach these targets, following large increases in the incidence of TB during the 1990s. At current rates of progress these regions will prevent the targets being achieved globally.

The Stop TB Strategy is WHO's recommended approach to reducing the burden of TB in line with global targets. The Global Plan of the Stop TB Partnership details the scale at which the six components of the strategy should be implemented if the global targets are to be achieved. To date, progress has been mixed. The first component of the strategy – the detection and treatment of new cases in DOTS programmes – fares best. Globally, the rate of case detection for new smear-positive cases reached 61% in 2006 (compared with the target of at least 70%) and the treatment success rate improved to 84.7% in 2005, just below the target of 85%. Progress in the implementation and planning of other parts of the strategy ranges from major – with provision of TB/HIV interventions for TB patients in the African Region – to minor – with a need for improved guidance on advocacy, communication and social mobilization (ACSM) activities, and more ambitious planning for treatment of patients with multidrugresistant TB (MDR-TB), in the European, South-East Asia and Western Pacific regions.

Available funding for TB control in 2008 peaked at US\$ 3.3 billion across 90 countries (with 91% of global cases) that reported data, up from less than US\$ 1 billion in 2002. Nonetheless, these same countries reported funding gaps totalling US\$ 385 million in 2008; only five of the 22 high-burden countries reported no funding gap. The gap between the funding reported to be available by countries and the funding requirements estimated to be needed for the same countries in the Global Plan is larger still: US\$ 1 billion. This is mainly due to the higher funding requirements for collaborative TB/HIV activities, management of MDR-TB and ACSM in the Global Plan, compared with country reports.

Progress in case detection slowed globally in 2006 and began to stall in China and India. The detection rate in the African Region remains low in absolute terms. Budgets stagnated between 2007 and 2008 in all but fi ve of the 22 high-burden countries. Incidence rates are falling slowly compared with the 5–10% decline annually that is theoretically feasible. Renewed effort to accelerate progress in global TB control in line with the expectations of the Global Plan, supported by intensifi ed resource mobilization from domestic and donor sources, is needed.

# Key points

#### The global burden of TB

- 1. There were an estimated 9.2 million new cases of TB in 2006 (139 per 100 000 population), including 4.1 million new smear-positive cases (44% of the total) and 0.7 million HIV-positive cases (8% of the total). This is an increase from 9.1 million cases in 2005, due to population growth. India, China, Indonesia, South Africa and Nigeria rank first to fifth respectively in terms of absolute numbers of cases. The African Region has the highest incidence rate per capita (363 per 100 000 population).
- 2. There were an estimated 14.4 million prevalent cases of TB in 2006.
- 3. There were an estimated 0.5 million cases of multidrug-resistant TB (MDR-TB) in 2006.
- 4. In 2006 there were an estimated 1.5 million deaths from TB in HIV-negative people and 0.2 million among people infected with HIV.
- 5. In 2007, a total of 202 (out of 212) countries and territories reported TB notification data for 2006 to WHO. A total of 5.1 million new cases (out of the estimated 9.2 million new cases) were notified for 2006 among these 202 countries and territories, of which 2.5 million (50%) were new smear-positive cases. The African, South-East Asia and Western Pacific regions accounted for 83% of total case notifications.

#### **Targets and strategies for TB control**

- 6. Targets for global TB control have been set within the framework of the Millennium Developments Goals (MDGs). MDG 6 Target 6.C is to halt and reverse incidence by 2015. The Stop TB Partnership has set two additional impact targets, which are to halve prevalence and death rates by 2015 compared with their level in 1990. The outcome targets first set by the World Health Assembly in 1991 are to detect at least 70% of new smear-positive cases in DOTS programmes and to successfully treat at least 85% of detected cases. All five targets have been adopted by the Stop TB Partnership and, in 2007, were recognized in a World Health Assembly resolution (WHA 60.19).
- 7. The Stop TB Strategy launched by WHO in 2006 is designed to achieve the 2015 impact targets as well as the targets for case detection and treatment

success. The Global Plan, launched in January 2006, details the scale at which the six components of the Stop TB Strategy should be implemented to achieve these targets, and the funding required, for each year 2006–2015.

8. The Stop TB Strategy has six major components: (i) DOTS expansion and enhancement; (ii) addressing TB/HIV, MDR-TB and other challenges; (iii) contributing to health system strengthening; (iv) engaging all care providers; (v) empowering patients, and communities; and (vi) enabling and promoting research.

#### **Implementing the Stop TB Strategy**

DOTS expansion and enhancement

9. DOTS was being implemented in 184 countries that accounted for 99% of all estimated TB cases and 93% of the world's population in 2006. A total of 4.9 million new cases of TB were notified by DOTS programmes in 2006 (98% of the total of 5.1 million new cases notified globally), including 2.5 million new smearpositive cases (99% of the total notified globally). Between 1995 (when reliable records began) and 2006, a total of 31.8 million new and relapse cases, and 15.5 million new smear-positive cases were notified by DOTS programmes.

#### Addressing TB/HIV, MDR-TB and other challenges

- 10. There has been considerable progress in HIV testing among TB patients, and in provision of co-trimoxozole preventive therapy (CPT) and antiretroviral therapy (ART) to HIV-positive TB patients.
- 11. Almost 700 000 TB patients were tested for HIV in 2006 among all reporting countries, up from 470 000 in 2005 and 22 000 in 2002. The numbers tested in 2006 are equivalent to 12% of TB case notifications globally, and 22% of notified cases in the African Region. Among 11 African countries with over 50% of the world's HIV-positive TB cases that reported data for all years 2002–2006, the percentage of notified cases that were tested quadrupled, from 8% to 35%. Rwanda (76%), Malawi (64%) and Kenya (60%) achieved the highest testing rates, which are also ahead of the 51% target set for the African Region in the Global Plan.
- 12. The number of HIV-positive TB patients treated with CPT reached 147 000 in 2006, equivalent to 78% of the HIV-positive TB patients that were identified

through testing and 2.5 times higher than the 58 000 patients treated with CPT in 2005. The number started on CPT is less than the 0.5 million specified in the Global Plan for 2006; numbers could be increased if more countries emulated the high testing rates of countries such as Rwanda, Malawi and Kenya.

- 13. The number of HIV-positive TB patients enrolled on ART was 67 000 in 2006, more than double the 29 000 reported for 2005 and seven times the 9 800 reported in 2004, but less than the 220 000 target for 2006 in the Global Plan. The proportion of diagnosed HIV-positive TB patients enrolled on ART was 41% compared with the 44% target for 2006 in the Global Plan; as with CPT, one reason why numbers fall short of the Global Plan is that HIV testing rates are not yet high enough.
- 14. Implementation of interventions to reduce the burden of TB in HIV-positive people was far below the targets set in the Global Plan in 2006. The Global Plan target for 2006 was to screen 11 million HIV-positive people for TB disease; the actual figure reported was 314 211. Only 27 000 HIV-positive people without active TB were started on IPT (0.1% of the 33 million people estimated to be infected with HIV), almost all of whom were in Botswana.
- 15. A total of 23 353 cases of MDR-TB were notified in 2006, of which just over half were in the European Region. Among these notified cases, only the 2 032 cases reported from projects and programmes approved by the Green Light Committee (GLC) are known to have been enrolled on treatment that meets the standards established in WHO guidelines.
- 16. The total number of MDR-TB cases that countries forecast will be enrolled on treatment in 2007 and 2008 is about 50 000 in both years. Projections for 2008 are much less than the target of 98 000 that was set in the Global MDR-TB/XDR-TB Response Plan. Most of the shortfall is in the European, South-East Asia and Western Pacific regions, and within these regions in China and India in particular. Major expansion of services that meet the standards established in WHO guidelines is needed.

#### Health system strengthening; engaging all care providers

- 17. Implementation of components 3–6 of the Stop TB Strategy is currently less well understood than for components 1 and 2, because the available data are more limited.
- 18. In the area of health system strengthening (component 3), diagnosis and treatment of TB is fully integrated into general health services in most countries. Links with general health sector or development planning frameworks are variable, but alignment with sector-wide approaches was comparatively good

among reporting countries. The Practical Approach to Lung Health is being piloted or expanded nationwide in 15 countries, and is included in the plans of 73 countries. Many countries lack comprehensive plans for human resource development or a recent assessment of staffing needs.

19. Among the 22 high-burden countries (HBCs) that collectively account for 80% of TB cases globally, 14 are scaling up public–private and public–public mix approaches to involve the full range of care providers in TB control, and seven have used the International Standards for Tuberculosis Care to facilitate this process. However, the contribution of different providers to detection, referral and treatment of cases will remain unclear until recording and reporting forms recommended by WHO are more widely introduced.

## *Empowering patients, and communities; enabling and promoting research*

20. Surveys of Knowledge, Attitudes and Practice (KAP) have been conducted in 13 of the 22 HBCs to help with the design of advocacy, communication and social mobilization (ACSM) activities. However, ACSM is still a new area for many countries, and much more guidance and technical support are necessary. Involvement of communities in TB care was reported by 20 of the 22 HBCs. Operational research (part of component 6) was reported by 49 countries.

#### **Financing TB control**

- 21. The total budgets of national TB control programmes (NTPs) in HBCs amount to US\$ 1.8 billion in 2008, up from US\$ 0.5 billion in 2002 but almost the same as budgets for 2007; NTP budgets for the 90 countries with 91% of global TB cases that reported complete data total US\$ 2.3 billion in 2008. Budgets are typically equivalent to about US\$ 100–300 per patient treated.
- 22. DOTS accounts for the largest single share of NTP budgets in almost all countries. Budgets for the diagnosis and treatment of MDR-TB have become strikingly large in the Russian Federation (US\$ 267 million) and South Africa (US\$ 239 million) and, when combined, these two countries account for 93% of the budgets for MDR-TB reported by HBCs.
- 23. With a few exceptions, NTP budgets do not include the costs associated with using general health system resources, such as staff and infrastructure for TB control. When these costs are added to NTP budgets, we estimate that the total cost of TB control in HBCs will reach US\$ 2.3 billion in 2008 (up from US\$ 0.6 billion in 2002), and US\$ 3.1 billion across 90 reporting countries. Costs per patient treated are generally US\$ 100–400.

- 24. For the 22 HBCs, NTP budgets and our estimates of the total costs of TB control activities planned for 2008 are very similar to those in 2007 for all but five countries (Brazil, Ethiopia, Mozambique, Nigeria and the United Republic of Tanzania). This stagnation is worrying, because it suggests that the deceleration in case detection that occurred between 2005 and 2006 could persist into 2008.
- 25. Funding for TB control has grown to US\$ 2.0 billion in HBCs and US\$ 2.7 billion across the 90 reporting countries in 2008. Increased funding is mainly from domestic sources in Brazil, China, the Russian Federation and South Africa and from Global Fund grants in other countries. Across HBCs in 2008, governments will cover 73% of the total costs of TB control and grants will cover 13% (including US\$ 200 million from the Global Fund). Reported funding gaps for 2008 total US\$ 328 million among HBCs (14% of total costs) and US\$ 385 million across 90 reporting countries (13% of total costs). Only five HBCs reported no funding gap for 2008 (Bangladesh, Ethiopia, India, Indonesia, and South Africa)
- 26. Funding gaps reported by countries would be larger if country plans and assessments of funding requirements were fully aligned with the Global Plan. In 2008, the gap between the total available funding reported by countries and the total funding requirements laid out in the Global Plan is US\$ 0.8 billion in HBCs and US\$ 0.9 billion across all 90 reporting countries. The discrepancy is mostly due to higher budgets for MDR-TB (South-East Asia and Western Pacific regions), collaborative TB/HIV activities (African and South-East Asia regions) and ACSM (all regions) in the Global Plan.
- 27. Several countries have plans and budgets that are well aligned with the Global Plan. Many countries in Africa have embarked upon, and in some cases completed, the development of medium-term plans and budgets using a WHO tool designed to support planning and budgeting in line with targets set out in the Global Plan. Completion of this work, and its expansion to other countries, are now crucial and should form the basis for intensified efforts to mobilize the necessary resources from domestic and donor sources.

#### **Progress towards outcome targets**

28. The case detection rate for new smear-positive cases in DOTS programmes is estimated at 61% globally in 2006 (i.e. the 2.5 million notified cases divided by the 4.1 million estimated cases), a small increase from 2005 but still short of the 70% target. The Western Pacific Region (77%) and 77 countries achieved the 70% target; the Region of the Americas (69%) and the South-East Asia Region were close (67%). The Eastern Mediterranean Region (52%), the European Region (52%) and the African Region (46%) were much further from the target. The European Region could reach the target by increasing both DOTS population coverage and the use of smear microscopy.

- 29. The estimated case detection rate in the African Region in 2006 may be an underestimate, given the difficulty of disentangling the effect of improved programme performance from the effect of the HIV epidemic on notifications. Analytical work of the type recently done in Kenya, and new surveys of the prevalence of disease planned in several African countries, will help to improve the current estimates.
- 30. The treatment success rate in DOTS programmes was 84.7% in 2005, just short of the 85% target. This is the highest rate since reliable monitoring began, despite an increase in the size of the cohort evaluated to 2.4 million patients in 2005. Treatment success rates were lowest in the European Region (71%), the African Region (76%) and the Region of the Americas (78%). The South-East Asia and Western Pacifi c regions and 58 countries achieved the 85% target; the Eastern Mediterranean Region (83%) was close.
- 31. Based on current data and estimates, the Western Pacific Region achieved both the 70% case detection target (in 2006) and the 85% treatment success target (in 2005), as did 32 individual countries including five HBCs: China, Indonesia, Myanmar, the Philippines and Viet Nam.
- 32. Progress in case detection decelerated globally between 2005 and 2006, stalled in China and India, and fell short of the Global Plan milestone of 65% for 2006. The African Region, China and India collectively account for 69% of undetected cases.

#### **Progress towards impact targets**

- 33. Globally, the TB incidence rate per 100 000 population is falling slowly (-0.6% between 2005 and 2006), having peaked around 2003. By 2006, TB incidence per capita was approximately stable in the European Region and in slow decline in all other WHO regions (from 0.5% between 2005 and 2006 in the South-East Asia Region to 3.2% between 2005 and 2006 in the Region of the Americas). MDG 6 Target 6.C, to halt and reverse the incidence of TB, will be achieved well before the target date of 2015 if the global trend is sustained.
- 34. Prevalence and death rates per capita are falling, and faster than TB incidence. Globally, prevalence rates fell by 2.8% between 2005 and 2006, to 219 per 100 000 population (compared with the 2015 target of 147 per 100 000 population). Death rates fell by 2.6% between 2005 and 2006, to 25 per 100 000 population (compared with the 2015 target of 14 per 100 000

population). These estimates and targets include cases and deaths in HIV-positive people.

- 35. If trends in prevalence and death rates for the past five years are sustained, the Stop TB Partnership targets of halving prevalence and death rates by 2015 compared with 1990 levels could be achieved in the South-East Asia, Western Pacific and Eastern Mediterranean regions, and in the Region of the Americas. Targets are unlikely to be achieved globally, however, because the African and European regions are far from the targets. For example, deaths are estimated at 83 per 100 000 population in 2006 in the African Region, compared with a target for the region of 21.
- 36. While DOTS programmes are reducing death and prevalence rates, a new ecological analysis suggests that they have not yet had a major impact on TB transmission and trends in TB incidence around the world. If this is correct, then the challenge is to show that the diagnosis of active TB can be made early enough, and that treatment success rates can be high enough, to have a substantial impact on incidence on a large geographical scale. The greater the impact of TB control on incidence, the more likely it is that prevalence and death rates will be halved by the MDG deadline of 2015.

# Principales constatations

#### La charge mondiale de tuberculose

- On a estimé à 9,2 millions le nombre de nouveaux cas de tuberculose en 2006 (139 pour 100 000) dont 4,1 millions de nouveaux cas à frottis positif (44 % du total) et 0,7 million de VIH-positifs (8 % du total). L'augmentation par rapport aux 9,1 millions de cas en 2005 résulte de la croissance démographique. Les cinq pays qui ont enregistré le plus grand nombre de cas étaient, dans l'ordre, l'Inde, la Chine, l'Indonésie, l'Afrique du Sud et le Nigéria. C'est dans la Région africaine que le taux d'incidence pour 100 000 est le plus élevé (363).
- 2. La prévalence de la tuberculose en 2006 a été estimée à 14,4 millions de cas.
- 3. Le nombre de cas de tuberculose à bacilles multirésistants (tuberculose MR) en 2006 a été estimé à 0,5 million.
- 4. Le nombre de décès par tuberculose en 2006 a été estimé à 1,7 millions dont 0,2 millions VIH-positifs.
- 5. En 2007, 202 pays et territoires (sur 212) ont notifié à l'OMS des données concernant la tuberculose pour 2006. Au total, 5,1 millions de nouveaux cas (sur les 9,2 millions de nouveaux cas estimés) ont été notifiés pour 2006 par ces 202 pays et territoires, dont 2,5 millions (50 %) étaient des nouveaux cas à frottis positif. Trois Régions de l'OMS, l'Afrique, l'Asie du Sud-Est et le Pacifique occidental, totalisaient 83% des cas notifiés.

#### Cibles et stratégies de lutte antituberculeuse

6. Les cibles de la lutte mondiale ont été fixées dans le cadre des objectifs du Millénaire pour le développement (OMD). La cible 6.C de l'OMD 6 consiste à maîtriser la tuberculose et commencer à inverser la tendance d'ici 2015. Le Partenariat Halte à la tuberculose a fixé deux cibles supplémentaires concernant l'impact, qui consistent à réduire de moitié les taux de prévalence et de mortalité d'ici 2015 comparativement au niveau de 1990. Les cibles initialement fixées par l'Assemblée mondiale de la Santé en 1991 consistent à détecter au moins 70 % des nouveaux cas à frottis positif dans le cadre des programmes DOTS et à traiter avec succès au moins 85 % des cas détectés. Les cinq cibles ont été adoptées par le Partenariat Halte à la tuberculose et reconnues en 2007 dans

une résolution de l'Assemblée mondiale de la Santé (WHA60.19).

- 7. La Stratégie Halte à la tuberculose lancée par l'OMS en 2006 vise à atteindre les cibles pour 2015 concernant l'impact ainsi que les cibles concernant la détection des cas et le taux de succès thérapeutiques. Le plan mondial, lancé en janvier 2006, précise à quelle échelle les six éléments de la Stratégie Halte à la tuberculose doivent être appliqués pour atteindre ces cibles et indique le financement nécessaire pour chaque année de 2006 à 2015.
- 8. La Stratégie Halte à la tuberculose comprend six éléments essentiels : i) poursuivre l'extension d'une stratégie DOTS de qualité et son amélioration ; ii) lutter contre la co-infection tuberculose-VIH, contre la tuberculose MR et s'attaquer à d'autres défis ; iii) contribuer au renforcement des systèmes de santé ; iv) impliquer tous les soignants ; v) donner aux personnes atteintes de tuberculose et aux communautés la capacité d'agir et vi) favoriser et promouvoir la recherche.

#### Mise en œuvre de la Stratégie Halte à la tuberculose

### *Poursuivre l'extension d'une stratégie DOTS de qualité et son amélioration*

9. La stratégie DOTS a été appliquée dans 184 pays regroupant 99 % des cas de tuberculose et 93 % de la population mondiale en 2006. Au total, 4.9 millions de nouveaux cas de tuberculose estimés ont été notifiés par des programmes DOTS en 2006 (98 % du total mondial de 5,1 millions de nouveaux cas notifiés), dont 2,5 millions de nouveaux cas à frottis positif (99 % du total mondial des cas notifiés). Entre 1995 (quand on a commencé à disposer de données fiables) et 2006, les programmes DOTS ont notifié en tout 31,8 millions de nouveaux cas à frottis positif.

### *Lutter contre la co-infection tuberculose-VIH, contre la tuberculose MR et s'attaquer à d'autres défis*

10. Des progrès considérables ont été enregistrés concernant le test de dépistage du VIH chez les malades de la tuberculose, et l'administration d'un traitement préventif au cotrimoxazole (TPC) et d'un traitement antirétroviral (ART) aux cas de tuberculose VIH-positifs.

- 11. Près de 700 000 malades de la tuberculose ont subi un test de dépistage du VIH en 2006 dans l'ensemble des pays fournissant des données, contre 470 000 en 2005 et 22 000 en 2002. Le nombre de malades avant subi un test en 2006 représentait 12 % du total mondial de cas de tuberculose notifiés et 22 % des cas notifiés dans la Région africaine. Parmi les 11 pays africains enregistrant plus de 50 % du nombre total de cas de tuberculose chez des VIH-positifs qui ont signalé des données pour l'ensemble des années 2002–2006, le pourcentage des cas notifiés ayant subi un test a quadruplé, passant de 8 % à 35 %. Le Rwanda (76 %), le Malawi (64 %) et le Kenya (60 %) ont présenté les taux de tests de dépistage les plus élevés - des pourcentages supérieurs à la cible de 51 % fixée pour la Région africaine dans le plan mondial.
- 12. Le nombre de malades de la tuberculose VIH-positifs sous CPT a atteint 147 000 en 2006, ce qui correspond à 78 % des cas de tuberculose VIH-positifs recensés par un test de dépistage et à 2,5 fois plus que les 58 000 cas sous CPT en 2005. Le nombre de TPC commencé est inférieur au demi-million prévu par le plan mondial pour 2006 ; il pourrait augmenter si davantage de pays enregistraient des taux de dépistage plus élevés comparables à ceux du Rwanda, du Malawi et du Kenya.
- 13. Le nombre de malades de la tuberculose VIH-positifs commençant un ART a été de 67 000 en 2006, c'est-à-dire plus du double des 29 000 signalés en 2005 et sept fois plus que les 9800 signalés en 2004, mais il reste inférieur à la cible de 220 000 pour 2006, prévue dans le plan mondial. La proportion des cas de tuberculose diagnostiqués comme VIH-positifs commençant un ART était de 41 % contre une cible de 44 % pour 2006 prévue par le plan mondial ; comme pour le TPC, les résultats ont été inférieurs à ceux prévus par le plan mondial en partie en raison de taux de dépistage du VIH pas assez élevés.
- 14. Les interventions visant à réduire la charge de morbidité tuberculeuse chez les VIH-positifs sont bien en deçà des cibles fixées dans le plan mondial en 2006. La cible du plan mondial pour 2006 prévoyait le dépistage de 11 millions de VIH-positifs pour la tuberculose alors que le nombre effectivement signalé était de 314 211. Seuls 27 000 VIH-positifs sans tuberculose évolutive ont commencé un traitement préventif à l'isoniazide (0,1 % des 33 millions de sujets qu'on estime infectés par le VIH), presque tous au Botswana.
- 15. Au total, 23 353 cas de tuberculose MR ont été notifiés en 2006 dont un peu plus de la moitié dans la Région européenne. Parmi ces cas notifiés, on sait qu'un traitement répondant aux normes fixées par les directives de l'OMS a commencé uniquement pour les 2 032 cas signalés par des projets et des pro-

grammes approuvés par le Comité Feu Vert.

16. Le nombre total de cas de tuberculose MR pour lesquels les pays prévoient de commencer un traitement en 2007 et 2008 est d'environ 50 000 pour chacune des deux années. Les projections pour 2008 sont bien inférieures à la cible de 98 000 fixée dans le plan d'intervention mondial contre la tuberculose MR et ultrarésistante. C'est surtout en Europe, en Asie du Sud-Est et dans le Pacifique occidental, et dans ces deux dernières Régions en Chine et en Inde en particulier, que le déficit est le plus important. Une forte extension des services s'impose pour atteindre les normes fixées dans les directives de l'OMS.

### *Renforcer les systèmes de santé ; impliquer tous les soignants*

- 17. La mise en œuvre des éléments 3 à 6 de la Stratégie Halte à la tuberculose est actuellement moins bien comprise que celle des éléments 1 et 2, les données disponibles étant plus limitées.
- 18. Dans le domaine du renforcement des systèmes de santé (élément 3), le diagnostic et le traitement de la tuberculose sont entièrement intégrés aux services de santé généraux dans la plupart des pays. Les liens avec les cadres de planification du secteur de la santé en général ou du développement varient, mais l'alignement sur des approches sectorielles est assez satisfaisant dans les pays notifiant des données. L'approche pratique de la santé respiratoire est appliquée au stade pilote ou élargie à l'échelle nationale par 15 pays et figure dans les plans de 73 pays. De nombreux pays ne disposent pas encore de plans complets de développement des ressources humaines ni d'une évaluation récente des besoins en personnels.
- 19. Parmi les 22 pays à forte charge de morbidité tuberculeuse qui regroupent 80 % des cas dans le monde, 14 sont en train de renforcer leurs approches publicprivé et public-public pour associer tout l'éventail des dispensateurs de soins à la lutte antituberculeuse, et sept ont utilisé les normes internationales de soins pour la tuberculose afin de faciliter le processus. La contribution des différents dispensateurs à la détection, à la référence et au traitement des cas restera incertaine tant que les formulaires dont l'OMS a recommandé l'utilisation pour l'enregistrement et la notification n'auront pas été plus largement introduits.

#### Donner aux personnes atteintes de tuberculose et aux communautés la capacité d'agir ; encourager et promouvoir la recherche

20. Des enquêtes sur les connaissances, les attitudes et les pratiques ont été effectuées dans 13 des 22 pays à forte morbidité pour contribuer à la mise au point d'activités de sensibilisation, de communication et de mobilisation sociale. Il s'agit là toutefois d'un domaine encore nouveau pour de nombreux pays qui ont besoin de recommandations et d'un appui technique bien plus importants. Vingt des 22 pays à forte morbidité ont fait état d'une participation des communautés aux soins. La recherche opérationnelle (qui fait partie de l'élément 6) a été mentionnée par 49 pays.

#### Financer la lutte antituberculeuse

- 21. Les budgets des programmes nationaux de lutte antituberculeuse dans les pays à forte morbidité s'établissent au total à US \$1,8 milliard en 2008, contre US \$0,5 milliard en 2002, le montant total pour 2008 étant pratiquement le même qu'en 2007; les budgets de ces programmes pour les 90 pays regroupant 91 % des cas mondiaux de tuberculose et qui ont signalé des données complètes s'établissent au total à US \$2,3 milliards en 2008. Ces budgets correspondent à des dépenses de l'ordre de US \$100 à 300 par malade soigné.
- 22. La stratégie DOTS absorbe la part la plus importante des budgets de la tuberculose dans la plupart des pays. Les budgets consacrés au diagnostic et au traitement de la tuberculose MR sont devenus particulièrement importants en Fédération de Russie (US \$267 millions) et en Afrique du Sud (US \$239 millions) et ils représentent ensemble 93 % des budgets de pays à forte morbidité consacrés à la tuberculose MR.
- 23. A quelques exceptions près, les budgets nationaux de la tuberculose n'englobent pas les coûts associés à l'utilisation des ressources des systèmes de santé généraux, par exemple les personnels et l'infrastructure de la lutte antituberculeuse. En ajoutant ces coûts aux budgets nationaux de la tuberculose, on estime que le coût total de la lutte antituberculeuse dans les pays à forte morbidité atteindra US \$2,3 milliards en 2008 (contre 0,6 milliard en 2002), et US \$3,1 milliards pour les 90 pays notifiant des données. Les coûts par malade traité sont généralement de l'ordre de US \$100 à 400.
- 24. Dans les 22 pays à forte morbidité, les budgets nationaux et les estimations du coût total des activités de lutte antituberculeuse prévus en 2008 sont très semblables à 2007, sauf dans cinq cas (Brésil, Ethiopie, Mozambique, Nigéria et République-Unie de Tanzanie). Cette stagnation est préoccupante car elle semble indiquer que la décélération en matière de détection des cas observée en 2005 et 2006 pourrait se maintenir en 2008.
- 25. Le financement de la lutte antituberculeuse est passé en 2008 à US \$2,0 milliards dans les pays à forte morbidité et à US \$2,7 milliards dans les 90 pays notifi ant des données. L'augmentation provient principale-

ment de ressources intérieures en Afrique du Sud, au Brésil, en Chine et en Fédération de Russie et de subventions du Fonds mondial dans les autres pays. Dans l'ensemble des pays à forte morbidité en 2008, les autorités nationales couvriront 73 % de l'ensemble des coûts de la lutte antituberculeuse et les subventions 13 % (dont US \$200 millions du Fonds mondial). Les défi cits de fi nancement signalés pour 2008 atteignent au total US \$328 millions dans les pays à forte morbidité (14 % de l'ensemble des coûts) et US \$385 millions dans les 90 pays notifi ant des données (13 % de l'ensemble des coûts). Seuls cinq des pays à forte morbidité n'ont pas signalé de défi cit de financement pour 2008 (Afrique du Sud, Bangladesh, Ethiopie, Inde et Indonésie).

- 26. Les déficits de financement signalés par les pays seraient plus importants si l'on alignait les plans des pays et les évaluations des besoins de fonds sur le plan mondial. Pour 2008, l'écart entre le montant total des fonds disponibles indiqué par les pays et le montant total des besoins de fi nancement prévu dans le plan mondial est de US \$0,8 milliard dans les pays à forte morbidité et de US \$0,9 milliard dans l'ensemble des pays notifiant des données. La différence est due en grande partie aux budgets plus élevés consacrés à la tuberculose MR (Régions de l'Asie du Sud-Est et du Pacifique occidental), aux activités de collaboration tuberculose/VIH (Régions de l'Afrique et de l'Asie du Sud-Est) et aux activités de sensibilisation, de communication et de mobilisation sociale (ensemble des Régions) dans le plan mondial.
- 27. Plusieurs pays ont des plans et des budgets qui sont bien alignés sur le plan mondial. De nombreux pays d'Afrique ont commencé, et dans certains cas mené à bien, la mise au point de plans et de budgets à moyen terme utilisant un outil de l'OMS qui vise à appuyer la planification et la budgétisation conformément aux cibles fixées dans le plan mondial. Il est maintenant crucial de mener à bien ce travail et de l'étendre à d'autres pays pour servir de base aux efforts intensifiés visant à mobiliser les ressources nécessaires sur le plan interne et auprès des donateurs.

#### Progrès réalisés en vue d'atteindre les cibles en matière de résultats

28. Le taux mondial de détection des cas pour les nouveaux cas à frottis positif dans les programmes DOTS est estimé à 61 % en 2006 (ce qui correspond aux 2,5 millions de cas notifi és divisés par les 4,1 millions de cas estimés), en légère augmentation par rapport à 2005, mais encore loin de la cible de 70 %. La Région du Pacifi que occidental (77 %) ainsi que 77 pays ont atteint la cible de 70 % ; alors que la Région des Amériques (69 %) et celle de l'Asie du Sud-Est (67 %) sont un peu au-dessous. En revanche, les autres Régions sont beaucoup plus éloignées

de la cible, à savoir la Méditerranée orientale (52 %), l'Europe (52 %) et l'Afrique (46 %). La Région européenne pourrait atteindre la cible en améliorant la couverture de la population par la stratégie DOTS ainsi qu'en recourant à l'examen microscopique des frottis.

- 29. Le taux estimé de détection des cas dans la Région africaine en 2006 est peut-être en deçà de la réalité, car il est difficile de distinguer l'effet de l'amélioration des programmes de l'effet de l'épidémie de VIH sur les notifications. Les travaux analytiques du genre de ceux qui ont récemment été entrepris au Kenya, et les nouvelles enquêtes sur la prévalence de la maladie prévues dans plusieurs pays africains, contribueront à améliorer les estimations.
- 30. Le taux des succès thérapeutiques dans le cadre des programmes DOTS était de 84,7 % en 2005, juste au-dessous de la cible de 85 %. C'est là le taux le plus élevé obtenu depuis l'introduction d'un suivi fiable, malgré l'augmentation de la taille de la cohorte évaluée à 2,4 millions de patients en 2005. Les taux de succès thérapeutiques les plus faibles ont été enregistrés dans la Région européenne (71 %), la Région africaine (76 %) et la Région des Amériques (78 %). La Région de l'Asie du Sud-Est et celle du Pacifique occidental ainsi que 58 pays ont atteint la cible de 85 % et la Région de la Méditerranée orientale, avec 83 %, n'en était pas loin.
- 31. Sur la base des données et des estimations actuelles, la Région du Pacifique occidental a atteint la cible de détection des cas de 70 % (en 2006) et la cible des succès thérapeutiques de 85 % (en 2005), de même que 32 pays dont cinq parmi ceux à forte morbidité, à savoir la Chine, l'Indonésie, le Myanmar, les Philippines et le Viet Nam.
- 32. On a observé un ralentissement des progrès dans le domaine de la détection des cas au niveau mondial entre 2005 et 2006, et un coup d'arrêt en Chine et en Inde, la cible de 65 % pour 2006 fixée dans le plan mondial n'ayant pas été atteinte. Ensemble, la Région africaine, la Chine et l'Inde regroupent 69 % des cas non détectés.

### Progrès réalisés en vue d'atteindre les cibles concernant líimpact

 Au niveau mondial, le taux d'incidence de la tuberculose pour 100 000 a légèrement diminué (-0,6 % entre 2005 et 2006), après avoir atteint un pic vers 2003. En 2006, le taux d'incidence pour 100 000 était relativement stable dans la Région européenne et légèrement en baisse dans toutes les autres Régions de l'OMS (la diminution entre 2005 et 2006 s'établissant entre 0,5 % dans la Région de l'Asie du Sud-Est et 3,2 % dans la Région des Amériques). La cible 6.C de l'OMD 6, qui vise à maîtriser la tuberculose et à commencer à inverser la tendance, sera atteinte bien avant la date butoir de 2015 si la tendance mondiale est maintenue.

- 34. Les taux de prévalence et de mortalité pour 100 000 diminuent plus rapidement que l'incidence. Au niveau mondial, les taux de prévalence ont diminué de 2,8 % entre 2005 et 2006, étant ramenés à 219 pour 100 000 (alors que la cible pour 2015 était de 147 pour 100 000). Les taux de mortalité ont eux diminué de 2,6 % entre 2005 et 2006, pour atteindre 25 pour 100 000 (alors que la cible pour 2015 était de 14 pour 100 000).
- 35. Si les tendances de la prévalence et de la mortalité des cinq dernières années sont maintenues, les cibles du Partenariat Halte à la tuberculose qui consistent à réduire de moitié les taux de prévalence et de mortalité d'ici 2015 comparativement aux niveaux de 1990 pourraient être atteintes dans les Régions de l'Asie du Sud-Est, du Pacifique occidental et de la Méditerranée orientale, ainsi que dans celle des Amériques. Mais il est peu probable que l'on réussira à atteindre les cibles au niveau mondial, car les Régions africaine et européenne sont loin du niveau fi xé. C'est ainsi qu'on estime à 83 pour 100 000 les décès en 2006 dans la Région africaine, alors que la cible pour la Région est de 21.
- 36. Alors que les programmes DOTS parviennent à réduire les taux de mortalité et de prévalence, une nouvelle analyse écologique laisse penser qu'ils n'ont pas encore eu un impact majeur sur la transmission et les tendances de l'incidence tuberculeuse dans le monde entier. Si tel est le cas, le défi consiste à montrer que le diagnostic de tuberculose évolutive peut être réalisé suffisamment tôt, et que les taux de succès thérapeutique peuvent être suffi samment élevés pour avoir un impact substantiel sur l'incidence sur une grande échelle géographique. Plus l'impact de la lutte antituberculeuse sur l'incidence est important, plus on a de chances de réduire de moitié les taux de prévalence et de mortalité d'ici la date butoir de 2015 pour les OMD.

# Resultados fundamentales

#### La carga mundial de la tuberculosis

- El número estimado de nuevos casos de tuberculosis en 2006 fue de 9,2 millones (139 por 100 000 habitantes), entre ellos 4,1 millones de nuevos casos bacilíferos (44% del total) y 0,7 millones de casos VIH-positivos (8% del total). El incremento respecto de los 9,1 millones de casos de 2005 se debe al crecimiento de la población. La India, China, Indonesia, Sudáfrica y Nigeria ocupan, por este orden, los cinco primeros puestos en cifras absolutas de casos. La Región de África es la de mayor tasa de incidencia (363 por 100 000 habitantes).
- 2. En 2006 se estima que hubo 14,4 millones de casos prevalentes de tuberculosis.
- 3. La cifra estimada de casos de tuberculosis multirresistente en 2006 fue de 0,5 millones de casos.
- 4. La cifra estimada de defunciones por tuberculosis en 2006 fue de 1,7 millones, incluidos 0,2 millones de personas infectadas por el VIH.
- 5. En 2007, 202 de 212 países y territorios comunicaron a la OMS datos de notificación de la tuberculosis correspondientes a 2006. Para ese año, se notificó un total de 5,1 millones de casos nuevos (de una cifra estimada de 9,2 millones de casos nuevos) en esos 202 países y territorios, de los cuales 2,5 millones (50%) eran nuevos casos bacilíferos. El 83% del total de casos correspondió a las Regiones de África, Asia Sudoriental y el Pacífico Occidental.

#### Metas y estrategias para el control de la tuberculosis

6. Las metas para el control mundial de la tuberculosis se han fijado en el marco de los Objetivos de Desarrollo del Milenio (ODM). La meta 6.C, incluida en el ODM 6, consiste en haber detenido y comenzado a reducir la incidencia para el año 2015. La Alianza Alto a la Tuberculosis ha fijado otras dos metas de impacto, que son reducir a la mitad respecto de los niveles de 1990 las tasas de prevalencia y de mortalidad antes de 2015. Las metas de resultados fijadas en primer lugar por la Asamblea Mundial de la Salud en 1991 son detectar al menos el 70% de los nuevos casos bacilíferos en los programas DOTS y tratar satisfactoriamente a al menos el 85% de los casos detectados. Las cinco metas han sido adoptadas por la Alianza Alto a la Tuberculosis y, en 2007, fueron reconocidas en una resolución de la Asamblea Mundial de la Salud (WHA60.19).

- 7. La estrategia Alto a la Tuberculosis, lanzada por la OMS, en 2006, está diseñada para alcanzar las metas de impacto de 2015 así como las metas en materia de detección de casos y éxito terapéutico. El Plan Mundial, lanzado en enero de 2006, detalla la escala en la que deben aplicarse los seis componentes de la estrategia Alto a la Tuberculosis para alcanzar esas metas, así como los fondos necesarios, para cada año entre 2006 y 2015.
- 8. La estrategia Alto a la Tuberculosis consta de seis grandes componentes: i) expandir y mejorar el DOTS; ii) hacer frente a la tuberculosis acompañada del VIH, la tuberculosis multirresistente y otros problemas; iii) contribuir al fortalecimiento de los sistemas de salud; iv) involucrar a todo el personal de salud; v) dar mayor capacidad de acción a los pacientes y a las comunidades, y vi) favorecer y promover las investigaciones.

#### **Ejecución de la estrategia Alto a la Tuberculosis** *Expansión y mejora del DOTS*

9. En 2006, el DOTS se estaba ejecutando en 184 países que albergaban el 99% de los casos de tuberculosis y el 93% de la población mundial. En ese año, los programas de DOTS notificaron un total de 4,9 millones de nuevos casos de tuberculosis (un 98% del total de 5,1 millones de casos nuevos notificados en todo el mundo), entre ellos 2,5 millones de nuevos casos bacilíferos (un 99% del total de nuevos casos bacilíferos (un 99% del total de nuevos casos bacilíferos notificados en todo el mundo). Entre 1995, cuando comenzaron los registros fiables, y 2006 los programas de DOTS notificaron un total de 31,8 millones de casos nuevos y recaídas y 15,5 millones de nuevos casos bacilíferos.

### *Hacer frente a la tuberculosis acompañada de VIH, la tuberculosis multirresistente y otros problemas*

- 10. Se ha avanzado considerablemente en la realización de pruebas de detección del VIH entre pacientes de tuberculosis, así como en la administración de tratamiento preventivo con cotrimoxazol y tratamiento antirretroviral (TAR) a los pacientes de tuberculosis VIH-positivos.
- 11. En 2006 casi 700 000 pacientes se sometieron a las pruebas de detección del VIH en todos los países

notificantes, frente a los 470 000 de 2005 y los 22 000 de 2002. La cifra de 2006 equivale al 12% de los casos de tuberculosis notificados en todo el mundo, y al 22% de los casos notificados en la Región de África. En los 11 países africanos con más del 50% de los casos de tuberculosis VIH-positivos del mundo y que notificaron datos todos los años comprendidos entre 2002 y 2006, el porcentaje de casos notificados que fueron sometidos a pruebas de detección se cuadruplicó, del 8% al 35%. Rwanda (76%), Malawi (64%) y Kenya (60%) alcanzaron las tasas más altas de realización de pruebas de detección y con ello se situaron por delante de la meta del 51% fijada en el Plan Mundial para la Región de África.

- 12. El número de pacientes de tuberculosis VIH-positivos a los que se administró profilaxis tratados con cotrimoxazol se elevó a 147 000 en 2006, lo que equivale al 78% de los pacientes tuberculosos con VIH que se detectaron gracias a las pruebas, y es 2,5 veces mayor que los 58 000 pacientes tratados con cotrimoxazol en 2005. La cifra de los que empezaron la profilaxis con cotrimoxazol no llega a los 0,5 millones indicados en el Plan Mundial para 2006; podría aumentar si más países emularan las elevadas tasas de realización de pruebas de detección de países como Rwanda, Malawi y Kenya.
- 13. El número de pacientes de tuberculosis VIH-positivos participantes en el TAR fue de 67 000 en 2006, más del doble de los 29 000 notificados en 2005 y siete veces los 9800 notificados en 2004, aunque no sellegó a la meta de 220 000 indicada en el Plan Mundial para 2006. La proporción de pacientes de tuberculosis con diagnóstico positivo de VIH inscritos en el TAR fue del 41% frente a la meta del 44% del Plan Mundial para 2006. Como con la profilaxis con cotrimoxazol, una de las razones de que las cifras no alcancen las previstas en el Plan Mundial es que las tasas de realización de pruebas de detección del VIH aún no son lo bastante altas.
- 14. La ejecución de intervenciones para reducir la carga de la tuberculosis entre las personas VIH-positivas estuvo muy por debajo de lo previsto en el Plan Mundial para 2006. La meta del Plan Mundial para 2006 consistía en someter a 11 millones de personas VIH-positivas a pruebas de detección de la tuberculosis; la cifra real comunicada fue de 314 211. Sólo 27 000 VIH-positivos sin tuberculosis activa comenzaron a recibir tratamiento preventivo intermitente (el 0,1% de los 33 millones de personas que se estima están infectadas por el VIH), casi todos ellos en Botswana.
- 15. En 2006 se notificó un total de 23 353 casos de tuberculosis multirresistente, de los cuales algo más de la mitad se encontraban en la Región de Europa. De esos casos notificados, sólo se sabe con seguridad

que han comenzado un tratamiento que cumple las directrices de la OMS los 2032 casos notificados por proyectos y programas aprobados por el Comité Luz Verde.

16. La cifra total de casos de tuberculosis multirresistente que los países prevén que comenzarán el tratamiento en 2007 y 2008 es de unos 50 000 en ambos años. Las proyecciones para 2008 son muy inferiores a la meta de 98 000 fijada en el Plan Mundial de Respuesta ante la Tuberculosis Multirresistente y Extremadamente Resistente. El mayor retraso se observa en las Regiones de Europa, Asia Sudoriental y Pacífico Occidental, y dentro de esas regiones en China y la India. Se necesita proceder a una importante expansión de servicios que cumplan las normas establecidas en las directrices de la OMS.

### Fortalecimiento de los sistemas de salud: involucrar a todo el personal de salud

- 17. Actualmente, la ejecución de los componentes 3 a 6 de la estrategia Alto a la Tuberculosis no se comprende tan bien como la de los componentes 1 y 2, pues los datos disponibles son más limitados.
- 18. En la esfera del fortalecimiento de los sistemas de salud (componente 3), el diagnóstico y el tratamiento de la tuberculosis están plenamente integrados en los servicios de salud generales en la mayoría de los países. La relación con el sector sanitario en general o con los marcos de planificación del desarrollo es variable, pero el alineamiento con los enfoques sectoriales fue comparativamente bueno entre los países informantes. El enfoque práctico de la salud pulmonar se está ensayando o ampliando a escala nacional en 15 países y figura en los planes de 72 países. Muchos países carecen de planes integrales de desarrollo de recursos humanos o de una evaluación reciente de las necesidades de dotación de personal.
- 19. Entre los 22 países con alta carga de morbilidad, que colectivamente albergan el 80% de los casos de tuberculosis en el mundo, 14 están expandiendo los enfoques de asociación publicoprivada o entre entidades públicas para hacer participar a todo el abanico de proveedores de atención de salud en la lucha contra la tuberculosis, y siete han utilizado las normas internacionales de tratamiento de la tuberculosis para facilitar ese proceso. Sin embargo, la contribución de distintos proveedores a la detección, el envío y el tratamiento de casos seguirá estando poco clara hasta que se difundan más ampliamente los formularios de notificación y registro recomendados por la OMS.

# Dar más capacidad de acción a los pacientes y las comunidades; permitir y promover las investigaciones

20. Se han realizado encuestas sobre conocimientos, actitudes y prácticas en 13 de los 22 países con alta

carga de morbilidad para ayudar con el diseño de las actividades de promoción, comunicación y movilización social. Esas actividades, no obstante, aún resultan bastante nuevas en algunos países, que necesitan mucha más orientación y apoyo técnico. Veinte de los 22 países con alta carga de morbilidad han informado de la participación de las comunidades en la atención de la tuberculosis. Cuarenta y nueve países informaron de investigaciones operacionales (parte del componente 6).

#### Financiación de la lucha contra la tuberculosis

- 21. Los presupuestos totales de los programas nacionales de lucha contra la tuberculosis en los países con alta carga de morbilidad se elevan a US\$ 1800 millones en 2008, frente a US\$ 500 millones en 2002, aunque permanecen casi al mismo nivel que los presupuestos de 2007; los presupuestos de los programas nacionales de los 90 países con el 91% de los casos mundiales de tuberculosis que comunicaron datos completos suman US\$ 2300 millones en 2008. Los presupuestos son típicamente equivalentes a unos US\$ 100–US\$ 300 por paciente tratado.
- 22. El DOTS representa la parte más importante de los presupuestos de los programas antituberculosos nacionales en casi todos los países. Los presupuestos para el diagnóstico y el tratamiento de la tuberculosis multirresistente han crecido de manera muy llamativa en la Federación de Rusia (US\$ 267 millones) y Sudáfrica (US\$ 239 millones); tomados conjuntamente, los presupuestos de esos dos países representan el 93% de los presupuestos para combatir la tuberculosis multirresistente comunicados por los países con alta carga de morbilidad.
- 23. Salvo raras excepciones, los presupuestos de los programas nacionales de lucha contra la tuberculosis no incluyen los costos asociados al uso de recursos del sistema de salud general, como personal e infraestructura para combatir la enfermedad. Cuando esos costos se suman a los presupuestos de los programas, se estima que el costo total de la lucha contra la tuberculosis en los países con alta carga de morbilidad alcanzará los US\$ 2300 millones en 2008 (desde US\$ 600 millones en 2002), y US\$ 3100 millones en los 90 países que presentan informes. Los costos por paciente tratado suelen ser de US\$ 100–US\$ 400.
- 24. En cuanto a los 22 países con alta carga de morbilidad, los presupuestos de los programas nacionales de lucha y nuestras estimaciones de los costos totales de las actividades de control de la tuberculosis previstas para 2008 son muy parecidos a los de 2007 en todos los países salvo cinco (Brasil, Etiopía, Mozambique, Nigeria y República Unida de Tanzanía). Este estancamiento resulta preocupante, pues sugiere que la desaceleración en la detección de casos que

tuvo lugar entre 2005 y 2006 podría prolongarse en 2008.

- 25. En 2008, los fondos destinados a la lucha contra la tuberculosis han crecido hasta US\$ 2000 millones en los países con alta carga de morbilidad y US\$ 2700 millones en los 90 países informantes. El aumento de fondosprocedeprincipalmentedefuentesnacionales en el Brasil, China, la Federación de Rusia y Sudáfrica, y de donaciones del Fondo Mundial en otros países. En todos los países con alta carga de morbilidad, los gobiernos sufragarán en 2008 el 73% de los costos totales de la lucha antituberculosa y las donaciones cubrirán el 13% (incluidos US\$ 200 millones del Fondo Mundial). Los déficits de financiación comunicados para 2008 alcanzan un total de US\$ 328 millones entre los países con alta carga de morbilidad (14% de los costos totales) y US\$ 385 millones en los 90 países informantes (13% de los costos totales). Sólo cinco países con alta carga de morbilidad informaron de que no tenían déficit de financiación en 2008 (Bangladesh, Etiopía, India, Indonesia y Sudáfrica).
- 26. Los déficits de financiación comunicados por los países serían mayores si los planes y las evaluaciones de las necesidades de fondos en los países concordaran plenamente con el Plan Mundial. En 2008, la diferencia entre el total de fondos disponibles comunicado por los países y las necesidades totales de fi nanciación expuestas en el Plan Mundial es de US\$800 millones en los países con alta carga de morbilidad y US\$ 900 millones en los 90 países informantes. La discrepancia se debe sobre todo a los presupuestos más elevados para la tuberculosis multirresistente (Asia Sudoriental y Pacífico Occidental), actividades colaborativas contra la tuberculosis y el VIH (África y Asia Sudoriental) y actividades de promoción, comunicación y movilización social (todas las regiones) en el Plan Mundial.
- 27. Varios países tienen planes y presupuestos bien alineados con el Plan Mundial. Muchos países de África han emprendido, y en algunos casos terminado, la elaboración de planes y presupuestos a plazo medio utilizando un instrumento de la OMS diseñado para apoyar la formulación de planes y presupuestos de acuerdo con las metas establecidas en el Plan Mundial. La terminación de estos trabajos y su expansión a otros países son ahora cruciales y deben constituir la base de esfuerzos mayores para movilizar los recursos necesarios tanto de procedencia interna como de donantes.

### Progresos realizados hacia las metas en materia de resultados

28. La tasa de detección de nuevos casos bacilíferos en los programas de DOTS se estima en un 61% a escala mundial en 2006 (es decir, los 2,5 millones de casos

notificados divididos por los 4,1 millones de casos estimados), lo que representa un ligero aumento con respecto a 2005 pero no llega a la meta del 70%. La Región del Pacífico Occidental (77%) y 77 países alcanzaron la meta del 70%; la Región de las Américas (69%) y la Región de Asia Sudoriental (67%) se acercaron a ella. Las Regiones del Mediterráneo Oriental (52%), Europa (52%) y África (46%) estuvieron mucho más lejos de la meta. La Región de Europa podría alcanzar la meta aumentando tanto la cobertura de la población con DOTS como el uso de microscopia de frotis.

- 29. Es posible que la tasa estimada de detección de casos en la Región de África en 2006 sea inferior a la real, dada la dificultad de separar el efecto de la mejora en los resultados de los programas del efecto de la epidemia de VIH en las notificaciones. Los trabajos analíticos como los realizados recientemente en Kenya y las nuevas encuestas de prevalencia de la enfermedad previstas en varios países africanos ayudarán a mejorar las estimaciones actuales.
- 30. La tasa de éxito terapéutico de los programas DOTS fue del 84,7% en 2005, prácticamente la meta del 85%. Se trata de la tasa más elevada desde que comenzaron las observaciones fiables, a pesar del aumento del tamaño de la cohorte evaluada a 2,4 millones de pacientes en 2005. Las tasas de éxito terapéutico fueron particularmente bajas en las Regiones de Europa (71%), África (76%) y las Américas (78%). Las Regiones de Asia Sudoriental y del Pacífico Occidental y 58 países alcanzaron la meta del 85%; la Región del Mediterráneo Oriental se acercó a ella (83%).
- 31. De acuerdo con los datos y las estimaciones actuales, la Región del Pacífico Occidental llegó tanto a la meta de detección de casos (70%) en 2006 como a la meta de éxito terapéutico (85%) en 2005, al igual que otros 32 países, incluidos cinco países con alta carga de morbilidad: China, Indonesia, Myanmar, Filipinas y Viet Nam.
- 32. El avance en la detección de casos se desaceleró en todo el mundo entre 2005 y 2006, se estancó en China y la India, y no llegó a la cifra del 65% fijada en el Plan Mundial para 2006. La Región de África, China y la India colectivamente albergan al 69% de los casos no detectados.

#### Avance hacia las metas de impacto

 A escala mundial, la incidencia de la tuberculosis por 100 000 habitantes está disminuyendo lentamente (-0,6% entre 2005 y 2006), tras haber alcanzado un máximo en torno a 2003. En 2006, la incidencia era aproximadamente estable en la Región de Europa y disminuía lentamente en todas las demás regiones de la OMS (desde el 0,5% entre 2005 y 2006 en la Región de Asia Sudoriental hasta el 3,2% entre 2005 y 2006 en la Región de las Américas). La meta 6.C del ODM 6, detener e invertir la incidencia de la tuberculosis, se conseguirá bastante antes de la meta fijada para 2015 si se mantiene la tendencia mundial.

- 34. Las tasas de prevalencia y de mortalidad están disminuyendo, y más deprisa que la incidencia de la tuberculosis. A escala mundial, las tasas de prevalencia cayeron en un 2,8% entre 2005 y 2006, hasta 219 por 100 000 habitantes (en comparación con la meta de 147 por 100 000 habitantes en 2015). Las tasas de mortalidad se redujeron en un 2,6% entre 2005 y 2006, hasta 25 por 100 000 habitantes (en comparación con la meta de 14 por 100 000 habitantes en 2015). Estas estimaciones y metas incluyen casos y muertes en personas VIH-positivas.
- 35. Si se mantienen las tendencias de las tasas de prevalencia y de mortalidad de los últimos cinco años, las metas de la Alianza Alto a la Tuberculosis de reducir a la mitad esas tasas antes de 2015 en relación con las cifras de 1990 podrían conseguirse en las Regiones de Asia Sudoriental, el Pacífico Occidental y el Mediterráneo Oriental, así como en la Región de las Américas. No es probable, sin embargo, que se alcancen las metas a escala mundial, dado que las Regiones de África y Europa se encuentran alejadas de ellas. Por ejemplo, en la Región de África se estima una tasa de mortalidad de 83 por 100 000 habitantes en 2006, frente a la meta de 21 prevista para la región.
- 36. Mientras que los programas DOTS están reduciendo las tasas de mortalidad y de prevalencia, un nuevo análisis ecológico sugiere que aún no han ejercido un efecto importante en la transmisión de la tuberculosis ni en las tendencias de su incidencia en todo el mundo. Si esto es así, el reto consiste en demostrar que el diagnóstico de la tuberculosis activa puede hacerse con antelación suficiente, y que las tasas de éxito terapéutico pueden ser lo bastante altas como para tener un impacto considerable en la incidencia a una escala geográfica importante. Cuanto mayor sea el impacto del control de la tuberculosis en la incidencia, más probabilidad habrá de que las tasas de prevalencia y de mortalidad sean reducidas a la mitad antes del plazo de 2015 fijado en el ODM.

# Introduction

This report is the twelfth annual report on global control of tuberculosis (TB) published by the World Health Organization (WHO) in a series that started in 1997. It is based on data reported to WHO via its standard data collection form by 202 out of 212 countries and territories in 2007, and on the series of data collected from these countries and territories annually since 1996.

Using these data, we present our latest assessment of the epidemiological burden of TB as well as progress towards targets for global TB control that have been established within the context of the Millennium Development Goals (MDGs) and by the World Health Assembly (WHA) and Stop TB Partnership.<sup>1,2,3,4</sup> The impact targets are to halt and reverse incidence by 2015 (MDG 6 Target 6.C) and to halve prevalence and death rates by 2015 compared with 1990. The outcome targets are to detect at least 70% of new smear-positive cases and to successfully treat 85% of those cases that are detected.

The Stop TB Strategy launched by WHO in 2006 describes the interventions that should be implemented to achieve the 2015 targets, and the Global Plan to Stop TB details the scale at which many of these interventions should be provided.<sup>5,6</sup> The report thus includes analysis of the extent to which the components and subcomponents of the strategy are being implemented, including comparisons with the Global Plan. With implementation of the Stop TB Strategy at the scale needed to achieve global targets dependent on accurate budgeting of the funding required backed up by resource mobilization and effective spending, the third major topic of the report is financing for TB control.

Following these three major themes, the report is structured in three chapters, as follows:

• The global TB epidemic and progress in TB control. This chapter includes estimates of incidence, prevalence and mortality in 2006 and of trends in incidence since 1990; case notifications reported for 2006; estimates of the case detection rate for new smear-positive cases as well as all types of case between 1995 (when reliable monitoring began) and 2006; treatment outcomes between 1994 and 2005 for new and re-treatment cases; and analysis and discussion of progress towards the MDG, Stop TB Partnership and WHA targets. All data are presented globally, for each WHO region and for each of the 22 high-burden countries (HBCs) that collectively account for 80% of TB cases globally.

- *Implementing the Stop TB Strategy*. This chapter describes and assesses implementation of each of the six major components of the strategy as well as their subcomponents. The major components are: (i) DOTS implementation; (ii) addressing TB/HIV, MDR-TB and other challenges; (iii) contributing to health system strengthening; (iv) engaging all care providers; (v) empowering patients, and communities; and (vi) promoting research. The chapter gives most attention to DOTS, collaborative TB/HIV activities, and the diagnosis of MDR-TB and treatment of MDR-TB patients, since the quantity and quality of data for these was comparatively high.
- Financing TB control. This chapter presents and discusses data on the following topics: (i) the budgets of national TB control programmes (NTPs) and available funding and funding gaps for these budgets between 2002 (when reliable monitoring began) and 2008 for the 22 HBCs, and for the 90 countries (with 91% of the world's estimated cases) that reported complete data for 2008; (ii) the total costs of TB control, which include NTP budgets plus the costs associated with use of general health system staff and infrastructure not usually included in NTP budgets, again for the 22 HBCs for 2002-2008 and for all 90 countries that reported complete data for 2008; (iii) comparisons of funding needs set out in the Global Plan with those based on country reports; (iv) per patient costs and budgets; (v) expenditures compared with available funding and changes in the number of patients treated; (vi) the contribution of the Global Fund to financing for TB control; and (vii) a discussion of why funding gaps for TB control persist.

<sup>&</sup>lt;sup>1</sup> The Millennium Development Goals are described in full at unstats.un.org/unsd

<sup>&</sup>lt;sup>2</sup> 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).

<sup>&</sup>lt;sup>3</sup> Stop Tuberculosis Initiative. Report by the Director-General. Fifty-third World Health Assembly. Geneva, 15–20 May 2000 (A53/5, 5 May 2000).

<sup>&</sup>lt;sup>4</sup> Dye C et al. Targets for global tuberculosis control. International Journal of Tuberculosis and Lung Disease, 2006, 10:460-462.

<sup>&</sup>lt;sup>5</sup> Raviglione MC, Uplekar MW. WHO's new Stop TB Strategy. Lancet, 2006, 367:952–955.

<sup>&</sup>lt;sup>6</sup> *The Global Plan to Stop TB, 2006–2015.* WHO and Stop TB Partnership, 2006.

Each chapter begins with a summary of the data reported to WHO in 2007, and ends with a short summary of major findings. The main part of the report finishes with a short summary of the major conclusions from all three chapters.

The remainder of the report consists of four annexes. Three of these annexes (Annex 1, Annex 3 and Annex 4) provide detailed regional or country-specific data. Annex 1 comprises 22 country profiles (one for each HBC); each profile includes epidemiological and financial data as well as an assessment of how the Stop TB Strategy is being implemented. Annex 3 includes country-specific data for 1990–2006 for surveillance and epidemiological indicators discussed in the main part of the report, i.e. case notifications and treatment outcomes, and estimates of incidence, prevalence and mortality. Annex 4 lists the surveys of the prevalence of TB disease and infection that have been conducted in the past and that are planned in the near future, as well as the countries for which mortality data are available in a central WHO database. Annex 2 explains the methods used to produce the main findings included in Chapters 1, 2 and 3.

In short, *Global tuberculosis control 2008* presents an overview of progress in reducing the burden of TB worldwide.

#### **CHAPTER 1**

# The global TB epidemic and progress in control

The status of the TB epidemic and progress in control of the disease have been assessed by WHO annually since 1997. This assessment has included estimates of TB incidence, prevalence and mortality from 1990 onwards; analysis of case notification data from around 200 (of 212) countries and territories since 1995 (when reliable records began); and analysis of progress towards the global targets for case detection and treatment success established by the World Health Assembly in 1991. More recently, it has also included assessment of progress towards the newer impact targets related to incidence, prevalence and mortality that have been set within the framework of the Millennium Development Goals (MDGs) and by the Stop TB Partnership.

This chapter provides our current assessment of the state of the TB epidemic and progress towards targets, using the most recent data reported to WHO in 2007 as well as new analytical work on the broader determinants of the TB epidemic conducted in 2007. It is structured in eight major sections as follows:

- *Goals, targets and indicators for TB control.* This section explains the targets and related indicators for global TB control that have been set for 2005, 2015 and 2050.
- *Data reported to WHO in 2007.* This section describes the data on case notifications reported for 2006 and those for treatment outcomes reported for 2005, the years for which data were requested by WHO in 2007.
- *Incidence in 2006 and trends since 1990.* This section provides estimates of the number of new cases of TB in 2006, including estimates of the number of TB cases that were HIV-positive. It also includes analysis of the trend in incidence since 1990 and its relationship with trends in HIV prevalence in the general population.
- *Case notifications*. This section summarizes the total number of TB cases notified in 2006 at global as well as regional and country levels.
- *Case detection rates.* Combining case notification data for 2006 with the estimates of incidence for 2006, this section presents estimates of the rates of case detection in 2006, at global and regional levels. Trends since 1995, and their implications for progress towards the global target of 70%, are discussed.

- *Treatment outcomes in DOTS programmes.* This section covers results on outcomes of treatment for all new cases and re-treatment cases (2005 cohorts) and progress towards the global target of an 85% treatment success rate.
- *Progress towards targets for case detection and cure.* This section reports the number of countries and regions that have met both targets, as well as the number that have reached the milestones of a 50% case detection rate and a 70% treatment success rate.
- Progress towards impact targets included in the Millennium Development Goals. This section assesses the current status of progress towards targets for reductions in incidence, prevalence and mortality set for 2015, including a new (and still developing) analysis of the extent to which TB control efforts or broader determinants of TB epidemiology are driving the global TB epidemic.

Throughout the chapter, particular attention is given to the 22 high-burden countries (HBCs) that collectively account for around 80% of TB cases globally. This is because these countries are the focus of intensive efforts to implement the Stop TB Strategy (see also **Chapter 2**). However, additional data for all countries are provided in **Annex 3**. Further details for the HBCs are also available in **Annex 1**. The methods used to produce the results presented in this chapter are explained in **Annex 2**.

#### 1.1 Goals, targets and indicators for TB control

Global targets and indicators for TB control have been developed within the framework of the MDGs as well as by the Stop TB Partnership and WHO's World Health Assembly (**Table 1.1**).<sup>1,2,3</sup> The impact targets are to halt and reverse TB incidence by 2015 and to halve prevalence and death rates by 2015 compared with a baseline of 1990. The incidence target is MDG Target 6.C, while the targets for reducing prevalence and death rates

<sup>&</sup>lt;sup>1</sup> Dye C et al. Targets for global tuberculosis control. *International Journal of Tuberculosis and Lung Disease*, 2006, 10:460–462.

<sup>&</sup>lt;sup>2</sup> The Global Plan to Stop TB, 2006–2015. Geneva, Stop TB Partnership and World Health Organization, 2006 (WHO/HTM/STB/2006.35).

<sup>&</sup>lt;sup>3</sup> 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).

#### TABLE 1.1

#### Goals, targets and indicators for TB control

#### **MILLENNIUM DEVELOPMENT GOAL 6**

#### Combat HIV/AIDS, malaria and other diseases

- Target 6.C: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases
- Indicator 6.8: Incidence, prevalence and death rates associated with tuberculosis
- Indicator 6.9: Proportion of tuberculosis cases detected and cured under DOTS (the internationally recommended strategy for TB control)

#### **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% cured. These are targets set by the World Health Assembly of WHO.
- 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.

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, which are related to DOTS implementation, are to achieve a case detection rate of at least 70% under DOTS and to reach a treatment success rate of at least 85% in DOTS cohorts. These outcome targets were first established by the World Health Assembly in 1991. The ultimate goal of TB elimination by 2050, with the target of less than 1 case per million population, has been set by the Stop TB Partnership.

The Stop TB Strategy, launched by WHO in 2006, sets out the major interventions that should be implemented to achieve the MDG, Stop TB Partnership and World Health Assembly targets. These are divided into six broad components: (i) pursuing high-quality DOTS expansion and enhancement; (ii) addressing TB/HIV, MDR-TB and other challenges; (iii) contributing to health system strengthening; (iv) engaging all care providers; (v) empowering people with TB, and communities; 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.<sup>1</sup> This means that in addition to the targets shown in **Table 1.1**, the Global Plan also

#### FIGURE 1.1

#### Estimated number of new TB cases, by country, 2006



<sup>1</sup> The Global Plan to Stop TB, 2006–2015. Geneva, Stop TB Partnership and World Health Organization, 2006 (WHO/HTM/STB/2006.35).

#### TABLE 1.2

#### Estimated epidemiological burden of TB, 2006

			INCIDE	NCE <sup>a</sup>				MO	HIV PREV. IN		
		ALL	FORMS	SMEAF	R-POSITIVE	ALL	FORMS	ALL	FORMS	TB CASES <sup>b</sup>	
	POPULATION 1000s	NUMBER 1000s	PER 100 000 POP PER YEAR	NUMBER 1000s	PER 100 000 POP PER YEAR	NUMBER 1000s	PER 100 000 POP	NUMBER 1000s	PER 100 000 POP PER YEAR	%	
1 India	1 151 751	1 933	168	867	75	3 445	299	325	28	1.2	
2 China	1 320 864	1 311	99	590	45	2 658	201	201	15	0.3	
3 Indonesia	228 864	534	234	240	105	578	253	88	38	0.6	
4 South Africa	48 282	454	940	184	382	482	998	105	218	44	
5 Nigeria	144 720	450	311	198	137	890	615	117	81	9.6	
6 Bangladesh	155 991	351	225	158	101	610	391	70	45	0.0	
7 Ethiopia	81 021	306	378	136	168	520	641	68	83	6.3	
8 Pakistan	160 943	292	181	131	82	423	263	55	34	0.3	
9 Philippines	86 264	248	287	111	129	373	432	39	45	0.1	
10 DR Congo	60 644	237	392	105	173	391	645	51	84	9.2	
11 Russian Federation	143 221	153	107	68	48	179	125	24	17	3.8	
12 Viet Nam	86 206	149	173	66	77	194	225	20	23	5.0	
13 Kenya	36 553	141	384	56	153	122	334	26	72	52	
14 UR Tanzania	39 459	123	312	53	135	181	459	26	66	18	
15 Uganda	29 899	106	355	46	154	168	561	25	84	16	
16 Brazil	189 323	94	50	59	31	104	55	7.6	4.0	12	
17 Mozambique	20 971	93	443	39	186	131	624	24	117	30	
18 Thailand	63 444	90	142	40	62	125	197	13	20	11	
19 Myanmar	48 379	83	171	37	76	82	169	6.1	13	2.6	
20 Zimbabwe	13 228	74	557	30	227	79	597	17	131	43	
21 Cambodia	14 197	71	500	31	220	94	665	13	92	9.6	
22 Afghanistan	26 088	42	161	19	73	60	231	8.3	32	0.0	
High-burden countries	4 150 313	7 334	177	3 265	79	11 889	286	1 330	32	11	
AFR	773 792	2 808	363	1 203	155	4 2 3 4	547	639	83	22	
AMR	899 388	331	37	165	18	398	44	41	4.5	6.4	
EMR	544 173	570	105	256	47	826	152	108	20	1.1	
EUR	887 455	433	49	194	22	478	54	62	7.0	3.0	
SEAR	1 721 049	3 100	180	1 391	81	4 975	289	515	30	1.3	
WPR	1 764 231	1 915	109	860	49	3 513	199	291	17	1.2	
Global	6 590 088	9 157	139	4 068	62	14 424	219	1 656	25	7.7	

a All estimates include TB in people with HIV. Estimates of incidence, prevalence and mortality in people with HIV are given by country and region in Annex 3, Table A3.1.

<sup>b</sup> Prevalence of HIV in incident TB cases of all ages.

includes input targets (funding required per year) and output targets (e.g. number of patients with MDR-TB who should be 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 outcomes and impact of TB control: case detection and treatment success rates (outcome indicators), and incidence, prevalence and death rates (impact indicators). An analysis of progress against other targets is provided in **Chapters 2 and 3**.

#### 1.2 Data reported to WHO in 2007

By the end of 2007, 202 of 212 countries and territories had reported case notifications for 2006 and/or treatment outcomes for patients registered in 2005 (**Annex 3**). These countries include 99.6% of the world's population. Reports were submitted by all 22 HBCs. The 10 countries and territories that did not report were the Bahamas, the British Virgin Islands, Chad, Equatorial Guinea, Monaco, San Marino, Senegal, Seychelles, the United States Virgin Islands and Wallis and Futuna Islands.

# **1.3 TB incidence in 2006 and trends since 1990** 1.3.1 Estimated incidence in 2006

Based on surveillance and survey data (Annex 3; Annex 4), we estimate that 9.2 million new cases of TB occurred in 2006 (139 per 100 000), including 4.1 million (62 per 100 000) new smear-positive cases (Table 1.2; Figure 1.1). These numbers include TB in HIV-positive people. India, China, Indonesia, South Africa and Nigeria rank first to fifth in terms of incident cases; the estimated numbers of cases in these and other HBCs in 2006 are also shown in Table 1.2. Asia (South-East Asia and Western Pacific regions) accounts for 55% of global cases, and Africa accounts for 31%; the other three regions account for relatively small fractions of global cases.

Among the 9.2 million new cases of TB in 2006, we estimate that around 709 000 (7.7%) were HIV-positive. This estimate is based on the global estimates of HIV prevalence among the general population (all ages) published by the Joint United Nations Programme on HIV/ AIDS (UNAIDS) and WHO in December 2007,<sup>1</sup> as well as

<sup>&</sup>lt;sup>1</sup> 2007 AIDS epidemic update. Geneva, Joint United Nations Programme on HIV/AIDS and World Health Organization, 2007 (UNAIDS/07.27E/JC1322E).

#### **Geographical distribution of estimated HIV-positive TB**

cases, 2006. For each country or region, the number of incident TB cases arising in people with HIV is shown as a percentage of the global total of such cases. AFR\* is all countries in the WHO African Region except those shown separately; AMR\* excludes Brazil; EUR\* excludes the Russian Federation; SEAR\* excludes India.



data on the relative risk of developing TB in HIV-positive and HIV-negative people (see Annex 2 for further details on methods). As in previous years, the African Region accounts for most HIV-positive cases: 85% in 2006 (Figure 1.2). Most of the remaining cases (6%) are in the South-East Asia Region, mainly in India. Some African countries account for a strikingly large number of cases relative to their population. South Africa, for example, has 0.7% of the world's population but 28% of the global number of HIV-positive TB cases and 33% of HIVpositive cases in the African Region.

The magnitude of the TB burden within countries can also be expressed as the number of incident cases per 100 000 population (Figure 1.3). Among the 15 countries with the highest estimated TB incidence rates, 12 are in Africa (Figure 1.4). The high incidence rates estimated for the African countries in this list are partly explained by the relatively high rates of HIV coinfection. Where HIV infection rates are higher in adult populations, they are also estimated to be higher among new TB patients (Figure 1.4). Figure 1.5 maps the distribution of HIV among TB patients, showing the relatively high rates in countries of eastern and southern Africa.

#### 1.3.2 Trends in incidence

The estimated average change in TB incidence (all forms) per 100 000 population over the 10-year period 1997-2006, based on case notifications reported by 134 countries that were judged to have a reliable series of



#### Estimated TB incidence rates, by country, 2006

FIGURE 1.3

data, was between –10% and +10% in all countries except for New Caledonia (**Figure 1.6**). Data from 93 countries indicate that incidence per capita was falling, albeit slowly; in 66 of these 93 countries the rate of decline was between zero and 6% per year.

By using estimates of the proportion of cases detected in each country, and by matching countries without trend data to those with such data, we can build a picture of incidence trends (all forms of TB) for nine epidemiologically different subregions of the world for the 17-year period 1990–2006 (**Figure 1.7**). The global incidence of TB per capita peaked around 2003 and appears to have stabilized or begun to decline. Incidence per 100 000 population is approximately stable in the European Region and is falling in all the five other WHO regions. It is also falling in all nine subregions, with the possible exception of African countries with low HIV prevalence (Africa – low HIV). The downward trend was fastest in the Latin America and Caribbean subregion (–3.4% per year, 2001–2006).

Globally, the slow decline in incidence per capita is more than offset by population growth. This means that the number of new cases was still increasing between 2005 and 2006, from 9.1 to 9.2 million (an increase of 0.6%). The increases in numbers of new cases were in the African, Eastern Mediterranean, European and South-East Asia regions.

In subregion Africa – high HIV, the annual change in TB incidence runs almost parallel with the change in HIV prevalence in the general population. Since 1990, both

#### 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 (purple bars), 2006







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#### FIGURE 1.6

Frequency distribution of estimated changes in the TB incidence rate for 134 countries in 6 subregions, 1997-2006



HIV prevalence and TB incidence have been increasing more slowly each year and, by 2006, both indicators were falling (**Figure 1.8**). The correspondence between declining HIV prevalence in the general population and reported TB cases is especially close in data from Malawi, the United Republic of Tanzania and Zimbabwe (data not shown).

#### **1.4 Case notifications**

The 202 countries reporting to WHO notified 5.4 million new and relapse cases, of which 2.5 million (47%) were new smear-positive cases (**Table 1.3**; **Figure 1.9**). Of these notifications, 5.3 million were from DOTS areas, including 2.5 million new smear-positive cases. A total of 31.8 million new and relapse cases, and 15.5 million new smear-positive cases, were notified by DOTS programmes in the 12 years between 1995 (when reliable records began) and 2006.

Comparing different parts of the world, the African Region (23%), 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 2006. Because DOTS has emphasized diagnosis by sputum smear microscopy, 47% of all new and relapse cases were new smearpositive (approximately 45% expected) in DOTS areas, compared with 30% elsewhere. Among new pulmonary cases reported by DOTS programmes, 58% were new smear-positive (a minimum of 65% expected), compared with 39% elsewhere (**Table 1.3**).

#### **1.5 Case detection rates**

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

The 2.5 million new smear-positive cases notified in 2006 from all sources (i.e. DOTS and non-DOTS programmes) represent 62% of the 4.1 million estimated cases (**Table 1.2, Table 1.3; Annex 3**). This is a small increase from a figure of 60% in 2005, following a slow and linear increase from 35% to 43% between 1995 and 2001 and

#### FIGURE 1.7 (OPPOSITE)

AFRICA – COUNTRIES WITH HIGH HIV PREVALENCE: Botswana, Burkina Faso, Burundi, Cameroon, Central African Rep, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Ethiopia, Gabon, Kenya, Lesotho, Liberia, Malawi, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Swaziland, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

AFRICA – COUNTRIES WITH LOW HIV PREVALENCE: Algeria, Angola, Benin, Cape Verde, Comoros, Eritrea, Gambia, Ghana, Guinea, Guinea-Bissau, Madagascar, Mali, Mauritania, Mauritius, Niger, Sao Tome & Principe, Senegal, Seychelles, Sierra Leone, Togo.

**CENTRAL EUROPE: Albania**, Bosnia & Herzegovina, Croatia, **Hungary**, Montenegro, **Poland**, Serbia, **Slovakia**, TFYR Macedonia, **Turkey**.

EASTERN EUROPE: Armenia, Azerbaijan, Belarus, Bulgaria, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Rep Moldova, Romania, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan.

EASTERN MEDITERRANEAN: Afghanistan, Djibouti, Egypt, Iran (Islamic Republic of), Iraq, Jordan, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Somalia, Sudan, Syrian Arab Rep, Tunisia, West Bank & Gaza Strip, Yemen.

HIGH-INCOME COUNTRIES AND TERRITORIES: Andorra, Antigua & Barbuda, Australia, Austria, Bahamas, Bahrain, Barbados, Belgium, Bermuda, British Virgin Is, Brunei Darussalam, Canada, Cayman Islands, China Hong Kong SAR, China Macao SAR, Cyprus, Czech Rep, Denmark, Estonia, Finland, France, French Polynesia, Germany, Greece, Guam, Iceland, Ireland, Israel, Italy, Japan, Kuwait, Luxembourg, Malta, Monaco, Netherlands, Netherlands Antilles, New Caledonia, New Zealand, Norway, Portugal, Puerto Rico, Qatar, Rep. of Korea, San Marino, Saudi Arabia, Singapore, Slovenia, Spain, Sweden, Switzerland, Trinidad & Tobago, Turks & Caicos Is, United Arab Emirates, United Kingdom, United States, US Virgin Is.

LATIN AMERICA: Anguilla, Argentina, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Montserrat, Nicaragua, Panama, Paraguay, Peru, St Kitts & Nevis, St Lucia, St Vincent & the Grenadines, Suriname, Uruguay, Venezuela.

**SOUTH-EAST ASIA:** Bangladesh, **Bhutan**, Democratic People's Republic of Korea, *India*, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand, Timor-Leste.

WESTERN PACIFIC: American Samoa, Cambodia, *China*, Cook Is, Fiji, Kiribati, Lao PDR, **Malaysia**, Marshall Islands, Micronesia, Mongolia, Nauru, Niue, N Mariana Is, Palau, Papua New Guinea, Philippines, Samoa, Solomon Is, Tokelau, Tonga, Vanuatu, Viet Nam, Wallis & Futuna.

Trends in estimated TB incidence rates (per 100 000 population per year, all forms, black lines), and the estimated annual change in incidence rates (purple lines), for nine subregions and the world, 1990–2006. For each subregion, series are constructed with data from those countries and territories whose surveillance systems are reliable enough to determine the national and subregional trends in incidence over this period (shown in bold opposite), or for which changes in incidence are assessed on the basis of other data (e.g. death registrations: countries shown in bold italics).





**High-income countries** 



















Latin America









Annual changes (%) in estimated HIV prevalence rate in the general population, purple line) and the TB case notification rate (black line, see Figure 1.7) for sub-region Africa high-HIV, 1990–2006. Changes are relative to the preceding year. Estimates of HIV prevalence are from UNAIDS (personal communication).



a more rapid increase from 43% to 60% between 2001 and 2005 (**Figure 1.10b**). The improvement that occurred between 2002 and 2006 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 1.4**).

The Region of the Americas and the European Region reported the largest numbers of new smear-positive cases from outside DOTS programmes. Counting all smear-positive cases from all sources, the case detection rate in the Region of the Americas was 76% (Table 1.4, Figure 1.11a). Counting all new cases (pulmonary and extrapulmonary) from all sources, the overall case detection rate in Europe was 70% (Figure 1.11b).

The 5.1 million new TB cases (all forms) that were notified from all sources in 2006 represent 56% of the 9.2 million estimated new cases. This is a further improvement from 2005, and continues the upward trend that began in 2002, following several years in which the detection rate had remained stable at 40–50% (Figure 1.10b).

#### TABLE 1.3

#### **Case notifications, 2006**

					NEW	CASES						% 0	FNEW		
	NEW AND RELAPSE CASES		SM POS	EAR- ITIVE	SMEAR-I UNK	NEGATIVE/ NOWN	EX PULM	TRA- ONARY	CASES EX REL	ATMENT (CLUDING APSE	0	<b>THER</b> <sup>a</sup>	CASES SMEAR- POSITIVE <sup>b</sup>		
	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	DOTS	WHOLE COUNTRY	
1 India	1 228 589	1 228 827	553 797	-	400 496	400 680	183 203	-	169 138	-	-	-	58	58	
2 China	940 889	-	468 291	-	382 492	-	38 294	-	30 492	-	40 007	-	55	-	
3 Indonesia	277 589	-	175 320	-	91 029	-	7 0 1 3	-	-	-	-	-	66	-	
4 South Africa	303 114	-	131 099	-	93 348	-	47 849	-	38 051	-	-	-	58	-	
5 Nigeria	70 734	-	39 903	-	25 782	-	2 975	-	3 491	-	-	-	61	-	
6 Bangladesh	145 186	-	101 967	-	24 565	-	14 436	-	-	-	-	-	81	-	
7 Ethiopia	122 198	-	36 674	-	40 234	-	43 255	-	811	-	-	-	48	-	
8 Pakistan	176 678	-	65 253	-	82 519	-	25 745	-	2 389	-	-	-	44	-	
9 Philippines	147 305	-	85 740	-	55 964	-	1 445	-	912	-	-	-	61	-	
10 DR Congo	95 666	-	63 488	-	10 093	-	18 213	-	1 989	-	484	-	86	-	
11 Russian Federation	102 997	124 689	29 989	-	56 713	73 252	9 502	12 059	12 472	27 576	-	-	35	31	
12 Viet Nam	97 363	-	56 437	-	16 645	-	17 711	-	921	-	-	-	77	-	
13 Kenya	108 342	-	39 154	-	48 338	-	17 443	-	6 892	-	-	-	45	-	
14 UR Tanzania	59 282	-	24 724	-	20 120	-	12 621	-	2 818	-	-	-	55	-	
15 Uganda	40 782	-	20 364	-	14 940	-	4 027	-	797	-	-	-	58	-	
16 Brazil	61 127	77 632	32 463	-	17 688	22 585	8 374	10 656	4 3 4 2	5 661	-	-	65	65	
17 Mozambique	35 257	-	18 275	-	10 618	-	4 929	-	375	-	-	-	63	-	
18 Thailand	56 230	-	29 081	-	17 607	-	7 800	-	1 437	-	1 161	-	62	-	
19 Myanmar	122 472	-	40 241	-	42 741	-	34 495	-	3 973	-	-	-	48	-	
20 Zimbabwe	44 328	-	12 718	-	23 775	-	6 559	-	3 4 4 6	-	-	-	35	-	
21 Cambodia	34 660	-	19294	-	6 875	-	7 800	-	806	-	-	-	74	-	
22 Afghanistan	25 475	-	12 468	-	6 809	-	5 066	-	-	-	-	-	65	-	
High-burden countries	4 296 263	4 3 3 4 6 9 8	2 056 740	2 067 794	1 489 391	1 511 011	518 755	523 594	285 552	301 975	41 652	41 652	58	58	
AFR	1 223 008	1 234 260	549 420	555 123	379 631	381 696	220 151	220 643	74 728	75 102	1 479	1 479	59	59	
AMR	204 547	224 548	114 412	125178	48 830	54 670	29 824	32 392	9 377	10 803	463	465	70	70	
EMR	318 973	322 306	131 820	131 882	113 401	115 040	64 921	66 543	3 474	3 474	17	17	54	53	
EUR	310 156	359 735	100 102	109 901	142 303	170 786	45 579	56 363	41 548	61 126	141	3 091	41	39	
SEAR	1 920 371	1 920 644	938 572	938 637	609 499	609 705	261 837	261 839	182 640	182 640	1 382	1 389	61	61	
WPR	1 297 078	1 331 333	662 152	671254	488 956	506 031	79 672	86 136	36 571	40 752	40 997	44 288	58	57	
Global	5 274 133	5 392 826	2 496 478	2 531 975	1 782 620	1 837 928	701 984	723 916	348 338	373 897	44 479	50 729	58	58	

Indicates zero, or all cases notified under DOTS; no additional cases notified under non-DOTS.

<sup>a</sup> Cases not included elsewhere in table.

<sup>b</sup> Expected percentage of new pulmonary cases that are smear-positive is 65-80%.

#### Tuberculosis notification rates, by country, 2006



#### TABLE 1.4 Case detection rate for new smear-positive cases (%), 1995–2006<sup>a</sup>

		DOTS PROGRAMMES										WHOLE COUNTRY														
	-	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
11	ndia	0.3	0.9	1.0	1.6	6.8	12	23	30	43	55	59	64		37	40	37	37	45	44	48	49	52	58	60	64
2 0	China	15	29	32	32	30	31	31	30	43	64	80	79		22	34	39	34	33	34	34	33	45	65	*	*
3	ndonesia	1.3	4.4	7.4	12	19	20	21	30	37	52	65	73		12	*	*	*	*	*	*	*	*	*	*	*
4 8	South Africa	-	-	6.3	22	61	58	56	66	71	70	67	71		2	70	84	110	88	72	65	67	71	73	70	*
5 N	Vigeria	11	11	10	11	12	12	12	11	15	17	18	20		*	*	*	*	*	*	14	12	*	*	*	*
6 E	Bangladesh	6.4	14	18	23	23	24	26	30	35	40	54	65		14.4	21	23	26	25.5	26	27.0	31	*	*	*	*
7 E	Ethiopia	15	20	22	23	24	30	30	30	31	31	29	27		*	24	*	*	*	*	*	*	*	*	*	*
8 F	Pakistan	1.0	1.7	-	3.7	2.0	2.8	5.2	13	17	25	37	50		2	*	-	13	5	*	9	13	*	*	*	*
9 F	Philippines	0.4	0.5	3.2	10	20	48	56	61	67	72	74	77		96	87	82	70	71	64	*	*	*	*	*	*
10 E	)R Congo	41	47	44	54	51	48	50	49	55	62	63	61		43	*	*	*	*	*	*	*	*	*	*	*
11 F	Russian Federation	-	0.5	1.1	1.0	1.8	4.9	5.5	7.4	9.3	15	33	44		77	74	67	63	31	37	36	40	42	45	48	47
12 \	/iet Nam	30	59	78	82	83	82	83	87	85	89	84	85		59	77	84	85	83	*	*	*	*	*	*	*
13 k	Kenya	57	58	54	59	58	51	59	61	64	66	68	70		*	*	*	*	*	56	*	*	*	*	*	*
14 L	JR Tanzania	57	56	53	54	52	49	48	45	46	47	47	46		*	*	*	*	*	*	*	*	*	*	*	*
15 L	Jganda	-	-	56	56	56	48	44	44	44	45	44	44		48	53	*	*	*	*	*	*	*	*	*	*
16 E	Brazil	-	-	-	3.2	3.1	5.8	6.3	7.5	14	37	43	55		61	61	61	55	60	61	59	65	64	70	70	69
17 N	Mozambique	57	52	50	49	48	45	43	43	43	44	46	47		*	*	*	*	*	*	*	*	*	*	*	*
18 T	Thailand	-	0.3	5.1	22	40	47	74	67	73	73	76	73		57	47	36	*	*	*	*	*	*	*	*	*
19 N	Ayanmar	-	26	27	29	33	49	58	68	76	86	100	109		26	29	29	*	*	*	60	*	*	*	*	*
20 Z	Zimbabwe	-	-	-	50	47	45	45	46	41	44	41	42		48	53	56	*	*	*	*	*	*	*	*	*
21 0	Cambodia	40	34	45	48	54	50	48	57	62	62	68	62		*	43	*	*	*	*	*	*	*	*	*	*
22 A	Afghanistan	-	-	3.1	9.3	8.6	15	24	33	34	44	52	66		-	-	*	*	*	*	*	*	*	*	*	*
High	-burden countries	8.3	14	16	20	23	26	30	34	43	53	59	63		31	36	37	37	39	39	40	42	47	55	60	63
A	\FR	23	25	29	34	35	35	36	42	44	46	45	46		33	41	40	45	41	40	41	43	45	47	46	46
A	AMR	25	25	27	31	34	41	40	43	47	56	60	69		65	66	70	68	69	69	71	71	72	73	74	76
E	MR	11	9.6	11	18	20	24	26	31	33	38	45	52		24	26	23	32	31	26	29	31	33	38	45	52
E	EUR	2.6	3.5	4.6	11	11	12	14	22	23	26	36	52		64	63	58	58	45	47	43	42	52	48	50	57
S	SEAR	1.5	4.0	5.5	8.0	14	18	27	34	44	55	62	67		29	30	29	30	37	39	42	45	50	57	62	67
۷	VPR	16	28	32	33	32	37	39	39	50	65	77	77		36	45	49	44	44	44	43	43	53	67	78	78
Globa	al	11	16	18	22	24	28	32	37	44	52	58	61		35	39	40	41	42	41	43	44	49	55	60	62

\*

Indicates not available. No additional data beyond DOTS report, either because country is 100% DOTS, or because no non-DOTS report was received. Estimates for all years are recalculated as new information becomes available and techniques are refined, so they may differ from those published previously. а

**Progress towards the 70% case detection target.** (a) Open circles mark the number of new smear-positive cases notified under DOTS 1995–2006, expressed as a percentage of estimated new cases in each year. The straight line through these points indicates the average annual increment from 1995 to 2000 of about 134 000 new cases, compared to the average increment from 2000 to 2006 of about 243 000 cases. 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

The principal WHO measure of case detection is the rate of case detection for new smear-positive cases in DOTS programmes, i.e. the number of new smear-positive cases detected by DOTS programmes divided by the estimated number of incident smear-positive cases. In 2006, DOTS programmes detected 2 496 478 new smear-positive cases (99% of all new smear-positive cases that were notified) out of an estimated 4.1 million new smear-positive cases, giving a case detection rate of 61% (Table 1.4, Figure **1.10a**). The point estimate of a 61% case detection rate for 2006 is still below the 70% target set for 2005. There is, however, much uncertainty surrounding this estimate: the calculated 95% confidence limits range from 55% to 75%, but this does not account for all sources of random and systematic error.

New smear-positive case detection rates by DOTS programmes in 2006 were lowest in the African (46%) and European (52%) regions and highest in the Western Pacific Region (77%), the South-East Asia Region (67%) and the Region of the Americas (69%; Table 1.4, Figure 1.11, Figure 1.12). The Western Pacific is still the only region to have exceeded the 70% target, although the Americas (69%) and the South-East Asia regions (67%) fall just short on 2006 estimates. The particularly low figure for Europe compared with the overall case detection rate for all forms of TB of 70% (Figure 1.11b) suggests two major reasons for failing to reach the WHO target in this region: incomplete geographical coverage

of DOTS and lack of emphasis on sputum smear microscopy (countries in the European Region report substantial numbers of cases in whom disease is diagnosed by methods other than sputum smear microscopy, and these cases are not necessarily smear-negative). In the Region of the Americas, the target of a 70% case detection rate for new smear-positive cases in DOTS programmes could be achieved simply by expanding the geographical coverage of DOTS programmes.

Although case detection of new smear-positive cases improved globally between 2005 and 2006, the rate of increase slowed compared with previous years: the increment between 2005 (58%) and 2006 (61%) was just 3%, the smallest reported annual increase since 1999–2000 (**Table 1.4, Figure 1.10a**). In the South-East Asia Region, the acceleration in case-finding after 2000 was

Proportion of estimated cases notified under DOTS (grey portion of bars) and non-DOTS (purple portion of bars) in 2006. The number of notified cases (in thousands) is shown in or above each portion or each bar. The grey portion of the bars is cases notified in DOTS programmes. The purple portion is the number notified outside DOTS prorammes.

#### (a) New smear-positive







#### FIGURE 1.12

Smear-positive case detection rate under DOTS, by WHO region, 1995–2006. Heavy line shows global DOTS case detection rate.



#### FIGURE 1.13

Smear-positive case detection rate within DOTS areas<sup>a</sup> for high-burden countries (purple) and the world (grey), 1995–2006



Calculated as DOTS case detection rate of new smear-positive cases divided by DOTS coverage.

attributable mostly to progress in Bangladesh, India, Indonesia and Myanmar. The more recent deceleration in detection is mainly a result of slowing DOTS expansion into India's northern states, as the Indian national TB control programme (NTP) reaches full national coverage. The Western Pacific Region is dominated by China, where case-finding expanded rapidly between 2002 and 2005. However, China has made no progress in case-finding since reporting that the 70% target had been met in 2005 (**Table 1.3, Table 1.4; Annex 1**). The South-East Asia and Western Pacific regions are now slowing global progress in case detection.

DOTS programmes detected 4 990 374 new cases in 2006 (98% of all notifications) out of a total of 9.2 million estimated cases (**Table 1.2**, **Table 1.3**). This is equivalent to a case detection rate (all new cases) of 54%.

#### 1.5.3 Case detection rate within DOTS areas

The case detection rate within DOTS areas (measured by the ratio of case detection to DOTS population coverage) changed little between 1995 and 2001, averaging 50% worldwide. Subsequently, it has increased to 66% in 2006 (**Figure 1.13**). This illustrates how increases in case detection rates in DOTS areas have made an important contribution to the overall improvement in case detection since 2001.

### 1.5.4 Number of countries reaching the 70% case detection target

National estimates of the case detection rate suggest that 77 countries met the 70% target by the end of 2006. Of the additional new smear-positive cases reported by DOTS programmes in 2006 (compared with 2005), 30% were in India and 33% were in Bangladesh, Pakistan and Indonesia (Figure 1.14).

While China and India have made big improvements in case detection in recent years, these two countries
#### FIGURE 1.14

Contributions to the global increase in the number of new smear-positive cases notified under DOTS made by high-burden countries, 2005–2006



#### FIGURE 1.15

Smear-positive TB cases undetected by DOTS programmes in eight high-burden countries, 2006. Numbers indicate the percentage of all missed cases that were missed by each country.



still accounted for an estimated 28% of all undetected new smear-positive cases in 2006. In 2006, as in 2005, Nigeria succeeded China as the second largest reservoir of undetected cases (10%). These three countries are among eight that together accounted for 59% of all smear-positive cases not detected by DOTS programmes in 2006 (Figure 1.15).

#### 1.5.5 Prospects for future progress

It is inevitable that progress in case-finding of new smearpositive cases will slow as HBCs reach nationwide DOTS coverage, but the rate of increase in case detection is decelerating before reaching the 70% target globally. To compensate for slower progress in the regions where case detection is above (Western Pacific) or close to (South-East Asia) the target, faster progress is needed where case detection islower, namely in the African (46%), the Eastern Mediterranean (52%) and European (52%) regions. The African Region is the most important in absolute terms; based on the latest estimates, it accounts for 75% of the "missing" cases among these three regions, with Ethiopia and Nigeria alone accounting for more than one-quarter of missing cases in these three regions.

The implication that DOTS programmes in the African Region in particular need to improve case detection comes with an important caveat. Efforts to assess improvements in case detection in the African Region have been confounded 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 leading to better case-finding, and the impact of the HIV epidemic, on increases in case notifications. In this context, a detailed investigation of DOTS implementation in Kenya found that the rise in smear-positive notifications from 92 to 107 per 100 000 between 2000 and 2006 was mostly due to an increase in case detection, rather than an increase in TB incidence linked to HIV. Consequently, the case detection rate has increased to 70% in 2006 (see also Annex 1).<sup>1</sup> Similar investigations in other African countries may reveal that case detection is higher than stated in this report, and perhaps increasing more quickly than portrayed in Table 1.4

## **1.6 Outcomes of treatment in DOTS programmes**

## 1.6.1 New smear-positive cases

A total of 2 359 003 new smear-positive cases were registered for treatment in DOTS programmes in 2005, approximately the same number that were notified that year (**Table 1.5**). The biggest proportional discrepancies, where registered cases exceeded notifications, were in the Americas (Brazil), and in the Russian Federation and South Africa.

<sup>&</sup>lt;sup>1</sup> Mansoer J et al. Estimating changes in the tuberculosis case detection rate in Kenya [submitted for publication].

#### TABLE 1.5

#### Treatment outcomes for new smear-positive cases treated under DOTS, 2005 cohort

						TRE	ATMENT C	OUTCOMES (%	) <sup>a</sup>			% EST <sup>b</sup> CASES
	NOTIFIED	REGISTEREDª	REGST'D (%)	CURED	COMPLETED TREATMENT	DIED	FAILED	DEFAULTED	TRANS- FERRED	NOT EVAL'D	TREATMENT SUCCESS (%)	TREATED UNDER DOTS
1 India	506 852	507 204	100	83	2.3	4.5	2.4	6.9	0.6	0.0	86†	51
2 China	472 719	472 719	100	92	1.9	1.7	0.9	0.8	0.9	1.9	94†	75
3 Indonesia	158 640	158 640	100	83	7.7	2.1	1.1	4.1	1.9	0.0	91†	59
4 South Africa	119 906	128 393	107	58	13	7.1	1.7	10	5.6	3.9	71	51
5 Nigeria	35 048	35 080	100	50	25	9.0	3.8	11	0.5	0.4	75	13
6 Bangladesh	84 848	84 848	100	91	0.9	3.5	0.6	2.1	1.8	0.5	91†	50
7 Ethiopia	38 525	39 430	102	64	14	5.4	0.6	4.3	4.6	7.1	78	23
8 Pakistan	48 319	48 205	100	71	13	2.8	0.7	9.5	3.7	0.0	83	31
9 Philippines	81 647	81 125	99	82	7.4	2.4	1.0	4.3	2.4	0.5	89†	66
10 DR Congo	65 040	65 066	100	80	5.2	5.7	1.2	4.4	2.5	1.3	85	54
11 Russian Federation	22 690	25 692	113	55	2.8	13	14	11	4.1	0.0	58	22
12 Viet Nam	55 492	55 492	100	90	2.1	3.3	1.0	1.5	1.9	0.0	92†	78
13 Kenya	40 389	40 436	100	71	12	5.0	0.3	7.7	4.6	0.0	82	56
14 UR Tanzania	25 264	25 324	100	79	3.5	9.5	0.3	3.5	4.5	0.0	82	39
15 Uganda	20 559	20 559	100	32	41	5.7	0.4	16	5.0	0.1	73	32
16 Brazil	26 224	33 527	128	32	44	5.1	0.7	9.0	4.4	4.3	77	42
17 Mozambique	17 877	17 877	100	78	1.1	12	1.1	5.4	1.7	0.8	79	37
18 Thailand	29 762	29 919	101	70	4.8	8.2	1.8	6.7	3.2	5.5	75	57
19 Myanmar	36 541	34 859	95	78	7.4	5.4	2.4	5.1	2.1	0.0	85	81
20 Zimbabwe	13 155	12 860	98	59	9.0	12	1.6	7.4	12	0.0	68	27
21 Cambodia	21 001	21 001	100	89	3.7	3.3	0.3	2.0	1.8	0.1	93†	63
22 Afghanistan	9 949	10 013	101	83	6.9	2.1	1.4	2.1	4.6	0.0	90†	47†
High-burden countries	1 930 447	1 948 269	101	80	6.1	4.1	1.6	5.0	2.0	1.1	86†	52
AFR	538 816	546 832	101	63	13	6.9	1.4	8.6	4.5	2.5	76	35
AMR	101 808	108 413	106	57	21	4.8	1.0	6.5	3.2	6.2	78	50
EMR	113 677	113 555	100	72	11	2.9	1.1	7.7	3.7	1.2	83	37
EUR⁰	72 316	73 768	102	60	10	8.3	8.4	7.7	2.9	2.2	71	27
SEAR	855 306	854 169	100	83	3.5	4.1	1.9	5.6	1.2	0.2	87†	54
WPR	661 322	662 266	100	89	3.2	2.2	0.9	1.5	1.3	1.9	92†	71
Global	2 343 245	2 359 003	101	78	7.1	4.3	1.7	5.4	2.3	1.6	85	49

Treatment success ≥ 85% (treatment success for DR Congo 84.9%, for the world 84.7%). Cohort: cases diagnosed during 2005 and treated/followed-up through 2006. 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.

Est: estimated cases for 2005 (as opposed to notified or registered for treatment)

Laboratory-confirmed notifications and treatment outcomes from Belarus. Bosnia & Herzegovina, Bulgaria, Israel and Italy included here; outcomes for smear-positive cases not available.

The cure rate among cases registered under DOTS worldwide was 77.6%, and a further 7.1% completed treatment (no laboratory confirmation of cure), giving a reported overall treatment success rate of 84.7%, very close to the 85% target (Table 1.5). This means that 49% of the smear-positive cases estimated to have occurred in 2005 were treated successfully by DOTS programmes. Among all the patients treated under DOTS, 9% had no reported outcome (defaulted, transferred, not evaluated). Treatment results for 12 consecutive cohorts (1994-2005) 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 has increased 10-fold from 240 000 in 1994 to 2.4 million in 2005 (Table 1.5, Table 1.6).

The DOTS treatment success rate reached or exceeded 85% in ten HBCs (Table 1.5) and in 58 countries in total (Annex 3), and was reported to be 90% or more in cohorts of varying sizes in Afghanistan, Bangladesh, Cambodia, China, Indonesia and Viet Nam.

The global average treatment success rate was brought

close to the target level by better outcomes in the South-East Asia and Western Pacific regions. The differences in treatment outcomes among WHO regions were similar to those reported in previous years, varying from 71% in Europe and 76% in Africa, to 87% in South-East Asia and 92% in the Western Pacific. The Western Pacific Region has always reported treatment success above the 85% target; South-East Asia has exceeded the target since 2002, and the Eastern Mediterranean Region has remained just below it (83% since 1999; Table 1.5, Table **1.6**). Treatment success has been increasing in Africa, although cohorts of DOTS patients in this region continue to have high death and default rates: one or other of these indicators exceeded 10% in Mozambique, Nigeria, South Africa, Uganda and Zimbabwe.

In contrast to other regions, treatment outcomes deteriorated between 2004 and 2005 in the Region of the Americas and the European Region (Table 1.6). The treatment success rate of 71% in Europe in 2005 is the lowest recorded in that region since 1996 (albeit in an expanding cohort). In the Russian Federation, death and treat-

TABLE 1.6												
Treatment success for new sr	near-positiv	e cases	s treate	d under	DOTS (%	%), 1994	<b>-2005</b>	cohorts	a			
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1 India	83	79	79	82	84	82	84	85	87	86	86	86
2 China	94	96	96	96	97	96	95	96	93	94	94	94
3 Indonesia	94	91	81	54	58	50	87	86	86	87	90	91
4 South Africa	-	-	69	73	74	60	66	65	68	67	70	71
5 Nigeria	65	49	32	73	73	75	79	79	79	78	73	75
6 Bangladesh	73	71	72	78	80	81	83	84	84	85	90	91
7 Ethiopia	74	61	73	72	74	76	80	76	76	70	79	78
8 Pakistan	74	70	-	67	66	70	74	77	78	79	82	83
9 Philippines	80	-	82	83	84	87	88	88	88	88	87	89
10 DR Congo	71	80	48	64	70	69	78	77	78	83	85	85
11 Russian Federation	-	65	62	67	68	65	68	67	67	61	59	58
12 Viet Nam	91	91	90	85	93	92	92	93	92	92	93	92
13 Kenya	73	75	77	65	77	78	80	80	79	80	80	82
14 UR Tanzania	80	73	76	77	76	78	78	81	80	81	81	82
15 Uganda	_	_	33	40	62	61	63	56	60	68	70	73
16 Brazil	-	-	-	-	91	89	73	67	75	83	81	77
17 Mozambique	67	39	54	67	-	71	75	78	78	76	77	79
18 Thailand	_	-	78	62	68	77	69	75	74	73	74	75
19 Myanmar	-	66	79	82	82	81	82	81	81	81	84	85
20 Zimbabwe	-	-	-	-	70	73	69	71	67	66	54	68
21 Cambodia	84	91	94	91	95	93	91	92	92	93	91	93
22 Afghanistan	-	-	-	45	33	87	86	84	87	86	89	90
High-burden countries	87	83	78	81	83	81	84	84	83	84	86	86
AFR	59	62	57	63	70	69	72	71	73	73	74	76
AMR	76	77	83	82	81	83	81	82	83	83	82	78
EMR	82	87	86	79	77	83	83	83	84	83	83	83
EUR	68	69	72	72	76	77	77	75	76	75	74	71
SEAR	80	74	77	72	72	73	83	84	85	85	87	87
WPR	90	91	93	93	95	94	92	93	90	91	91	92
Global	77	79	77	79	81	80	82	82	82	83	84	85

Indicates not available.
<sup>a</sup> See notes for Table 1.5.

## FIGURE 1.16

Outcomes for those patients not successfully treated in (a) DOTS and (b) non-DOTS areas, by WHO region, 2005 cohort



(b) Non-DOTS WPR 82 SEAR No non-DOTS outcomes reported EUR EMR AMR AFR 10 30 0 20 40 Percentage of cohort

#### 🗖 Died 📕 Failed 🥅 Defaulted 🥅 Transferred 🥅 Not evaluated

ment failure rates were higher in 2005 than in any other HBC, and the treatment success rate of 58% was the lowest reported from that country since WHO records began in 1995. In the Region of the Americas in 2005, only 78% of patients completed treatment or were cured, the worst outcome since 1995.

Variation in treatment outcomes among regions raises important questions about the quality of treatment, the quality of the data and how quickly these will improve in future.

Poor outcomes in Africa and Europe are undoubtedly linked to high rates of HIV infection, drug resistance and weak health services.<sup>1,2</sup> Treatment results for individual African countries again point to the effects of HIV and inadequate patient support. The cohort death rate for the region as a whole was 7%, and higher still in Mozambique, Nigeria, South Africa, the United Republic of Tanzania and Zimbabwe (**Table 1.5**). Treatment interruption (default) and transfer without follow-up were also especially high in the African Region, at 8.6% and 4.5% respectively. More than 15% of patients had no known outcome in Ethiopia, South Africa, Uganda and Zimbabwe (**Table 1.5**). Cure was not confirmed (via a final, negative sputum smear) for large numbers of patients in Nigeria (25%) and Uganda (41%).

Death during treatment was 8.3% in the European Region, where a higher fraction of cases are drug resistant (Eastern Europe) or occur among the elderly (Western and Central Europe) (**Figure 1.16**). Treatment interruption was 7.7%, and the treatment failure rate was 8.4%, mainly because failure rates were high in Eastern Europe.

In the Region of the Americas, deteriorating outcomes are explained, at least in part, by the expansion of DOTS coverage, often into regions of countries with weaker health services. No outcome was reported for 16% of patients in the region as a whole (18% in Brazil) and in Brazil, 44% of patients completed treatment without cure being confirmed (via a final, negative sputum smear).

In 2005, as in previous years, treatment success was extraordinarily high in the Western Pacific Region (92%).

## 1.6.2 Re-treatment cases

A total of 531 232 patients were re-treated under DOTS in 2005 (**Table 1.7**). The re-treatment success rate in 2005 was 71%. As expected from the results of treating new patients, re-treatment success rates were lowest in the European Region (45%) 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 25 and 47 countries, depending on the category of case (Figure 1.17; 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 almost exclusively in the Region of the Americas and the European Region. There were few data for African countries (only Comoros, Gabon, and Mauritius), even though Africa accounts for 85% 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 targets for case detection** and cure

Point estimates of case detection and treatment success indicate that the world as a whole failed to meet the targets for both indicators. However, measurement uncertainty allows the possibility that case detection exceeded 70% in 2006, and treatment success was only 0.3% below the target of 85% in the 2005 cohort. Both targets for case detection and treatment success were exceeded in the Western Pacific Region. South-East Asia achieved more than 85% treatment success, and case detection was just under 70%. The European Region performed worst on both indicators.

Data on both treatment success and case detection were provided by 202 countries that were implementing DOTS. In 99 countries, the rate of case detection exceeded 50% and the treatment success rate was over 70% (Figure 1.18). Of these countries, 32 appear to have reached both WHO targets. They include five HBCs: China, Indonesia, Myanmar, the Philippines and Viet Nam (Figure 1.18, Figure 1.19). Among 166 countries that provided data for both the 2004 and the 2005 cohorts, 98 (59%) showed higher treatment success rates for the 2005 cohort, and 56 of 177 (32%) improved case detection by more than 5% between 2005 and 2006.

Progress can also be directly compared with the expectations set out in the Global Plan (**Table 1.8**), which was designed to achieve the MDG, Stop TB Partnership and World Health Assembly targets set for 2015 (**Table 1.1**). The case detection rate for new smear-positive cases under DOTS in 2006, at 61%, lags behind the milestone of 65% in the Global Plan. This further reinforces the message that progress in DOTS implementation has decelerated between 2005 and 2006. The detection of smear-negative and extrapulmonary cases also lags behind the Global Plan, and by a larger amount (48% esti-

<sup>&</sup>lt;sup>1</sup> As argued in *Global tuberculosis control: surveillance, planning and financing. WHO report 2007.* Geneva, World Health Organization, 2007 (WHO/HTM/TB/2007.376).

<sup>&</sup>lt;sup>2</sup> HIV may also have contributed to the high death rate in Thailand (12%) although, among Asian countries, Thailand has a relatively high proportion of elderly patients (Annex 3).

## TABLE 1.7

Re-treatment outcomes for smear-positive cases treated under DOTS, 2005 cohorta

		TREATMENT OUTCOMES (%)							
	REGISTERED	CURED	TREATMENT COMPLETED	DIED	FAILED	DEFAULTED	TRANS- FERRED	NOT EVAL'D	TREATMENT SUCCESS (%)
1 India	224 143	47	24	7.0	4.5	16	1.2	0.1	71
2 China	89 239	85	5.0	2.6	2.5	1.3	1.0	3.1	90†
3 Indonesia	4 812	63	15	3.4	3.8	8.3	6.5	0.0	78
4 South Africa	63 588	29	29	11	2.3	16	6.4	6.3	58
5 Nigeria	3 662	48	18	1.8	11	20	0.2	0.8	66
6 Bangladesh	3 876	73	6.4	3.9	2.3	4.9	4.1	5.2	80
7 Ethiopia	3 116	41	15	8.7	1.8	4.8	4.2	24	56
8 Pakistan	5 0 0 9	61	15	4.6	2.6	11	3.3	1.7	76
9 Philippines	_	-	_	-	-	-	_	-	-
10 DR Congo	5 4 4 8	71	3.7	10	4.5	6.1	3.2	2.0	74
11 Russian Federation	10 855	33	3.5	16	26	16	5.5	0.0	37
12 Viet Nam	7 374	79	3.8	5.4	5.8	3.0	2.8	0.3	83
13 Kenya	3 794	68	9.1	9.9	0.6	6.9	5.4	0.0	77
14 UR Tanzania	5 067	37	39	13	0.5	4.0	4.7	1.5	77
15 Uganda	-	-	-	-	-	-	-	-	-
16 Brazil	7 394	26	21	6.8	1.7	18	9.9	16	47
17 Mozambique	1 855	69	1.1	15	2.4	10.1	2.6	0.2	70
18 Thailand	2 285	52	5.9	12	4.9	6.8	4.5	13	58
19 Myanmar	6 039	59	13	9.2	5.9	7.4	4.7	0.0	73
20 Zimbabwe	4 667	13	46	16	0.3	13	11	0.0	60
21 Cambodia	1 306	49	27	8.7	2.1	2.7	4.3	6.7	76
22 Afghanistan	856	87	2.3	2.6	1.3	1.6	4.9	0.5	89†
High-burden countries	454 298	53	19	7.1	4.1	12	2.6	2.2	72
AFR	112 510	35	27	11	2.7	13	5.7	6.1	62
AMR	16 290	40	15	6.4	2.7	14	5.9	15	55
EMR	12 860	60	15	4.5	3.5	10	3.6	2.6	75
EUR	29 865	39	6.7	13	17	15	4.3	6.3	45
SEAR	253 864	49	22	6.8	4.7	15	1.6	0.3	72
WPR	105 843	81	5.8	3.0	2.7	1.7	1.8	3.7	87†
Global	531 232	52	19	7.1	4.5	12	2.8	3.0	71

Indicates not available.
† Treatment success ≥ 85%.
a See notes for Table 1.5.

## FIGURE 1.17

Treatment outcomes for HIV-positive and HIV-negative TB patients, 2005 cohort. The numbers under the bars are the numbers of patients included in the cohort.



mated for 2006 compared with the Global Plan milestone of 66%). 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-positive patients treated in DOTS programmes in 2006 was higher than the number forecast in the Global Plan, due to the estimated incidence of TB in 2006 being higher than anticipated by the Global Plan.

## 1.8 Progress towards impact targets included in the Millennium Development Goals

1.8.1 Trends in incidence, prevalence and mortality

With the 9.2 million new incident TB cases in 2006, there were an estimated 14.4 million prevalent cases (219/100 000) on average (Table 1.2). An estimated 1.7 million people (25/100 000) died from TB in 2006, including those coinfected with HIV (231 000). The sequence of annual estimates up to 2006 suggests (as in the data up to 2005) that all three major indicators of impact - incidence, prevalence and mortality per 100 000 population – are falling globally. In our assessment, prevalence was already in decline by 1990, mortality peaked before the year 2000 and incidence began to fall in 2003 (Figure 1.20). TB prevalence continued to fall globally between 1990 and 2006 because, in Africa, the HIV epidemic caused a smaller increase in prevalence than in incidence or mortality.

The fall in the global incidence rate reinforces data presented in *Global Tuberculosis Control 2007.* If verified by further monitoring, the data show that MDG 6 Target 6.C was

met by 2004, well ahead of the target date of 2015 (though as noted above, the total number of new cases continues to rise, due to population growth in the African, Eastern Mediterranean, European and South-East Asia regions). This turnover of the global epidemic is largely explained by stable or falling HIV prevalence in Africa and by the stabilization of TB incidence in the independent states that emerged from the dissolution of the Union of Soviet Socialist Republics. It is unlikely that either of these two phenomena is due primarily to the implementation of

## FIGURE 1.18

**DOTS status in 2006, countries close to targets.** 99 countries reported treatment success rates 70% or over and DOTS detection rates 50% or over. 32 countries (including 2 countries out of range of graph) have reached both targets; 2 in the African Region, 5 in the Region of the Americas, 4 in the Eastern Mediterranean Region, 4 in the European Region, 5 in the South-East Asia Region and 12 in the Western Pacific Region.



#### FIGURE 1.19

**DOTS progress in high-burden countries, 2005–2006.** Treatment success refers to cohorts of patients registered in 2004 or 2005, and evaluated, respectively, by the end of 2005 or 2006. 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 and EMR are shown in purple, those from SEAR and WPR are shown in black.



#### DOTS expansion and enhancement, 2006: country reports compared with expectations given in the Global Plan

	COUNTRY REPORTS <sup>a</sup>	GLOBAL PLAN
	(MILLIONS OR PER	CENTAGES)
Number of new smear-positive cases notified under DOTS	2.5	2.1
Estimated number of new smear-positive cases	4.0	3.3
New smear-positive case detection rate under DOTS	61%	65%
Number of new smear-positive cases successfully treated under DOTS	2.0	1.8
Number of new smear-positive cases registered for treatment under DOTS	2.3	2.1
New smear-positive treatment success rate, 2005	85%	83%
Number of new smear-negative and extrapulmonary cases notified under DOTS	2.4	3
Estimated number of new smear-negative and extrapulmonary cases	5.0	4.5
New smear-negative and extra-pulmonary case detection rate under DOTS	48%	66%

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

#### FIGURE 1.20

#### Estimated global prevalence, mortality and incidence rates, 1990-2006. Note the different scales on y-axes.



HIV/AIDS or TB control programmes (see next section 1.8.2 on determinants of TB dynamics), and there is little evidence, from regional trends in case notifications, that DOTS is accelerating the decline of the incidence of TB on a large scale in Asia.

The targets related to reductions in prevalence and deaths that have been set by the Stop TB Partnership - to halve 1990 prevalence and death rates by 2015 - are more demanding. If the estimated changes between 2001 and 2006 are correct, and if the average rates of change over this period persist, then prevalence and deaths per capita will fall quickly enough to meet the 2015 targets in the Region of the Americas and in the Eastern Mediterranean, South-East Asia and Western Pacific regions (Figure 1.21). They will not, however, be met in the African and European regions. In line with the trends in incidence (Figure 1.6), prevalence and death rates increased in the African and European regions between 1990 and 2006, most dramatically in Africa. For this reason, estimates for these two regions in 2006 are very much larger than the 2015 target values.

Based on progress between 2001 and 2006, and combining the results for all regions, the mortality and prevalence targets are unlikely to be met worldwide by 2015 (**Figure 1.21**).

## 1.8.2 Determinants of TB dynamics: comparisons among countries

A further assessment of the scale of the impact of DOTS around the world can be made by examining the national statistics that lie behind the regional and global summaries. The series of cases reported by 134 countries between 1997 and 2006 indicate that TB incidence rates per capita in most countries were changing at between –10% and +10% annually between 1997 and 2006, and falling slowly in the majority of these countries (**Figures 1.6 and 1.7**). It is possible that these variable rates of decline are attributable to the uneven success of TB control programmes. Alternatively, the differences among countries might be explained by other factors that affect transmission of and susceptibility to disease.

One way to distinguish between possible explanations is to identify, by comparing countries, which factors are more or less closely associated with changes in TB incidence. In a preliminary ecological analysis<sup>1</sup> of 30 possible explanatory variables (for methods, see **Annex 2**), trends in incidence per 100 000 population in the Latin America and Caribbean subregion are associated (p < 0.05) with HIV prevalence ( $r^2 = 0.41$ , Figure 1.22a),

<sup>&</sup>lt;sup>1</sup> A fuller analysis is in: Dye C et al, Determinants of trends in tuberculosis incidence: an ecologic analysis for 134 countries. Unpublished paper available from the authors.

with under-5 mortality ( $r^2 = 0.32$ ), and with access to clean water ( $r^2 = 0.43$ ) and adequate sanitation ( $r^2 = 0.50$ ), among other variables. In the high-income countries of Western Europe and the United States of America, immigration is the single most important factor associated with TB dynamics (Figure 1.22b). In Central and Eastern Europe and in the Eastern Mediterranean Region, TB trends are linked to a variety of economic indicators including health expenditure per capita (Figure 1.22c) and expenditure in relation to GDP (Figure 1.22d). Only three of seven direct measures of TB control were significantly associated with trends in TB incidence, and the form of the association does not suggest any causal link. For example, smear-positive treatment success under DOTS  $(r^2 = 0.29)$ , and the product of case detection (all forms of TB) and treatment success ( $r^2 = 0.32$ ), were inversely correlated with TB decline in high-income countries.

In multivariate analyses of this kind, the numerous explanatory variables tend to be inter-related, and some are more obviously linked to TB trends as covariates, rather than as primary epidemiological determinants. For example, in the African Region incidence was increasing more quickly in countries that spent more on TB control ( $r^2 = 0.49$ , Figure 1.22e). The likely explanation lies in the association between expenditure on TB per capita and HIV prevalence, with richer African countries that can spend more on health care also having higher HIV prevalence ( $r^2 = 0.53$ ). Similarly, the decline in TB incidence in Central and Eastern Europe tends to be faster in countries where a higher proportion of women smoke ( $r^2 = 0.67$ , Figure 1.22f). The likely explanation is that smoking among women reflects affluence, which is linked to health and health services in ways that outweigh the importance of smoking as a risk factor for TB (correlation with GDP,  $r^2 = 0.67$ ).

In brief, this ecological analysis provides no evidence that the standard, direct measures of DOTS implementation – case detection and treatment success in various combinations – can yet explain the variation in incidence trends among countries, despite the wide variation in DOTS implementation among countries. This observation suggests – subject to further investigation – that DOTS programmes have not yet had a major impact on TB transmission and incidence around the world.

All of the caveats attached to this proposition must be carefully examined before drawing firm conclusions. Key assumptions to be tested are that trends in case notifications reflect trends in TB incidence, and that there is measurable and meaningful variation among countries in incidence trends and their determinants. It is also possible that DOTS programmes have significantly cut transmission, but it is too soon to see the effects on incidence, or that the effects have been offset by the rise of other risk factors, such as diabetes. In addition, it is crucial to distinguish the well-established effects of DOTS on treatment outcome and mortality from the possible effects on transmission (under investigation here).

#### FIGURE 1.21





## 1.9 Summary

There were an estimated 9.2 million new cases of TB in 2006, of which 709 000 (8%) were HIV-positive. This is an increase from 2005, reflecting population growth in Asia, Africa and Europe. The countries that rank first to fifth in terms of absolute numbers of cases are India, China, Indonesia, South Africa and Nigeria, while Africa has the highest incidence rate per capita (linked to HIV) and accounts for 12 of the 15 countries with the highest TB incidence rates. There were an estimated 1.7 million deaths due to TB in 2006, of which 0.2 million were among HIV-positive people, and 14.4 million prevalent cases. These statistics show that TB remains a major global health problem.

More positively, the TB incidence rate per capita is declining globally, and in five out of the six WHO regions (it is approximately stable in Europe). The latest data indicate that the TB incidence rate has been falling globally since 2003. If this is confirmed by further monitoring, MDG 6 Target 6.C (to halt and reverse the incidence of TB) will be achieved well before the target date of 2015. Prevalence and deaths rates are also falling, and at a faster rate than TB incidence. Based on trends for the last five years, the Stop TB Partnership targets of halving prevalence and death rates by 2015 compared to 1990 could be achieved in the South-East Asia, West-

## FIGURE 1.22

Correlates of the average annual change in TB incidence rate (vertical axes, %/yr), 1997–2006, in different subregions of the world

#### (a) Latin America



4  $r^2 = 0.44$ • 0 -4 -8 -12 10 20 30 40 50 60 70 80 0 Percent of TB cases foreign born



(d) Eastern Mediterranean

(b) High-income countries



 $r^2 = 0.67$ 

. 25

30





ern Pacific and Eastern Mediterranean regions, and in the Region of the Americas. However, they are unlikely to be achieved globally based on current trends, due to two regions – the European and African regions – being far from the targets.

In addition to the impact indicators of incidence, prevalence and mortality, progress in TB control can also be assessed with reference to the outcome targets first set by the World Health Assembly in 1991: to detect at least 70% of new (incident) cases of smear-positive TB in DOTS programmes, and to successfully treat 85% of those cases that are detected. In 2005, the treatment success rate globally was 84.7%, just a fraction of one percent below the target, representing a further improvement from previous years despite a 10-fold increase in the annual number of patients treated in DOTS cohorts since 1994. This high average rate conceals the fact that treatment success rates remain well below the target in the European Region and in the Region of the Americas, and indeed the latest data show a worrying deterioration rather than progress in these two regions. With 5.3 million cases notified in DOTS programmes (98% of the total notified globally), of which 2.5 million were new smear-positive cases (99% of the total notified globally), the case detection rate for new smear-positive TB under DOTS is estimated at 61% globally (62% when notifications from non-DOTS programmes are included). The target of 70% has been exceeded in the Western Pacific Region and is close to being achieved in South-East Asia and the Region of the Americas. Increasing DOTS coverage in the Region of the Americas, and increasing both DOTS coverage and the use of smear microscopy in the European Region, could enable both of these regions to achieve the target for case detection. A total of 58 countries met the target for treatment success in 2005, 77 are assessed to have met the target for case detection in 2006, and 32 countries as well as the Western Pacific Region as

a whole appear to have met both targets in 2005–2006.

While continued improvement in treatment success and case detection rates is encouraging, there has been a deceleration in the rate of progress in case detection globally, and the rate of 61% achieved in 2006 is behind the Global Plan milestone of 65%. China and India account for 28% of the estimated number of undetected cases, but there was almost no improvement in case detection in either country during 2006. Most of the remaining cases estimated to be undetected are in Africa. This suggests that further progress in case detection globally will depend to a great extent on progress in the African Region, and on further progress in China and India. For the African Region, there is an important caveat, however. It is possible that rates of case detection are currently underestimated, due to the difficulty of disentangling the effect of improved case-finding and the HIV epidemic on TB notifications. Further analytical work of the kind already done in Kenya, and new surveys conducted as part of the impact measurement work discussed in Chapter 2, will help to improve our current estimates of case detection in Africa.

New analytical work is also improving our understanding of the extent to which TB control programmes are driving trends in TB incidence, working with or against other biological, social and economic factors. The ecological analysis presented in this chapter suggests that while DOTS programmes have reduced deaths and prevalence, they have not yet had a major impact on TB transmission and incidence around the world. These observations lay down a challenge: to show that the diagnosis of active TB can be made early enough, and that cure rates can be high enough, to have a substantial impact on incidence on a large geographic scale. The greater the impact on incidence, the more likely it is that prevalence and deaths will be halved by the MDG deadline of 2015.

# Implementing the Stop TB Strategy

The Stop TB Strategy, launched by WHO in 2006, 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, launched by the Stop TB Partnership in 2006, describes 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 (**Tables 2.1 and 2.2**) since 2006. In the 2007 round of data collection, countries were asked to report on activities implemented in 2006 and on activities planned for 2007 (see **Annex 2** for details on methods). In a few cases, data for 2008 were also requested.

This chapter summarizes the major findings and, wherever possible, presents these alongside comparable data reported in previous years to illustrate trends over time. It is structured in seven major sections. The first provides an overview of the completeness of reporting

#### TABLE 2.1

## **Components of the Stop TB Strategy**

- 1. Pursuing high-quality DOTS expansion and enhancement
  - a. Political commitment with increased and sustained financing
  - b. Case detection through quality-assured bacteriology
  - c. Standardized treatment with supervision and patient support
  - d. An effective drug supply and management system
  - e. Monitoring and evaluation system, and impact measurement
- 2. Addressing TB/HIV, MDR-TB and other challenges — Implement collaborative TB/HIV activities
  - Prevent and control MDR-TB

  - Address prisoners, refugees, other high-risk groups and special situations
- 3. Contributing to health system strengthening
  - Actively participate in efforts to improve system-wide policy, human resources, financing, management, service delivery and information systems
  - Share innovations that strengthen health systems, including the Practical Approach to Lung Health (PAL)
  - Adapt innovations from other fields

#### 4. Engaging all care providers

- Public-Public and Public-Private Mix (PPM) approaches
- Implement International Standards for Tuberculosis Care

#### 5. Empowering people with TB, and communities

- Advocacy, communication and social mobilization
- Community participation in TB care
- Patients' Charter for Tuberculosis Care

#### 6. Enabling and promoting research

- Programme-based operational research
- Research to develop new diagnostics, drugs and vaccines

for each component of the Stop TB Strategy. The next six sections present results for the six major components of the Stop TB Strategy, as follows:

- DOTS expansion and enhancement. This section starts with an overview of DOTS implementation, including the number of countries in which DOTS is implemented, DOTS population coverage and the number of patients treated in DOTS programmes. It then discusses political commitment, case detection through quality-assured bacteriology, standardized treatment with supervision and patient support, drug supply and management systems, and monitoring and evaluation including impact measurement.
- *TB/HIV, MDR-TB and other challenges.* This section analyses the implementation of collaborative TB/ HIV activities, the provision of diagnosis and treatment for cases of MDR-TB, TB control activities for prisoners, refugees and other high-risk groups, and TB control activities in special situations such as humanitarian emergencies.
- *Health system strengthening*. This section covers how the diagnosis of TB and treatment of TB patients are integrated into primary health care services, human resource development (HRD), and the links

### 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

between planning for TB control and planning for the health sector and public sector as a whole. It also covers implementation of the Practical Approach to Lung Health (PAL).

- *Engaging all care providers*. This section provides information on the implementation of public–private and public–public mix (PPM) approaches to TB control, including the use of the International Standards for Tuberculosis Care (ISTC).
- *Empowering people with TB, and communities.* This section assesses advocacy, communication and social mobilization (ACSM) activities, community participation in TB care and adoption of the Patients' Charter;
- *Enabling and promoting research*. This section summarizes operational research activities.

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.

## 2.1 Data reported to WHO in 2007

The data that were reported to WHO in 2007 are summarized in **Tables 2.3 and 2.4**. Reporting was best for questions about the existence and content of national strategic plans for TB control, ACSM and community TB care. Reporting was least complete for questions about collaborative TB/HIV activities that aim to reduce the burden of TB in HIV-positive people (intensified TB case-finding and provision of isoniazid preventive therapy, or IPT), TB control for special groups and populations, and PPM. Among the 22 HBCs, most of the data that were requested were provided.

## 2.2 DOTS expansion and enhancement

## 2.2.1 DOTS coverage and numbers of patients treated

The total number of countries implementing DOTS has increased steadily from 1995, reaching 184 countries by 2006 (**Figure 2.1**). All 22 HBCs have had DOTS programmes since 2000, many of which have been established for much longer.

DOTS coverage within countries has also increased since 1995 (**Table 2.5**). By the end of 2006, 93% of the world's population lived in counties, districts, oblasts and provinces of countries that had adopted DOTS. Population coverage was reported to exceed 90% in all regions except Europe (**Figure 2.2**). All but three HBCs (Brazil, Nigeria and the Russian Federation) reported that at least 90% of the population lived in areas where DOTS was being implemented. Population coverage in Brazil, Nigeria and the Russian Federation was 86%, 75% and 84% respectively (**Table 2.5**).

#### TABLE 2.3

**Reporting on implementation of the Stop TB Strategy, non high-burden countries, 2006.** Number of countries (out of 179 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 enhanceme	nt						
National strategic plan for TB cont	rol	16	4	8	153		
Case detection through quality-as	sured bacteriology	62	34	41	44		
Standardized treatment, with supe	ervision and patient support	30	121	30	0		
Drug supply and management sys	tem	57	40	63	21		
Monitoring and evaluation, includi	ng impact measurement	57	46	21	57		
2. TB/HIV. MDR-TB and other challe	enaes						
Collaborative TB/HIV activities							
Mechanisms for collaboration	and policy development	57	16	52	56		
HIV-testing for TB patients, pr	ovision of CPT and ART	69	37	12	63		
Intensified TB case-finding an	d IPT for HIV-positive people	119	11	11	40		
Management of MDR-TB							
Policy and stage of implement	tation	59	7	16	99		
Diagnosis and treatment of M	DR-TB	42	7	65	67		
High-risk groups and special situa	tions	120	46	0	15		
3. Health system strengthening							
Practical Approach to Lung Health	(PAL)	128	3	40	9		
Human resource development	()	55	6	31	89		
A Engaging all care providers							
Public-private and public-public	mix approaches (PPM)	128	10	11	32		
International Standards for Tubero	ninx approaches (1 1 m)	120	8	0	46		
		121	0	0	10		
5. Empowering people with TB, and	communities						
Advocacy, communication and so	cial mobilization (ACSM)	61	0	0	120		
Community participation in TB col	ntrol	61	0	0	120		
Patients' Charter for Tuberculosis	Care	68	6	0	107		
6. Enabling and promoting research	1						
Operational research		83	23	0	75		

## TABLE 2.4

## **Reporting on implementation of the Stop TB Strategy, high-burden countries, 2006.** Number of countries (out of 22) answering given percentage of questions on each sub-component of the strategy.

	PEF	PERCENTAGE OF QUESTIONS ANSWERED				
	<50%	50-75%	75-90%	>90%		
1. DOTS expansion and enhancement						
National strategic plan for TB control	0	0	3	19		
Standardized treatment, with supervision and patient support	0	1	12	9		
Case detection through quality-assured bacteriology	1	1	15	5		
Drug supply and management system	0	1	10	11		
Monitoring and evaluation, including impact measurement	1	7	10	4		
2. TB/HIV, MDR-TB and other challenges						
Collaborative TB/HIV activities						
Mechanisms for collaboration and policy development	0	0	12	10		
HIV-testing for TB patients, provision of CPT and ART	5	3	1	13		
Intensified TB case-finding and IPT for HIV-positive people	11	5	6	0		
Management of MDR-TB						
Policy and stage of implementation	0	1	4	17		
Diagnosis and treatment of MDR-TB	2	1	5	14		
High-risk groups and special situations	1	1	20	0		
3. Health system strengthening						
Links with other planning initiatives	1	3	9	9		
Practical Approach to Lung Health (PAL)	0	0	19	3		
Human resource development	1	6	8	7		
4. Engaging all care providers						
Public-private and public-public mix approaches (PPM)	0	2	9	11		
International Standards for Tuberculosis Care	2	0	0	20		
5. Empowering people with TB, and communities						
Advocacy, communication and social mobilization (ACSM)	3	1	2	16		
Community participation in TB control	3	3	15	1		
Patients' Charter for Tuberculosis Care	2	9	0	11		
6. Enabling and promoting research						
Operational research	4	6	0	12		

## FIGURE 2.1

## Number of countries implementing DOTS (out of a total of 212 countries), 1991–2006



## FIGURE 2.2

**DOTS coverage by WHO region, 2006.** The purple portion of each bar shows DOTS coverage as a percent of the population. The numbers in each bar show the population (in millions) within (purple portion) or outside (grey portion) DOTS areas.



## Progress in DOTS implementation, 1995–2006

TABLE 2.5

				P	PERCENT OF	POPULATI	ON COVERI	ED BY DOTS	;			
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1 India	1.5	2	2.3	9	13.5	30	45	51.6	67.2	84.0	91.0	100
2 China	49	60	64	64	64	68	68	78	91	96	100	100
3 Indonesia	6	13.7	28.3	80	90	98	98	98	98	98	98	98
4 South Africa	-	0	13	22	66	77	77	98	99.5	93	94	100
5 Nigeria	47	30	40	45	45	47	55	55	60	65	65	75
6 Bangladesh	40.5	65	80	90	90	92	95	95	99	99	99	100
7 Ethiopia	39	39	48	64.4	63	85	70	95	95	70	90	100
8 Pakistan	2	8	-	8	8	9	24	44	66	79	100	100
9 Philippines	4.3	2	15	16.9	43	89.6	95	98	100	100	100	100
10 DR Congo	47	51.4	60	60	62	70	70	70	75	75	100	100
11 Russian Federation	-	2.3	2.3	5	5	12	16	25	25	45	83	84
12 Viet Nam	50	95	93	96	98.5	99.8	99.8	99.9	100	100	99.9	100
13 Kenya	15	100	100	100	100	100	100	100	100	100	100	100
14 UR Tanzania	98	100	100	100	100	100	100	100	100	100	100	100
15 Uganda	-	0	100	100	100	100	100	100	100	100	100	100
16 Brazil	-	0	0	3	7	7	32	25	33.6	52	68	86
17 Mozambique	97	100	84	95	-	100	100	100	100	100	100	100
18 Thailand	-	1.1	4	32	59	70	82	100	100	100	100	100
19 Myanmar	-	59	60	60.3	64	77	84	88.3	95	95	95	95
20 Zimbabwe	-	0	0	100	11.6	100	100	100	100	100	100	100
21 Cambodia	60	80	88	100	100	99	100	100	100	100	100	100
22 Afghanistan	-	-	12	11	13.5	15	12	38	53	68	81	97
High-burden countries	24	32	36	43	45	55	61	68	79	87	94	98
AFR	43	46	56	61	56	71	70	81	85	83	88	91
AMR	12	48	50	55	65	68	73	73	78	83	88	93
EMR	16	12	18	33	51	65	71	77	87	90	97	98
EUR	5.4	8.2	17	22	23	26	32	40	42	47	60	67
SEAR	6.7	12	16	29	36	49	60	66	77	89	93	100
WPR	43	55	57	58	57	67	68	77	90	94	98	100
Global	22	32	37	13	47	57	62	60	78	83	80	03

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

As reported in greater detail in Chapter 1, 4.9 million new cases of TB were notified by DOTS programmes in 2006, of which 2.5 million were new smear-positive cases. These numbers represented 98% and 99% of total TB case notifications (DOTS and non-DOTS programmes), respectively. The percentage of all estimated new cases ofsmear-positive TB detected by DOTS programmes - the case detection rate - was 61% globally in 2006; the case detection rate for all cases was 54%. A cumulative total of 31.8 million new and relapse cases have been treated in DOTS programmes in the 12 years from 1995 (when reliable records began) to 2006. Globally, the treatment success rate was 84.7% in the 2005 cohort, meaning that the target of 85% has almost been reached. The Western Pacific Region has reached both targets related to DOTS implementation (i.e. 70% case detection rate and 85% treatment success rate), 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 is useful for setting the information provided in the rest of this chapter in context.

## 2.2.2 Political commitment

Continued political commitment is essential for sustaining DOTS as well as for introducing and then scaling up other components of the Stop TB Strategy. Two indicators of political commitment are the existence of a national strategic plan for TB control and the share of the total funding required for TB control that is being provided from domestic sources.

A national strategic plan for TB control was reported to exist in 155 countries, including all HBCs. Among HBCs, eight increased domestic funding for TB control between 2007 and 2008: Afghanistan, Brazil, Ethiopia, Mozambique, Myanmar, the United Republic of Tanzania, Viet Nam and Zimbabwe. In a further eight HBCs (Cambodia, China, the Democratic Republic of the Congo, India, Indonesia, Kenya, the Russian Federation and South Africa), domestic funding in 2008 was maintained at a level similar to 2007. The share of the NTP budget being funded from domestic sources averages 64% across the 22 HBCs for 2008, but varies from less than 20% in Afghanistan, Kenya, Myanmar and Uganda to 30-50% in eight countries (for example, Indonesia, Mozambique, Nigeria and Pakistan) to 50-69% in four countries (for example, China and the Philippines) to over 70% in five countries (Brazil, India, the Russian

## TABLE 2.6

#### Stock-outs of laboratory reagents and of first-line anti-TB drugs, 2006

	LABORATORY REAGENTS AND SUPPLIES		FIRS ANTI-1	ST-LINE IB DRUGS
	CENTRAL	PERIPHERAL	CENTRAL	PERIPHERAL
1 India	Ν	Ν	Ν	Ν
2 China	Y	Some units	Ν	Ν
3 Indonesia	Ν	Ν	Ν	N
4 South Africa	Ν	N	Ν	All units
5 Nigeria	Ν	-	Ν	N
6 Bangladesh	Ν	N	Ν	N
7 Ethiopia	Ν	Ν	Ν	N
8 Pakistan	Ν	Some units	Ν	N
9 Philippines	Ν	Ν	Ν	N
10 DR Congo	Ν	Some units	Ν	Some units
11 Russian Federation	Ν	Ν	Ν	N
12 Viet Nam	Ν	N	Ν	N
13 Kenya	Ν	Ν	Ν	Ν
14 UR Tanzania	Ν	N	Ν	All units
15 Uganda	Ν	Some units	Y	Some units
16 Brazil	Y	All units	Ν	N
17 Mozambique	Ν	Ν	Ν	Ν
18 Thailand	Ν	N	Ν	N
19 Myanmar	Ν	Ν	Ν	Ν
20 Zimbabwe	Ν	Some units	Y	Some units
21 Cambodia	Ν	Ν	Ν	Ν
22 Afghanistan	Ν	Ν	Ν	Ν
High-burden countriesª	2/22	6/21	2/22	6/22
AFR (46) <sup>b</sup>	6/39	9/35	7/38	12/38
AMR (44)	3/35	8/29	6/35	9/27
EMR (22)	2/22	5/21	3/21	3/20
EUR (53)	3/37	6/35	2/35	4/35
SEAR (11)	1/10	2/11	1/10	1/11
WPR (36)	5/32	6/26	7/28	5/24
Global (212)	20/175	36/157	26/167	34/155

Indicates information not provided.

<sup>a</sup> 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

<sup>b</sup> The number of countries in each region is shown in parentheses.

Federation, South Africa and Viet Nam). There were insufficient data to make an assessment for Thailand. Full details about financing for TB control, including discussion of how domestic funding is related to a country's income level, are provided in **Chapter 3**.

## 2.2.3 Case detection through quality-assured bacteriology

Sputum smear microscopy is being widely used for the diagnosis of TB: 85% of reporting countries (151/177) stated that it is used for all people with suspected pulmonary TB. This included 20 HBCs. Laboratory supplies are generally adequate, but six HBCs reported stock-outs at peripheral level in some units: Brazil, China, Pakistan, the Democratic Republic of the Congo, Uganda and Zimbabwe (Table 2.6). Among all countries, 20 reported some stock-outs at central level; 36 reported stock-outs at peripheral level (Table 2.6). More positively, almost all HBCs have established links with non-NTP laboratory services, including laboratories in the private sector and/ or laboratory services provided by nongovernmental organizations (NGOs). This should help to expand diagnostic capacity in future, which is particularly needed in Ethiopia, Nigeria and Pakistan. In these three HBCs, the number of laboratories performing sputum smear microscopy is below the recommended benchmark of 1 per 100 000 population (Table 2.7) and case detection rates remain below the global target of 70%.

While coverage and use of sputum smear microscopy services are generally high, the availability of culture and DST remains limited in most HBCs (Table 2.7). Only seven HBCs had at least one culture laboratory for every 5 million population, which is the level recommended in the Global Plan. These were Brazil, Cambodia, China, the Russian Federation (with 34 culture laboratories for every 5 million population), South Africa, Thailand and Viet Nam. The same set of countries, plus Indonesia and Uganda, had one laboratory able to provide services for drug susceptibility testing (DST) per 10 million population. This leaves many countries with a major shortage of laboratories providing culture and DST services. Encouragingly, the need for expansion of culture and DST capacity has been widely recognized. Among the 22 HBCs, 17 have plans to establish or scale up culture and DST services.

National reference laboratories (NRLs) are essential for the expansion of quality-assured culture and DST services. Most HBCs listed increased NRL capacity and improved NRL performance as a priority activity for 2007. For this to be successful, there are several major challenges that need to be overcome. These include a shortage of adequately trained staff, insufficient funding, suboptimal biosafety standards and limited availability of sustained technical assistance.

Given the demand for improvement in diagnostic services, particularly for drug-resistant TB, the supranational reference laboratory network (SRLN) is also in

#### Coverage of laboratory services, high-burden countries, 2006

				LABORATORIES INCLUDED IN EXTERNAL QUALITY ASSUBANCE (EQA)						
		NATIONAL	SPUTU	M SMEAR	CUL	TURE	DST		FOR SPUTUM	
	POPULATION THOUSANDS	ON LABORATORY DS (NRL)	NUMBER OF LABS	PER 100 000 POP	NUMBER OF LABS	PER 5 MILLION POP <sup>a</sup>	NUMBER OF LABS	PER 10 MILLION POP <sup>a</sup>	NUMBER	%
1 India	1 151 751	Y	11 968	1.0	8	0.03	8	0.07	9 422	79
2 China	1 320 864	Y	3 010	0.2	360	1.4	90	2.7	2 770	92
3 Indonesia	228 864	N	4 855	2.1	41	0.9	11	1.8	4 855	100
4 South Africa	48 282	Y	143	0.3	13	1.3	8	2.7	143	100
5 Nigeria	144 720	Ν	694	0.5	0	0.0	0	0.0	416	60
6 Bangladesh	155 991	Y	687	0.4	3	0.1	0	0.2	679	99
7 Ethiopia	81 021	Y	713	0.9	1	0.1	1	0.1	-	-
8 Pakistan	160 943	N	982	0.6	3	0.1	1	0.2	318	32
9 Philippines	86 264	Y	2 374	2.8	3	0.2	3	0.3	2 374	100
10 DR Congo	60 644	Y	1 069	1.8	1	0.1	1	0.2	1 069	100
11 Russian Federation	143 221	Ν	4 953	3.5	978	34	302	68	998	20
12 Viet Nam	86 206	Y	874	1.0	18	1.0	2	2.1	740	85
13 Kenya	36 553	Y	770	2.1	2	0.3	2	0.5	400	52
14 UR Tanzania	39 459	Y	690	1.7	3	0.4	1	0.8	690	100
15 Uganda	29 899	Y	726	2.4	3	0.5	2	1.0	515	71
16 Brazil	189 323	Y	4044	2.1	193	5.1	38	10	2 100	52
17 Mozambique	20 971	Y	250	1.2	1	0.2	1	0.5	11	4.4
18 Thailand	63 444	Y	937	1.5	65	5.1	18	10	864	92
19 Myanmar	48 379	Y	391	0.8	2	0.2	1	0.4	50	13
20 Zimbabwe	13 228	Y	180	1.4	1	0.4	1	0.8	10	5.6
21 Cambodia	14 197	Y	186	1.3	3	1.1	1	2.1	186	100
22 Afghanistan	26 088	N	500	1.9	1	0.2	1	0.4	-	-

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

<sup>1</sup> 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 (numbers shown in italics), one laboratory for culture and DST in each major administrative area (e.g. province) may be sufficient. See also footnote 3 in country profiles (Annex 1).

the process of global expansion. 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 Asia Region and five in the Western Pacific Region (**Figure 2.3**). All regions have plans to expand their SRL networks, and candidate laboratories will be assessed and evaluated in the near future. This should increase coverage of quality-assured culture and DST services at both national and global levels.

## 2.2.4 Standardized treatment, with supervision and patient support

The vast majority of reporting countries (96%, 173/181) use standardized short-course chemotherapy, including all HBCs. Treatment with the Category I regimen for 6 months is used in 122 countries worldwide, while 31 countries use an 8-month regimen without rifampicin in the continuation phase of treatment. Among countries using the 8-month regimen, 13 (including five HBCs) have plans to switch to the 6-month regimen.

Health-facility based, community-based or homebased directly observed therapy (DOT) was used during the initial phase of treatment in 166 countries, although only 123 of these stated that it was used for all patients in all DOTS units. Among HBCs, Brazil, China, Nigeria, Pakistan and Thailand reported that DOT was available only in some units and/or only for some patients. Almost all reporting countries (96%, 170/178), including all HBCs, provided anti-TB drugs free-of-charge to all patients being treated with the Category I regimen under DOTS. Incentives and enablers are used in some countries, mostly in the European Region. Examples include food parcels, tickets for public transport and provision of psychological counselling to ensure adherence to treatment.

#### 2.2.5 Drug supply and management system

Uninterrupted provision of quality-assured anti-TB drugs is fundamental to effective TB control. However, despite the availability of funding from the Global Fund and the Global Drug Facility (GDF), as well as the option of procurement at highly competitive prices from the GDF, drug shortages continue to occur in all regions, at both central and peripheral levels (Table 2.6). This includes shortages in two HBCs (Uganda, and Zimbabwe) at central level, and in five HBCs (the Democratic Republic of the Congo, South Africa, Uganda, the United Republic of Tanzania and Zimbabwe) at peripheral level. Reported shortages were particularly common in the African Region and the Region of the Americas. Reporting on drug availability was relatively incomplete for the Region of the Americas as well the European and Western Pacific regions. This suggests that better monitoring of drug stocks is needed in some countries in these regions, for example via the revised recording and

#### FIGURE 2.3

Tuberculosis supranational reference laboratory network, 2006



reporting forms that have been developed by WHO and other partners.

During the past year, the availability of qualityassured and affordable anti-TB drugs has improved. For example, the prequalification process for paediatric formulations of fixed-dose combinations (FDCs) has been accelerated via mechanisms including pooled procurement by the GDF, the involvement of UNITAID and provision of technical assistance from the WHO prequalification project. A total of 71 countries including 12 HBCs ordered FDCs from the GDF in 2007.

Members of the Stop TB Partnership, including WHO and Management Sciences for Health, continue to hold training workshops in drug management in collaboration with the GDF. In 2007, two workshops were held, one in Benin and the other in Cape Town.

## 2.2.6 Monitoring and evaluation, including impact measurement

Global targets to reduce the epidemiological burden of TB have been set for 2015 within the context of the MDGs and by the Stop TB Partnership (see **Chapter 1**). Measuring progress towards these targets requires routine monitoring of case notifications and treatment outcomes, as well as evaluation of the impact of TB control on incidence, prevalence and mortality using routine surveillance data (TB case notification data and TB mortality data from vital registration systems) and, in some cases, special surveys of the prevalence of disease, infection or mortality. Questions related to impact measurement were asked on the WHO data collection form for the first time in 2007.

Out of 212 countries, 184 DOTS countries and seven non-DOTS countries routinely record and report data on case notifications and treatment outcomes. In addition, 119 (of 202) reporting countries (59%) stated that they publish an annual report of NTP activities and performance. Although some countries have been publishing an annual report for more than 20 years, most countries started to produce such reports in the 1990s. Among the 22 HBCs, all published annual reports except for the Democratic Republic of the Congo, South Africa and Thailand.

Plans to assess the impact of TB control were reported by 128 out of 202 (63%) countries (**Table 2.8**). Among HBCs, only Afghanistan, the Democratic Republic of the Congo and Mozambique did not report having a plan for impact measurement. The proportion of countries with a plan for impact measurement was particularly high in the South-East Asia Region (9 out of 11 countries).

In-depth analysis of routine surveillance data collected by NTPs was the most frequent method by which countries intended to assess the impact of TB control (116/128, 91%). Analysis of mortality data from vital registration systems (also a form of routine surveillance data) was also reported by a large number of countries (51 out of 128 reporting countries), with numbers in absolute terms highest in the European and Western

#### TABLE 2.8

Plans to assess the impact of TB control on the epidemiological burden of TB in the next 10 years

	PLAN TO ASSESS IMPACT EXISTS	IN-DEPTH ANALYSIS OF ROUTINE SURVEILLANCE DATA	PREVALENCE OF DISEASE SURVEY <sup>a</sup>	PREVALENCE OF INFECTION SURVEY <sup>a</sup>	MORTALITY SURVEY	ANALYSIS OF VITAL REGISTRATION DATA (MORTALITY RECORDS)
1 India	Y	Y	Y, sub-national	Y	Y	Ν
2 China	Y	Y	Y	Y	Y	Y
3 Indonesia	Y	Ν	Y	Y, sub-national	Y	Y
4 South Africa	Y	Y	Y	Ν	Ν	Y
5 Nigeria	Y	Y	Y	-	Ν	Ν
6 Bangladesh	Y	Y	Y	Y	N	N
7 Ethiopia	Y	Y	Ν	Y	Y	Ν
8 Pakistan	Y	Y	Y, sub-national	Y	N	Ν
9 Philippines	Y	Ν	Y	Y	Ν	Ν
10 DR Congo	Ν	N	N	Ν	N	N
11 Russian Federation	Y	Y	Y	Y	Y	Y
12 Viet Nam	Y	Y	Y	Y	N	N
13 Kenya	Y	Y	Y	Y	Ν	Ν
14 UR Tanzania	Y	Y	Y	Y	N	Ν
15 Uganda	Y	Y	Y	Ν	Ν	Ν
16 Brazil	Y	Y	N	Ν	Y	Y
17 Mozambique	Ν	N	N	Ν	Ν	Ν
18 Thailand	Y	Y	Y	Ν	Y	N
19 Myanmar	Y	Y	Y	Ν	Y	Y
20 Zimbabwe	Y	Y	Y	Ν	Ν	Y
21 Cambodia	Y	N	Y	Y	Ν	Ν
22 Afghanistan	Ν	Ν	Ν	Ν	Ν	Ν
High-burden countries <sup>b</sup>	19	16	17	12	8	7
AFR (46) <sup>c</sup>	27	22	18	9	5	4
AMR (44)	23	23	5	5	5	9
EMR (22)	15	13	12	10	2	3
EUR (53)	32	32	13	12	9	18
SEAR (11)	9	8	7	5	6	5
WPR (36)	22	18	14	11	7	12
Global (212)	128	116	69	52	34	51

Indicates information not provided.

<sup>a</sup> National survey unless otherwise specified.

<sup>b</sup> The lower part of table shows the number of countries planning each type of assessment (including those planning sub-national surveys).

c The number of countries in each region is shown in parentheses

Pacific regions and the Region of the Americas. Only four countries in the African Region (Comoros, Rwanda, SouthAfrica and Zimbabwe) reported plans to use mortality data from vital registration systems.

Surveys of the prevalence of disease were being planned by 69 countries, including 55 national and 14 sub-national surveys. Of the 44 countries that reported the year in which they were intending to start their national surveys, 8 (18%) were due to start in 2007, 17 (39%) in 2008, 7 (16%) in 2009 and the remainder in later years. Measurement of burden and impact is particularly well advanced in the Western Pacific Region, where all four HBCs have already undertaken at least one disease prevalence survey and where follow-up surveys are planned.

In December 2007, the WHO Task Force on TB Impact Measurement agreed a set of epidemiological criteria to guide the selection of countries that should undertake prevalence of disease surveys during the period up to 2015.<sup>1</sup> These criteria were used to identify countries with all or a combination of the following characteristics: (i) weak routine reporting systems; (ii) high TB prevalence; (iii) high TB burden (number of cases); and (iv) high HIV/AIDS prevalence. The Task Force also considered whether a country already had a plan to conduct a survey within the next 10 years and whether they had done a survey since the year 2000. Of the 57 countries that met the criteria, 30 reported plans to carry out a national (n=25) or sub-national (n=5) survey. Among HBCs, 20 met the criteria, of which 17 reported plans to carry out either a national survey (n=15) or a sub-national survey (n=2, India and Pakistan). Three HBCs met the criteria but did not report having a plan to conduct a survey within the next 10 years: the Democratic Republic of the Congo, Ethiopia and Mozambique. Of the 155 countries that did not meet the criteria, 39 reported having a plan to conduct either a national (n=30) or a sub-national (n=9) survey.

The Task Force also identified a shorter list of 21 countries<sup>2</sup> in which surveys should be prioritized in order

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).

<sup>&</sup>lt;sup>2</sup> From among the longer list of 57 countries.

to produce credible regional and global assessments of whether the 2015 impact targets are achieved, as well as to assess progress in the period up to 2015. This list includes 15 HBCs and six other countries.<sup>1</sup> Among the 21 countries, 16 countries (including 12 HBCs) have reported plans to carry out national surveys and two (1 HBC) have reported plans to carry out a sub-national survey.

Most of the 52 countries that are planning prevalence of TB infection (tuberculin) surveys at national or subnational levels also reported plans to conduct prevalence of disease surveys. It is important that these countries try to implement both surveys at the same time and in the same place.

Population-based mortality surveys (e.g. verbal autopsy studies) were being planned by only 34 countries. From the available data, it is not clear if these surveys will be limited to TB or whether they will be combined with collection of data for other diseases.

## 2.3 TB/HIV, MDR-TB and other challenges

## 2.3.1 Collaborative TB/HIV activities

Globally, there were an estimated 709 000 new HIV-positive TB cases in 2006 (see **Chapter 1** for further details). This estimate accounts for the revisions to the global estimates of HIV prevalence in the general population that were published by UNAIDS in December 2007.<sup>2</sup> The African Region accounts for 85% of estimated cases, India for 3.3%, the European Region for 1.8% and other countries for 9.4%.

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.<sup>3</sup> These activities include establishing mechanisms for collaboration between TB and HIV programmes (coordinating bodies, joint TB/HIV planning, monitoring and evaluation, HIV surveillance); for HIV-positive people, intensified TB case-finding and, for those without active TB, IPT; infection control in health-care and congregate settings; HIV testing for TB patients; and, for those TB patients infected with HIV, co-trimoxazole preventive therapy (CPT) and ART.

## Mechanisms for collaboration and policy development

Among 63 countries that have been identified as priorities at global level<sup>4</sup> and which collectively account around 40 had established coordinating bodies, developed a joint TB/HIV plan and were undertaking HIV surveillance by 2006 (Figure 2.4). Around 50 countries had policies for HIV counselling and testing among TB patients, as well as for provision of CPT and ART to those coinfected with HIV; these countries account for about 90% of the estimated number of HIV-positive TB cases globally. A relatively high number of countries also had policies for intensified case-finding among HIV-positive people. In contrast, a smaller number of countries had policies related to IPT (26 countries) and infection control (31 countries), with these countries accounting for only 66% and 41% respectively of the global number of HIVpositive TB cases. While there was variation in the extent to which mechanisms for collaboration or policies were in place in 2006, in all instances there was an improvement compared with 2005 (Figure 2.4).

for 97% of estimated HIV-positive cases worldwide,

When all countries that reported data are considered, 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 (**Figure 2.5**).

#### HIV testing for TB patients

HIV testing for TB patients is a critical entry point to interventions for both treatment and prevention. There was a substantial increase in provision of HIV testing for TB patients between 2002 and 2006, with reported numbers increasing from 21 806 patients across 9 countries in 2002 (less than 1% of notified TB cases) to 687 174 patients across 112 countries in 2006 – equivalent to 12% of notified TB cases (**Figure 2.6**). In the African Region, 287 945 patients (22% of all notified cases) were tested (**Table 2.9**).

This increase in numbers of patients tested for HIV may be exaggerated 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 2.6). Stronger and clearer evidence that HIV testing has increased since 2004 is presented in Figure 2.7. This shows the number of TB patients who were tested for HIV in 64 countries that reported data for all three years 2004–2006. The number of TB patients tested for HIV in 11 African countries representing 57% of estimated HIV-positive TB cases globally (and 66% of cases in the African Region, data not shown) increased almost five-fold in three years, while the percentage of all notified cases that were tested increased from 7.5% to 35%. Most of this increase was driven by two countries (Kenya and South Africa) and, to a lesser extent, by Malawi and Zambia (data not shown). Outside the African Region, the number of patients tested for HIV also increased, but by a much smaller amount in absolute terms. The percentage of TB patients tested outside Africa was, however, relatively high (e.g. 56% in 2006).

Across all reporting countries (n=101), testing led

<sup>&</sup>lt;sup>1</sup> The list of 21 countries is: Bangladesh, Cambodia, China, Ghana, Indonesia, Kenya, Malawi, Mali, Mozambique, Myanmar, Nigeria, Pakistan, the Philippines, Rwanda, Sierra Leone, South Africa, Thailand, the United Republic of Tanzania, Uganda, Viet Nam and Zimbabwe.

<sup>&</sup>lt;sup>2</sup> 2007 AIDS epidemic update. Geneva, Joint United Nations Programme on HIV/AIDS and WHO, 2007 (UNAIDS/07.27E/ JC1322E).

<sup>&</sup>lt;sup>3</sup> Interim policy on collaborative TB/HIV activities. Geneva, World Health Organization, 2004 (WHO/HTM/TB/2004.330; WHO/HTM/HIV/2004.1).

<sup>&</sup>lt;sup>4</sup> Refers to 41 countries that were identified as priorities at global level in 2002 and that account for 97% of estimated HIVpositive TB cases globally, plus 22 additional countries that UNAIDS has defined as having a generalized HIV epidemic.

### FIGURE 2.4

**Mechanisms for collaboration and policies for collaborative TB/HIV activities, 63 priority countries, 2005–2006.** Numbers under bars are the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



FIGURE 2.5

**Mechanisms for collaboration and national policies for collaborative TB/HIV activities, all countries, 2006.** Numbers under bars are the percentage of total estimated HIV-positive TB cases accounted for by countries with the respective mechanism or policy.



#### FIGURE 2.6

**HIV testing for TB patients, all countries, 2006.** Numbers under bars represent the number of countries reporting data followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



#### FIGURE 2.7

HIV testing in the 64 countries that reported data for each year 2004–2006. Numbers above bars are the percentage of notified TB cases that were tested for HIV.



HIV testi	IIV testing and treatment in TB patients, by WHO region, 2006									
	% OF NOTIFIED TB PATIENTS TESTED FOR HIV	% OF TESTED TB PATIENTS HIV-POSITIVE	% OF ESTIMATED HIV-POSITIVE TB CASES <sup>a</sup> 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	22	52	25	78	39	85				
AMR	32	15	54	84	76	3.0				
EMR	1.4	6.1	4.0	17	16	0.9				
EUR	46	1.7	41	54	45	1.8				
SEAR	4.1	18	40	66	33	5.6				
WPR	2.7	6.9	12	66	35	3.2				
Global	12	27	26	78	41	100				

<sup>a</sup> Including estimated HIV-positive TB cases in countries which did not provide information on testing.

FIGURE 2.8

TABLE 2.9



## HIV testing for TB patients in selected countries, 2006

#### FIGURE 2.9

**Co-trimoxazole preventive therapy for HIV-positive TB patients, 2002–2006.** Numbers under bars represent the number of countries reporting data followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



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to the detection of 186 217 HIV-positive TB patients. These detected cases represent approximately 26% of the number of HIV-positive TB cases estimated to exist in 2006 (**Table 2.9**). However, there is considerable variation among regions. In the South-East Asia and Western Pacific regions in particular, targeted HIV testing (of patients in specific geographical areas or of patients with specific risk factors) appears to result in a relatively high proportion of the estimated number of HIV-positive TB cases being identified through testing. In South-East Asia, only 4% of notified cases were tested, but this resulted in the detection of 40% of the region's estimated HIV-positive TB cases. In the Western Pacific Region, the figures were 3% and 12%, respectively.

This progress in the number of TB patients being tested for HIV is impressive. However, there is room for further improvement, as illustrated by the high variability in current testing rates among countries (Figure 2.8). The high testing rates achieved by a few countries show that there is scope for increasing testing rates elsewhere.

#### 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 HIVpositive patients. This seems to be working. The benefits of testing can be seen in the high proportion of TB patients testing positive for HIV who were treated with CPT (78%) and ART (41%) in 2006. These proportions represent a slight improvement from 2005 (Figure 2.9 and Figure 2.10). In absolute terms, the improvement in provision of CPT and ART is much more marked. In 2006, almost 146 586 HIV-positive TB patients were treated with CPT in 46 countries that collectively account for 75% of the global number of HIV-positive TB cases, and 66 601 were started on ART across 54 countries that account for 75% of the global number of HIVpositive TB cases. As with HIV testing, trends are somewhat distorted by the variation in the number of countriesreporting data (see figures below bars in both Figure 2.9 and Figure 2.10). However, there has been a large increase in the number of patients benefiting from both treatment interventions since 2004. In Africa specifically, the

proportion of patients in whom HIV infection was diagnosed who are started on CPT reached 78% in 2006; the figure for ART was 41% (**Table 2.9**).

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

Screening for TB among HIV-positive people attending HIV care services grew from 194 718 people in 2005 to 314 394 people in 2006 (**Figure 2.11**). Among those screened, 84 713 were found to have TB; this number is equivalent to 12% of the 709 000 HIV-positive TB cases estimated to exist globally. This high proportion suggests that if screening for TB was increased beyond its currently low levels (only 0.9% of the estimated 33 million HIV-positive people were screened in 2006), TB case-finding would improve.

Provision of IPT remains at very low levels, with reported numbers treated with IPT reaching only 27 056 in 2006 – equivalent to less than 0.1% of the estimated 33 million people estimated to be infected with HIV globally (**Figure 2.11**). The low number of people being treated with IPT is inconsistent with policy establishment: while 84 countries reported the existence of an IPT policy, only 25 reported any provision of IPT. Numbers on IPT are also dominated by Botswana, which accounted for 70% of the total number of people reported to be on IPT globally in 2006.

## Progress against Global Plan targets

The Global Plan describes 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 is shown in Table 2.10. This shows that, among the 171 countries considered in the Global Plan, 541 415 TB patients were tested for HIV compared with 1.6 million specified in the Global Plan. The proportions of TB patients tested for HIV were 20% and 47% respectively. A total of 146 581 HIVpositive TB patients were started on CPT in 2006, compared with the 500 000 specified in the Global Plan. In terms of the percentage of TB cases found to be HIVpositive and that were enrolled on CPT, the comparison is much more favourable: 86% of TB cases in whom HIV infection was diagnosed were started on CPT in 2006 based on country reports, compared with the target of 46% for 2006 in the Global Plan. For ART, 66 542 diagnosed HIV-positive TB cases were reported to have been enrolled in 2006, compared with a target of 220 000 in the Global Plan. As for CPT, the figures are more impressive in terms of the percentage of diagnosed HIVpositive cases started on ART; 41% according to country reports compared with 44% in the Global Plan. The bigger differences between the absolute numbers of people

## FIGURE 2.10

Antiretroviral therapy for HIV-positive TB patients, 2003–2006. Numbers under bars represent the number of countries reporting data followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



## FIGURE 2.11

Intensified TB case finding, diagnosis of TB and IPT provision among HIV-positive people, 2006. Numbers above bars show the number of people receiving the intervention as a percentage of estimated HIV-positive people in reporting countries. Numbers under bars represent the number of countries reporting data followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



#### **TABLE 2.10**

#### Collaborative TB/HIV activities, 2006: country reports compared with expectations given in The Global Plan to Stop TB, 2006–2015

	COUNTRY REPORTS AND LATEST ESTIMATES <sup>a</sup>	GLOBAL PLAN
	(MILLIONS OR PER	RCENTAGES)
HIV-testing for TB patients, provision of CPT and ART		
Number of TB patients tested for HIV	0.5 <sup>b</sup>	1.6
Total number of notified TB cases including new, re-treatment and other cases	3.6°	3.4
Proportion of all notified TB cases that were tested for HIV	20% <sup>c,d</sup>	47%
Number of diagnosed HIV-positive TB cases enrolled on CPT	0.2	0.5
Number of diagnosed HIV-positive TB cases	0.19	1.02
Proportion of all HIV-positive TB cases that enrolled on CPT	86% <sup>e</sup>	46%
Number of diagnosed HIV-positive TB cases enrolled on ART	0.07	0.22
Number of diagnosed HIV-positive TB cases eligible for ART	0.19	0.5
Proportion of all HIV-positive TB cases that enrolled on ART	41% <sup>f</sup>	44%
Intensified TB case-finding and IPT for people with HIV		
Number of HIV-positive people attending HIV services screened for TB	0.31	11
Number of HIV-positive people attending HIV services	7.3	18
Proportion of HIV-positive people attending HIV services that were screened for TB	8.5% <sup>g</sup>	61%
Number of eligible HIV-positive people offered IPT	0.03 <sup>h</sup>	1.2
Estimated number of HIV-positive people eligible to receive IPT	28	30
Proportion of estimated number of HIV-positive people eligible for IPT that received IPT	0.3% <sup>i</sup>	4%

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

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

The numbers of notified TB cases are weighted according to the population coverage of collaborative TB/HIV activities anticipated by the Global Plan

Only the 95 countries which provided both numerator and denominator are included in this percentage Only the 43 countries which provided both numerator and denominator are included in this percentage

Only the 47 countries which provided both numerator are included in this percentage

Only the 37 countries which provided both numerator and denominator are included in this percentage.

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. Only the 17 countries which provided the numerator are included in the denominator of this percentage.

#### FIGURE 2.12

Antiretroviral therapy for HIV-positive TB patients: country reports compared to the Global Plan, 2006–2008. Data from country reports are notified cases (2006) and projections (2007-2008). Numbers under bars represent the number of countries reporting data followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



receiving CPT and ART compared with similar numbers for the percentage of diagnosed HIV-positive TB cases started on such treatment in both country reports and the Global Plan are attributable to the shortfall in HIV testing. For patients to be treated with either CPT or ART, they must first be diagnosed with HIV, which means that a much higher percentage of TB patients must be tested for HIV.

For ART specifically among TB/HIV interventions, the WHO data collection form requests countries to provide projections of the number of HIV-positive patients who will be started on ART in 2007 and 2008, as well as actual provision of ART in 2006. These data are compared with the Global Plan targets for ART in Figure 2.12. About one-third of the countries reported ART projections for 2007 and 2008. Nonetheless, among those countries that did report, anticipated progress is encouraging, with projected numbers higher than the Global Plan targets for those countries in 2007 and 2008.

Activity in HIV care services (intensified casefinding and IPT) is far from Global Plan targets (Table 2.10). The Global Plan target for 2006 was to screen 11 million HIV-positive people for TB; the actual figure reported was 314 211. IPT provision remains at very low levels, although, as noted above, Botswana is an exception.

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

#### **TABLE 2.11**

Number of MDR-TB cases estimated, notified and expected to be treated, 27 global priority countries and WHO regions

		-		-	•			
	ESTIMATED	CASES, 2006	NOTIFIED	EXPECTED	TO BE TREATED	<b>\TED</b>		
	% OF ALL TB CASES WITH MDR-TB	NUMBER OF MDR-TB CASES	2006	2007	2008			
1 China	8.3	130 548	2	165	388			
2 India	4.9	110 132	21	100	450			
3 Russian Federation	19	36 037	3 949	24 100	24 000			
4 Pakistan	5.0	15 233	-	0	0			
5 Bangladesh	4.0	14 583	-	50	150			
6 South Africa	2.6	14 034	6716	4 843	5 2 5 2			
7 Ukraine	22	13 429	-	-	_			
8 Indonesia	2.2	12 142	59	-	100			
9 Philippines	4.6	11 848	403	170	340			
10 Nigeria	2.3	11 171	-	0	500			
11 Uzbekistan	24	9 829	83	60	395			
12 DR Congo	2.8	7 044	1	-	-			
13 Kazakhstan	25	6 6 0 8	4 117	_	_			
14 Viet Nam	4.0	6 421	-	100	-			
15 Ethiopia	1.9	5 825	-	50	50			
16 Myanmar	4.8	4 251	666	75	75			
17 Tajikistan	20	3 204	0	0	-			
18 Azerbaijan	29	2 397	398	50	150			
19 Republic of Moldova	27	2 0 3 5	1 040	290	_			
20 Kyrgyzstan	18	1 368	336	-	-			
21 Belarus	16	1 096	651	-	_			
22 Georgia	12	652	266	155	225			
23 Bulgaria	13	451	53	50	50			
24 Lithuania	17	425	332	-	-			
25 Armenia	14	381	215	30	_			
26 Latvia	14	218	143	130	115			
27 Estonia	20	128	52	67	-			
Global priority countries	5.6	421 490	19 503	30 485	32 240			
AFR	2.2	66 711	7 074	7 673	7 993			
AMR	3.4	12 254	2 088	6 7 3 6	5 301			
EMR	4.2	25 475	295	901	928			
EUR	16	82 042	12 498	27 243	27 358			
SEAR	4.3	149 615	767	2 587	3 004			
WPR	6.9	153 042	631	1 397	1 643			
Global	4.8	489 139	23 353	46 537	46 227			

- Indicates information not provided.

targets are achievable if currently less well-performing countries emulate targets that have already been reached or exceeded in several countries.

## 2.3.2 Diagnosis and treatment of MDR-TB

The most recent estimates suggest that, globally, there were about 489 000 cases of MDR-TB in 2006. These cases are very unevenly spread, with 27 countries (of which 15 are in Eastern Europe) accounting for 86% of the total (**Table 2.11**). These 27 countries have been identified as priorities for improved diagnosis and management of MDR-TB at global level.

The Global Project on Anti-tuberculosis Drug Resistance Surveillance (DRS) continues to increase the number of countries from which a direct measure of the number of cases of MDR-TB is available. This allows estimates of the number of cases to be refined over time. By 2007, the project had collected data from 117 countries covering areas that contain more than 50% of global smear-positive TB cases. Recently, new data have become available from new areas of three HBCs (China, India, and the Russian Federation) and from three HBCs for the first time: Ethiopia, the Philippines and the United Republic of Tanzania. Furthermore, 33 countries reported information on resistance to second-line drugs among MDR-TB cases in surveys or through routine surveillance systems. Full details are available in the fourth global report on anti-TB drug resistance surveillance.<sup>1</sup>

#### Diagnostic services

Diagnosis of MDR-TB depends on the extent to which DST services are available and used (see also section 2.2.3 above on Case detection through quality-assured bacteriology). In 2006, 118 732 diagnostic drug susceptibility tests were reported among 108 countries, with

<sup>&</sup>lt;sup>1</sup> 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 2.13

**Diagnostic DST for new and re-treatment cases by WHO region, 2006.** Numbers under bars represent the number of countries reporting data followed by the percentage of total estimated cases of MDR-TB accounted for by reporting countries.



<sup>a</sup> Data from India and China excluded because testing of only 26 (India) and 10 (China) re-treatment cases was reported.

#### FIGURE 2.14

Notified cases of MDR-TB (2004–2006) and projected patients to be treated (2007–2008). Numbers under bars represent the number of countries reporting data followed by the percentage of total estimated cases of MDR-TB accounted for by reporting countries.



The proportion of new cases for whom DST was done was also highest in the European Region (24%), followed by the Region of the Americas at 14% (**Figure 2.13**). The percentage of the regional number of MDR-TB cases accounted for by reporting countries was also relatively high in these regions, particularly for the European Region. In other regions, the proportion of new cases for whom DST was done was low among reporting countries. Figures were higher for all regions for re-treatment cases, ranging from 9% in the African Region to 24% in the European Region.

74% of these tests conducted in the European Region.

Among those tested in 2006, 23 353 cases of MDR-TB were diagnosed, of which just over half were in Europe. A total of 2 032 cases (8.7% diagnosed cases) were reported from GLC projects. Among the 27 global priority countries, 19 503 cases were notified, which is only 4.6% of the estimated number of cases in these countries (**Table 2.11**).

## Scaling-up management of MDR-TB

The small number of MDR-TB cases diagnosed compared with the number of cases that are estimated to exist shows that an enormous amount of work remains to be done to improve the availability and provision of diagnosis and treatment for MDR-TB.

For the 27 global priority countries, the latest status of progress in introducing and scaling-up treatment of patients with MDR-TB in mid-2007 is shown in Table 2.12. Six countries have conducted a survey of drug resistance, implemented a GLC-approved pilot project, developed national guidelines for the management of MDR-TB and conducted related training, have scaled-up or are in the process of scaling-up activities, and have fully integrated MDR-TB treatment within the NTP including reporting of data: China, the Democratic Republic of the Congo, Estonia, Kazakhstan, the Republic of Moldova and Uzbekistan. Besides these countries, four others have reported expansion of activities: Azerbaijan, Kyrgyzstan, the Russian Federation and South Africa. Among all countries, the biggest expansion that is projected in absolute terms is in the Russian Federation, which fore casts that the number of MDR-TB cases treatedwill reach 24 000 in 2008, compared with just under 4 000 notified cases in 2006 (Table 2.11). Elsewhere, the increase in treated cases anticipated by NTPs that report being in the process of scaling-up is small in absolute terms. China is a notable example: while it ranks first globally in terms of estimated cases (130 548), the number of patients projected to be treated in 2008 is 388 (up from 165 cases in 2007), which is only 0.3% of the estimated cases (Table 2.11). At the other end of the spectrum, no activities related to the management of MDR-TB have begun in Nigeria or Pakistan, and, besides a survey of drug resistance, no further activities were reported by Ethiopia (Table 2.12).

Across all countries, increased implementation of

## TABLE 2.12

#### Management of drug-resistant TB, global priority countries and WHO regions, 2007

•										
	DRUG RESISTANCE SURVEY CONDUCTED	APPLIED TO GLC	GLC-APPROVED PROJECTS PILOTED	NATIONAL GUIDELINES FOR MANAGEMENT OF DRUG- RESISTANT TB	TRAINING MATERIAL	TRAINING CONDUCTED	SCALING UP INITIATED	MANAGEMENT OF DRUG- RESISTANT TB FULLY INTEGRATED INTO ACTIVITIES OF NTP	MDR-TB DATA REPORTED	
1 China	Y	Y	Y	Y	Y	Y	Y	Y	Y	
2 India	Y	Y	Y	Y	Y	N	Ν	Y	Y	
3 Russian Federation	Y	Ν	Y	Ν	Ν	Y	Y	Y	Y	
4 Pakistan	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	-	
5 Bangladesh	N	Y	Y	Y	Ν	N	Ν	Ν	-	
6 South Africa	Y	Ν	Ν	Y	Y	Y	Y	Y	Y	
7 Ukraine	Y	Y	Y	Ν	Ν	N	Ν	Ν	-	
8 Indonesia	Y	Y	Y	Ν	Ν	N	Ν	Ν	Y	
9 Philippines	Y	Y	Y	Ν	Ν	N	Ν	Ν	Y	
10 Nigeria	N	Ν	Ν	Ν	Ν	Ν	Ν	Ν	-	
11 Uzbekistan	Y	Y	Y	Y	Y	Y	Y	Y	Y	
12 DR Congo	Y	Y	Y	Y	Y	Y	Y	Y	Y	
13 Kazakhstan	Y	Y	Y	Y	Y	Y	Y	Y	Y	
14 Viet Nam	Y	Y	Y	Ν	Ν	Ν	Ν	Ν	-	
15 Ethiopia	Y	Ν	Ν	Ν	Ν	Ν	Ν	Ν	-	
16 Myanmar	Y	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Y	
17 Tajikistan	N	Ν	Ν	Ν	Ν	Y	Ν	Y	-	
18 Azerbaijan	Y	Y	Y	Ν	Ν	Y	Y	Y	Y	
19 Republic of Moldova	Y	Y	Y	Y	Y	Y	Y	Y	Y	
20 Kyrgyzstan	Y	Y	Y	Ν	Ν	N	Y	Y	Y	
21 Belarus	Y	Ν	Ν	Ν	Y	Y	Ν	Y	Y	
22 Georgia	Y	Y	Y	-	-	Y	-	Y	Y	
23 Bulgaria	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Ν	Y	
24 Lithuania	Y	Y	-	-	-	-	-	-	Y	
25 Armenia	Y	Ν	Y	Ν	Ν	Y	Ν	Ν	Y	
26 Latvia	Y	Y	Y	N	Y	Y	N	Y	-	
27 Estonia	Y	Y	Y	Y	Y	Y	Y	Y	-	
Global priority countries	<sup>a</sup> 22	17	18	9	10	14	10	15	18	
AFR (46) <sup>b</sup>	19	10	5	15	8	7	5	16	14	
AMR (44)	20	12	11	21	15	18	12	24	19	
EMR (22)	11	5	4	9	5	4	4	13	12	
EUR (53)	28	11	12	21	14	20	12	28	43	
SEAR (12)	6	6	4	6	3	3	3	4	0	
WPR (36)	17	4	5	8	4	6	3	10	14	
Global (212)	101	48	41	80	49	58	39	95	102	

Indicates information not provided.
<sup>a</sup> The lower part of table shows the number of countries answering "yes" to each question.

<sup>b</sup> The number of countries in each region is shown in parentheses.

MDR-TB treatment was reported by 39 countries. Consistent with this, projections of the number of cases that would be diagnosed and treated globally in 2007 (46 537 cases) were much higher than the 23 353 cases notified in 2006 (**Figure 2.14**). Most of these cases are expected to be treated outside GLC projects, although the number enrolled for treatment in GLC projects is projected to increase more than five-fold by 2008, compared with 2005. Of all those cases notified in 2006 (within and outside GLC projects), it is not known what number were actually enrolled on treatment, and of those treated how many were treated according to WHO guidelines.<sup>1</sup> All that can be said for certain is that the 2032 patients who were enrolled on treatment in GLC projects were being treated according to WHO guidelines.

## Role of the Green Light Committee

Although many cases of MDR-TB are notified outside GLC projects, the GLC has put in place specific mechanisms to promote more rapid expansion of MDR-TB diagnosis and treatment. These include building partnerships with major funding mechanisms such as the Global Fund and UNITAID, reshaping and streamlining GLC application processes during 2006 and 2007, and facilitating the development of WHO guidelines for the programmatic management of drug-resistant TB in 2006.

By the end of 2007, 67 projects in 52 countries had been approved by the GLC, such that these projects will have access to high-quality and competitively-priced drugs for a cumulative total of over 30 000 patients with MDR-TB. In 2006 specifically, the GLC reviewed and approved applications for a total of 12 604 patients – six times more than in 2005. In 2006–2007, treatment programmes for MDR-TB in 20 countries were newly-approved by the GLC: these countries were Armenia, Bangladesh, Belize,

<sup>&</sup>lt;sup>1</sup> Guidelines for the programmatic management of drug-resistant tuberculosis. Geneva, World Health Organization, 2006 (WHO/HTM/TB/2006.361)

#### FIGURE 2.15

MDR-TB treatment outcomes in seven countries, 2003 cohort. Numbers under bars are the number of patients in the cohort.



Burkina Faso, Cambodia, China, the Democratic Republic of the Congo, Ecuador, Guatemala, Guinea, Kazakhstan, Lesotho, Mongolia, Paraguay, Rwanda, Samoa, Viet Nam, Uganda, Ukraine and Uruguay. At then end of 2007, most GLC-approved countries were in the Region of the Americas (14 countries) and the European Region (13 countries), followed by the African Region (7 countries), the Western Pacific Region (7 countries), the South-East Asia Region (6 countries) and the Eastern Mediterranean Region (5 countries).

These enhanced efforts by the GLC, however, cover less than 5% of patients with drug-resistant TB worldwide. There is an urgent need for countries to substantially increase the provision of treatment for patients with MDR-TB that meets the standards established in WHO guidelines.

#### Treatment outcomes

Given that it takes 18-24 months to treat patients with MDR-TB, the most recent year for which treatment outcome data were requested by WHO in 2007 was 2003. While 50 countries reported data, the size of the cohorts was too small (less than 40 in 42 countries; 28 of these countries had cohorts of fewer than 10 patients) to allow any useful analysis. The seven countries with larger cohorts are shown in Figure 2.15. The best treatment success rate (70%) was in Latvia, which has a GLC-approved project. Treatment success rates were also relatively high in Brazil (60%) and Germany (63%), neither or which has a GLC-approved project. In contrast, outcomes were especially poor in two other countries without GLC projects: Lithuania and Romania (36% and 26% treatment success rates, respectively, and high death and treatment failure rates). To improve our understanding of treatment outcomes for patients with MDR-TB, more data from more countries, both GLC-approved and outside the GLC framework, 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) that diagnostic DST should be offered 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 (e.g. contacts of MDR-TB cases, those for whom treatment is failing after 3 months); and (ii) that all those in whom MDR-TB is diagnosed should be enrolled in GLCapproved or equivalent treatment programmes. Despite the progress that has been made in some countries documented above, the number of MDR-TB patients notified in 2006 and country projections of the number of MDR-TB patients to be treated in 2007 and 2008 fall far behind the expectations of the Global Plan (Figures 2.14 and Figure 2.16). In 2007, the Global Plan indicates that 52 000 MDR-TB patients should be diagnosed and treated, while reports from countries representing 80% of MDR-TB cases globally indicate a figure of 46 537. In 2008, the Global Plan indicates that 98 000 patients should be diagnosed and treated, while reports from countries representing 86% of MDR-TB cases globally indicate a figure of 46 227 (little different to 2007).

Differences between Global Plan expectations and country projections vary by region, as shown for 2007 in **Figure 2.16**. In the African Region, the Eastern Mediterranean Region and the Region of the Americas, country forecasts are higher than Global Plan expectations, with relatively large numbers of patients expected to be treated in Brazil and South Africa in particular (see also **Chapter 3**, where the high number of patients expected to be treated in South Africa is also reflected in budget data). However, in the three regions with the greatest number of MDR-TB cases (the European, South-East Asia and Western Pacific regions), meeting the expectations of the Global Plan will require substantial efforts to scale-up diagnosis and treatment, especially in China and India.

### 2.3.3 High-risk groups and special situations

Vulnerable populations such as prisoners, refugees and other high-risk groups are considered in NTP plans in 138 (68%) of 202 reporting countries. Among the 22 HBCs, 19 have included such populations in their plans, including prisoners (20 HBCs), refugees and displaced people (10 HBCs), slum dwellers (9 HBCs), cross-border populations (8 HBCs), migrant workers (5 HBCs) and ethnic minorities (8 HBCs). Other vulnerable groups such as the homeless, alcohol dependent individuals, tobacco

<sup>&</sup>lt;sup>1</sup> The Global MDR-TB and XDR-TB response plan 2007–2008. Geneva, World Health Organization, 2007 (WHO/HTM/ STB/2007.387).

smokers, injecting drug users and patients with diabetes have also been considered in a few HBCs.

It is noteworthy that major political instability notwithstanding, NTP structures in Iraq have been maintained at national and governorate levels. TB control services were provided whenever and wherever possible, depending on the security situation. Among other known troubled areas, TB control activities have been successfully implemented in collaboration with various international partners in secured areas of Afghanistan, the eastern region of the Democratic Republic of the Congo and in Somalia. In the earthquake-affected regions of Azad Kashmir in Pakistan, NTP services

were re-established quickly and successfully in 2006.

## 2.4 Health system strengthening

Apart from PAL implementation and human resource development (HRD), questions about the strengthening of health systems were sent to HBCs only; findings in sections 2.4.1 and 2.4.3 below therefore refer only to HBCs.

## 2.4.1 Integration of TB control within primary health care

With a few exceptions, both TB diagnosis and TB treatment are fully integrated into the general health system. Laboratory services for TB diagnosis are integrated into general laboratory services in 15 of the 22 HBCs, and treatment is delivered through the general primary health care (PHC) network in all but two HBCs (China and the Russian Federation). General health-care staff are normally responsible for TB management in PHC settings, although seven HBCs have staff dedicated to TB control at PHC facilities such as clinics (Bangladesh, Brazil, China, Ethiopia, Mozambique, Myanmar and Nigeria). Distribution of anti-TB drugs is fully integrated into general drug distribution in 10 HBCs.

#### 2.4.2 Human resource development

Optimum HRD for TB control requires at least seven components: (i) a recent HRD needs assessment; (ii) a comprehensive plan for HRD that addresses both training and staffing needs for all components of the Stop TB Strategy; (iii) up-to-date job descriptions; (iv) staff who are assigned to work on HRD at the national level; (v) inclusion of TB in the training curricula of doctors, nurses and laboratory technicians; (vi) training for existing staff at all levels of the health system; and (vii) systematic monitoring of recruitment and training needs, for example to account for staff turnover.

Only half of the HBCs have conducted a recent HRD needs assessment, and 13 HBCs reported having a comprehensive plan for HRD related to TB control (**Table** 

#### FIGURE 2.16

Country projections of MDR/XDR-TB patients to be enrolled on treatment in 2007 compared with the Global Plan



**2.13**). Six HBCs are without comprehensive HRD plans or a recent HRD needs assessment: Cambodia, the Democratic Republic of the Congo, Mozambique, the Russian Federation, Uganda and Zimbabwe.

Among the HRD plans that do exist, several could be strengthened. Only 11 countries have considered staffing needs for all of the four following components of TB control: DOTS implementation, MDR-TB, collaborative TB/HIV activities and PPM (**Table 2.13**). Other plans address training needs but not staffing needs (e.g. Nigeria and the Philippines).

Job descriptions of staff involved in the implementation of the Stop TB Strategy were up-to-date or almost all up-to-date (in line with current policies and recommendations) in 17 HBCs; exceptions were the Russian Federation (none up-to-date), and the Democratic Republic of the Congo, Mozambique, Nigeria, and Zimbabwe (some up-to-date).

The number of staff assigned to HRD at national level remains limited. On the positive side, 15 of the 22 HBCs have a designated person for HRD at the central level of the NTP. However, a full-time member of staff was available in only four countries: Bangladesh, Brazil, China and South Africa. Staff working full-time on TB control are available at provincial (or equivalent) level in 20 HBCs. Monitoring of staff availability and turnover appears weak across HBCs. Only 10 HBCs provided at least some information about the availability of staff trained in TB control in primary health-care facilities.

Training related to TB control is included in the basic curricula of doctors in 18 HBCs, and in the curriculum of laboratory technicians in 15 HBCs. However, training of teaching staff in medical and nursing schools is available in only nine HBCs, and training for teachers of laboratory staff is being provided in just seven HBCs.

Among HBCs and other countries, around 87 reported having conducted a recent HRD needs assessment, and 90 countries reported having a comprehensive HRD plan (**Table 2.13**). The number of plans that considered staff-

#### **TABLE 2.13**

#### Human resource development (HRD), 2006

			HRD PL	AN INCLUDE	S TRAINING	NEEDS IN	HRD PLAN INCLUDES STAFFING NEEDS IN				
	HRD NEEDS ASSESSMENT	COMPRE- HENSIVE STRATEGIC HRD PLAN	DOTS	MANAGE- MENT OF MDR-TB	COLLAB- ORATIVE TB/HIV ACTIVITIES	PUBLIC- PRIVATE AND PUBLIC- PUBLIC MIX APPROACHES (PPM)	DOTS	MANAGE- MENT OF MDR-TB	COLLAB- ORATIVE TB/HIV ACTIVITIES	PUBLIC- PRIVATE AND PUBLIC- PUBLIC MIX APPROACHES (PPM)	JOB DESCRIPTIONS UP TO DATE
1 India	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
2 China	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
3 Indonesia	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Almost all
4 South Africa	Y	Ν	-	-	-	-	-	-	-	-	All
5 Nigeria	N	Y	Y	Y	Y	Ν	Ν	Ν	Ν	Ν	Some
6 Bangladesh	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
7 Ethiopia	Y	Ν	-	-	-	-	-	-	-	-	Almost all
8 Pakistan	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Almost all
9 Philippines	N	Y	Y	Y	Y	Y	Ν	Ν	Ν	Ν	Almost all
10 DR Congo	N	Ν	-	-	-	-	-	-	-	-	Some
11 Russian Federation	N	Ν	-	-	-	-	-	-	-	-	None
12 Viet Nam	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
13 Kenya	Y	Ν	-	-	-	-	-	-	-	-	Almost all
14 UR Tanzania	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Almost all
15 Uganda	N	Ν	-	-	-	-	-	-	-	-	All
16 Brazil	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	All
17 Mozambique	N	Ν	-	-	-	-	-	-	-	-	Some
18 Thailand	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Almost all
19 Myanmar	Y	Y	Y	Ν	Y	Y	Υ	Ν	Y	Y	Almost all
20 Zimbabwe	N	Ν	-	-	-	-	-	-	-	-	Some
21 Cambodia	N	Ν	-	-	-	-	-	-	-	-	Almost all
22 Afghanistan	Ν	Y	Y	Y	Y	Y	-	Y	-	Y	All
High-burden countries <sup>a</sup>	11	13	13	12	13	12	10	10	10	11	17
AFR (46) <sup>b</sup>	18	20	20	17	18	14	16	14	12	8	22
AMR (44)	17	18	17	17	17	15	14	16	16	13	20
EMR (22)	13	16	15	13	11	12	14	14	11	12	14
EUR (53)	17	13	10	12	11	8	10	12	11	7	28
SEAR (11)	6	7	7	5	5	5	7	4	5	5	9
WPR (36)	16	16	15	14	16	12	15	10	14	10	24
Global (212)	87	90	84	78	78	66	76	70	69	55	117

Indicates not applicable (no plan, or activity not implemented).

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). The number of countries in each region is shown in parentheses.

ing and/or training needs for major components of TB control ranged from about 60 to 80 countries, depending on the component, while 117 countries reported having up-to-date or almost up-to-date job descriptions. In no region except the Eastern Mediterranean and the South East Asia did the number of countries reporting that a key component of HRD was in place exceed half of the number of countries in the region.

Overall, these data show that major strengthening of HRD for TB control is needed in many countries in all regions.

## 2.4.3 Links between planning for TB control and broader health or public sector planning initiatives and frameworks

Given the level of integration of TB control activities within primary health-care services described above, TB control requires a well-functioning health-care system including NTP participation in efforts to strengthen health systems. Contributing to health system strengthening is an explicit component of the national strategic

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plan for TB control in 20 of the 22 HBCs. Beyond this, five of the most important examples of national plans and frameworks to which plans for TB control should be aligned are national health development plans, poverty reduction strategy papers, national human resource plans for health, medium-term expenditure frameworks and sector-wide approaches (SWAps). Among HBCs that reported the existence of these plans and frameworks, the extent to which alignment of the national plan and budget for TB control was reported varied (Figure 2.17). The proportion of countries reporting alignment with medium-term expenditure frameworks and SWAps was high, but there is much scope to increase alignment with national plans for HRD as well as general plans for health-care development.

## 2.4.4 Practical Approach to Lung Health

PAL is included in the national plans of 73 countries including 10 HBCs. By the end of 2006, 26 countries including three HBCs had prepared detailed plans to develop and implement PAL activities. Of these, 24 had

established a national working group on PAL and 17 had produced national PAL guidelines. Seven countries were piloting or preparing for expansion, while eight countries were undertaking nationwide expansion of activities: Bolivia, Chile, El Salvador, Jordan, Kyrgyzstan, Morocco, South Africa and the Syrian Arab Republic. In 2007, five countries from the African Region including three HBCs (the Democratic Republic of the Congo, Ethiopia and Kenya) developed plans to initiate PAL implementation.

## 2.5 Engaging all care providers

## 2.5.1 Public-public and public-private mix approaches

Considerable progress has been made since the PPM initiative was launched by WHO in 2000. By 2007, 16 of the 22 HBCs had a focal person for PPM in the central NTP, 16 had undertaken a situational analysis for PPM implementation and 14 had developed national operational guidelines for PPM. The number of HBCs scaling up PPM interventions more than tripled between 2005 and 2007, from four to 14 countries.

Almost half of the HBCs have managed to involve all health institutions belonging to public sector healthcare networks, such as public hospitals, medical college hospitals, army health facilities and prison health facilities (**Figure 2.18 and 2.19**). A large number of HBCs have also started to involve private practitioners, private hospitals and NGO health facilities in key activities such as referral of patients with TB symptoms, diagnosis according to programmatic guidelines and treatment with anti-TB drugs provided by the NTP (**Figures 2.18 and 2.19**). However, in most HBCs, only a small fraction of all eligible providers belonging to these categories has been involved to date.

Of the top five HBCs, three HBCs (Bangladesh, China and India) reported formal PPM activities in place in

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FIGURE 2.18



FIGURE 2.17

Alignment of NTP plans and budgets with other planning frameworks and initiatives, high-burden countries, 2006



nearly 100% of their basic management units (BMUs). However, geographical coverage of formal PPM activities does not imply a high level of actual involvement or contribution to referral, diagnosis and treatment by non-NTP providers. To quantify the contribution of different providers to referral, diagnosis and treatment, PPM monitoring that is in line with existing WHO guidelines on recording and reporting for NTPs needs to be implemented. By 2007, only nine of the 22 HBCs had started to systematically record the source of referral and place of treatment of patients.

Among all countries, around 100 or more (depending on the category of provider) reported that all or some of the following types of provider were involved in referral and diagnosis: private practitioners, private hospitals, general public hospitals, medical colleges and prisons. Numbers were lower (mostly around 60 to 80 countries reporting the involvement of some or all providers) for

#### FIGURE 2.19





three categories: NGO and mission facilities, health and social insurance services, and the corporate sector. Figures were generally lower again for treatment. Around 70 countries reported that some or all providers in the following categories were involved in treatment: private practitioners, private hospitals, NGO and mission facilities, and health insurance services, although figures were higher for the involvement of medical colleges (100 countries) and general public hospitals (127 countries). Details of these data are not shown in this report, but are available upon request.

## 2.5.2 International Standards for Tuberculosis Care

The ISTC have been disseminated and used in seven HBCs and endorsed by national professional associations in six HBCs. Several HBCs have promoted and implemented the Standards in some settings: examples include Indonesia, India, Kenya, Thailand and the United Republic of Tanzania. Other HBCs including China, Kenya, Myanmar, Nigeria, Thailand and the United Republic of Tanzania have plans to either launch the ISTC nationally or to use them to target specific groups of care providers. Kenya plans to use the ISTC as a tool of accreditation. The ISTC have been particularly useful for convincing national professional societies and associations, as well as academic institutions, to support implementation of internationally recommended approaches to TB control.

## 2.6 Empowering people with TB, and communities

## 2.6.1 Advocacy, communication and social mobilization

An ACSM strategy involves three distinct sets of activities: advocacy aimed at changing the behaviour of leaders or decision-makers, communication channelled to

## FIGURE 2.20

**Community participation in TB control, all countries, 2006.** Examples of community participation include identification and referral of TB suspects, and patient support. No response includes countries that did not report any data to WHO and countries that did not respond to questions on community participation in TB control.



individuals and small groups, and social mobilization to secure support for efforts in TB control from civil society and the community as a whole. There has been progress in the effective implementation of ACSM activities at country level, often facilitated by grants from the Global Fund (grants for ACSM amounted to US\$ 85 million in rounds 6 and 7). In general, however, progress remains uneven. Several HBCs have advanced in all three areas (advocacy, communication, and social mobilization), while 13 have conducted knowledge, attitudes and practice (KAP) surveys to better target their ACSM activities and 14 have involved patient-centred organizations or networks in advocacy and/or implementation of DOTS. Monitoring and evaluation of ACSM activities remains problematic, as countries continue to struggle to identify useful measures of implementation and impact.

Most HBCs still need to build local capacity to improve implementation of their ACSM strategy. For example, 20 of the 22 HBCs have requested assistance to refine their ACSM strategies in 2007–2008, and 17 have requested help to develop appropriate ACSM indicators.

Data collection in 2007 focused on the 22 HBCs and for this reason we do not provide information for other countries in this report.

## 2.6.2 Community participation in TB care

Among the 22 HBCs, 20 reported that there was community involvement in TB care (Figure 2.20). Only one (Ethiopia) stated that there was no involvement of communities in TB care, while one did not respond (Thailand). At regional level, community involvement was most common in the South-East Asia Region (82% of countries), followed by the Western Pacific Region (67% of countries) and the African Region (65% of countries). In the African Region, community involvement in TB care is recognized to be a key mechanism for expanding access to high-quality TB care as well as improving awareness and understanding of the disease. In the other three regions, community involvement was reported to exist in only around 40% of countries (Figure 2.20). This suggests that community involvement in TB care is not yet a strategic priority for many countries in these regions, even though in the Region of the Americas the level of community involvement in PHC services as a whole is high.

A better understanding of how communities are currently involved in TB control is required to make full use of their potential contribution. For example, despite the fact that 20 HBCs report community involvement in TB care, little is known about the specific roles or functions for which communities have taken responsibility.

## 2.6.3 Patients' Charter

The Patients' Charter provides the foundation for a human rights-based approach to the involvement of patients and communities in TB care and prevention. To date, only four HBCs have used it. This probably reflects the fact that it was only published in 2006, and as such there has been limited time for its adoption and use.

## 2.7 Enabling and promoting research

A total of 49 countries including 19 HBCs reported that operational research activities were implemented in 2006. The countries with the largest programmes of operational research (in terms of the number of studies being done) were China and India. The most common topics were related to the following components of the Stop TB Strategy: DOTS (around 40 studies, with examples including how to improve diagnosis and patient care); TB/HIV, MDR-TB and other challenges (about 40 studies); and PPM (7 studies). Many countries also reported conducting surveys of drug resistance and prevalence of disease, as well as plans to conduct indepth analysis of the impact of TB control using routine surveillance data (see also sections 2.2.6 and 2.3.2 above).

## 2.8 Summary

Implementation of the Stop TB Strategy varies among 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 of the Global Plan. In 2006, 93% of the world's population lived in areas where DOTS was being implemented, and the global case detection rate was 61%. The treatment success target of 85% had almost been reached by the end of 2005. At the same time, there is much scope for improvement in the provision of laboratory culture and DST services, and, while impact measurement is advanced in some regions, it is at an early stage of development in others.

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 be best quantified. Although implementation still lags behind the Global Plan, there is clear evidence of major progress in the implementation of interventions such as HIV testing for TB patients and provision of CPT and ART to HIV-positive TB patients in the African Region. There is also progress in the diagnosis and treatment of MDR-TB, but here current and projected levels of implementation are far behind the Global Plan in the South-East Asia and Western Pacific regions, and within these regions in China and India in particular.

Among components 3–6, our understanding of implementation is more limited, because to date it is less well quantified. In the area of health system strengthening (component 3), considerable work on HRD is needed in many countries in all regions, although reported alignment with broader health sector planning frameworks as well as expansion of PAL to a larger number of countries are encouraging.

PPM and the ISTC (component 4) are being introduced and expanded in an increasing number of countries. However, the relative contribution of different providers to detection, referral or treatment of cases will remain unclear until the new routine recording and reporting forms recommended by WHO are more widely introduced.

ACSM (component 5) is still a new area for many countries and one where much more guidance and technical support are necessary. For this report, information on operational research (part of component 6) was comparatively superficial.

Overall, planning and implementation that covers all elements of the Stop TB Strategy and that is in line with the targets set in the Global Plan is already happening in some countries, but now needs to extend to many more.

## **CHAPTER 3**

# Financing TB control

Implementing the Stop TB Strategy at the scale required to achieve the MDG, Stop TB Partnership and World Health Assembly targets for global TB control (see also **Chapters 1 and 2**) requires accurate budgeting of the financial resources required, mobilization of the necessary funding and spending of available money 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.

In this report, we provide our latest assessment of financing for TB control. As with the previous two chapters, emphasis is given to the 22 HBCs, but analyses for all countries that have reported financial data are included. The chapter is structured in eight major sections, which are:

- *Data reported to WHO in 2007.* This section describes the number of countries that reported financial data and the share of the global number of TB cases accounted for by these countries.
- *NTP budgets, available funding and funding gaps.* This section analyses changes in NTP budgets in HBCs for the period 2002–2008, including presentation of budgets broken down by funding source and line item.
- *Total costs of TB control.* This section estimates the total costs of TB control, which include the resources used for diagnosis of TB and treatment of patients within the general health-care system (e.g. primary health-care staff and infrastructure) as well as the costs included in NTP budgets. Total costs in the years 2002–2008 are estimated for HBCs, and for all countries by WHO region in 2008.
- Comparisons with the Global Plan. In this section, total funding requirements for TB control based on country reports are compared with the total funding requirements estimated in the Global Plan. This is done for the period 2006–2008 for HBCs, and for 2008 for all countries.
- *Per patient costs and budgets.* Using the total budget and cost data provided in earlier sections of this chapter and forecasts of patients to be treated in 2008, this section provides a summary of per patient budgets and costs in each HBC in 2008.

- *Expenditures compared with available funding and changes in cases treated.* This section investigates the extent to which available funding was spent in 2006, as well as the relationship between changes in funding for TB control and changes in the number of new cases detected and treated in DOTS programmes.
- *The Global Fund contribution to TB control.* With the Global Fund the largest single source of donor financing for TB control, this section includes the latest data on its contribution to funding for TB control.
- *How can funding gaps for TB control be closed?* This section discusses why funding gaps for TB control persist. It gives particular attention to the resources available from the Global Fund, and what is needed to close the gap between currently available funding and the funding needs set out in the Global Plan.

Further details about the financing of TB control in the 22 HBCs are provided in **Annex 1**.

## 3.1 Data reported to WHO in 2007

Financial data were received from 156 out of 212 (74%) countries and territories (**Table 3.1**), similar to the number that reported data in 2006.<sup>1</sup> Complete budget data for 2007 were provided by 94 countries (up from 87 for 2007 in last year's report), 90 countries provided complete budget data for 2008, and 80 provided complete expenditure data for 2006 (compared with 83 that provided complete expenditure data for 2005). The countries that provided financial reports accounted for 99% of the regional burden of TB in four WHO regions, with lower figures of 93% and 88% for the African and European regions respectively. Overall, countries that reported financial data account for 97% of the global burden of TB.

Data were received from all 22 HBCs (**Table 3.2**). Complete budget data for 2007 were provided by 20 countries (the exceptions were Thailand and the United Republic of Tanzania), and complete budget data for 2008 were provided by 21 countries (the exception was Thailand). It is now five years since the NTP in Thailand reported complete budget data, reflecting a decentralized system

<sup>&</sup>lt;sup>1</sup> Global tuberculosis control: surveillance, planning and financing. Geneva, World Health Organization, 2007 (WHO/ HTM/TB/2007.376).

Budget, expenditure and utilization data received, all countries, 2008

	NUMBER FINANCIAL		BUDGET 2007			BI	BUDGET 2008			ENDITURE 200	6	UTILIZATION	PROP. OF ESTIMATED REGIONAL			
	OF COUNTRIES	REPORTS RECEIVED	COMPLETE	PARTIAL	NONE	COMPLETE	PARTIAL	NONE	COMPLETE	PARTIAL	NONE	OF HEALTH SERVICES	TB INCIDENCE ACCOUNTED FOR BY COUNTRIES THAT REPORTED FINANCIAL DATA (%)			
AFR	46	39	30	5	4	29	3	7	25	3	11	29	93			
AMR	44	27	14	6	7	14	5	8	11	7	9	16	99			
EMR	22	20	13	3	4	12	2	6	11	4	5	14	99			
EUR	53	30	12	8	10	13	5	12	12	7	11	15	88			
SEAR	11	10	8	2	0	8	1	1	8	1	1	6	99			
WPR	36	30	17	5	8	14	8	8	13	4	13	17	99			
Global	212	156	94	29	33	90	24	42	80	26	50	97	97			

TABLE 3.2

Budget, expenditure and utilization data received, high-burden countries, 2008

	NUMBER	FINANCIAL		BUDGET 2007			BUDGET 2008		EXPENDITI	UTILIZATION	
	COUNTRIES	RECEIVED	COMPLETE	PARTIAL	NONE	COMPLETE	PARTIAL	NONE	COMPLETE	NONE	SERVICES
AFR	9	9	8	1 <sup>a</sup>	0	9	0	0	7	2 <sup>b</sup>	9
AMR	1	1	1	0	0	1	0	0	1	0	1
EMR	2	2	2	0	0	2	0	0	2	0	2
EUR	1	1	1	0	0	1	0	0	1	0	1
SEAR	5	5	4	1 <sup>c</sup>	0	4	1 <sup>c</sup>	0	4	1 <sup>c</sup>	4 <sup>c</sup>
WPR	4	4	4	0	0	4	0	0	4	0	4
Global	22	22	20	2	0	21	1	0	19	3	21

<sup>a</sup> UR Tanzania.

b Mozambique and Uganda.

<sup>c</sup> Thailand.

in which financial data are not reported to or aggregated by the central unit of the NTP. For the past two years, the NTP in South Africa has demonstrated how this difficulty can be addressed. Until 2006, it also did not report financial data to WHO, as information was not reported to the central unit by any of the country's nine provinces. In 2006, the NTP manager sent the WHO data collection form to each of the country's nine provinces, allowing an aggregated report to be prepared. In 2007 this process was further strengthened, including via a planning and budgeting workshop at which provincial teams set out their plans and budget requirements for the period 2007–2011.

Complete expenditure data for 2006 were provided for 19 countries, with data missing for two African countries (Mozambique and Uganda) and Thailand. A total of 21 countries provided data on the utilization of health services and made projections of the number of patients who would be treated in 2007 and 2008.

Considerable clarification and verification of financial data by WHO are still required, but the quality of the data when first submitted continues to improve. This was especially the case for the African Region in 2007, probably facilitated by related work on planning and budgeting undertaken with 35 countries in the region in 2007 (see also section 3.4.3 below). Among HBCs, Brazil, the Democratic Republic of the Congo, Indonesia, Kenya, Myanmar and South Africa stood out as providing timely data that required almost no follow-up.

## 3.2 NTP budgets, available funding and funding gaps

### 3.2.1 High-burden countries, 2002–2008

NTP budgets in 21 of the 22 HBCs have increased during the period 2002-2008, often by substantial amounts, but have stagnated in all but five countries (Brazil, Ethiopia, Mozambique, Nigeria and the United Republic of Tanzania) between 2007 and 2008 (Figures 3.1 and Figure 3.2; Table 3.3; Annex 1). There are insufficient data to make an assessment for Thailand. The total combined budget for the 22 HBCs in 2008 is US\$ 1.8 billion, almost four times the US\$ 509 million budgeted for in 2002, but just US\$ 16 million higher than in 2007. The Russian Federation has by far the largest budget (US\$ 722 million), followed by South Africa (US\$352 million), China (US\$225 million), India (US\$ 67 million) and Brazil (US\$ 64 million). These five countries account for 81% of the NTP budgets reported for 2008 by 21 HBCs. Three countries have budgets of around US\$ 50 million (Indonesia, Nigeria and the United Republic of Tanzania), followed by Kenya with a budget of US\$ 33 million. The remaining 13 HBCs have budgets of US\$ 25 million or less in 2008.

In absolute terms, the budgetary increase in the Russian Federation far exceeds that in any other HBC, at US\$ 560 million since 2002. The second largest increase is in South Africa (US\$ 289 million), following comprehensive planning and budgeting for all components of the Stop TB Strategy during 2007, and likely more accu-

#### FIGURE 3.1

#### Total NTP budgets by line item, high-burden countries, 2002-2008



Estimates assume budget 2002 equal to expenditure 2002 (Ethiopia), budget 2003 (Afghanistan, Bangladesh, Mozambique and Uganda) or expenditure 2003 (Russian а Federation and Zimbabwe). Estimates assume budget 2003 equal to expenditure 2003 (Russian Federation and

Zimbabwe) or budget 2004 (Thailand). "Unknown" applies to Afghanistan 2002–2004, Russian Federation 2002–2003 and

Mozambique 2002-2003 as breakdown by line item not available.

#### FIGURE 3.2

#### Total NTP budgets by source of funding, high-burden countries, 2002-2008



Estimates assume budget 2002 equal to expenditure 2002 (Ethiopia), budget 2003 (Afghanistan, Bangladesh, Mozambique and Uganda) or expenditure 2003 (Russian а Federation and Zimbabwe)

b Estimates assume budget 2003 equal to expenditure 2003 (Russian Federation and Zimbabwe) or budget 2004 (Thailand). "Unknown" applies to Afghanistan 2004, DR Congo 2002, Nigeria 2002 and UR Tanzania

с 2007, as breakdown by funding source not available.

## TABLE 3.3

#### NTP budgets and available funding, high-burden countries, 2008

	TOTAL NTP	DTAL CHANGE NTP SINCE		HANGE AVAILABLE FUNDING SINCE (US\$ MILLIONS)					CHANGE IN AVAILABLE FUNDING SINCE 2002 (US\$ MILLIONS)				CHANGE IN FUNDING
	(US\$ MILLIONS)	(US\$ MILLIONS)	(%)	GOVERNMENT (EXCL. LOANS)	LOANS	GRANTS (EXCL. GLOBAL FUND)	GLOBAL FUND	(US\$ MILLIONS)	GOVERNMENT (EXCL. LOANS)	LOANS	GRANTS (EXCL. GLOBAL FUND)	GLOBAL FUND	2002 (US\$ MILLIONS)
1 India	67	31	86	7.7	31	8.3	20	0	1.4	6.7	2.8	20	0
2 China	225	127	130	139	13	0.7	20	53	86	13	-1.8	20	9.5
3 Indonesia	57	23	66	23	0	13	21	0	17	0	10	21	-25
4 South Africa	352	289	459	350	0	1.8	0	0	292	0	0.2	-3.6	0
5 Nigeria	49	37	290	5.8	0	2.2	11	30	3.9	0	-1.9	11	23
6 Bangladesh	17	10	149	3.0	0.6	0.9	13	0	-0.4	0	-2.6	13	0
7 Ethiopia	17	12	249	0.6	0	4.4	12	0	-0.5	0	0.6	12	0
8 Pakistan	25	19	359	10	0	0	6.2	8.3	7.1	0	-0.7	6.2	6.7
9 Philippines	18	1.9	11	8.2	0	0.1	8.0	2.0	-3.8	0	0.1	8.0	-2.4
10 DR Congo	21	10	98	1.6	0.8	5.7	7.9	4.6	0.6	0.8	0	7.9	0.9
11 Russian Federation	722	560	346	501	33	5.0	30	153	347	33	-2.6	30	153
12 Viet Nam	15	3.1	27	7.1	0	3.5	3.5	0.4	-1.6	-2	2.5	3.5	0.4
13 Kenya	33	28	538	1.6	0	12	5.6	15	0.02	0	9.1	5.6	13
14 UR Tanzania <sup>b</sup>	52	47	844	4.2	0	17	20	11	4.0	0	12	20	10
15 Uganda	13	8	150	0.5	0	0.5	3.7	8.4	0.4	-1.2	-0.1	3.7	5.1
16 Brazil	64	50	371	41	0	0	6.1	16	28	0	0	6.1	16
17 Mozambique	19	11	134	2.0	0	9.4	5.1	2.2	1.7	0	7.0	5.1	-3.1
18 Thailand <sup>c</sup>	8.8	-	_	5.6	0	0	1.4	1.8	-	-	-	-	-
19 Myanmar	14	11	384	1.0	0	2.6	0	10	0.6	0	2.4	0	7.7
20 Zimbabwe	6.4	4.7	279	1.4	0	1.7	1.9	1.4	1.3	0	0.1	1.9	1.4
21 Cambodia	9.0	4.7	109	0.6	0	1.5	2.2	4.8	-0.7	-0.7	0.3	2.2	3.6
22 Afghanistan	15	12	395	0.1	0	7.5	0.9	6.8	-0.2	0	6.2	0.9	5.3
High-burden countries	1818	1299	249 <sup>d</sup>	1116	78	97	200	328	784	50	44	195	227

Indicates not available. а

Figures assume budget 2002 equal to expenditure 2002 (Ethiopia), budget 2003 (Afghanistan, Bangladesh, Mozambique and Uganda) or expenditure 2003 (Russian Federation and Zimbabwe)

b For US\$ 23 million of the available funding the exact split between the Global Fund and grants from other donors is not known. This table assumes a 50/50 split.

Data for Thailand are partial. Median value.

## FIGURE 3.3 NTP budgets by line item, 21 high-burden countries,<sup>a,b</sup> 2008



rate budgeting for individual provinces than was possible in previous years. In both countries, large budgets for the diagnosis and treatment of MDR-TB are particularly striking (**Figure 3.3**). The Russian Federation and South Africa account for most of the amount that has been budgeted for MDR-TB across HBCs (US\$ 506 million out of a total of US\$543 million, equivalent to 93%).

In relative terms, the most striking budgetary increase is the 844% increase reported by the United Republic of Tanzania (Figure 3.4a; Table 3.3). This larger figure follows a planning and budgeting process that was completed in late 2007. The plan for 2008-2012 covers all elements of the Stop TB Strategy, is in line with Global Plan targets and includes a comprehensive assessment of the budget required for collaborative TB/HIV activities (both those funded and provided though the NTP and those funded and provided via the national AIDS control programme). This has brought the budget developed by the NTP to a level very comparable to that estimated in the Global Plan (see also section 3.4.1 below and Annex 1). If the budget for collaborative TB/HIV activities likely to be funded and managed by the national AIDS control programme is removed, the budget in the United Republic of Tanzania is approximately halved.

Other countries with large relative increases in their NTP budgets over the past seven years include Afghanistan, Brazil, Myanmar, Nigeria, Pakistan and South Africa. Countries with noticeably small increases in their budgets since 2002 are the Philippines and Viet Nam, reflecting the fact that both countries had already reached, or were close to achieving, the global targets for TB control in 2002.

DOTS accounted for easily the largest proportion of NTP budgets between 2002 and 2006, and in 2008 continues to account for much the largest share of the NTP budget in all of the 22 HBCs except the Russian Federa-

#### FIGURE 3.4

## Trends in NTP budgets and funding, 19 high-burden countries,<sup>a</sup> 2002–2008





<sup>a</sup> China, the Russian Federation and South Africa were excluded since patterns are clear from other figures and tables.
#### FIGURE 3.5

Changes in NTP budget and available funding, 21 high-burden countries,<sup>a,b</sup> 2002–2008



<sup>a</sup> Cost data for Thailand not complete.

<sup>b</sup> Countries ranked by percentage change in NTP budget.

tion, South Africa and the United Republic of Tanzania (Figure 3.1; Figure 3.3).<sup>1</sup> In contrast to earlier years, a much larger proportion (around 30%) of total NTP budgets across all HBCs is accounted for by diagnosis and treatment of MDR-TB in 2007 and 2008, with the Russian Federation and South Africa accounting for just over US\$ 500 million of the total of US\$ 540 million. Collaborative TB/HIV activities remain a comparatively small component of NTP budgets for the HBCs as a whole, but account for more than 50% of the budget reported by the NTP in the United Republic of Tanzania and for a relatively large proportion of the budgets reported by several other African countries including the Democratic Republic of the Congo, Kenya, Mozambique, Uganda and Zimbabwe (see also section 3.4.1 and Annex 1). High costs for collaborative TB/HIV activities in the United Republic of Tanzania follow a comprehensive costing analysis, as noted above.

The large budget increases described above have been accompanied by big improvements in available funding (**Figure 3.2, Figure 3.4b, Figure 3.5; Table 3.3**). For all HBCs, funding for NTP budgets has increased by just over US\$ 1 billion since 2002, reaching US\$ 1.4 billion of the US\$ 1.8 billion needed in 2008. Funding has also increased in all individual HBCs, although the increases range from less than US\$ 5 million in six countries (Cambodia, Myanmar, the Philippines, Uganda, Viet Nam and Zimbabwe) to around US\$ 100 million in China, around US\$ 300 million in South Africa and around US\$ 400 million in the Russian Federation. As with NTP budgets, however, funding has stagnated between 2007 and 2008.

The extra US\$ 1 billion of funding for NTPs in HBCs in 2008 (compared with 2002) has come mostly from HBC governments (including loans). This extra domestic funding amounts to US\$ 0.8 billion (Table 3.3, columns 10-13) in total, an overall statistic that conceals the fact that most of the additional domestic funding has come from four countries only: Brazil, China, the Russian Federation and South Africa (an extra US\$ 799 million including loans in 2008, compared with 2002). In other HBCs, increases in funding have come primarily from theGlobal Fund in 12 HBCs, from a combination of the Global Fund and grant funding in Indonesia, Kenya, Mozambique, and Pakistan, and mainly from donors other than the Global Fund in Afghanistan and Myanmar. Funding from the Global Fund in 2008 amounts to US\$ 200 million compared with zero in 2002, and all HBCs except Myanmar have Global Fund grants. In relative terms, the most impressive improvements in funding overall (from all sources) have occurred in Indonesia, Mozambique, Myanmar, South Africa and the United Republic of Tanzania (Figure 3.5).

Among all HBCs, national governments will provide US\$ 1194 million (66%) of the funding required by NTPs in 2008 and US\$ 297 million (16%) will be funded by donor agencies (**Table 3.3**). This leaves a reported funding gap of US\$ 328 million (18%). In absolute terms, the largest funding gaps are those reported by Brazil, China, Nigeria and the Russian Federation (US\$ 252 million, or 77% of the total reported gap). Proportionally, the largest gaps are in Afghanistan, Cambodia, Kenya, Myanmar, Nigeria, Pakistan, the Russian Federation and Uganda (with gaps representing 31–73% of the required budget). Only five HBCs reported no funding gap, or a negligible funding gap: Bangladesh, Ethiopia, India, Indonesia and South Africa.

## 3.2.2 All countries by region, 2008

Data for all countries (in addition to the 22 HBCs) began to be collected in 2003 and were reported for the first time in 2004. There is variation in the set of countries that report complete data each year, making presentation of needs for all countries over time difficult. For this reason, **Figure 3.6** presents NTP budgets by source of funding for 2008 only. In 2008, 90 countries (22 HBCs and 68 other countries) submitted complete financial data. Globally, these countries account for 91% of TB cases (up from 90% in 2007); at regional level, they account for almost all TB cases in the African, Eastern Mediterranean, South-East

<sup>&</sup>lt;sup>1</sup> See **Annex 2** for a definition of the budgetary line items included in the category DOTS.

#### FIGURE 3.6

Regional distribution of NTP budgets by source of funding, 22 high-burden countries and 68 non high-burden countries, 2008. Numbers in parentheses above bars show the percentage of all estimated TB cases in the region accounted for by the countries included in the bar. Numbers below the bars show the number of countries contributing to each bar.



Asia and Western Pacific regions (89-97% depending on the region), for 74% of the regional total in the Region of the Americas, and for 60% of the regional total in the European Region.

NTP budgets in 2008 in these 90 countries total US\$ 2.4 billion, up from US\$ 1.6 billion in 2007 for countries accounted for 91% of TB cases globally, with a funding gap of US\$ 385 million (also higher than the US\$ 307 million gap reported in 2007).

Budgetary funding gaps as a proportion of the total budget were similar for HBCs and non-HBCs in the Region of the Americas and the Eastern Mediterranean Region, and much lower or non-existent in non-HBCs in the European, South-East Asia and Western Pacific regions. It is only in the African Region that funding gaps represent a higher share of the budget required in non-HBCs. Overall, NTP budgets per TB case (estimated annual incidence) were higher for HBCs compared with non-HBCs in the African Region, the European Region and the Region of the Americas, and much lower for HBCs compared with non-HBCs in the Eastern Mediterranean, South-East Asia and Western Pacific regions.

## 3.3 Total costs of TB control

## 3.3.1 High-burden countries, 2002–2008

NTP budgets include only part of the resources needed for TB control. In particular, they do not include the costs associated with general health-service staff and infrastructure, which are used when TB patients are hospitalized or make outpatient clinic visits for DOT and monitoring. For the 22 HBCs combined, the total cost of TB control is projected to be almost US\$ 2.3 billion in 2008, compared with US\$ 0.6 billion in 2002 (Figures 3.7-3.9; Table 3.4). As with NTP budgets, the total cost of TB control is expected to stagnate between 2007 and 2008, except in five countries (Brazil, Ethiopia, Mozambique, Nigeria and the United Republic of Tanzania).

## FIGURE 3.7

Total TB control costs by line item, high-burden countries,<sup>a</sup> 2002-2008



- Total TB control costs for 2002-2006 are based on expenditure data, whereas those for 2007–2008 are based on budget data. Estimates assume costs 2002 equal to costs 2003 for Afghanistan, Bangladesh, b
- Mozambique, Nigeria, Uganda and Zimbabwe
- 'Unknown" applies to Russian Federation 2003 and Thailand 2002–2006.
- d "Other" includes costs for hospitalization and fluorography in the Russian Federation not reflected in NTP budget or NTP expenditure data.

#### FIGURE 3.8

### Total TB control costs by source of funding, high-burden countries,<sup>a</sup> 2002–2008



Total TB control costs for 2002-2006 are based on expenditure data, whereas those for 2007–2008 are based on budget data b

Estimates assume costs 2002 equal to costs 2003 for Afghanistan, Bangladesh, Mozambique, Nigeria, Uganda and Zimbabwe

# TABLE 3.4 Total TB control costs and available funding, high-burden countries, 2008

	TOTAL COSTS	CHANGE	CHANGE SINCE		AVAILAB (US\$ M	LE FUNDING MILLIONS)		FUNDING GAP	CHANGE I	N AVAILAE (US\$	BLE FUNDING SINC MILLIONS)	E 2002	CHANGE IN FUNDING
	(US\$ MILLIONS)	2002ª (US\$ MILLIONS)	(%)	GOVERNMENT (EXCL. LOANS)	LOANS	GRANTS (EXCL. GLOBAL FUND)	GLOBAL FUND	(US\$ MILLIONS)	GOVERNMENT (EXCL. LOANS)	LOANS	GRANTS (EXCL. GLOBAL FUND)	GLOBAL FUND	2002 (US\$ MILLIONS
1 India	111	48	78	52	31	8.3	20	0	12	13	3.4	20	0
2 China	225	164	269	139	13	0.7	20	53	82	12	-2.6	20	53
3 Indonesia	62	41	199	28	0	13	21	0	9.2	0	11	21	0
4 South Africa	538	374	228	536	0	1.8	0	0	378	0	0.2	-3.6	0
5 Nigeria	80	70	717	36	0	2.2	11	30	30	0	-1.6	11	30
6 Bangladesh	24	13	129	9.3	0.6	0.9	13	0	2.5	0	-2.6	13	0
7 Ethiopia	29	21	304	12	0	4.4	12	0	9.1	0	0.6	12	0
8 Pakistan	28	23	465	13	0	0	6.2	8.3	10	0	-1.2	6.2	8.3
9 Philippines	28	6.2	28	18	0	0.1	8.0	2.0	-1.2	-2.2	-0.4	8.0	2.0
10 DR Congo	30	18	154	11	0.8	5.7	7.9	4.6	5.6	0.8	-0.4	7.9	4.6
11 Russian Federation	811	669	473	590	33	5.0	30	153	449	33	5.0	30	153
12 Viet Nam	25	6.7	36	18	0	3.5	3.5	0	1.5	-1.8	3.0	3.5	0.4
13 Kenya	35	30	555	3.3	0	12	5.6	15	0.5	0	9.1	5.6	15
14 UR Tanzania <sup>b</sup>	58	46	419	9.5	0	17	20	11	3.1	0	12	20	11
15 Uganda	14	11	386	1.1	0	0.5	3.7	8.4	0.1	-1.2	-0.1	3.7	8.4
16 Brazil	95	57	147	73	0	0	6.1	16	34	0	0	6.1	16
17 Mozambique	25	21	528	7.8	0	9.4	5.1	2.2	5.1	-0.8	9.1	5.1	2.2
18 Thailand <sup>c</sup>	8.8	-	-	5.6	0.0	0.0	1.4	1.8	-	-	-	-	-
19 Myanmar	15	12	403	2.8	0	2.6	0	10	0.6	0	1.7	0	10
20 Zimbabwe	11	5.5	92	6.3	0	1.7	1.9	1.4	2.0	0	0.1	1.9	1.4
21 Cambodia	11	6.5	133	3.0	0	1.5	2.2	4.8	0.2	-0.7	0	2.2	4.8
22 Afghanistan	17	15	942	1.4	0	7.5	0.9	6.8	1.1	0	6.2	0.9	6.8
High-burden countries	2280	1660	269 <sup>d</sup>	1578	78	97	200	328	1033	53	53	195	326

Indicates not available.

<sup>a</sup> TB control costs for 2007–2008 were estimated using budget data, whereas those for 2002–2006 were estimated using expenditure rather than budget data wherever possible. Estimates assume expenditure 2002 equal to available funding 2002 (Kenya and UR Tanzania), to expenditure 2003 (Afghanistan, Bangladesh, Mozambique, Nigeria and Zimbabwe) or to available funding 2002 (Kenya and UR Tanzania), to expenditure 2003 (Afghanistan, Bangladesh, Mozambique, Nigeria and Zimbabwe) or to available funding 2003 (Uganda).

<sup>b</sup> For US\$ 23 million of the available funding the exact split between the Global Fund and grants from other donors is not known. This table assumes a 50/50 split.

Data for Thailand are partial

<sup>d</sup> Median value.

#### FIGURE 3.9

## Total TB control costs by country, high-burden countries,<sup>a</sup> 2002–2008



<sup>a</sup> Total TB control costs for 2002–2006 are based on expenditure data, whereas those for 2007–2008 are based on budget data.

Increases in projected costs during the period 2002-2008 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. As in previous years, the largest costs in 2008 are for the Russian Federation and South Africa, which together account for US\$ 1.3 billion (59%) of the total of US\$ 2.3 billion (Figure 3.9; Table 3.4). China (US\$ 225 million), India (US\$ 111 million), Brazil (US\$95 million) and Nigeria (US\$80 million) rank third to sixth. These six countries account for 82% of the total cost of TB control in the 22 HBCs in 2008. Of the remaining countries, 13 have costs of US\$ 30 million or less in 2008, while three (Indonesia, Kenya, the United Republic of Tanzania) have costs in the range US\$ 35 million to US\$ 62 million (Table 3.4, column 2). The countries with by far the largest projected absolute increases in annual costs between 2002 and 2008 are the Russian Federation and South Africa, followed by China (Figure 3.9; Table 3.4).

In South Africa, there are two major reasons for the high cost of TB control anticipated in 2008. Firstly, the costs associated with general district hospital and specialized TB hospital infrastructure are relatively high, due to the number of beds (approximately 8000 across the country's nine provinces) as well as a unit price per bed-day that is higher in South Africa than in



most other HBCs (around US\$ 40 per day in TB hospitals to over US\$ 100 in general district hospitals, reflecting the higher unit costs associated with a middle-income country). Secondly, there is a large budget for the diagnosis and treatment of MDR-TB (see also **Annex 2** and section 3.2 above). The largest components of the budget for MDR-TB in 2008 are renovation and construction of infrastructure in line with a new national policy of hospitalizing all patients with MDR-TB for at least six months, improvement of infection control in MDR-TB and XDR-TB units as well as in general district hospitals and provision of second-line anti-TB drugs for the enrolment of around 5000 patients on treatment.

FIGURE 3.10

High costs in the Russian Federation in 2008 reflect continued staffing and maintenance of an extensive network of TB hospitals and sanatoria, a large budget for second-line anti-TB drugs to treat many MDR-TB patients (US\$ 267 million, with an estimated total of about 24 000 cases to be enrolled on treatment in 2008; see also **Figure 3.3 and Chapter 2**) 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 (see also **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 2008,<sup>1</sup> means that the resources available for TB control are estimated to have increased from US\$ 0.6 billion in 2002 to US\$ 2.0 billion in 2008 (**Figure 3.8; Table 3.4**). For all HBCs, the estimated gap between the funding already available and the total cost of TB control is US\$ 328 million in 2008, i.e. the NTP budget gap reported above.

The contribution by HBC governments to the total cost of TB control in 2008 is 73% on average, which is

slightly larger than their contribution to NTP budgets but very similar to figures reported for earlier years in previous reports in this series. Also as in previous years, this high average figure conceals important variation among countries (**Figure 3.10**). Seven HBCs are dependent on grants to cover around 50% or more of the total costs of TB control (Afghanistan, Bangladesh, the Democratic Republic of the Congo, Ethiopia, Indonesia, Kenya and Mozambique), and a further six (Cambodia, Myanmar, Pakistan, Uganda, the United Republic of Tanzania and Zimbabwe) that are likely to rely on grant funding to a similar or greater extent to fill reported funding gaps.

The share of the total costs provided by HBC governments is closely related to average income levels (**Figure 3.11**), although the government contribution relative to income levels is comparatively high in the Democratic Republic of the Congo, Ethiopia, India, South Africa, Viet Nam and Zimbabwe, and comparatively low in Cambodia, Indonesia, Kenya, Uganda and the United Republic of Tanzania.

#### 3.3.2 All countries, 2008

Total costs for 86 countries that submitted complete financial data to WHO, which account for 91% of TB cases globally and which were also included in the Global Plan, are shown for 2008 in **Figure 3.13**.<sup>2</sup> Overall, country reports indicate planned costs of US\$ 3.1 billion in 2008, up from US\$ 2.3 billion in 2007.

<sup>&</sup>lt;sup>1</sup> 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.

<sup>&</sup>lt;sup>2</sup> Four of the 90 countries that reported complete data were not considered in the Global Plan cost estimates.

## FIGURE 3.11

## Government contribution (including loans) to total TB control costs by gross national income (GNI) per capita, 19 high-burden countries,<sup>a</sup> 2008



<sup>a</sup> Data on GNI per capita not available for Myanmar and Afghanistan. Cost data for Thailand not complete.

## 3.4 Comparisons with the Global Plan

The Global Plan sets out what needs to be done between 2006 and 2015 to achieve the MDG and related Stop TB Partnership targets for TB control (see also **Chapters 1 and 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 estimates that are based on the financial data reported by countries.

#### 3.4.1 High-burden countries

For the 22 HBCs as a whole, expenditures (2006), planned costs and available funding for 2006–2008 according to country reports are compared with those derived from the Global Plan in **Figure 3.12**.<sup>1</sup> In 2006, actual expenditures in HBCs were slightly lower than those estimated

to be required in the Global Plan, particularly for collaborative TB/HIV activities and ACSM. Expenditures for DOTS and use of general health system resources for DOTS treatment were similar. These findings are in line with the progress in DOTS implementation, the shortfall in implementation of collaborative TB/HIV activities (e.g. HIV testing, CPT and ART for HIV-positive TB patients) and the need for guidance in implementation of ACSM discussed in **Chapter 2**.

In 2007 and 2008, planned costs based on country reports are higher than expenditures in 2006, mostly due to an increase in planned spending on DOTS implementation and MDR-TB

treatment (almost entirely in the Russian Federation and South Africa). However, planned costs fall short of those estimated to be required in the Global Plan, with the gap widening between 2007 and 2008 from US\$ 0.2 billion to US\$ 0.5 billion. Moreover, the gap is bigger once the distortion caused by the high planned costs for MDR-TB treatment in just two countries is removed. If the "excess" costs for diagnosis and treatment of MDR-TB (compared with the Global Plan) in the Russian Federation and South Africa are excluded, then the gap between the financial resources estimated to be needed in country plans and the Global Plan reaches US\$ 0.7 billion for the 22 HBCs in 2008. The shortfall in MDR-TB treatment applies in particular to China, India and Indonesia.

These aggregated comparisons conceal the fact that four HBCs have planned costs consistent with those detailed in the Global Plan in 2008: Afghanistan, Brazil, Kenya and the United Republic of Tanzania. In addition,

#### FIGURE 3.12





<sup>1</sup> See **Annex 2** for explanation of how costs for individual countries were derived from the Global Plan.

#### FIGURE 3.13

Total TB control costs in 2008 in 22 high-burden countries and 64<sup>a</sup> other countries by region: country reports compared with the Global Plan. Numbers in parentheses above bars show the percentage of all estimated TB cases in the region accounted for by the countries included in the bar. Numbers in parentheses in the x-axis show the number of countries contributing to each bar.



The Netherlands, Serbia, Slovakia, and Switzerland are excluded because they were not included in the Global Plan.
 "Other" includes PPM, PAL, CTBC, operational research, surveys and other.

there are four 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.<sup>1</sup> With the exception of MDR-TB, country plans are consistent with the Global Plan in China, Myanmar, the Philippines and Viet Nam (see **Annex 1**).

As noted in **Chapter 2**, the Russian Federation and South Africa are unusual in having plans to treat more patients with MDR-TB in 2008 than the numbers anticipated by the Global MDR-TB and XDR-TB Response Plan. For collaborative TB/HIV activities, the shortfall is mainly in Cambodia, the Democratic Republic of the Congo, Ethiopia, India, Mozambique, Nigeria, Uganda and Zimbabwe. For ACSM, examples of countries with shortfalls include the Democratic Republic of the Congo, Ethiopia, India and Pakistan; exceptions with ACSM budgets comparable to or larger than those indicated in the Global Plan include Afghanistan, Brazil, Cambodia, Kenya and the Philippines. These 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 2008 to be estimated for 86 of the 171 countries that were included in the Global Plan (22 HBCs and 64 other countries).<sup>2</sup> These 86 countries account for 91% of all new TB cases arising each year.<sup>3</sup> A regional comparison of costs and available funding based on (a) country reports and (b) the Global Plan is shown for these 86 countries in **Figure 3.13**.

Overall, country reports indicate planned costs of US\$ 3.1 billion in 2008 (up from US\$ 2.3 billion in 2007), compared with US\$ 3.6 billion in the Global Plan. The main discrepancy evident from Figure 3.13 is the Global Plan's higher estimate of the cost of collaborative TB/HIV activities, which the regional analysis shows is primarily due to differences with country reports in the African and (to a lesser extent) South-East Asia regions. As noted above, however, the apparent similarity between the Global Plan and country reports for MDR-TB when data are aggregated for all countries is misleading. As Figure 3.13 makes clear, costs for MDR-TB treatment based on country reports fall far short of Global Plan expectations in the South-East Asia and Western Pacific regions, by about US\$ 350 million in 2008. Within these regions, as also illustrated in Chapter 2, the shortfall is primarily in China and India The funding gap reported by countries amounts to US\$ 385 million in 2008, but the gap is US\$ 0.9 billion if the available funding of US\$ 2.7 billion is compared with the US\$ 3.6 billion requirement included in the Global Plan. The total funding gap further increases to US\$1.2 billion once the distortion caused by unusually high planned costs and funding for MDR-TB treatment in the Russian Federation and South Africa is removed.

## 3.4.3 Implications of differences between country reports and the Global Plan

The differences between the Global Plan and country reports highlighted above suggest that country planning, budgeting and financing is lagging behind the Global Plan for three major components of the Stop TB Strategy: collaborative TB/HIV activities, diagnosis and treatment of MDR-TB, and ACSM.

For collaborative TB/HIV activities, the difference between the Global Plan and country reports is exaggerated. The data presented in **Chapter 2 and Annex 1** show

<sup>&</sup>lt;sup>1</sup> The Global MDR-TB and XDR-TB response plan 2007–2008. Geneva, World Health Organization, 2007 (WHO/HTM/ STB/2007.387).

<sup>&</sup>lt;sup>2</sup> Four of the 90 countries that reported complete data were not considered in the Global Plan cost estimates.

<sup>&</sup>lt;sup>3</sup> All of the 171 countries included in the Global Plan accounted for 98% of TB cases globally in 2004.

that although implementation of collaborative TB/HIV activities lags behind the Global Plan (consistent with the data presented in Figure 3.12 and Figure 3.13), there are a few countries in which implementation in 2006 and plans for 2007-2008 are well aligned, as also noted in this chapter. Some of the shortfall in the budgets reported by countries is attributable to only partial inclusion of the costs of collaborative TB/HIV activities in NTP budgets. For example, budgeting for all TB/HIV activities in the United Republic of Tanzania led to estimates for 2008 that are almost the same as those in the Global Plan, in contrast to previous years when the TB/HIV budget reported by the NTP was much lower. In Kenya, implementation is in line with the Global Plan, but the NTP budget does not include the costs of activities funded by the national AIDS control programme or the cost of activities that are funded via NGOs. In India, the only TB/HIV-related costs included in the NTP budget are the costs of HIV testing for TB patients, which is a relatively inexpensive intervention; it is not known to what extent other activities are budgeted for and funded by the national AIDS control programme. More comprehensive assessments of the kind recently undertaken for the United Republic of Tanzania are needed to enable a more accurate assessment of the real gap between the Global Plan and country plans, and the associated funding requirements.

The shortfall in budgets for diagnosis and treatment of MDR-TB clearly mirror the shortfall in implementation and planning described in **Chapter 2**. The reporting of budgets for ACSM that are relatively small as well as different from those included in the Global Plan is consistent with the reality that ACSM represents new territory for most NTPs, and that it is a component of the Stop TB Strategy for which NTPs state that guidance is needed (see **Chapter 2**).

WHO has developed a planning and budgeting tool that is designed to help countries to align their plans and budgets with the expectations set out in the Global Plan, as well as to produce more accurate country-specific estimates of the financial resources that are required.<sup>1</sup> While the development of the tool was primarily motivated by a recognized need to assist countries to plan and budget in line with the Global Plan and the Stop TB Strategy, it is also intended to help with planning and budgeting for TB control in general. In 2007, 35 countries in the African Region were introduced to the tool through workshops and country missions, and several have used it to complete the task of setting out plans and budgets for a five-year period, starting in either 2007 or 2008. The countries that are most advanced include the Democratic Republic of the Congo, Gabon, Kenya, Malawi, Nigeria, South Africa, the United Republic of Tanzania and Zambia; progress has also been made in Ethiopia, Mozambique and Uganda. Outside Africa, the tool has been used in Afghanistan, Brazil, Indonesia and Uzbekistan, and will be introduced in all countries in the South-East Asia Region in 2008.

Review of finalized plans and budgets will increasingly inform and improve our comparisons of funding requirements reported by countries and those included in the Global Plan (e.g. as has been possible for Kenya, South Africa and the United Republic of Tanzania this year). For the 2009 report, this will include actual revision of the Global Plan estimates where appropriate, using up-to-date and country-specific data.

## 3.5 Budgets and costs per patient

Budgets and costs per patient in HBCs are shown in **Table 3.5**. The budget for first-line anti-TB drugs per patient is lowest in India (US\$ 14) and Zimbabwe (US\$ 12), and highest in Brazil (US\$ 77), Mozambique (US\$ 63) and the Russian Federation (US\$ 286). In most countries, the budget is in the range US\$ 20–40.

The budget per patient, including all line items, also varies. Three countries have budgets below US\$ 100 per patient (Ethiopia, India and Zimbabwe). A total of six countries have budgets in the range US\$ 100-200 per patient, five are in the range US\$ 200-300 and three are in the range US\$ 300-550.2 The Russian Federation and South Africa are the only two countries with a budget exceeding US\$ 1000 per patient (for reasons discussed in section 3.3.1), but budgets are also relatively high in Brazil and the United Republic of Tanzania. Brazil is a middle-income country, and comparatively high costs are expected; the high cost in the United Republic of Tanzania reflects the inclusion, for the first time, of the budget for the full range of collaborative TB/HIV activities, even when some of those activities are funded and provided by the national AIDS control programme (see also sections 3.2.1 and 3.3.2).

In 2008, the total cost per patient treated is estimated at under US\$ 100 in only one country: India. It is in the range US\$ 100-300 in 12 countries (as in 2007), and US\$ 300-500 in three countries (also as in 2007). Five countries have much higher costs: Brazil, Mozambique, the Russian Federation, South Africa and the United Republic of Tanzania. As noted above, three of these countries are middle-income countries with generally higher prices for the inputs needed for TB control, while the Russian Federation and South Africa have large budgets for MDR-TB treatment as well as maintenance or upgrading of hospital infrastructure. Costs of US\$ 774 in the United Republic of Tanzania and US\$ 685 in Mozambique are due mainly to comprehensive budgeting for collaborative TB/HIV activities (see also sections 3.2.1 and 3.3.2 and Annex 1).

Among the low-income countries, there is no clearcut relationship between the cost per patient treated and GNI per capita. For example, in India and Pakistan

<sup>&</sup>lt;sup>1</sup> See http://www.who.int/tb/dots/planning\_budgeting\_tool/ en/index.html

<sup>&</sup>lt;sup>2</sup> Figures were not calculated for Thailand because the budget and health services utilization data reported to WHO were incomplete.

## TABLE 3.5

## Total TB control costs and NTP budgets per patient, high-burden countries, 2008

		2008 (US\$)		CHANGES SINCE 2002, (FACTOR <sup>a</sup> )				
	FIRST-LINE DRUGS BUDGET	NTP BUDGET	TOTAL COST	FIRST-LINE DRUGS BUDGET	NTP BUDGET	TOTAL COST		
1 India	14	50	84	1.4	1.5	1.4		
2 China	26	236	236	1.5	1.8	1.8		
3 Indonesia	51	213	232	1.6	1.8	1.7		
4 South Africa	55	1254	1917	0.9	4.3	2.5		
5 Nigeria	30	258	419	0.6	1.8	21		
6 Bangladesh	16	105	143	0.8	1.3	3.8		
7 Ethiopia	19	70	119	0.7	1.6	1.9		
8 Pakistan	31	119	135	0.5	2.6	1.4		
9 Philippines	31	149	231	0.7	1.2	1.2		
10 DR Congo	20	186	274	0.6	2.0	1.6		
11 Russian Federation	286	5739	6389	4.6	4.6	5.8		
12 Viet Nam	18	165	284	0.5	1.9	1.5		
13 Kenya	33	301	319	0.9	5.8	4.8		
14 UR Tanzania	21	703	774	0.5	8.6	4.2		
15 Uganda	43	208	217	0.8	4.5	3.2		
16 Brazil	77	748	1118	1.7	4.5	2.4		
17 Mozambique	63	522	685	2.7	6.7	4.5		
18 Thailand	-	-	-	-	-	-		
19 Myanmar	28	100	114	1.6	4.8	2.1		
20 Zimbabwe	12	92	163	0.4	3.2	1.6		
21 Cambodia	19	243	308	0.5	1.8	1.5		
22 Afghanistan	30	432	469	0.4	1.4	4.0		
High-burden countries (median value)	30	213	274	0.8	2.0	2.1		

Indicates not available. Calculated as 2007 value divided by 2002 value.

the cost per patient treated is low relative to income levels, while in the Democratic Republic of the Congo and Mozambique the cost per patient treated 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 200% per patient for budgets and of 210% for total costs (though the median for firstline drugs shows a decrease of 20% since 2002).

## **3.6 Expenditures compared with available** funding and changes in cases treated

For countries that have received large increases in funding, there are two important challenges: to spend the extra money, and to translate extra spending into improved case detection and treatment success rates. To date, we have 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 3.6; Figure 3.14). There were seven countries in which the NTP spent 80-100% of the funds available to them (Afghanistan, Brazil, Cambodia, China, the Democratic Republic of the Congo, the Philippines and Viet Nam) and three where expenditures exceeded the level of funding reported prospectively to WHO in 2006 (Kenya, Pakistan and South Africa).<sup>1</sup> India spent 75% of the available funds, and Ethiopia spent 71%. The remaining six countries that reported expenditure data spent between 61% (Indonesia) and 69% (Myanmar) of the available funds. The data reported by the NTP in the United Republic of Tanzania indicate that only 24% of the available funding was spent; it seems likely that this is a problem with the expenditure report. No assessment could be made for Mozambique, Thailand and Uganda, as no expenditure data were reported; for these two African countries, as with the United Republic of Tanzania, reporting expenditure data to WHO has been a recurring problem. When country data are aggregated by region (Figure 3.14), the ability to mobilize and then spend financial resources in 2006 was best in the Region of the Americas, the European Region and the Western Pacific Region, and worst in the African Region (considering five countries that reported data, excluding South Africa where the magnitude of the budget and expenditures makes patterns in other countries hard to detect).

The ability to translate spending into improved case-finding can be assessed by comparing changes in expenditures 2003-2006 with changes in the number of patients treated 2003–2006 (Figure 3.15; 2006 is the most recent year for which both case notification and expenditure data are available). Of the 19 HBCs for which data were available, all of the 14 countries that increased spending between 2003 and 2006 also increased the number of new cases that were detected and treated in DOTS programmes (a similar pattern applied for new

<sup>&</sup>lt;sup>1</sup> This explains why the value of expenditures in 2006 as a percentage of the available funding prospectively reported in 2006 (final column of Table 3.6) is above 100.

## TABLE 3.6

Budget, available funding and expenditures (US\$ millions), high-burden countries, 2006

	BUDGET	AVAILABLE FUNDING <sup>a</sup>	EXPEND ITURES <sup>b</sup>	AVAILABLE FUNDING AS % OF NTP BUDGET	EXPENDITURES AS % OF AVAILABLE FUNDING <sup>C</sup>
1 India	66	66	50	100	75
2 China	194	156	149	80	96
3 Indonesia	57	57	35	100	61
4 South Africa	78	78	112	100	143
5 Nigeria	25	20	13	79	65
6 Bangladesh	22	22	14	100	64
7 Ethiopia	6.4	6.4	4.5	100	71
8 Pakistan	21	13	13	61	104
9 Philippines	17	13	12	77	96
10 DR Congo	26	12	9.3	44	80
11 Russian Federation	428	385	694	90	180
12 Viet Nam	10	10	10	100	98
13 Kenya	30	10	11	32	114
14 UR Tanzania	8.1	7.7	1.8	95	24
15 Uganda	10	5.7	-	57	-
16 Brazil	40	34	34	85	99
17 Mozambique	12	9.3	-	76	-
18 Thailand <sup>d</sup>	4.3	4.3	-	100	-
19 Myanmar	17	7.4	5.1	44	69
20 Zimbabwe	13	11	10.6	80	100
21 Cambodia	7.0	4.7	4.3	67	91
22 Afghanistan	19	3.5	2.8	19	80
High-burden countries	1111	934	1184	77°	90 <sup>e</sup>

Indicates not available

Based on budget data, reported prospectively in 2006.

Based on actual expenditures reported in 2007. Figures can be above 100% when additional funds were mobilized after budget data were reported in 2006.

Data for Thailand are partial.

Average values.

#### FIGURE 3.14

#### Budget, available funding and expenditures by WHO region, 19 high-burden countries,<sup>a</sup> 2006



Expenditure data not available for Mozambique and Uganda. Data for South Africa not а

included. Data are partial for Thailand. b

## FIGURE 3.15

## Change in NTP expenditure and change in all types of patients treated under DOTS, 20 high-burden countries, a,b 2003-2006



Expenditure data are not available for Thailand and Uganda. Comparison for Kenya is with expenditure 2004 and for South Africa is with expenditure 2005. Comparison for Mozambique is expenditure 2005 with expenditure 2002.

Countries ranked by percentage change in NTP expenditure. Expenditure data for Ethiopia, UR Tanzania and Zimbabwe appear incomplete. С

smear-positive cases specifically; data not shown). However, the relationship was variable. In Brazil and the Russian Federation, the increase in the number of patients treated under DOTS exceeded the increase in expenditures, probably because increasing the number of cases treated under DOTS requires a substitution of DOTS for non-DOTS treatment rather than an increase in total notifications. There was an almost one-to-one relationship between increased expenditures and increased notifications of new cases under DOTS in Indonesia, and the percentage increase in cases treated under DOTS was more than 70% of the percentage increase in expenditures in Bangladesh and China. At the other end of the spectrum, six countries reported lower expenditures in 2006 compared with 2003 (Afghanistan, Ethiopia, the Philippines, the United Republic of Tanzania, Viet Nam and Zimbabwe), of which two reported a small decrease in the number of cases treated (the United Republic of Tanzania and Zimbabwe), one reported a large increase in the number of cases treated (Afghanistan), and two reported small changes in the number of cases treated (the Philippines and Viet Nam). While the data are plausible for the Philippines and Viet Nam (small changes in both cases and expenditures are unsurprising in countries that have achieved targets for case detection and treatment success rates), it seems likely that expenditures have been underreported in the other four countries. This is consistent with the considerable difficulty in providing expenditure data to WHO that have been observed for these four countries over the past five years.

## 3.7 Global Fund financing

## 3.7.1 High-burden countries

The Global Fund is the single most important source of external financing in HBCs, with 11 countries (Bangladesh, Cambodia, the Democratic the Congo, Ethiopia, India, Indonesia, Mozambique, Pakistan, the Philippines, Uganda and Zimbabwe) relying on it to fund more than 25% of their NTP budgets. Only one HBC (Myanmar) lacks a Global Fund grant. After seven rounds of proposals, the total value of approved proposals in the HBCs is US\$ 1.4 billion and the amounts in the Phase 1 grant agreements (i.e. the grants that cover the first two years of the proposal) total US\$ 547 million (data not shown).

By the end of 2007, US\$ 502 million had been disbursed. Across all grants and countries, the actual disbursement rate is very similar to the expected rate,<sup>1</sup> though there is variation among countries with disbursements higher than those expected in 30 out of 53 grants and less than expected in 23 (data not shown). Countries for which disbursements are particularly low in relation to the expected disbursement of funds include Bangladesh (for one of the two principal recipients in round 5), Brazil (for one of the principal recipients in round 5), India (rounds 3 and 4), Indonesia (round 5, possibly linked to a temporary cessation of funding in 2007) and Kenya (round 2). The main delay in the initial flow of funds to countries is the time taken to sign the grant agreement after proposal approval; the median time is 11 months, which is in line with Global Fund expectations that it takes about one year to prepare and finalize the Phase 1 grant agreement and related documentation once proposals are approved by the Board. Once grant agreements are signed, disbursements are usually made within two months.

## 3.7.2 All countries

In seven funding rounds between 2002 and 2007, the Global Fund approved proposals worth a total of US\$ 2.5 billion for TB control in 108 countries, out of total commitments for HIV, TB and malaria of around US\$ 10 billion.<sup>2</sup> The African Region has the single largest share, at 37% (Figure 3.16), which is higher than 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. The share of total funding approved for the Eastern Mediterranean Region and the European Region (13% and 11% respectively) is double these regions' share of the global burden of TB (6% and 5%), while the share of funding for the Region of the Americans is in line with its share of the global burden of TB.

The value of approved proposals for TB control was relatively high in rounds 5 and 6 compared with rounds 1–4, as was the proposal approval rate (**Figure 3.17**), but fell in round 7.<sup>3</sup> The approval rate for TB proposals submitted to the Global Fund was 50% in round 5 and 64% in round 6, up from 37–40% in rounds 1–4, but fell to 51% in round 7.

## 3.8 Why do funding gaps for TB control persist?

The 22 HBCs have reported a combined funding gap of US\$ 328 million for 2008, while the funding gap reported for 90 countries (the 22 HBCs plus 68 other countries) amounts to US\$ 385 million. In the context of the Global Fund having issued seven calls for proposals since 2002 resulting in funding commitments of over US\$ 10 billion for HIV, malaria and TB control programmes, it may seem surprising that funding gaps for TB control persist.

TB proposals submitted to the Global Fund must

<sup>&</sup>lt;sup>1</sup> The expected rate assumes that disbursements should be spread evenly over the two- or five-year period of the grant agreement following the programme start date.

<sup>&</sup>lt;sup>2</sup> The Global Fund has committed US\$ 10 billion in rounds 1–7; in round 7, US\$ 1.1 billion was committed for a two-year period. See www.theglobalfund.org/en/media\_center/press/ pr\_071112

<sup>&</sup>lt;sup>3</sup> Calculated as the number of proposals approved divided by the number of proposals reviewed by the Global Fund's Technical Review Panel.



a Refers to the total budgets approved in rounds 1–7.

#### FIGURE 3.17

FIGURE 3.16

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



number of proposals that can be approved for funding by the Board is limited by the total financial resources available. The US\$ 2.4 billion committed thus far for TB control (see section 3.7) represents about one quarter of total commitments to date; if funds were split evenly among AIDS, TB and malaria, this would increase to US\$ 3.3 billion. The Fund began to disburse funds in 2003, and current commitments extend to 2012; funds committed to date thus equate to approximately US\$ 240 million per year, with a theoretical maximum of around US\$ 330 million per year. This simple analysis demonstrates that even if TB control programmes were to increase their share of Global Fund commitments to 33%, the total reported funding gap of US\$ 385 million would not be eliminated, although it could be reduced by about US\$ 100 million. Excluding funding gaps in four middle-income countries with more domestic resources (Brazil, China, the Russian Federation and South Africa), the gaps reported by countries fall to about US\$ 100 million among HBCs, and to about US\$ 60 million in other countries. In this context, filling funding gaps via the Global Fund appears more feasible, but depends on (i) the submission of high-quality and sufficiently ambitious proposals including well-justified budgets, (ii) the criteria used by the Global Fund to define countries eligible to apply for funding and (iii) the criteria used to allocate funds among the three diseases. In round 7, there was a decrease in funding for TB control proposals, and a decrease in the proportion of proposals that were approved compared with the peak in round 6. The relative success of round 6 followed the organization of a series of proposal development workshops by the Stop TB Department in WHO; to maximize resource mobilization for TB control programmes in future rounds, this level of assistance with proposal preparation may be

first be approved by its Technical Review Panel, and the

If gaps reported by countries are difficult to fill via the Global Fund, then closing the additional gap that will open up if all countries plan in line with the Global Plan via the Global Fund appears unrealistic. Filling funding gaps in the years up to the MDG target year of 2015 there-fore depends on domestic resource mobilization and/or external resource mobilization from donors other than the Global Fund.

needed in future.

Increasing domestic financing for TB control would mean a major shift from trends during the period 2002– 2008, when almost all of the increase in domestic funding among the 22 HBCs was accounted for by Brazil, China, the Russian Federation and South Africa. Two ways to assess the extent to which countries can mobilize more domestic funds are (i) to compare the percentage of funding currently being provided from domestic sources with a country's national income (measured as GNI per capita) to see if there are differences between countries with similar income levels and (ii) to compare costs and funding gaps per capita with total government health

## TABLE 3.7 Financial indicators, high-burden countries, 2008

	NTP BUDGET PER CAPITA (US\$)	TOTAL TB CONTROL COSTS PER CAPITA (US\$)	FUNDING GAP PER CAPITA (US\$)	GENERAL GOVERNMENT EXPENDITURE ON HEALTH PER CAPITA (US\$) <sup>a</sup>	TOTAL EXPENDITURE ON HEALTH PER CAPITA (US\$) <sup>a</sup>	GENERAL GOVERNMENT HEALTH SPENDING USED FOR TB CONTROL (%)	TB GAP AS PERCENTAGE OF GENERAL GOVERNMENT HEALTH SPENDING (%)
1 India	0.1	0.1	0	5.4	31	1.9	0
2 China	0.2	0.2	0.04	27	70	0.6	0.2
3 Indonesia	0.2	0.3	0	11	33	2.5	0
4 South Africa	7.4	11	0	158	390	7.2	0
5 Nigeria	0.4	0.6	0.2	7.0	23	8.9	3.3
6 Bangladesh	0.1	0.2	0	3.8	14	4.5	0
7 Ethiopia	0.2	0.3	0	2.9	5.6	13	0
8 Pakistan	0.1	0.2	0.05	2.7	14	6.7	2.0
9 Philippines	0.2	0.3	0.02	14	36	2.4	0.2
10 DR Congo	0.3	0.5	0.1	1.3	4.7	42	6.3
11 Russian Federation	5.1	5.7	1.1	150	245	3.7	0.7
12 Viet Nam	0.2	0.3	0.005	8.1	30	3.7	0.1
13 Kenya	0.9	1.0	0.4	8.6	20	12	5.1
14 UR Tanzania	1.3	1.4	0.3	5.2	12	29	5.5
15 Uganda	0.4	0.4	0.3	6.2	19	7.9	4.9
16 Brazil	0.3	0.5	0.1	157	290	0.3	0.1
17 Mozambique	0.9	1.2	0.1	8.4	12	15	1.4
18 Thailand <sup>b</sup>	0.1	0.1	-	57	88	0.2	-
19 Myanmar	0.3	0.3	0.2	0.6	4.5	51	33
20 Zimbabwe	0.5	0.9	0.1	13	27	7.1	0.9
21 Cambodia	0.6	0.8	0.3	6.1	24	14	5.6
22 Afghanistan	0.5	0.5	0.2	2.3	14	25	10
High-burden countries (mean value)	0.9	1.2	0.2	30	64	12	3.8

Indicates not available.

Latest data available are for 2004. Columns 6 and 7 will be overestimates if government health expenditure has increased since 2004.

<sup>b</sup> Data for Thailand are partial.

expenditure per capita (**Table 3.7**). 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 Mozambique). 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 and China, 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), Afghanistan, Cambodia and Myanmar.

Besides grant funding from the Global Fund, the President's Emergency Plan for AIDS Relief is a major source of donor funding, at least for collaborative TB/HIV activities, for most of the African HBCs as well as Viet Nam. With billions of dollars available through this plan, it is important that collaborative TB/HIV activities and related aspects of TB control (e.g. laboratory strengthening) are supported as much as possible – for example, as in happening in Kenya. UNITAID<sup>1</sup> is also a relatively new source of donor funding for TB diagnostics and anti-TB drugs.

Overall, the importance of increasing both donor and domestic funding for TB control is highlighted in a recent publication.<sup>2</sup> This included an analysis of funding needs according to the Global Plan for least-developed, low-income, lower middle-income and upper middleincome countries separately. Combined with benchmarks for domestic contributions to funding for health care used by the Commission on Macroeconomics and Health,<sup>3</sup> this analysis suggested that domestic funding could increase to about US\$ 5 billion per year by 2010 and that donor funding would need to increase to about US\$ 1 billion per year (compared with approximately US\$ 300 million in 2008).

## 3.9 Summary

The financial data reported to WHO in 2007 are the most complete since financial monitoring was initiated in 2002, with 90 countries that collectively account for 91% 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 80 countries (77% of total cases globally) submitted a complete report.

NTP budgets in HBCs amount to US\$ 1.8 billion in 2008, up from US\$ 0.5 billion in 2002; NTP budgets for the 90 countries reporting complete data total US\$ 2.3

<sup>1</sup> http://www.unitaid.eu/

<sup>&</sup>lt;sup>2</sup> Floyd K, Pantoja A. Financial resources required for TB control to achieve global targets set for 2015. *Bulletin of the World Health Organization*, 2008 [in press].

<sup>&</sup>lt;sup>3</sup> Macroeconomics and health: investing in health for economic development. Report of the Commission on Macroeconomics and Health. Geneva, World Health Organization, 2001:166– 167.

billion in 2008. In HBCs, budgets are generally equivalent to about US\$ 100–300 per patient treated, but range from below US\$ 100 in India to above US\$ 1000 in the Russian Federation and South Africa. DOTS accounts for the largest single share of NTP budgets in almost all countries, but budgets for the diagnosis and treatment of MDR-TB have become strikingly large in absolute and relative terms in the Russian Federation and South Africa. In several African countries as well as Cambodia, collaborative TB/HIV activities account for a comparatively high proportion of the NTP budget.

With a few exceptions, NTP budgets do not include the costs associated with using general health system resources such as staff and infrastructure for TB control. When these costs are added to NTP budgets, we estimate that the total cost of TB control in HBCs will reach US\$ 2.3 billion in 2008 (up from US\$ 0.6 billion in 2002), and US\$ 3.1 billion across the 90 reporting countries. Costs per patient treated are generally in the range US\$ 100–400, and below US\$ 100 only in India.

For the 22 HBCs, NTP budgets and our estimates of the total costs of TB control have stagnated between 2007 and 2008 in all but five countries, four of which are in Africa. This trend is worrying, because it suggests that the deceleration in progress towards the case detection and treatment success targets highlighted in **Chapter 1** could persist into 2008.

Sustaining a trend evident since 2002, funding for TB control continues to grow, mainly from domestic financing in Brazil, China, the Russian Federation and South Africa and from Global Fund grants in other countries. Across HBCs in 2008, governments will cover 73% of the total costs of TB control and grants will cover 13% (including US\$ 200 million from the Global Fund, out of total grant funding of US\$ 297 million). For all countries, the figures are 75% and 12% respectively. Despite increases in funding, countries have reported funding gaps for 2008 that total US\$ 328 million among HBCs (14% of total costs) and US\$ 385 million across all reporting countries (13% of total costs). Only five HBCs reported that they had no funding gap for 2008.

Gaps reported by countries for 2007 and 2008 would be larger still if country plans and assessments of funding requirements were fully aligned with the Global Plan. In 2008, the gap between the total available funding based on country reports and the total funding requirements laid out in the Global Plan is US\$ 0.8 billion in HBCs and US\$ 0.9 billion across all 90 reporting countries. The discrepancy is mostly due to higher budgets for MDR-TB (South-East Asia and Western Pacific regions), collaborative TB/HIV activities (African and South-East Asia regions) and ACSM (all regions) in the Global Plan. These differences expressed in financial terms are consistent with results for the implementation and planning of interventions presented in **Chapter 2**.

More positively, there are several examples of countries with plans and budgets that are well aligned with the Global Plan, as well as a few that were well-aligned before the mid-2007 upward revision of targets for the treatment of MDR-TB. Many countries in Africa including all of the HBCs in the region have embarked upon, and in some cases completed, the development of medium-term plans and budgets using a WHO planning and budgeting tool that is designed to help countries to plan and budget in line with the Global Plan. Completion of this work as well as the development of country-owned plans and budgets based on Global Plan targets in further countries are now crucial and should form the basis for intensified efforts to mobilize the necessary resources from both domestic and donor sources.

# Conclusions

This concluding section of the report highlights key findings from **Chapters 1, 2 and 3**, as well as common themes across all chapters.

The data and analysis presented in **Chapter 1** show that TB remains a major cause of illness and death worldwide, especially in Asia and Africa. Globally, there were an estimated 9.2 million new cases and 1.7 million deaths from TB in 2006, including 0.7 million cases and 0.2 million deaths in HIV-positive people. Population growth means that these numbers are higher than in 2005. More positively, and confirming a finding first reported in 2007, the data also show that the number of new cases per capita appears to have been falling globally since 2003, and in all six WHO regions except the European Region where rates are approximately stable. If this trend is sustained, MDG 6 Target 6.C, to halt and reverse the incidence of TB, will be achieved well before the target date of 2015. Four regions are also on track to halve prevalence and death rates by 2015 compared with a baseline of 1990, in line with targets set by the Stop TB Partnership. Africa and Europe are not on track to reach these targets, following large increases in the incidence of TB during the 1990s. At current rates of progress, these regions could prevent the targets being achieved globally.

The Stop TB Strategy is WHO's recommended approach to reducing the burden of TB in line with global targets, and the Stop TB Partnership's Global Plan has set out the scale at which the strategy needs to be implemented to achieve global targets. To date, **Chapter 2** shows that progress with implementation of the six components of the strategy is mixed.

- *DOTS expansion and enhancement.* This is the component for which progress is best. Globally, the percentage of estimated new cases of smear-positive TB that were detected in DOTS programmes reached 61% in 2006, compared with the global target of at least 70%. The rate of treatment success for smear-positive cases detected in DOTS programmes improved to 84.7% in 2005, just below the target of 85%.
- Addressing TB/HIV, MDR-TB and other challenges. There has been considerable progress in the African Region with the provision of TB/HIV interventions such as HIV testing for all TB patients and co-trimoxazole preventive therapy (CPT) and antiretroviral therapy (ART) for HIV-positive TB patients. However, planning for treatment of patients with

MDR-TB falls far short of Global Plan targets in the European, South-East Asia and Western Pacific regions.

- *Contributing to health system strengthening.* Diagnosis of TB and treatment of patients are fully integrated into general health services in most countries. Links with general health sector or development planning frameworks are variable, but consistency with sector-wide approaches was comparatively good among reporting countries. The Practical Approach to Lung Health is being piloted or expanded nationwide in 15 countries, and is included in the plans of 72 countries. Many countries lack comprehensive plans for human resource development or a recent assessment of staffing needs.
- *Engaging all care providers*. Among the 22 HBCs that collectively account for 80% of TB cases globally, 14 are scaling up public–private and public–public mix approaches to involve the full range of care providers in TB control, and seven have used the International Standards for Tuberculosis Care to facilitate this process.
- *Empowering TB patients, and communities.* Several HBCs are implementing ACSM activities, and 13 have conducted KAP surveys. Nonetheless, many countries state that they need much more guidance and technical assistance in this area.
- *Promoting research*. Operational research activities were reported by 49 countries including 19 HBCs.

The data and analysis presented in Chapter 3, on financing for TB control, show that the funding available for TB control in 2008 reached US\$ 3.3 billion across 90 countries (with 91% of global cases) that reported data. This is up from less than US\$ 1 billion in 2002. Nonetheless, funding gaps totalling US\$385 million in 2008 were reported by the 90 reporting countries, and only five of the 22 HBCs reported no funding gap. The gap between the funding reported to be available by countries and the funding requirements estimated to be needed for the same countries in the Global Plan is larger still: US\$1 billion. This is mainly due to the higher funding requirements for collaborative TB/HIV activities, management of MDR-TB and ACSM in the Global Plan, compared with country reports. This finding is in line with the implementation and planning deficits described in Chapter 2. Most of the funding deficit is for collaborative TB/HIV activities, management of MDR-TB and ACSM. Another example of consistency between the data included in **Chapter 2** and **Chapter 3** is the diagnosis and treatment of MDR-TB in the Russian Federation and South Africa. These two countries account for a large share of the patients with MDR-TB who are projected to be started on treatment in 2008, in line with fact that these two countries account for 93% of the total budgets for management of MDR-TB reported by HBCs.

Overall, there are several signs that global progress in TB control is slowing and that there are parts of the world where much more needs to be done to achieve the global targets that have been set. Progress in case detection decelerated globally in 2006 and began to stall in China and India. The percentage of estimated cases being detected in DOTS programmes in the African region remains low, at 46%. Incidence rates are falling slowly compared with the decline of 5–10% per year that is theoretically feasible. Budgets stagnated between 2007 and 2008 in all but five of the 22 HBCs. Renewed effort to increase the rate of progress in global TB control in line with the expectations of the Global Plan, backed up by intensified resource mobilization from domestic and international donors, is required.

# ANNEX 1

# Profiles of high-burden countries

## **COUNTRY PROFILE**

# fghanistan

Despite political instability and limited resources, the NTP of Afghanistan has managed to provide high-quality TB treatment to greater numbers of patients each year for the past decade. Funding has increased, but significant gaps remain. Case detection within DOTS areas was nearly 70% in 2006; full DOTS coverage coupled with the planned collaboration with private providers and expansion of recently introduced community-based TB care should improve the overall rate of case detection.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	26 088
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	161
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-4.2
Incidence (ss+/100 000 pop/yr)	73
Prevalence (all cases/100 000 pop) <sup>2</sup>	231
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	32
Of new TB cases, % HIV+ <sup>b</sup>	0.0
Of new TB cases, % MDR-TB <sup>c</sup>	3.4
Of previously treated TB cases, % MDR-TB $^{\circ}$	37
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	98
Notification rate (new ss+/100 000 pop/yr)	48
DOTS case detection rate (new ss+, %)	66
DOTS treatment success (new ss+, 2005 cohort, %)	90
Of new pulmonary cases notified under DOTS, % ss+	65
Of new cases notified under DOTS, % extrapulmonary	21
Of new ss+ cases notified under DOTS, % in women	68
Of sub-national reports expected, % received at next reporting level	95
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	500
Number of laboratories performing culture	1
Number of laboratories performing DST	1
Of laboratories performing smear microscopy, % covered by EQA	100
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	-
Of re-treatment cases receiving DST, % MDR-TB	-
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	No policy
National surveillance system for HIV-infection in IB patients?	Yes
UT I B patients (new and re-treatment) notified, % tested for HIV	_
UT I B PATIENTS LESTED TOF HIV, % HIV+	—
OF HIV, TP patients detected, % receiving VPT	_
OTTIVE TO PATIENTS DELECTED, % TECEIVING ANT	-

## WHO Eastern Mediterranean Region (EMR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Steady increases in ss+ and ss- notifications over the last few years as DOTS coverage has increased



#### **Unfavourable treatment outcomes, DOTS**

Cohort treatment success rates have been consistently close to or above target since 1999



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	_	12	11	14	15	12	38	53	68	81	97
DOTS notification rate (new and relapse/100 000 pop	) —	-	6.6	16	16	34	47	62	60	76	87	98
DOTS notification rate (new ss+/100 000 pop)		-	3.2	9.2	8.3	14	22	29	28	34	40	48
DOTS case detection rate (all new cases, %)	_	-	2.8	6.7	7.3	16	23	30	31	42	50	58
DOTS case detection rate (new ss+, %)	_	_	3.1	9.3	8.6	15	24	33	34	44	52	66
Case detection rate within DOTS areas (new ss+, %)e	_	-	26	85	64	99	198	88	63	64	65	68
DOTS treatment success (new ss+, %)	_	_	45	33	87	86	84	87	86	89	90	-
DOTS re-treatment success (ss+, %)	_	_	-	78	84	78	_	_	_	-	89	_

## AFGHANISTAN

Achievements

## IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

Political commitment, standardized treatment, and monitoring and evaluation system

<ul> <li>Increased number of DOTS centres providing TB diagnosis and treatment from 537 to 803</li> <li>Trained more than 2275 doctors, nurses and laboratory technicians on TB diagnosis and treatment following NTP policies</li> <li>Strengthened supervision by training health workers, increasing number of supervisory visits and supplying more vehicles for visits</li> <li>Produced 2nd annual report of NTP activities</li> </ul>	<ul> <li>Strengthen managerial capacity at provincial and district levels</li> <li>Improve collaboration and coordination with the various partners involved in TB control</li> </ul>
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Commenced preparation for DRS in 2007</li> <li>Piloted EQA in Balkh and Kabul provinces, resulting in improved technical performance of sputum smear microscopy in these provinces</li> <li>Developed EQA guidelines for the whole country</li> <li>Developed laboratory recording and reporting system</li> <li>Provided initial training in microscopy to more than 400 laboratory technicians</li> <li>Recruited and trained 30 laboratory supervisors in EQA assessment at central, regional and provincial levels</li> </ul>	<ul> <li>Planned activities</li> <li>Establish NRL</li> <li>Implement EQA countrywide</li> <li>Establish effective laboratory supervision system</li> <li>Train 4 key NTP staff in culture and DST</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Signed agreement between NTP and GDF for procurement of anti-TB drugs (4.5 million dollars) for the next 3 years</li> <li>Trained 400 pharmacists in drug management and logistics</li> </ul>	<ul> <li>Planned activities</li> <li>Introduce routine checking of drug stocks in each province</li> <li>Train additional pharmacists on drug management/logistic system of NTP</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
Collaborative TB/HIV activitiesAchievementsAppointed TB/HIV focal pointFormed TB/HIV working groupEstablished sentinel surveillance of HIV infection among TB patientsFinalized TB/HIV policy, strategy and operational guidelines	<ul> <li>Planned activities</li> <li>Pilot provision of HIV counselling and testing to TB patients in Pul-cherkhi Jail, among injecting drug users in Kabul and based at the National TB Institute (covering a population of 60 000 people)</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB</li> <li>Achievements</li> <li>No activities undertaken given absence of reference laboratory</li> </ul>	<ul> <li>Planned activities</li> <li>Ensure adequate supply of second-line drugs</li> <li>Establish information system on chronic TB cases</li> <li>Begin DST in NRL in 2008</li> </ul>
High-risk groups and special situations Achievements None reported	<ul> <li>Planned activities</li> <li>Establish cross-border collaboration to ensure effective treatment and notification of TB in Afghani migrants</li> </ul>
HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEV	ELOPMENT
<ul> <li>Achievements</li> <li>Assessed burden of respiratory conditions in primary health-care settings</li> </ul>	<ul> <li>Planned activities</li> <li>Improve integration of TB control activities within ongoing process of primary health-care service development</li> </ul>

**Planned activities** 

## AFGHANISTAN

Achievements <ul> <li>Recruited national PPM officer</li> <li>Conducted situation analysis for PPM</li> <li>Established national PPM taskforce committee</li> <li>Developed operational plan to begin PPM initiatives</li> </ul>	<ul> <li>Planned activities</li> <li>Develop PPM national guidelines</li> <li>Develop training modules for private practitioners and private pharmacies</li> <li>Launch PPM pilot in Kabul and Balkh provinces</li> </ul>
EMPOWERING PEOPLE WITH TB, AND COMMUNITIES	
<ul> <li>Advocacy, communication and social mobilization Achievements</li> <li>Conducted media campaign on TB control (TV and radio)</li> <li>Developed and disseminated IEC packages (posters, brochures, cups and leaflets)</li> <li>Community participation in TB care Achievements</li> <li>Organized 35 community events in each quarter for awareness at central and regional levels</li> <li>Implemented IEC for patient empowerment and community involvement</li> <li>Trained 74 community health workers on community-based DOTS</li> <li>Held TB partnership workshop for BPHS implementers</li> </ul>	<ul> <li>Planned activities</li> <li>Develop guide for journalists explaining terminology used in TB control</li> <li>Organize advocacy events for World TB day</li> <li>Planned activities</li> <li>Organize community events for awareness at all levels</li> <li>Hold community events for World TB day</li> <li>Train trainers for community health workers</li> </ul>
Patients' Charter Achievements The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.	<ul> <li>Planned activities</li> <li>None reported</li> </ul>
RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT	
Achievements • Conducted study on magnitude and determinants of non-compliance	<ul> <li>Planned activities</li> <li>Conduct study to identify all TB cases detected in the health system</li> </ul>

- Conducted study on magnitude and determinants of non-compliance with treatment among TB patients in Kabul
- Conducted study on role of private pharmacies in treatment of TB in the central region of Afghanistan
- Conduct study to identify all TB cases detected in the health system in Afghanistan
- Establish impact of active case-finding among household contacts of TB patients on case detection rate in Afghanistan
- Indirectly estimate TB burden by determining extent of underreporting in the health system

#### FINANCING THE STOP TB STRATEGY

#### NTP budget by source of funding

Increased budget requirement in 2006-2008 reflects plan to strengthen TB control throughout the country; increased funding from donors other than the Global Fund in 2008, but large funding gaps persist



#### NTP budget by line item

Increased budget for community involvement in TB control as well as for laboratories, specifically for establishing a NRL in 2008



#### Total TB control costs by line item<sup>4</sup>

Costs for clinic visits based on 71 outpatient visits per new ss+ TB patient during treatment and 68 outpatient visits per new ss-/extrapulmonary patient



Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007-2008

Country report similar to Global Plan; cost for DOTS higher in Global Plan due to higher forecast of patients to be treated



#### NTP budget by line item, 2008

Largest component of budget for DOTS (62%) and, unusually among HBCs, operational research/surveys (13%)



### NTP funding gap by line item

Funding gaps within DOTS component mainly for laboratory supplies and equipment (2007) and routine programme management and supervision activities (2008). Funding gap has decreased since 2006 but remains large relative to total budget



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increased expenditure per patient in 2006; high costs and budget per patient compared with available funding per patient



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	08
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement	8.7	6.3	9.8	3.3
TB/HIV, MDR-TB and other challenges	0	0	0	0
Health system strengthening	0	0	0	0
Engage all care providers	0	0	0.01	0.1
People with TB, and communities Research Other	0.6 0.02 2.8	0.6 0.02 2.1	0.05 0.03 1.6	0.05 1.9 0
Financial indicators for TB				
Government contribution to NTP budget (including loans)	0.	9%	0	.8%
Government contribution to total cost TB control (including loans) NTP budget funded	7. 229	9% %	8 56	.7% %
Per capita health financial indicators (US\$)				
NTP budget per capita	0.	4	0	.5
Total costs for TB control per capita	0.	5	0	.5
Funding gap per capita	0.	3	0	.2
Government health expenditure per capita (2004)			2.3	
Total health expenditure per capita (2004)			14	

## SOURCES, METHODS AND ABBREVIATIONS

#### Please see footnotes page 169

Incidence, prevalence and mortality estimates include patients infected with HIV. TB burden originally estimated for 1997, assuming an annual risk of TB infection of 3% based on 1982 national tuberculin survey and

biotection of the available data, but incidence estimate revised in 2005 assuming ss+ case detection rate of approximately 50%. MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 614/100 000 pop and mortality 70/100 000 pop/yr. For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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. Total TB control costs for 2003–2004 are based on available funding, whereas those for 2005–2006 are based on expenditure, and those for 2007–2008 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.

NTP available funding for 2005-2006 is based on the amount of funding actually received, using retrospective data; available funding for 2003-2004 and 2007-2008 is based on prospectively reported budget data; and estimated as the total budget minus any reported funding gap.

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

## **COUNTRY PROFILE**

# Bangladesh

The treatment success and case detection rates in Bangladesh continue to improve, although the case detection target of 70% had not yet been met in 2006; the proportion of smear-negative cases receiving treatment is estimated to be even lower. Collaboration with the private sector is increasing, which may help to improve case-finding. Preparation is under way for the introduction in 2007 of collaborative TB/HIV activities and of the management of MDR-TB.

SURVEILLANCE AND EPIDEMIULUGY, 2006	
Population (thousands) <sup>a</sup>	155 991
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	225
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-1.0
Incidence (ss+/100 000 pop/yr)	101
Prevalence (all cases/100 000 pop) <sup>2</sup>	391
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	45
Of new TB cases, % HIV+ <sup>b</sup>	0.0
Of new TB cases, % MDR-TB <sup>c</sup>	3.6
Of previously treated TB cases, % MDR-TB <sup>c</sup>	19
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	93
Notification rate (new ss+/100 000 pop/yr)	65
DOTS case detection rate (new ss+, %)	65
DOTS treatment success (new ss+ cases, 2005 cohort, %)	92
Of new pulmonary cases notified under DOTS, % ss+	81
Of new cases notified under DOTS, % extrapulmonary	10
Of new ss+ cases notified under DOTS, % in women	33
Of sub-national reports expected, % received at next reporting level	<sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	687
Number of laboratories performing culture	3
Number of laboratories performing DST	0
Of laboratories performing smear microscopy, % covered by EQA	99
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	_
Of re-treatment cases notified, % receiving DST	_
Of re-treatment cases receiving DST, % MDR-TB	-
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	_
National surveillance system for HIV-infection in TB patients?	Yes
Of TB patients (new and re-treatment) notified, % tested for HIV	_
Of TB patients tested for HIV, % HIV+	_

Of HIV+ TB patients detected, % receiving CPT Of HIV+ TB patients detected, % receiving ART

#### WHO South-East Asia Region (SEAR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Continued sharp increase in ss+ notifications; high proportion of cases ss+; extra-pulmonary notification rate increasing



#### **Unfavourable treatment outcomes, DOTS**

Treatment success rate above target for third consecutive year; default rates significantly lower for last two cohorts than in previous years



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	41	65	80	90	90	92	95	95	99	99	99	100
DOTS notification rate (new and relapse/100 000 pop	) 11	24	31	39	52	43	45	50	60	65	80	93
DOTS notification rate (new ss+/100 000 pop)	7.2	15	20	25	25	26	27	32	36	42	55	65
DOTS case detection rate (all new cases, %)	4.2	9.5	12	16	21	17	18	20	25	28	34	4(
DOTS case detection rate (new ss+, %)	6.4	14	18	23	23	24	26	30	35	40	54	65
Case detection rate within DOTS areas (new ss+, %)e	16	21	22	25	26	26	27	32	35	41	55	65
DOTS treatment success (new ss+, %)	71	72	78	80	81	83	84	84	85	90	92	-
DOTS re-treatment success (ss+, %)	75	57	58	74	72	76	_	69	73	81	80	_

## BANGLADESH

## IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

<ul> <li>Political commitment, standardized treatment, and monitoring a Achievements</li> <li>Developed strategic plan for 2006–2010, which was approved by national government</li> <li>Strengthened supervision and monitoring activities through establishment of network of national, divisional and district-level supervisors and appointment of new supervisors at sub-district level</li> <li>Produced 6th annual report of NTP activities</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Further strengthen supervision and monitoring system through collaboration with NGOs and WHO</li> <li>Revise national guidelines to incorporate guidelines for management of childhood TB</li> </ul>
<ul> <li>Achievements</li> <li>Increased number of microscopy centres included in EQA from 28 in 2005 to 33 out of 687 in 2006</li> <li>Initiated process of establishing NRL for culture and DST</li> <li>Conducted "training of trainers" for laboratory supervisors on EQA and AFB microscopy</li> </ul>	<ul> <li>Planned activities</li> <li>Establish an NRL for culture and DST</li> <li>Establish regional TB reference laboratories</li> <li>Continue to scale up EQA</li> <li>Further strengthen laboratory supervision through training and staff development</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Developed GDF drug procurement policy and plan</li> </ul>	<ul> <li>Planned activities</li> <li>Introduce drug management software</li> <li>Establish an effective drug procurement system for new category I and category II regimens</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES         Collaborative TB/HIV activities         Achievements <ul> <li>Developed mechanism for coordination between NTP and NAP</li> <li>Conducted 2nd survey of HIV prevalence in TB patients</li> <li>Signed agreement with Asharaloo, an NGO working with HIV-positive people, for provision of ART for TB patients</li> </ul>	<ul> <li>Planned activities</li> <li>Initiate collaboration between NTP and NAP</li> <li>Implement planned collaborative TB/HIV activities</li> <li>Address human resource development issues surrounding TB/HIV through advocacy and training</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB</li> <li>Achievements</li> <li>Received GLC approval for project to treat MDR-TB patients</li> <li>Established MDR-TB coordination committee, clinical management and social support committee and laboratory working group</li> <li>Held workshop to finalize operational guidelines for management of MDR-TB</li> <li>Damien Foundation disseminated results of hospital-based MDR-TB pilot project</li> </ul>	<ul> <li>Planned activities</li> <li>Obtain accreditation of NRL through proficiency testing</li> <li>Initiate GLC-approved project to manage MDR-TB (50 TB patients to be treated in first year)</li> <li>Conduct in-country "training of trainers" for management of MDR-TB management</li> <li>Implement MDR-TB projects at National Institute of Diseases of Chest and Hospitals, Dhaka</li> </ul>
<ul> <li>High-risk groups and special situations</li> <li>Achievements</li> <li>Set up health centres for prisons in collaboration with NGOs in Dhaka, Chittagong and Gazipur</li> <li>Set up additional service points and adjusted clinic hours for TB patients in order to increase access to TB diagnosis and treatment in a number of big cities, and for the armed forces and police</li> </ul>	<ul> <li>Planned activities</li> <li>Conduct assessment of TB and address special needs for TB control in refugee camps</li> <li>Expand DOTS for prisoners to all districts</li> <li>Provide DOTS to refugee camps at Cox Bazaar in collaboration with UNHCR and BRAC</li> </ul>
<ul> <li>HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVEL</li> <li>Achievements</li> <li>Collaborated with ministries of education, justice and defence, the NAP, NGOs and professional associations in planning for TB control</li> </ul>	<ul> <li>OPMENT</li> <li>Planned activities</li> <li>Initiate use of X-ray services in all chest disease clinics</li> <li>Strengthen laboratory capacity for diagnosing smear-negative, extrapulmonary and childhood TB</li> </ul>
ENGAGING ALL CARE PROVIDERS Achievements Disseminated PPM guidelines Implemented PPM activities in all districts, with central planning Scaled up PPM in workplaces and metropolitan cities	<ul> <li>Planned activities</li> <li>Develop and distribute PPM training materials, and conduct "training of trainers"</li> <li>Develop and distribute advocacy material to private providers</li> </ul>

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

# Advocacy, communication and social mobilization Achievements

- Developed draft ACSM operational guidelines
- Initiated development of ACSM strategy

## **Community participation in TB care**

## Achievements

- Organized DOTS committee meetings in collaboration with community leaders
- Developed a mechanism to involve community health volunteers (shasthya shebikas, village doctors, cured patients) in building awareness of TB, referral of suspects, motivation and advocacy for uninterrupted treatment and treatment supervision
- Established TB DOTS clubs consisting of cured patients at different levels (26% of TB suspects referred for diagnosis came from these clubs in 2006)

## **Patients' Charter**

## Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

#### RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### **Achievements**

- Established research committee within NTP
- Began preparation for national surveys of disease prevalence and infection
- Partner NGOs undertook and published various studies

## Planned activities

- Organize meeting of stakeholders to finalize ACSM operational guidelines
- Begin implementation of ACSM operational guidelines

## **Planned activities**

- Strengthen TB DOTS clubs through provision of government support and involvement of senior religious leaders (these clubs are currently being run by NGOs)
- Further involve community outreach centres in DOTS activities
- Train and mobilize health assistants (government paid employees at sub-district level of which there are around 2200 at peripheral level) for involvement in TB control

#### **Planned activities**

• Distribute the Patients' Charter as part of ACSM strategy

## **Planned activities**

- Carry out national survey of prevalence of disease and of infections
- Initiate preparations for DRS

#### FINANCING THE STOP TB STRATEGY

## NTP budget by source of funding

Decreasing budget for TB control since 2006, despite increase in projected number of



## NTP budget by line item

Decreasing budget for DOTS, mainly due to reduced budget for routine programme management and supervision activities



#### Total TB control costs by line item<sup>4</sup>

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



## Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007–2008

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



#### NTP budget by line item, 2008

DOTS expansion and enhancement (component 1 of Stop TB Strategy) accounts for largest share of the NTP budget (78%)



## NTP funding gap by line item

Funding gaps reported only for 2004–2005, for DOTS and initiatives to increase case detection and treatment success; grants from Global Fund have been used to eliminate funding gaps



#### Per patient costs, budgets and expenditures<sup>5</sup>

Decreased budget and expenditure per patient as number of patients treated or projected to be treated increases and budgets/expenditures decrease



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	08
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement	16	0	14	0
TB/HIV, MDR-TB and other challenges	0.3	0	0.4	0
Health system strengthening	0.2	0	0.2	0
Engage all care providers	0.9	0	0.6	0
People with TB, and communities	2.0	0	1.8	0
Research	0.2	0	0.1	0
Other	1.2	0	0.8	0
Financial indicators for TB				
Government contribution to NTP budget (including loans)	219	%	20	%
Government contribution to total cost TB control (including loans)	389	%	41	%
NTP budget funded	1009	%	100	%
Per capita health financial indicators (US\$)				
NTP budget per capita	0.	1	0	.1
Total costs for TB control per capita	0.	2	0	.2
Funding gap per capita	0		0	
Government health expenditure per capita (2004)			3.8	
Total health expenditure per capita (2004)			14	

#### SOURCES, METHODS AND ABBREVIATIONS

a-h Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimated on basis of 40-year-old tuberculin survey and local prevalence surveys, and assumed to be declining at 1% per yr.
- <sup>2</sup> MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 621/100 000 pop and mortality 74/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+ TB, as well as DST for re-treatment and failure cases, there should be at least one culture facility and one DST facility in each of the 6 divisions.
   Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided
- <sup>4</sup> Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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.
   <sup>5</sup> NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

## **COUNTRY PROFILE**

# Brazil

Control of TB in Brazil is well funded and is integrated into the general health-care system, with primary health care increasingly decentralized through the Unified Health System. The various health information systems of the Ministry of Health's programmes (including death registrations) are increasingly well integrated, with access to cross-linked individual patient data at central level. This allows for detailed analyses both of programme performance and of burden and impact. Plans to computerize the information system of the laboratories will increase further the range of possible applications of the data. Nonetheless, late reporting and the time taken to resolve duplicate entries mean that treatment outcomes were not available for 4% of the 2005 cohort. Brazil was the first high-burden country to offer ART to all HIV-positive TB patients, and treatment for MDR-TB patients is expanding (400 patients treated in 2006, with 1000 expected in 2007).

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	189 323
<b>TB burden, 2006 estimates</b> <sup>1</sup> Incidence (all cases/100 000 pop/yr) Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup> Incidence (ss+/100 000 pop/yr) Prevalence (all cases/100 000 pop) <sup>2</sup> Mortality (deaths/100 000 pop/yr) <sup>2</sup> Of new TB cases, % HIV+ <sup>b</sup> Of new TB cases, % MDR-TB (1996) <sup>c</sup> Of previously treated TB cases, % MDR-TB (1996) <sup>c</sup>	50 -3.3 31 55 4.0 12 0.9 5.4
Surveillance and DOTS implementation Notification rate (new and relapse/100 000 pop/yr) Notification rate (new ss+/100 000 pop/yr) DOTS case detection rate (new ss+, %) DOTS treatment success (new ss+ cases, 2005 cohort, %) Of new pulmonary cases notified under DOTS, % ss+ Of new cases notified under DOTS, % extrapulmonary Of new ss+ cases notified under DOTS, % in women Of sub-national reports expected, % received at next reporting level	41 22 <b>55</b> 77 65 14 33 vel <sup>d</sup> 100
Laboratory services <sup>3</sup> Number of laboratories performing smear microscopy Number of laboratories performing culture Number of laboratories performing DST Of laboratories performing smear microscopy, % covered by EQA Management of MDR-TB	4,044 193 38 52
Of new cases notified, % receiving DST at start of treatment Of new cases receiving DST at start of treatment, % MDR-TB Of re-treatment cases notified, % receiving DST Of re-treatment cases receiving DST, % MDR-TB	
<b>Collaborative TB/HIV activities</b> National policy of counselling and testing TB patients for HIV? National surveillance system for HIV-infection in TB patients? Of TB patients (new and re-treatment) notified, % tested for HIV Of TB patients tested for HIV, % HIV+ Of HIV+ TB patients detected, % receiving CPT Of HIV+ TB patients detected, % receiving ART	Yes (to all patients) Yes 65 15 86 80



Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notifications declining pre-2000, then approximately constant; assumed to reflect declining incidence coupled with improved case-finding over past several years



#### **Unfavourable treatment outcomes, DOTS**

Treatment success rate for 2005 cohort lower than for 2004 cohort and below target; outcomes reported for almost all registered patients; only about half of successfully treated cases confirmed cured in last 5 cohorts



🗌 Not evaluated 🔲 Transferred 🔲 Defaulted 📕 Failed 🔲 Died 🔲 Target <15%

DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	0.0	0.0	3.0	7.0	7.0	32	25	34	52	68	86
DOTS notification rate (new and relapse/100 000 pop	) –	_	_	2.4	2.4	3.1	4.3	4.9	9.1	24	28	32
DOTS notification rate (new ss+/100 000 pop)	_	-	-	1.3	1.2	2.3	2.3	2.7	5.0	12	14	17
DOTS case detection rate (all new cases, %)	_	0.0	0.0	3.8	3.8	4.9	6.4	8.3	15	43	52	62
DOTS case detection rate (new ss+, %)	_	_	_	3.2	3.1	5.9	6.3	7.6	14	37	43	55
Case detection rate within DOTS areas (new ss+, %)e	_	_	_	106	44	84	20	30	43	70	64	64
DOTS treatment success (new ss+, %)	_	_	_	91	89	73	67	75	83	81	77	_
DOTS re-treatment success (ss+, %)	_	_	_	_	_	43	47	60	64	51	47	_

IMPLEMENTING THE STOP TB STRATEGY <sup>1</sup>	
DOTS EXPANSION AND ENHANCEMENT	
<ul> <li>Political commitment, standardized treatment, and monitoring Achievements</li> <li>Strengthened information systems to improve quality through periodic review of system and training of new staff, and updating recording and reporting forms</li> <li>Produced 4th annual report of NTP activities</li> </ul>	<ul> <li>g and evaluation system</li> <li>Planned activities</li> <li>Implement the Global Fund round 5 proposal in 11 large metropolitan areas</li> <li>Accelerate the implementation of National Plan 2004–2007 with the goal of reaching full DOTS coverage in 315 priority municipalities</li> <li>Conduct quarterly macroregional cycles of monitoring and evaluation with states and priority cities included in the 2004–2007 plan</li> <li>Continue strengthening information system</li> </ul>
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Strengthened laboratory network through development and implementation of broad training plan and introduction of culture in all states</li> <li>Organized workshop on laboratory monitoring data</li> <li>Conducted courses for training of laboratory staff in sputum smear microscopy</li> </ul>	<ul> <li>Planned activities</li> <li>Implement culture in laboratories in border areas and in major cities</li> <li>Develop and implement a computerized system for the laboratory network</li> <li>Introduce EQA in all laboratories (for smear, culture and DST)</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Planned for procurement of drugs for 2007–2008 in collaboration with MoH</li> </ul>	<ul> <li>Planned activities</li> <li>Plan for procurement of drugs for 2008–2009 in collaboration with the MoH</li> <li>Introduce quality control of anti-TB drugs distributed within the Unified Health System (SUS, Sistema Unico de Saúde)</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Developed National Collaborative TB/HIV Action Plan</li> <li>Applied experiences from NAP in mobilization and patient participation in collaborative TB/HIV activities</li> <li>Provided ART to all HIV-infected TB patients</li> </ul>	<ul> <li>Planned activities</li> <li>Ensure timely detection and quality treatment for people living with TB and HIV/AIDS through workshops, training, counselling, rapid HIV tests for people with TB and chemoprophylaxis</li> <li>Produce manuals, folders and posters on TB/HIV</li> <li>Strengthen and mobilize civil society to participate in collaborative TB/HIV activities</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB</li> <li>Achievements</li> <li>Developed and launched information system for monitoring drug resistance at national level</li> <li>Trained doctors and specialists in preparation for decentralization of management of MDR-TB cases to state level</li> </ul>	<ul> <li>Planned activities</li> <li>Assess use of information system for monitoring of drug resistance at national level</li> <li>Decentralize MDR-TB case management to the states</li> </ul>
<ul> <li>High-risk groups and special situations</li> <li>Achievements</li> <li>In collaboration with the National Foundation of Indigenous Health, implemented activities to improve access to TB control services for indigenous populations, primarily by establishing these services in health centres near settlements of indigenous people</li> </ul>	<ul> <li>Planned activities</li> <li>Further strengthen TB control services for indigenous populations</li> </ul>
HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEV	ELOPMENT
Achievements	Planned activities

- Involved sector-wide and intersectoral collaboration in planning for TB control
- Improved access to TB care resulting from Decentralization of the Basic Health Care Programme (PACS) and Family Health Care Programme (PSF), which is incorporated into these programmes
- Incorporated TB control as a priority into the management agreement of the SUS
- Developed a plan for PAL adaptation and implementation
- Speed up the decentralization of TB diagnosis and treatment to primary care settings
- Continue strengthening of the National Epidemiological Information System and monitoring and evaluation
- Strengthen the laboratory network and expand coverage of quality control
- Develop PAL guidelines and initiate PAL activities in pilot sites

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## BRAZIL

## ENGAGING ALL CARE PROVIDERS

## Achievements

- All providers, public and private, report all TB cases to NTP, and drugs are supplied for all TB patients, free of charge
- Conducted pilot PPM activities in São Paulo to improve collaboration between NTP and other providers

## EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- All metropolitan areas covered by the Global Fund Project (11 biggest metropolitan areas of the country) have ACSM activities, including production of IEC materials and organization of workshops with civil society partners
- Membership of STOP TB Brazil increased to 54 partners
- Mobilized government and civil society to fight TB at national, regional and local levels
- Created 3 TB NGO fora at state level
- Organized large-scale television and radio education campaigns

## Community participation in TB care

## Achievements

• Celebrated World TB Day in most municipalities

## **Planned activities**

 Strengthen TB case referral in the SUS and delivery of first-line and second-line drugs to all patients

## **Planned activities**

- Organize television and radio campaigns
- Fund state "Day of Awareness and Mobilization in the Struggle against TB" in Rio de Janeiro

#### **Planned activities**

- Involve community health agents in contact investigation and treatment supervision
- Form "GAEXPA" (group of people affected with TB in the municipality of Rio de Janeiro)

## **Patients' Charter**

#### **Achievements**

• Discussed dissemination of Patients' Charter at NGO meetings in Rio de Janeiro and Sao Paulo, but the charter has not yet been translated and printed

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

## **Achievements**

- Conducted national DRS and survey of prevalence of HIV infection in TB patients (2005–2007)
- Research network for TB, REDE-TB ("NETWORK-TB"), consisting more than 40 institutions, carried out clinical, operational and epidemiological research, in the area of new technologies for drugs, diagnostic methods and especially a large survey in vaccine
- Organized workshop with participants from NTP, MoH, University of Rio de Janeiro and WHO to revise the estimates of TB incidence using analysis of routinely collected TB data from SINAN (National Disease Information System) and death registrations in SIM

## Planned activities

Translate and distribute the Patients' Charter

## **Planned activities**

- Continue broad programme of research by REDE-TB
- Several states and some of the larger metropolitan regions are developing operational research programmes
- Continue to analyse available data to improve understanding of TB epidemiology and control in Brazil

#### FINANCING THE STOP TB STRATEGY

#### NTP budget by source of funding

Increased political commitment to control TB reflected in increased NTP budget and



#### NTP budget by line item

Increased budget for DOTS includes recruitment of additional staff, more municipalities with evaluation meetings, training for TB coordinators and laboratory technicians, and increased number of laboratories with capacity for culture and DST



#### Total TB control costs by line item<sup>4</sup>

Hospitalization costs are for 2500 dedicated TB beds; costs for clinic visits based on 56 outpatient visits per new ss+ patient during treatment and 6 outpatient visits per new ss-/extrapulmonary patient



## Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007–2008

Country report ahead of Global Plan in all components, except PPM/PAL; expected number of TB patients to be treated 2007–2008 higher in country report



#### NTP budget by line item, 2008

Most of the budget is for components 1, 2 and 5 of the Stop TB Strategy: DOTS (58%), MDR-TB and TB/HIV (19%) and ACSM/CTBC (13%)



#### NTP funding gap by line item

Large funding gap for ACSM; funding gap within DOTS component mainly for laboratory supplies and equipment



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increasing costs, budget and expenditure per patient as TB control is broadened in line with the Stop TB Strategy



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	2008		
(US\$ millions)	BUDGET	GAP	BUDGET	GAP		
DOTS expansion and enhancement	32	2.4	37	6.0		
TB/HIV, MDR-TB and other challenges	7.1	0.4	12	1.5		
Health system strengthening	1.0	1.0	1.0	1.0		
Engage all care providers	1.0	0.7	1.0	1.0		
People with TB, and communities	6.6	3.2	8.1	3.5		
Research	2.9	0.7	2.9	2.4		
Other	0.7	0.4	1.8	0.7		
Financial indicators for TB						
Government contribution to NTP budget (including loans)	739	%	65	65%		
Government contribution to total cost TB control (including loans)	839	%	77	%		
NTP budget funded	82	%	75	75%		
Per capita health financial indicators (US\$)						
NTP budget per capita	0.	3	0	.3		
Total costs for TB control per capita	0.	4	0	.5		
Funding gap per capita	0.	05	0	.1		
Government health expenditure per capita (2004)		15	57			
Total health expenditure per capita (2004)		29	90			

#### SOURCES, METHODS AND ABBREVIATIONS

<sup>a-h</sup> Please see footnotes page 169.

- Incidence, prevalence and mortality estimates include TB cases in HIV-positive people. Estimates revised in 2007 based on TB mortality data from vital registration system cross-linked with communicable disease registry data.
- MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 127/100 000 population. To ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 127/100 000 population. To ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 000 population. To ensure the prevalence rate is falling by 2015, and to reduce the state of the prevalence rates and halve 1990 prevalence rate is falling by 2015. The ensure the prevalence rates are the prevalence rates and halve 1990 prevalence rate is falling by 2015. The ensure the prevalence rates are the prevalence rates and halve 1990 prevalence rate is falling by 2015. The ensure the prevalence rates are the prevalence rates are the prevalence rates and halve 1990 prevalence rate is falling by 2015. The ensure the prevalence rates are the
- <sup>3</sup> For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+ TB, as well as DST for re-treatment and failure cases, there should be at least one culture facility and one DST facility in each of the 27 states.
- Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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. NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data,
- wrr available funding for 2002–2000 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

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

## **COUNTRY PROFILE**

# Cambodia

Cambodia has reported high treatment success rates for the last decade. In 2006, notifications of new cases fell for the first time since 1995. It is not yet possible to say whether this is a result of declining incidence or an indication of problems with case-finding. The use of community members to refer suspects for diagnosis and to supervise treatment, and collaboration with the private sector, are likely to improve case-finding. Collaborative TB/HIV activities are being introduced in more districts each year as collaboration between the NTP and national AIDS control programme improves. The treatment of MDR-TB has begun on a small scale; in order to treat more patients the NTP will need to ensure that culture and DST are available and of high quality. The budget for TB control has increased since 2004, but funding has decreased slightly, resulting in large gaps for 2006–2008.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	14 197
Estimates of epidemiological burden <sup>1</sup> Incidence (all cases/100 000 pop/yr) Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup> Incidence (ss+/100 000 pop/yr) Prevalence (all cases/100 000 pop) <sup>2</sup> Mortality (deaths/100 000 pop/yr) <sup>2</sup> Of new TB cases, % HIV+ <sup>b</sup> Of new TB cases, % MDR-TB (2005) <sup>c</sup> Of previously treated TB cases, % MDR-TB (2005) <sup>c</sup>	500 -1.0 220 665 92 9.6 0.0 3.1
Surveillance and DOTS implementation Notification rate (new and relapse/100 000 pop/yr) Notification rate (new ss+/100 000 pop/yr) DOTS case detection rate (new ss+, %) DOTS treatment success (new ss+ cases, 2005 cohort, %) Of new pulmonary cases notified under DOTS, % ss+ Of new cases notified under DOTS, % extrapulmonary Of new ss+ cases notified under DOTS, % in women Of sub-national reports expected, % received at next reporting level <sup>4</sup>	244 136 <b>62</b> <b>93</b> 74 23 49 100
Laboratory services <sup>3</sup> Number of laboratories performing smear microscopy Number of laboratories performing culture Number of laboratories performing DST Of laboratories performing smear microscopy, % covered by EQA Management of MDR-TB	186 3 1 100
Of new cases notified, % receiving DST at start of treatment Of new cases receiving DST at start of treatment, % MDR-TB Of re-treatment cases notified, % receiving DST Of re-treatment cases receiving DST, % MDR-TB	0.0  0.0 
Collaborative TB/HIV activities National policy of counselling and testing TB patients for HIV? (to National surveillance system for HIV-infection in TB patients? Of TB patients (new and re-treatment) notified, % tested for HIV Of TB patients tested for HIV, % HIV+ Of HIV+ TB patients detected, % receiving CPT Of HIV+ TB patients detected, % receiving ART	Yes all patients) Yes 10 9.6 70 35

## WHO Western Pacific Region (WPR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Decline of about 10% in ss+ notification rate compared with 2005, while extrapulmonary notification rate increased by 10%



#### Unfavourable treatment outcomes, DOTS

Treatment success rates have been consistently high for more than 10 years



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	60	80	88	100	100	99	100	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop	) 128	102	130	138	154	148	147	186	209	225	255	244
DOTS notification rate (new ss+/100 000 pop)	97	83	106	113	126	116	110	130	140	138	150	136
DOTS case detection rate (all new cases, %)	22	18	23	24	28	27	27	35	40	43	49	48
DOTS case detection rate (new ss+, %)	40	34	45	48	54	50	48	57	62	62	68	62
Case detection rate within DOTS areas (new ss+, %)e	67	43	51	48	54	51	48	57	62	62	68	62
DOTS treatment success (new ss+, %)	91	94	91	95	93	91	92	92	93	91	93	_
DOTS re-treatment success (ss+, %)	85	89	90	91	90	90	92	89	87	86	81	-

## CAMBODIA

## IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

<ul> <li>Political commitment, standardized treatment, and monitoring Achievements</li> <li>Developed policy documents and 5-year plan</li> <li>Completed external programme review in 2006</li> <li>Conducted training and organized supervision to support the progressive decentralization of TB control activities to the operational district level</li> <li>Produced 13th annual report of activities of NTP</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Hold quarterly monitoring and evaluation workshops with provincial and operational district stakeholders to analyse and evaluate programme performance</li> </ul>
Quality-assured bacteriology         Achievements         • Established DST capacity required for 2nd DRS         • Decentralized (quarterly-based) EQA to provincial level         • Improved quality of supervision by developing standardized checklist for laboratory activities         • Trained at least one member of staff from each of the 186 microscopy units in AFB microscopy, trained staff from all 3 culture units in culture, and trained NRL staff in DST	<ul> <li>Planned activities</li> <li>Improve quality of smear preparation in health centres and community DOTS services</li> <li>Continue expansion of quarterly-based EQA at provincial level</li> <li>Revise laboratory guidelines and training modules</li> <li>Improve quality of DST</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Improved capacity for forecasting and procurement of first-line drugs</li> </ul>	<ul> <li>Planned activities</li> <li>Apply to GDF for paediatric formulations</li> <li>Develop national procurement system for anti-TB drugs through GDF prequalified manufacturers</li> <li>Train central-level staff to manage second-line anti-TB drugs, which are not currently available through the NTP</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Trained staff in 28 out of 77 operational districts in collaborative TB/HIV activities and strengthened supervision of those activities</li> <li>Organized meetings with stakeholders in the area of HIV to improve referral of HIV patients for diagnosis and treatment of TB</li> </ul>	<ul> <li>Planned activities</li> <li>Train staff on collaborative TB/HIV activities in remaining operational districts and conduct refresher TB/HIV training in operational districts where staff have already been trained</li> <li>Strengthen supervision in TB/HIV sites and organize a national TB/HIV workshop</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB Achievements</li> <li>Received GLC approval to launch small-scale project to detect and treat MDR-TB in clinical trial setting</li> </ul>	<ul> <li>Planned activities</li> <li>Develop an MDR-TB working group, chaired by CENAT (NTP)</li> <li>Subject to Global Fund round 7 application approval, apply to GLC for approval of MDR-TB component</li> <li>Increase culture capacity of laboratory network; introduction of liquid culture planned for mid 2008</li> </ul>
<ul> <li>High-risk groups and special situations</li> <li>Achievements</li> <li>Intensified case-finding in prisons in Phnom Penh</li> <li>Implemented, in collaboration with the NGO, "Vor Ort" projects aimed at increasing TB awareness and case-finding in ethnic minorities in</li> </ul>	<ul> <li>Planned activities</li> <li>Conduct national assessment of TB in prisons and implement pilot interventions in 3 prisons in 2008 with TBCAP funding</li> </ul>

HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

## Achievements

Rattanakiri Province

- Planning for TB control involved cross-sectoral and intersectoral collaboration
- Aligned NTP budget and plan with poverty reduction strategy paper and SWAp

## **Planned activities**

- Align national strategic plan for TB laboratories with national policy on laboratories
- Implement activities listed in Global Fund round 5 plan: contribute to Strategic Health Plan 2008–2010, participate in development of peer review procedures, assess implementation of key operational planning and monitoring and evaluation processes, and strengthen management of procurement and distribution systems

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## CAMBODIA

## ENGAGING ALL CARE PROVIDERS

## Achievements

 Successfully implemented PPM pilot projects with private practitioners and pharmacies in collaboration with a number of NGOs in 5 out of 24 provinces in 2006 (11 provinces in 2007)

## EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

## Advocacy, communication and social mobilization Achievements

- Organized World TB Day activities at central, provincial and operational district levels
- Distributed TB leaflets at health centres

## Community participation in TB care Achievements

 Community members (generally volunteers) supervised treatment of patients living far from health centres, and referred suspects and contacts for diagnosis in 379 out of 947 health centres (located in 28 operational districts); volunteers receive one day of training, and meet monthly at health centres

## Patients' Charter

## Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

## Achievements

 Conducted national DRS (protocol designed, samples collected; results will be available in August 2008)

## Planned activities

- Translate and adapt ISTC to Khmer
- Draft PPM operational guidelines
- Organize annual workshop to review achievements and challenges of PPM pilot projects

## **Planned activities**

- Organize World TB Day celebrations at central, provincial and operational district levels
- Organize education activities in schools and communities
- Publish information leaflets for health centre staff

## **Planned activities**

- Organize refresher training for community volunteers, to increase case detection, referral and contact investigation
- Expand use of community volunteers to over half of health centres, with Global Fund support for training

## **Planned activities**

• Translate and adapt the Patients' Charter to Khmer

## **Planned activities**

- Conduct 3rd national survey of HIV seroprevalence among TB patients
- Conduct operational research on TB diagnosis (X-ray and sputum smear preparation)

#### FINANCING THE STOP TB STRATEGY

#### NTP budget by source of funding

Budget increased in 2007 and 2008 compared with previous years; increased funding from



#### NTP budget by line item

Increased budget for ACSM/CTBC, collaborative TB/HIV activities and operational research since 2006; new funding needs for MDR-TB in 2008



#### Total TB control costs by line item<sup>4</sup>

Hospitalization costs are for 1200 dedicated TB beds, costs for clinic visits cover an estimated 64 outpatient visits per patient during treatment



## Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007–2008

Global Plan costs for DOTS higher than country plan cost for DOTS due to higher estimated number of ss-/extrapulmonary patients to be treated; country plan for MDR-TB ahead of the expectations of Global Plan



#### NTP budget by line item, 2008

DOTS (52%) and ACSM/CTBC (17%) account for the largest share of the NTP budget



#### NTP funding gap by line item

Large funding gaps since 2006 for ACSM; funding gap within DOTS component mainly for routine programme management and supervision activities



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increasing cost per patient, but stable budget and available funding per patient



## NTP budget and funding gap by Stop TB Strategy component

	20	07	20	00
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strengthening Engage all care providers People with TB, and communities Research Other	4.6 1.2 0 0.2 1.5 0.3 0.7	2.5 0.5 0 0.1 0.6 0.2 0.5	4.7 1.5 0 0.3 1.5 0.3 0.7	2.5 0.8 0.2 0.5 0.2 0.5
Financial indicators for TB Government contribution to NTP budget (including loans) Government contribution to total cost TB control (including loans) NTP budget funded	7. 279 479	2% % %	6 26 47	.8% % %
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita Government health expenditure per capita (2004) Total health expenditure per capita (2004)	0. 0. 0.	6 7 3	0 0 6.1 24	.6 .8 .3

#### SOURCES, METHODS AND ABBREVIATIONS

- <sup>a-h</sup> Please see footnotes page 169
- 1 Incidence, prevalence and mortality estimates include patients infected with HIV. Estimate of TB burden reassessed following national prevalence survey in 2002. Incidence assumed to be declining at 1% per year as in other countries in Western Pacific Region.
- <sup>2</sup> MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 915/100 000 pop and mortality 119/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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.
- <sup>4</sup> Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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.
   <sup>5</sup> NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data;
- and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

## **COUNTRY PROFILE**

# China

Having reached the global targets for case detection and treatment success for the second consecutive year, the Chinese NTP is now working to improve access to high-quality TB care for all people with TB, including those with TB/HIV, those with MDR-TB and unofficial internal migrants (the "floating populations"). Activities funded by the Global Fund round 5 grant will begin to address these challenges in selected counties. While the NTP has a comprehensive human resource development plan based on a needs assessment, information about human resources at sub-national levels is not available centrally. Nonetheless, the NTP identifies a shortage of trained staff as one of the challenges to implementing the Stop TB Strategy. The relationship between TB dispensaries run by the NTP and general hospitals continues to be problematic, and pilot projects are under way to improve collaboration.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup> 1 32	20 864
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/vr)	99
Trend in incidence rate $(\%/\text{yr}, 2005-2006)^2$	-1.0
Incidence (ss+/100 000 pop/vr)	45
Prevalence (all cases/100 000 pop) <sup>2</sup>	201
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	15
Of new TB cases, % HIV+b	0.3
Of new TB cases, % MDR-TB <sup>c</sup>	5.0
Of previously treated TB cases, % MDR-TB <sup>c</sup>	26
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	71
Notification rate (new ss+/100 000 pop/yr)	35
DOTS case detection rate (new ss+, %)	79
DOTS treatment success (new ss+ cases, 2005 cohort, %)	94
Of new pulmonary cases notified under DOTS, % ss+	55
Of new cases notified under DOTS, % extrapulmonary	4.3
Of new ss+ cases notified under DOTS, % in women	30
Of sub-national reports expected, $\%$ received at next reporting $level^d$	100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	3 010
Number of laboratories performing culture	360
Number of laboratories performing DST	90
Of laboratories performing smear microscopy, % covered by EQA	92
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	0.0
Of new cases receiving DST at start of treatment, % MDR-TB	_
Of re-treatment cases notified, % receiving DST	0.0
Of re-treatment cases receiving DST, % MDR-TB	20
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
(	for specific
	groups)
National surveillance system for HIV-infection in TB patients?	No
Of TB patients (new and re-treatment) notified, % tested for HIV	0.1
Of TB patients tested for HIV, % HIV+	1.3
Of HIV+ TB patients detected, % receiving CPT	144
Of HIV+ TB patients detected, % receiving ART	333

#### WHO Western Pacific Region (WPR)

Rank based on estimated number of incident cases (all forms) in 2006



## **Case notifications**

With the second year of full DOTS coverage, the overall notification rate is fairly steady, although the ss- notification rate has increased and re-treatment notification rate decreased



Re-treatment Relapse New extrapulmonary New ss-/unk New ss+

Unfavourable treatment outcomes, DOTS



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	49	60	64	64	64	68	68	78	91	96	100	100
DOTS notification rate (new and relapse/100 000 pop	) 13	21	24	27	27	27	28	30	43	58	68	71
DOTS notification rate (new ss+/100 000 pop)	7.5	14	16	16	14	15	14	14	20	29	36	35
DOTS case detection rate (all new cases, %)	11	18	21	24	24	24	25	27	37	52	64	68
DOTS case detection rate (new ss+, %)	15	29	32	32	30	31	31	30	43	64	80	79
Case detection rate within DOTS areas (new ss+, %)e	31	47	50	50	46	45	45	39	47	66	80	79
DOTS treatment success (new ss+, %)	96	96	96	97	96	95	96	93	94	94	94	-
DOTS re-treatment success (ss+, %)	92	94	-	95	95	89	93	88	89	89	90	-

## CHINA

## IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> DOTS EXPANSION AND ENHANCEMENT

<ul> <li>Political commitment, standardized treatment, and monitoring Achievements</li> <li>MoH issued National TB Prevention and Control Implementation Plan 2006–2010, and conducted mid-term evaluation of National TB Control Plan in 2006</li> <li>State Council convened nationwide video conference on TB control in June, 2006, presented by local government</li> <li>Secured increased funding from central government</li> <li>Launched Global Fund round 5 project on 12 October 2006 focusing on MDR-TB, TB/HIV and TB control among "floating populations"</li> <li>Produced 25th annual report of NTP activities</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Further strengthen political commitment and increase funding from each level of government, especially central level</li> <li>Optimize web-based reporting system of TB, and improve routine recording and reporting at peripheral level</li> </ul>
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Revised the EQA manual for microscopy</li> <li>Conducted training of trainers in provincial laboratories</li> </ul>	<ul> <li>Planned activities</li> <li>Print and distribute posters for SOP for microscopy, quality of staining and microscopy manuals</li> <li>Draft biosafety manual for TB laboratories</li> <li>Introduce central supply of laboratory reagents</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Pilot tested SOP for anti-TB drug management of 9 TB facilities in Henan Province</li> </ul>	<ul> <li>Planned activities</li> <li>Evaluate pilot implementation of SOP anti-TB drug management of 9 TB facilities in Henan Province</li> <li>Scale up introduction of SOP in 18 prefectures of 6 additional provinces</li> <li>Finalize SOP manual and develop associated training material</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Developed national guidelines on collaborative TB/HIV activities</li> <li>Pilot tested the TB/HIV guidelines in 6 counties in 4 provinces</li> <li>Launched Global Fund round 5 project addressing TB/HIV in 67 counties in 14 provinces</li> </ul>	<ul> <li>Planned activities</li> <li>Scale up Global Fund round 5 project addressing TB/HIV to cover 134 counties in 14 provinces</li> <li>Introduce HIV surveillance among TB patients in 134 counties of 14 provinces covered by Global Fund round 5 project</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB</li> <li>Achievements</li> <li>Developed implementation plan for pilot project on programmatic management of MDR-TB</li> </ul>	<ul> <li>Planned activities</li> <li>Develop national framework for prevention and control of MDR-TB in China</li> <li>Implement programmatic management of MDR-TB in Guangdong and Hubei province, with support from Global Fund round 5 project</li> </ul>
<ul> <li>High-risk groups and special situations</li> <li>Achievements</li> <li>Successfully applied to Global Fund for support for projects to improve TB control among floating populations</li> </ul>	<ul> <li>Planned activities</li> <li>Implement planned activities outlined in Global Fund round 5 project among floating populations: provide TB diagnosis and treatment free of charge; introduce enablers such as free transport and living subsidy; develop national TB database for floating populations</li> </ul>

## **Achievements**

- Planning for TB control involved sector-wide and inter-sectoral collaboration
- Developed policy for national collaboration between general hospitals and TB dispensaries
- Implemented pilot project with focus on creating links between general hospitals and TB dispensaries
- Trained staff in communicable disease control at national and provincial levels

## **Planned activities**

- Continue training staff (including 12-15 key provincial-level staff members) to train trainers, to produce training material and to evaluate training of health staff
- Pilot test human resource development planning in selected provinces

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## CHINA

ENGAGING ALL CARE PROVIDERS	
<ul> <li>Achievements</li> <li>Introduced formal PPM activities nationwide</li> <li>MoH developed and distributed series of documents on regulation of reporting and referral systems for hospitals</li> <li>Developed standard training material on referral and tracing at central level</li> <li>Developed and implemented as pilot projects 3 new modules on PPM, including referring and defaulter tracing, designation of collaborating hospitals, and collaboration between TB hospitals and TB dispensaries</li> </ul>	<ul> <li>Planned activities</li> <li>Further develop current policy of collaboration, including strengthening of monitoring and supervision systems and optimizing recording and reporting systems</li> <li>Develop and promote use of standard training material for reporting, referral and tracing of TB patients</li> <li>Promote use of ISTC among general hospitals</li> <li>Expand PPM pilot initiatives in general hospitals</li> <li>Engage hospitals in public health programmes and promote cooperation among health service delivery institutions</li> </ul>
EMPOWERING PEOPLE WITH TB, AND COMMUNITIES	
<ul> <li>Advocacy, communication and social mobilization</li> <li>Achievements</li> <li>Implemented ACSM activities in all 2681 districts and counties</li> <li>Used mass media campaigns and conducted other special activities on World TB Day</li> <li>Developed toolkit for junior- and primary-school children</li> <li>Conducted health education activities in villages in collaboration with Women's Federation</li> </ul>	<ul> <li>Planned activities</li> <li>Develop ACSM action plan based on WHO framework to address community involvement</li> <li>Update toolkit developed for schoolchildren</li> <li>Strengthen cooperation between various sectors, such as media and NGOs</li> </ul>
Community participation in TB care	
<ul> <li>Achievements</li> <li>Involved communities in TB control in all 2681 districts and counties</li> <li>Mobilized and trained village doctors and members of Women's Federation at village level</li> <li>Health education activities (one-to-one basis) focusing on TB conducted by village doctors and members of Women's Federation at village level</li> <li>Established referral system between village doctors, doctors at community health service centres and NTP</li> </ul>	<ul> <li>Planned activities</li> <li>Improve community awareness of TB issues by strengthening mass media communication</li> <li>Engage TB patients and their families in TB control by expanding health education activities to them</li> <li>Improve efficacy of health promotion activities conducted by village doctors and members of Women's Federation</li> </ul>
Patients' Charter	
<b>Achievements</b> The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.	<ul> <li>Planned activities</li> <li>Adopt the main content of the Patients' Charter into the ongoing revision of TB control regulations</li> </ul>
RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT	
<ul> <li>Achievements</li> <li>Completed preparations for national baseline DRS survey; developed a DRS plan for all provinces</li> <li>Carried out 20 operational research projects</li> </ul>	<ul> <li>Planned activities</li> <li>Conduct DRS in 7 provinces</li> <li>Analyse trends in prevalent strains (molecular epidemiological study)</li> <li>Conduct training on operational research</li> </ul>

- Carry out monitoring visits of approved operational research projects
- Hold workshop to share results of operational research projects
#### NTP budget by source of funding

Continued increase in NTP budget and funding up to 2007, but reduction in both in 2008; most financing is from domestic sources



#### NTP budget by line item

Large increase in budget in 2007 to allow for purchase of essential equipment and vehicles; budget in all years mostly for DOTS; budget for MDR-TB includes US\$ 1153 per patient for second-line drugs



#### Total TB control costs by line item<sup>4</sup>

All costs for TB control are included in the NTP budget



#### Comparison of country report and Global Plan:9 total TB control costs, 2007-2008

Country report is ahead of Global Plan expectations for DOTS, but far behind for MDR-TB and ACSM; Global Plan targets for patients to be treated for MDR-TB are from the Global MDR/XDR Response Plan



#### NTP budget by line item, 2008

85% of budget is for component 1 of the Stop TB Strategy (DOTS expansion and enhancement); budget for MDR-TB is small - plans for treatment cover less than 1% of estimated MDR-TB cases



NTP funding gap by line item Funding gaps are for DOTS component of Stop TB Strategy, and within this mainly for routine programme management and supervision activities, and laboratory supplies and equipment



#### Per patient costs, budgets and expenditures<sup>5,6</sup>

Increasing budget per patient with peak in 2007 due to purchase of capital items such as vehicles and equipment in that year



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	2008			
(US\$ millions)	BUDGET	GAP	BUDGET	GAP		
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges	238 7.4	91 0	191 11	52 0.5		
Health system strengthening Engage all care providers People with TB, and communities	19 5.8	0 0 0	19 4.2	0 0 0		
Research Other	1.0 0.5	0 0	0 0.5	0 0		
Financial indicators for TB						
Government contribution to NTP budget (including loans) Government contribution to total cost TB control (including loans) NTP budget funded	56 56 66	% % %	67 67 77	% % %		
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita	0. 0. 0.	.2 .2 .07	0 0 0	.2 .2 .04		
Government health expenditure per capita (2004) Total health expenditure per capita (2004)			27 70			

#### SOURCES, METHODS AND ABBREVIATIONS

a-h Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence rate of ss+ cases estimated on basis of annual risk of TB infection (ARTI) measured in 2000, and assumed to be declining at same rate as ARTI (1% per year).
- MDG and STAT (1) to be found. MDG and STAT (1) to be found. Indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 322/100 000 pop and mortality 24/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+TB, as well as DST for re-treatment and failure cases, there should be at least one culture facility and one DST facility in each of the 31 provinces.
- Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 are based on budgets. Estimates of expenditure are based on received funding.
- NTP available funding for 2004-2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002-2003 and 2007-2008 is based on prospectively reported budget data and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

# emocratic Republic of the Congo

Despite a small increase in the number of clinics providing TB diagnosis and treatment, fewer cases of TB were notified by the Democratic Republic of the Congo in 2006 than in 2005. The reasons for this are unclear - it is possible that the incidence of TB has started to decline but, if so, it is likely that the epidemiology of HIV is part of the explanation. While treatment outcomes for smear-positive patients are good compared with other African countries, very few smear-negative cases are reported, suggesting problems with diagnosis. Coordination with the national AIDS control programme continues to be problematic, and fewer than 2% of TB patients were tested for HIV in 2006. However, the absorptive capacity of the NTP appears to be good, so it is likely that increased funding available in 2007 and 2008 will resolve at least some of these problems.

#### SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	60 644
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/vr)	392
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-1.3
Incidence (ss+/100 000 pop/yr)	173
Prevalence (all cases/100 000 pop) <sup>2</sup>	647
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	84
Of new TB cases, % HIV+ <sup>b</sup>	9.2
Of new TB cases, % MDR-TB <sup>c</sup>	2.4
Of previously treated TB cases, % MDR-TB $^{\circ}$	9.1
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	158
Notification rate (new ss+/100 000 pop/yr)	105
DOTS case detection rate (new ss+, %)	61
DOTS treatment success (new ss+ cases, 2005 cohort, %)	85
Of new pulmonary cases notified under DOTS, % ss+	86
Of new cases notified under DOTS, % extrapulmonary	20
Of new ss+ cases notified under DOTS, % in women	47
Of sub-national reports expected, % received at next reporting leve	l <sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	1 069
Number of laboratories performing culture	1
Number of laboratories performing DST	1
Of laboratories performing smear microscopy, % covered by EQA	100
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	1.3
Of re-treatment cases receiving DST, % MDR-TB	1.3
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
	(for specific
	groups)
National surveillance system for HIV-infection in TB patients?	No
Of TB patients (new and re-treatment) notified, % tested for HIV	1
Of TB patients tested for HIV, % HIV+	14
Ut HIV+ IB patients detected, % receiving CPT	90
UT HIV+ IB patients detected, % receiving ART	54

#### WHO Africa Region (AFR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notifications increased as DOTS coverage expanded, but have now stabilized under full coverage; high ss+ proportion suggests possible under-detection of ss- cases



#### **Unfavourable treatment outcomes, DOTS**

Steady improvement in treatment success rates over past 10 years; close to target for second consecutive year



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	47	51	60	60	62	70	70	70	75	75	100	100
DOTS notification rate (new and relapse/100 000 pop	) 84	99	94	121	120	120	128	132	153	164	165	158
DOTS notification rate (new ss+/100 000 pop)	42	52	52	69	71	71	81	83	97	109	111	105
DOTS case detection rate (all new cases, %)	33	36	33	40	37	34	34	33	37	39	40	39
DOTS case detection rate (new ss+, %)	41	47	44	54	51	48	50	49	55	61	63	61
Case detection rate within DOTS areas (new ss+, %)e	86	91	73	90	82	68	72	70	73	82	63	61
DOTS treatment success (new ss+, %)	80	48	64	70	69	78	77	78	83	85	85	_
DOTS re-treatment success (ss+, %)	72	33	46	31	67	_	_	67	72	71	74	-

DEMOCRATIC REPUBLIC OF THE CONGO	
IMPLEMENTING THE STOP TB STRATEGY <sup>1</sup>	
DOTS EXPANSION AND ENHANCEMENT	
<ul> <li>Political commitment, standardized treatment, and monitoring</li> <li>Achievements</li> <li>Increased number of primary health-care centres offering TB diagnosis and treatment from 1041 to 1069</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Disseminate quality control guidelines and directives for care of TE patients and associated data collection tools</li> </ul>
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Supplied intermediate and peripheral-level laboratories with materials, reagents and new microscopes</li> <li>Revised quality control and supervision guidelines</li> </ul>	<ul> <li>Planned activities</li> <li>Establish laboratories for culture in 2 cities (Kisangani and Lubumbashi); train staff in culture and DST</li> <li>Improve management of quality control data</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Prepared Global Fund round 6 proposal for strengthening drug management</li> </ul>	<ul> <li>Planned activities</li> <li>Rebuild second warehouse (in eastern part of the country)</li> <li>Distribute drugs equitably and effectively</li> <li>Provide adequate information regarding use of drugs</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
Collaborative TB/HIV activitiesAchievementsImplemented collaborative TB/HIV activities in 21 sites in 2 provincesAdvocated for establishment of a TB/HIV committeeTrained coordinators (doctors) at provincial level in collaborative TB/HIV activitiesDeveloped an expansion plan for collaborative TB/HIV activities	<ul> <li>Planned activities</li> <li>Initiate collaborative TB/HIV activities in at least 125 primary health-care centres</li> <li>Train TB providers in HIV counselling and testing and in provision of ART</li> <li>Revitalize TB/HIV steering committee</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB</li> <li>Achievements</li> <li>Revised MDR-TB guidelines</li> <li>Prepared and submitted proposal to GLC for an MDR-TB project to treat 1100 patients over a 5-year period</li> <li>Trained health-care providers in Kinshasa in management of MDR-TB</li> </ul>	<ul> <li>Planned activities</li> <li>Conduct training and refresher training for health-care providers in management of MDR-TB</li> </ul>

# **Achievements**

 Provided TB diagnosis and treatment in war-affected areas in east of country (Ituri and Masisi): distributed drugs and provided protection and equipment for staff with assistance from United Nations Mission in the Democratic Republic of the Congo (MONUC)

HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

#### **Achievements**

- · Provided finance for central health office and motivated staff of primary health-care clinics
- Conducted preliminary assessment to adapt PAL and developed plan for PAL implementation

#### **Achievements**

Conducted situation analysis for PPM

ENGAGING ALL CARE PROVIDERS

• Identified private health-care facilities, faith-based organizations and companies for collaboration in PPM activities

#### **Planned activities**

**Planned activities** 

None reported

- Donate motorcycles and bicycles to zonal health offices
- Develop PAL guidelines and implement PAL activities in pilot sites

- Develop PPM guidelines
- Provide anti-TB drugs and laboratory supplies to collaborating providers

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

#### EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

# Advocacy, communication and social mobilization Achievements

- Organized World TB Day events
- Updated social mobilization guidelines

# **Community participation in TB care**

#### Achievements

- Trained members of community-based organizations to provide support to TB patients, including treatment supervision for bedridden patients, in 200 out of 515 zones
- Encouraged community participation in World TB Day celebrations

# **Patients' Charter**

#### Achievements

Distributed Patients' Charter to all 23 provinces

# Planned activities

- Organize World TB Day events
- Update messages on TB and develop tools for communication
- Develop advocacy guide

#### **Planned activities**

 Increase number of zones where members of community-based organizations are trained in patient support

# **Planned activities**

- Translate Patients' Charter into 4 national languages
- Request inclusion of Patients' Charter when country places order through GDF
- Distribute Patients' Charter in all 1069 primary health-care centres

#### RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### Achievements

- Completed KAP study for TB
- Conducted study of rifampicin resistance in failure cases in Kinshasa

- Conduct seroprevalence study among new TB cases in Kinshasa city
- Evaluate effect on case-finding of "missed opportunities": failure to investigate TB in people presenting at health-care services

#### NTP budget by source of funding

Increased funding from the Global Fund and decreased funding gap since 2006



#### NTP budget by line item

Stable budget for collaborative TB/HIV activities since 2006; increased budget for DOTS in 2007 mainly for routine programme and supervision activities



#### Total TB control costs by line item<sup>4</sup>

Cost of clinic visits based on 76 visits for new patients during treatment



# Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007–2008

Like other African HBCs, main difference between Global Plan and country report is TB/HIV and ACSM/CTBC



#### NTP budget by line item, 2008

Largest shares of the budget are for component 1 of the Stop TB Strategy (DOTS expansion and enhancement: 65%) and for collaborative TB/HIV activities (18%)



#### NTP funding gap by line item

Funding gap within DOTS mainly for routine programme management and supervision activities; about 80% of funding needs for TB/HIV remain unfunded; surplus for "Other"



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increased costs per patient with peak in 2007, increased expenditure per patient which is similar to available funding suggesting good absorption capacity



#### NTP budget and funding gap by Stop TB Strategy component

20	07	20	00
BUDGET	GAP	BUDGET	GAP
16 4.5 0 0.5 0.4 2.9	6.2 3.7 0 0.3 0.3 -1.3	13 4.6 0 0.3 0.3 2.4	2.9 3.7 0 -0.7 0.1 -1.5
10' 34' 62'	% % %	12 40 78	% % %
0. 0. 0.	4 5 1	0 0 1.3 4.7	.3 .5 .1
	BUDGET 16 4.5 0 0.5 0.4 2.9 10' 34' 62' 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.	BUDGET GAP 16 6.2 4.5 3.7 0 0 0 0 0.5 0.3 0.4 0.3 2.9 -1.3 10% 34% 62% 0.4 0.5 0.1	BUDGET         GAP         BUDGET           16         6.2         13           4.5         3.7         4.6           0         0         0           0.5         0.3         0.3           2.9         -1.3         2.4           10%         12           34%         40           62%         78           0.4         0.5           0.4         0.1           0.5         0.3           10%         12           34%         40           62%         78           0.4         0.5           0.5         0           1.3         4.7

#### SOURCES, METHODS AND ABBREVIATIONS

#### <sup>a-h</sup> Please see footnotes page 169.

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimate originally based on assumption of 45% ss+ case detection rate in 1997 (DOTS and non-DOTS combined). Trend in incidence estimated from 3-year moving average of notifications from those countries in region judged to be detecting an unchanging proportion of cases.
   MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce
- 2 MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 267/100 000 pop and mortality 35/100 000 pop/yr.
- 3 For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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.
- re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DS1 facility per 10 million population. 4 Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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.
- 5 NTP available funding for 2002–2008 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year.

# Ethiopia

The Ethiopian Ministry of Health has declared the ambitious target of increasing case detection to 60% in 2007. The expansion of the network of general health-care facilities will help with this goal, as will plans to increase the involvement of Health Extension Workers in identification and referral of TB suspects, and to continue the scale up of collaboration with private health clinics. Intensified case-finding among HIV patients would also contribute. However, numerous challenges face the NTP, including retaining skilled staff, adequately supervising the activities of the programme and improving the relationship with the laboratories. The treatment success rate is low, partly as a result of poor reporting. The integration of TB recording and reporting into a multi-disease information system, unless carefully managed, is likely to result in a further deterioration in the quality of routinely collected data.

#### SURVEILLANCE AND EPIDEMIOLOGY, 2006

<b>Population</b> (thousands) <sup>a</sup>	81 021
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	379
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-1.3
Incidence (ss+/100 000 pop/yr)	168
Prevalence (all cases/100 000 pop) <sup>2</sup>	643
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	84
Of new TB cases, % HIV+ <sup>b</sup>	6.3
Of new TB cases, % MDR-TB (2005)°	1.6
Of previously treated TB cases, % MDR-TB (2005)°	12
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	151
Notification rate (new ss+/100 000 pop/yr)	45
DOTS case detection rate (new ss+, %)	27
DOTS treatment success (new ss+ cases, 2005 cohort, %)	78
Of new pulmonary cases notified under DOTS, % ss+	48
Of new cases notified under DOTS, % extrapulmonary	36
Of new ss+ cases notified under DOTS, % in women	45
Of sub-national reports expected, % received at next reporting levels	vel <sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	713
Number of laboratories performing culture	1
Number of laboratories performing DST	1
Of laboratories performing smear microscopy, % covered by EQA	0
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	-
Of re-treatment cases receiving DST, % MDR-TB	_
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
, ,	(to all patients)
National surveillance system for HIV-infection in TB natients?	Yes

National Surveinance System for the integration in the patients:	100
Of TB patients (new and re-treatment) notified, % tested for HIV	2.
Of TB patients tested for HIV, % HIV+	40
Of HIV+ TB patients detected, % receiving CPT	86
Of HIV+ TB patients detected, % receiving ART	27

#### WHO Africa Region (AFR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notifications equally spread among ss+, ss- and extrapulmonary, suggesting underutilization of microscopy for diagnosis, and possible over-diagnosis of extrapulmonary cases



#### Unfavourable treatment outcomes, DOTS

Treatment success rate remains below target; treatment outcomes not reported for 7% of 2005 cohort



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	39	39	48	64	63	85	70	95	95	70	90	100
DOTS notification rate (new and relapse/100 000 pop	) 43	67	92	106	107	131	133	151	157	160	157	151
DOTS notification rate (new ss+/100 000 pop)	15	21	25	29	32	44	46	50	53	54	49	45
DOTS case detection rate (all new cases, %)	19	27	35	37	35	40	37	40	40	40	40	39
DOTS case detection rate (new ss+, %)	15	20	22	23	24	30	30	30	31	31	29	27
Case detection rate within DOTS areas (new ss+, %)e	38	51	45	36	38	36	43	32	33	45	32	27
DOTS treatment success (new ss+, %)	61	73	72	74	76	80	76	76	70	79	78	-
DOTS re-treatment success (ss+, %)	79	71	69	60	74	71	64	60	60	54	56	-

2.6

# ETHIOPIA

#### IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

# Political commitment, standardized treatment, and monitoring and evaluation system

#### **Achievements**

- Received approval for Global Fund round 6 proposal for TB control activities
- Finalized 2007–2010 Strategic Plan for TB Control with participation and agreement of all stakeholders
- Revised standard regimen for Category III
- Developed monitoring and evaluation plan for NTP
- Recruited data manager, but planned move to integrated health information system poses challenges

# Produced annual report of NTP activities

Quality-assured bacteriology

#### Achievements

- Set up EQA system for sputum microscopy
- Revised AFB microscopy and EQA manual
- Conducted training of peripheral-level laboratory staff in all regions

# Drug supply and management system Achievements

Developed plan for procurement of drugs and management of supplies

# TB/HIV, MDR-TB AND OTHER CHALLENGES

# **Collaborative TB/HIV activities**

# Achievements

- Established functional TB/HIV Advisory Council and TB/HIV Technical Working Group
- Updated national guidelines on implementation of collaborative TB/HIV activities
- Trained over 800 health staff on collaborative TB/HIV activities
- Pilot collaborative TB/HIV activities expanded to more than 330 health facilities, 98 of which are hospitals
- Drafted comprehensive TB/HIV plan of action involving most stakeholders

# Diagnosis and treatment of multidrug-resistant TB Achievements

- MDR-TB addressed and granted approval in the round 6 Global Fund proposal
- Developed MDR-TB control plan
- Established functional MDR-TB technical advisory group

#### High-risk groups and special situations Achievements

Included specific targets in the strategic plan

# Health system strengthening, including human resource development Achievements Plan

- Trained over 900 health-care workers and public health managers in diagnosis and treatment of TB and leprosy
- Supplied office and transport equipment for the regional health bureaux
- Developed plan for PAL adaptation and implementation

# **Planned activities**

- Improve case detection through identification of TB suspects by health extension workers (HEWs), through collaboration with private health clinics and expansion of the network of general health clinics
- Update, disseminate and implement the new manual for management of TB and leprosy
- Conduct Global Fund 5-year assessment surveys

# **Planned activities**

- Strengthen EQA system for sputum microscopy
- Establish 6 regional reference laboratories with culture and DST facilities
- Open 120 new TB diagnostic facilities with AFB microscopy
- Recruit and equip national laboratory consultants for six regions in order to strengthen the EQA system

# **Planned activities**

Obtain paediatric anti-TB formulations from GDF

# **Planned activities**

- Improve monitoring and reporting of TB/HIV activities at all levels
- Reinforce human resources for collaborative TB/HIV activities
- Develop and implement guidelines on infection control in main hospitals

# **Planned activities**

- Develop guidelines for MDR-TB management and treatment
- Procure second-line TB drugs for 100 patients in the first year
- Set up MDR-TB treatment centre in Addis Ababa (St Peter's Hospital)
- Provide necessary MDR-TB training to health workers and health managers

# **Planned activities**

None described

- Strengthen diagnostic facilities through provision of X-ray machines, fluorescence microscopes, culture and DST equipment and vehicles for regional laboratories
- Standardize training material on TB and on TB/HIV
- Develop specific training material on TB for physicians

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

# ETHIOPIA

#### ENGAGING ALL CARE PROVIDERS

#### **Achievements**

- Published guidelines for management of TB in private health facilities
- Pilot tested PPM projects in 21 private health facilities; NTP provided training and anti-TB drugs

# EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization

#### Achievements

- Broadcast radio and TV messages aimed at improving health-seeking behaviour of people with TB
- Developed and disseminated posters and flyers to the general public and to community workers

# **Community participation in TB care**

# **Achievements**

- Sensitized community health extension workers (HEWs) on identification and referral of TB suspects
- Conducted sensitization workshops for community leaders on community TB control

# **Patients' Charter**

#### Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### Achievements

 Conducted studies on variations of sputum smear microscopy techniques and diagnosis of extrapulmonary TB (lymph nodes)

#### **Planned activities**

- Expand PPM to 100 private health facilities in 3 regions
- Initiate collaborative TB/HIV activities in all PPM facilities
- Supervise PPM activities and assess their performance

#### **Planned activities**

 Develop and disseminate posters and flyers on TB awareness for the general public

# **Planned activities**

- Develop training curriculum and modules for HEWs
- Train and supervise all HEWs to educate and mobilize the community for identification and referral of TB suspects
- Develop and disseminate reference materials for health extension workers

#### Planned activities

None reported

#### **Planned activities**

Study health-seeking behaviour, gender disparities and contact tracing

#### NTP budget by source of funding

Substantial increase in budget and external funding in 2008, mainly from the Global Fund



#### NTP budget by line item

Increased budget in 2008 for DOTS component mainly for laboratory supplies and equipment



#### Total TB control costs by line item<sup>4</sup>

Costs for clinic visits based on 66 outpatient visits per new TB patient to health facilities during treatment



#### Comparison of country report and Global Plan:9 total TB control costs, 2007-2008

Country reports similar to Global Plan for the DOTS component; much higher budget for TB/HIV, PPM and ACSM in Global Plan



#### NTP budget by line item, 2008

Budget has been developed for almost all interventions of the Stop TB Strategy; DOTS (55%) is the largest single component of the budget, followed by ACSM/CTBC (11%)



# NTP funding gap by line item

Funding gap reported only in 2005



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increased costs and budget per patient as TB control activities broadened in line with Stop TB Strategy; expenditures similar to available funding showing good absorption capacity



#### NTP budget and funding gap by Stop TB Strategy component

0000

	20	07	20	Uδ
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strengthening Engage all care providers People with TB, and communities Research Other	6.9 0.3 0 0.9 0.9 0.8	0 0 0 0 0 0	9.2 1.7 0 0.5 1.8 0.6 3.0	0 0 0 0 0 0
Financial indicators for TB Government contribution to NTP budget (including loans) Government contribution to total cost TB control (including loans) NTP budget funded	79 589 1009	% %	0 0 0	% % %
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita Government health expenditure per capita (2004) Total health expenditure per capita (2004)	0. 0. 0	2 2	0 0 2.9 5.6	.2 3

#### SOURCES, METHODS AND ABBREVIATIONS

#### a-h Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence based on assumption of 50% ss+ case detection rate in 1997 (DOTS and non-DOTS). Trend in incidence estimated from S-year moving average of notifications from those countries in region judged to be detecting an unchanging proportion of cases. MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce
- incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 308/100 000 pop and mortality 37/100 000 pop/yr
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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.
- Total TB control costs for 2002-2006 are based on expenditure, whereas those for 2007-2008 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.
- NTP available funding for 2004-2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002-2003 and 2007-2008 is based on prospectively reported budget data and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; vr. year

# India

In reaching 100% DOTS coverage, the Revised National Tuberculosis Control Programme (RNTCP, hereafter NTP) of India has begun to operate in parts of the country that are particularly challenging. It remains to be seen if the Stop TB Strategy can be implemented as successfully in these districts as it has been in the rest of India. The introduction of MDR-TB treatment as part of routine programme activities will succeed only if the planned sub-national reference laboratories function properly, and if a reliable supply of high-quality second-line drugs is available. Plans to expand collaborative TB/HIV activities nationally will need to reflect the local variations in HIV epidemiology. Assessing the impact of TB control in India will require careful analysis of the extensive and detailed data that are routinely collected by the NTP, in addition to recent and planned surveys of the prevalence of infection and of disease.

### SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	1 151 751
Estimates of epidemiological burden <sup>1</sup> Incidence (all cases/100 000 pop/yr) Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup> Incidence (ss+/100 000 pop/yr) Prevalence (all cases/100 000 pop) <sup>2</sup> Mortality (deaths/100 000 pop/yr) <sup>2</sup> Of new TB cases, % HIV+ <sup>b</sup> Of new TB cases, % MDR-TB <sup>c</sup> Of previously treated TB cases, % MDR-TB <sup>c</sup>	168 0.0 75 299 28 1.2 2.8 17
Surveillance and DOTS implementation Notification rate (new and relapse/100 000 pop/yr) Notification rate (new ss+/100 000 pop/yr) <sup>3</sup> DOTS case detection rate (new ss+, %) <sup>3</sup> DOTS treatment success (new ss+ cases, 2005 cohort, %) Of new pulmonary cases notified under DOTS, % ss+ Of new cases notified under DOTS, % extrapulmonary Of new ss+ cases notified under DOTS, % in women Of sub-national reports expected, % received at next reporting level	107 48 <b>64</b> <b>86</b> 58 16 31 vel <sup>d</sup> 100
Laboratory services <sup>4</sup> Number of laboratories performing smear microscopy Number of laboratories performing culture Number of laboratories performing DST Of laboratories performing smear microscopy, % covered by EQA	11 968 8 8 79
Management of MDR-TB Of new cases notified, % receiving DST at start of treatment Of new cases receiving DST at start of treatment, % MDR-TB Of re-treatment cases notified, % receiving DST Of re-treatment cases receiving DST, % MDR-TB	0.0 - 0.0 81
<b>Collaborative TB/HIV activities</b> National policy of counselling and testing TB patients for HIV?	Yes (for specific
National surveillance system for HIV-infection in TB patients? Of TB patients (new and re-treatment) notified, % tested for HIV Of TB patients tested for HIV, % HIV+ Of HIV+ TB patients detected, % receiving CPT Of HIV+ TB patients detected, % receiving ART	groups) No 4 15 —

# WHO South-East Asia Region (SEAR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notification rates of most case types increasing slightly; falling only for ss-pulmonary cases  $% \left( {\left[ {{{\rm{T}}_{\rm{T}}} \right]_{\rm{T}}} \right)$ 



#### Unfavourable treatment outcomes, DOTS

Treatment success rate target reached for 2001 cohort, but relatively unchanged since 30 -



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	1.5	2.0	2.3	9.0	14	30	45	52	67	84	91	100
DOTS notification rate (new and relapse/100 000 pop)	0.5	1.6	1.8	2.9	12	20	38	51	73	94	101	107
DOTS notification rate (new ss+/100 000 pop)	0.2	0.6	0.8	1.2	5.2	9.1	17	23	33	42	45	48
DOTS case detection rate (all new cases, %)	0.3	0.9	1.0	1.6	6.5	11	22	28	41	53	56	59
DOTS case detection rate (new ss+, %)	0.3	0.8	1.0	1.6	6.8	12	23	30	43	55	59	64
Case detection rate within DOTS areas (new ss+, %)e	19	42	45	18	51	40	51	58	64	66	65	64
DOTS treatment success (new ss+, %)	79	79	82	84	82	84	85	87	86	86	86	_
DOTS re-treatment success (ss+ %)	70	67	65	72	69	71	69	72	70	73	71	_

# INDIA

IMPLEMENTING THE STOP TB STRATEGY <sup>1</sup>	
DOTS EXPANSION AND ENHANCEMENT	
<ul> <li>Political commitment, standardized treatment, and monitoring a Achievements</li> <li>Expanded DOTS to the entire country (628 districts) in March 2006</li> <li>Secured long-term funding for TB activities under the World Bank credit agreement</li> <li>Received approval for the Global Fund round 6 proposal for TB control activities</li> <li>Hosted 3-yearly external evaluation (joint monitoring mission) in October 2006</li> <li>Produced 7th annual report of NTP activities</li> </ul>	and evaluation system Planned activities All planned activities reported for 2007 are described under the headings below.
Quality-assured bacteriology	
<ul> <li>Achievements</li> <li>Implemented full range of EQA activities for sputum microscopy in nearly 80% of peripheral microscopy units</li> </ul>	<ul> <li>Planned activities</li> <li>Scale up the full range of EQA activities to 100% of microscopy centres</li> </ul>
Drug supply and management system	
<ul> <li>Achievements</li> <li>Procured and introduced paediatric patient-wise boxes, with assistance from GDF and DFID</li> </ul>	<ul> <li>Planned activities</li> <li>Provide training in drug logistics to national-level master trainers, and to national- and state-level officials involved in drug management</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Established cross-referral mechanisms in 14 states; implemented intensified TB case-finding in integrated counselling and testing centres; and introduced selective referral of TB patients for voluntary HIV counselling and testing</li> <li>Scaled up periodic HIV survey in TB patients to 15 districts with differing HIV levels in women attending antenatal clinics</li> </ul>	<ul> <li>Planned activities</li> <li>Expand intensified TB case-finding in VCT centres, ART centres, and care and support centres countrywide</li> <li>Implement VCT for TB patients (selective in all states, to all TB patients in high HIV-prevalence settings)</li> <li>Strengthen collaborations countrywide at state and district levels via frequent meetings and reviews by coordination committees</li> <li>Pilot test the following: decentralized delivery of CPT through NTP; implementation of "shared confidentiality" of HIV status within the health-care system in order to improve coordination of TB and HIV care; and routine offer of voluntary HIV testing and counselling to all TB patients in 2 districts</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB Achievements</li> <li>Developed and published national guidelines for treatment of MDR-TB</li> <li>Completed DRS in the states of Gujarat and Maharashtra, and initiated in Andhra Pradesh</li> <li>Supplied culture and DST equipment to intermediate reference laboratories in 13 states; started accreditation process for these laboratories</li> </ul>	<ul> <li>Planned activities</li> <li>Launch management of MDR-TB in Gujarat and Maharashtra: MDR-TB suspects identified and DST carried out in March 2007, first cohort of patients began treatment in August 2007</li> <li>Introduce management of MDR-TB in 4 more states: Andhra Pradesh, Delhi, Haryana and Kerala</li> <li>Complete accreditation of 13 out of 18 intermediate reference laboratories</li> <li>Promote the rational use of second-line anti-TB drugs by all health-care providers</li> </ul>
High-risk groups and special situations	
<ul> <li>Achievements</li> <li>Initiated national guidelines for TB diagnosis and treatment among long-term and short-term prisoners</li> <li>Implemented specific action plan for TB control in tribal population</li> <li>NGOs and support groups collaborated with NTP to improve access to DOT for refugees, displaced people, migrant workers, immigrants, homeless people, and individuals dependent on alcoholic and drugs</li> </ul>	<ul> <li>Planned activities</li> <li>Implement tribal action plans at district level: increase human resources, expand network of diagnostic centres, provide incentives to patients for travel to diagnostic centres</li> </ul>

<sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

• Introduced PPM activities in urban areas, including slums

#### HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

#### Achievements

 Planning for TB control involved sector-wide and intersectoral collaboration, including close involvement of the NTP in planning the ongoing primary health-care reform by the National Rural Health Mission (NRHM)

#### ENGAGING ALL CARE PROVIDERS

#### Achievements

- Adopted ISTC in order to improve the standards of TB management across all sectors of health-care in India; ISTC now included in the NTP training module for private practitioners
- Continued scale up of PPM activities, including provision of anti-TB drugs free of charge to selected collaborating non-NTP providers; PPM now in place in almost all districts
- Formed national professional coalition of chest physicians', paediatricians' and family physicians' associations in 2007

#### **EMPOWERING PEOPLE WITH TB, AND COMMUNITIES**

# Advocacy, communication and social mobilization Achievements

- Undertook mass media activities in collaboration with national telecast network and with other disease control programmes
- Developed and implemented, in all states and districts, needs-based ACSM activities for patients and communities, health-care providers and decision-makers
- Strengthened capacity of NTP staff in states and districts to plan and implement locally relevant ACSM activities, including local training, and participatory approaches adapted to the social and cultural context

#### Community participation in TB care Achievements

- Involved communities in TB control activities in all districts, and self-help groups, cured TB patients, folk media and traditional healers in TB care and control activities
- Organized more than 30 000 community meetings and nearly 40 000 patient-provider meetings on TB control

# **Patients' Charter**

#### Achievements

The Patients' charter was published in 2006 and was therefore not available for use in countries until then.

#### RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### Achievements

 Initiated broad programme of operational research projects into strategies to improve access to diagnosis; methods of diagnosis, including diagnosis in children; efficacy of treatment regimens; TB diagnosis and control in remote settings; health-seeking behaviour; cost-effectiveness of PPM; and factors associated with default and relapse

#### **Planned activities**

- Continue active engagement with NRHM to support its elements for health system strengthening, while ensuring that essential TB control functions are protected and that an acceptable level of infrastructure, facilities and services at all levels in the NTP are maintained as per the Indian Public Health Standards formulated by the NRHM
- NTP will continue to provide human resources to fill critical gaps in the health system (e.g. laboratory technicians) and to provide additional sub-district level TB supervisors to maintain the supervision for and monitoring of the programme

#### **Planned activities**

- Revise PPM guidelines for NGOs and private practitioners
- Develop guidelines for further involvement of the Employee State Insurance and Railways health facilities in TB control
- Work with the Indian Medical Association to increase the number of private practitioners collaborating with the NTP

# **Planned activities**

- Hire a media agency at the national level to undertake electronic media activities, develop new material for use in targeted audiences such as private providers, and prepare material for use in medical colleges, for enhancing patient—provider interaction and to support and involve community groups
- Develop IEC baseline document to guide future capacity-enhancing interventions
- Encourage states and districts to develop ACSM activities focusing on tribal and other hard-to-reach populations

# **Planned activities**

- Enhance community involvement through community meetings, and collaboration with groups such as self-help groups, youth organizations, schoolchildren, local NGOs, faith-based organizations and Panchayat Raj Institutions
- Involve community volunteers and cured TB patients to provide motivation and support for TB patients
- Initiate TB care in the community

#### **Planned activities**

- Print and widely disseminate the Patients' Charter among providers and patients
- Inform professional organizations and state governments about the Patients' Charter, and encourage its adoption
- Display the Patients' Charter in local languages at all major health-care facilities

- Start subnational TB disease prevalence surveys at six sites, in addition to ongoing surveys at the TB Research Centre, Chennai
   Conduct encode national ARTI survey
- Conduct second national ARTI survey
- Revise the operational research priorities of the programme and increase operational research activities in collaboration with medical colleges

#### NTP budget by source of funding

Large increase in budget after 2005, which has been fully funded mainly by increasing funding from a World Bank loan and the Global Fund



#### NTP budget by line item

DOTS continues to be a dominant component of the NTP budget, although amounts for other elements of the Stop TB Strategy, particularly PPM, have increased since 2005



#### Total TB control costs by line item<sup>5</sup>

Hospitalization costs are for 11 750 dedicated TB beds, costs for clinic visits based on 75% patients using health facilities for DOT



# Comparison of country report and Global Plan:<sup>9</sup> total TB control costs,

Targets for MDR-TB patients to be treated in Global MDR/XDR Response Plan much higher than scaling up planned by NTP; NTP budget for TB/HIV small since most activities funded through HIV budgets; ACSM estimates in Global Plan used evidence from outside India



#### NTP budget by line item, 2008

65% of the budget is for component 1 of the Stop TB Strategy (DOTS expansion and enhancement); the budget for MDR-TB is small - plans for treatment of MDR-TB cover less than 1% of estimated cases



#### NTP funding gap by line item

No funding gaps have been reported for TB control since 2002

#### Per patient costs, budgets and expenditures<sup>6</sup>

Increasing cost per patient since 2002 as newer elements of TB control are introduced, but India remains the country with the lowest cost per patient treated among all HBCs



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	2008			
(US\$ millions)	BUDGET	GAP	BUDGET	GAP		
DOTS expansion and enhancement	46	0	48	0		
TB/HIV, MDR-TB and other challenges	0.05	0	0.7	0		
Health system strengthening	0	0	0	0		
Engage all care providers	3.1	0	2.7	0		
People with TB, and communities	4.6	0	4.6	0		
Research	1.0	0	0.9	0		
Other	9.0	0	9.5	0		
Financial indicators for TB						
Government contribution to NTP budget (including loans)	56	%	58	%		
Government contribution to total cost TB control (including loans)	74	%	74	%		
NTP budget funded	100	%	100	%		
Per capita health financial indicators (US\$)						
NTP budget per capita	0.	1	0	.1		
Total costs for TB control per capita	0.	1	0	.1		
Funding gap per capita	0		0			
Government health expenditure per capita (2004)			5.4			
Total health expenditure per capita (2004)		;	31			

#### SOURCES, METHODS AND ABBREVIATIONS

#### <sup>a-h</sup> Please see footnotes page 169

Incidence, prevalence and mortality estimates include patients infected with HIV. Estimate of ss+ incidence based on 3-year national tuberculin survey completed during 2003 (Chadha, VK, Tuberculosis epidemiology In India: a review. International Journal of Tuberculosis and Lung Disease, 2005, 9:1072–1082). Estimates of sx-prevalence from Gopi PG et al. Estimation of burden of tuberculosis in India: a review. International Journal of Medical Research, 2005, 122:243–248. WHO estimate of total prevalence of TB (458/100 000 pop in year 2000) is lower than that derived directly from survey (846/100 000 pop). Incidence rate assumed to be constant in absence of contrary evidence, but estimated prevalence and mortality rates decline with growing proportion of cases treated.

MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 568/100 000 pop and mortality 42/100 000 pop/yr. The population estimate used by the NTP is lower than that used here and gives a notification of smear-positive cases of 50 per 100 000 pop/yr. The population estimate used by the NTP is lower than that used here and gives a notification rate for new smear-positive cases of 50 per 100 000 pop/yr. The ropulation estimate used by the NTP is lower than that used here and gives a notification rate for new smear-positive cases of 50 per 100 000 population. By 2009, the RNTCP plans to have established a network of at least 24 state-level accredited labora-tories with quality-controlled culture and DST facilities in order to meet the requirements of the programme, including the routine management of MDR-TB.

- Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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.
- NP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap. indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown; yr, year

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# Indonesia

The case detection rate in Indonesia exceeded 70% for the first time in 2006; collaboration with private health-care providers and non-NTP public providers, in conjunction with community-based TB care, has probably contributed to the increase in case-finding. Treatment outcomes were reported for nearly all new smear-positive patients registered in 2005, with the highest treatment success rate yet reported by Indonesia. As more providers participate in TB care, the NTP will need to work to ensure that treatment outcomes continue to be reported for all patients. The treatment of MDR-TB patients has begun and is included in the fully funded budget for 2007–2008.

#### SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup> 2	28 864
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/vr)	234
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-2.4
Incidence (ss+/100 000 pop/yr)	105
Prevalence (all cases/100 000 pop) <sup>2</sup>	253
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	38
Of new TB cases, % HIV+b	0.6
Of new TB cases. % MDR-TB (2004)°	2.0
Of previously treated TB cases, % MDR-TB°	19
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	121
Notification rate (new ss+/100 000 pop/yr)	77
DOTS case detection rate (new ss+, %)	73
DOTS treatment success (new ss+, 2005 cohort, %)	91
Of new pulmonary cases notified under DOTS, % ss+	66
Of new cases notified under DOTS, % extrapulmonary	2.6
Of new ss+ cases notified under DOTS, % in women	41
Of sub-national reports expected, % received at next reporting level	98
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	4 855
Number of laboratories performing culture	41
Number of laboratories performing DST	11
Of laboratories performing smear microscopy, % covered by EQA	100
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	-
Of re-treatment cases receiving DST, % MDR-TB	-
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	No policy
National surveillance system for HIV-infection in TB patients?	No
Of TB patients (new and re-treatment) notified, % tested for HIV	-
Of TB patients tested for HIV, % HIV+	-
Of HIV+ TB patients detected, % receiving CPT	-
Of HIV+ TB patients detected, % receiving ART	-

WHO South-East Asia Region (SEAR)





#### **Case notifications**

Dramatic increase in case notifications over the past 10 years



#### **Unfavourable treatment outcomes, DOTS**

Treatment success rate target originally reached with 2000 cohort and outcomes have improved since. Outcomes reported for nearly all new ss+ patients registered for treatment in 2005



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	6.0	14	28	80	90	98	98	98	98	98	98	98
DOTS notification rate (new and relapse/100 000 pop)	1.8	7.3	11	20	33	32	43	71	79	94	113	121
DOTS notification rate (new ss+/100 000 pop)	1.8	5.9	9.6	16	24	24	25	35	42	58	70	77
DOTS case detection rate (all new cases, %)	0.6	2.4	3.7	6.7	12	12	16	27	31	38	46	51
DOTS case detection rate (new ss+, %)	1.3	4.4	7.4	12	19	20	21	30	37	52	65	73
Case detection rate within DOTS areas (new ss+, %)e	21	32	26	15	21	20	22	31	38	54	67	74
DOTS treatment success (new ss+, %)	91	81	54	58	50	87	86	86	87	90	91	_
DOTS re-treatment success (ss+, %)	32	-	-	73	70	72	83	78	78	82	78	_

# **INDONESIA**

#### IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> DOTS EXPANSION AND ENHANCEMENT

# Political commitment, standardized treatment, and monitoring and evaluation system

#### **Achievements**

- Produced NTP strategic plan for 2006–2010
- Developed and began implementation of electronic TB reporting and recording system
- Piloted registration of TB patients at health services units in order to improve quality of surveillance
- Initiated TB/HIV implementation by conducting a national TB/HIV symposium
- Began rapid involvement of hospital DOTS linkage including endorsement of ISTC and PCTC
- Produced annual report of NTP activities

#### **Quality-assured bacteriology**

#### **Achievements**

- Developed guidelines for EQA and TB laboratory management biosafety
- Prepared for first DRS in Central Java Province
- Conducted EQA of 3 laboratories for culture and DST

#### **Drug supply and management system Achievements**

Began training on management of anti-TB drug supplies

#### TB/HIV, MDR-TB AND OTHER CHALLENGES

### **Collaborative TB/HIV activities**

#### **Achievements**

 Pilot tested implementation of collaborative TB/HIV activities in health-care centres in 6 provinces

#### **Diagnosis and treatment of multidrug-resistant TB Achievements**

- Completed preparation for GLC assessment
- Established working group on management of MDR-TB

# High-risk groups and special situations

#### **Achievements**

 Included specific activities for prison populations, such as collaborative TB/HIV activities, in NTP plan for TB control

#### **Planned activities**

- Begin preparation for establishment of regional reference laboratory and 7 new provincial laboratories
- Implement and update LQAS in 3 pilot sites
- Complete testing of samples from 1st DRS
- Develop culture and DST guidelines (based on WHO guidelines)

#### **Planned activities**

- Improve drug management, planning, distribution, procurement and quality control
- Roll out drug management/logistics training for staff at all levels
- Procure paediatric FDCs and establish procurement of second-line anti-TB drugs

#### **Planned activities**

- Finalize national policy on collaborative TB/HIV activities in Indonesian and in English
- Review and revitalize national TB/HIV working group
- Implement collaborative TB/HIV activities in ARV referral hospitals
- Update guidelines on diagnosis and treatment of TB in HIV-positive people
- Develop TB/HIV surveillance system

#### **Planned activities**

- Apply to GLC and prepare for management of MDR-TB
- Develop guidelines for management of MDR-TB

#### **Planned activities**

- Establish special TB control initiatives for hard-to-reach areas (e.g. Papua)
- Formalize TB control activities in prisons through memorandum of understanding with Ministry of Justice
- Develop guidelines for TB control in the workplace
- Develop specific plan for urban TB control

HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

#### **Achievements**

- Planning for TB control involved sector-wide and intersectoral collaboration
- Strengthened management capacity at provincial and district levels through provincial DOTS teams
- Advocated for increased health budget (inclusive of TB) from parliament

#### **Planned activities**

- Develop networks and partnerships with other stakeholders
- Strengthen managerial capacities of staff by conducting leadership and management training courses
- Introduce and pilot test PAL initiatives, including tobacco use cessation activities

# **Planned activities**

• Implement electronic TB recording and reporting system nationwide

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

# INDONESIA

#### ENGAGING ALL CARE PROVIDERS

#### Achievements

- Adapted ISTC for professional organizations
- Implemented formal PPM activities in 235 districts/municipalities
- Developed TB control curricula for medical schools
- Collaborated with professional organizations in order to standardize TB diagnosis and treatment
- Established linkages and partnerships with professional societies and NGOs

# EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- Developed and began pilot testing ACSM guidelines and training modules
- Developed toolkit for health-care providers
- Prepared for national TB awareness campaign

#### Community participation in TB care Achievements

- Organized and supported working group on community-based TB care
- Completed review of community-based TB care in West Nusa Tenggara, Lampung, Padang and Jakarta provinces

# **Patients' Charter**

#### **Achievements**

- Officially endorsed and launched Charter on World TB Day
- Distributed 200 copies of Charter to partners

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

### Achievements

- Conducted HIV seroprevalence survey among TB patients in Yogyakarta Province (in collaboration with Gadjah Mada University, Yogyakarta)
- Carried out infection survey in West Sumatera (in collaboration with University of Indonesia)
- Conducted feasibility study for establishment of sentinel sites for surveillance of TB mortality (NIHRD), including testing of verbal autopsy questionnaires
- Assessed implementation of DOTS in hospitals, and potential introduction of management of MDR-TB in hospitals
- Adapted WHO planning and budgeting tool for use at provincial and district levels

#### **Planned activities**

- Include ISTC in training materials for hospitals and private practitioners
- Standardize diagnosis and treatment of TB by non-NTP providers using ISTC
- Strengthen provision of TB services for diagnosis and treatment in hospitals
- Initiate TB control in private/NGO clinics and in prisons
- Promote ISTC to professional organizations and societies
   Organize workshop on Stop TB Strategy for professional organizations

#### **Planned activities**

- Develop advocacy materials for stakeholders
- Launch year-long national TB awareness media campaign
- Finalize training module and guidelines for ACSM based on results of 2006 pilot project

#### **Planned activities**

- Continue to support working group activities
- Develop indicators and tools for community participation in TB control
- Pilot test village TB posts
- Expand community participation initiative

#### **Planned activities**

 Support development of patient groups for improving their involvement in TB Control

- Conduct infection survey in Central Java and East Nusa Tenggara (in collaboration with University of Indonesia)
- Establish sentinel sites for surveillance of TB mortality (NIHRD) in 4 provinces
- Conduct cost evaluation analysis of PPM activities in Yogyakarta
- Conduct study of TB financing at district level in 7 districts
- Pilot test use of WHO planning and budgeting tool at provincial and district levels
- Expand study of HIV seroprevalence in TB patients to 5 provinces (Papua, West Java, EastJava, Riau Island and Jakarta)
- Hold workshops on operational research in 4 provinces

#### NTP budget by source of funding

Budget for TB control fully funded since 2004; important increase in funding from grants, both from Global Fund and other donors



#### NTP budget by line item

Increased budget for PPM and ACSM since 2006; first year of budget for second-line drugs for 100 MDR-TB patients



#### Total TB control costs by line item<sup>4</sup>

NTP budget accounts for biggest share of TB control costs; no costs for hospitalization are estimated and on average each new TB patient visits a health facility 16 times during treatment



#### Comparison of country report and Global Plan:9 total TB control costs, 2007-2008

Costs based on country report lower than costs in Global Plan because (i) targets for MDR-TB patients to be treated in Global MDR/XDR Response Plan much higher than plans of NTP and (ii) estimated number of new TB patients to be treated higher in Global Plan compared to country report



#### NTP budget by line item, 2008

DOTS expansion and enhancement (66%) and PPM (10%) account for the highest share of the NTP budget; the share for MDR-TB is low - plans for treatment of MDR-TB cover less than 1% of estimated cases



#### NTP funding gap by line item

Breakdown of funding gap in 2002 and 2003 by line item not available; no funding gaps have been reported since 2004

#### Per patient costs, budgets and expenditures<sup>5</sup>

NTP expenditures per patient in 2006 lowest since 2004



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	2008		
(US\$ millions)	BUDGET	GAP	BUDGET	GAP	
DOTS expansion and enhancement	39	0	37	0	
TB/HIV, MDR-TB and other challenges	2.5	0	3.3	0	
Health system strengthening	0	0	0	0	
Engage all care providers	8.2	0	5.6	0	
People with TB, and communities	4.7	0	5.5	0	
Research	2.7	0	2.3	0	
Other	2.4	0	2.6	0	
Financial indicators for TB					
Government contribution to NTP budget (including loans)	419	%	41	%	
Government contribution to total cost of TB control (including loans	s) 45°	%	46	%	
NTP budget funded	100	%	100	%	
Per capita health financial indicators (US\$)					
NTP budget per capita	0.	3	0	.2	
Total costs for TB control per capita	0.	3	0	.3	
Funding gap per capita	0		0		
Government health expenditure per capita (2004)			11		
Total health expenditure per capita (2004)			33		

#### SOURCES, METHODS AND ABBREVIATIONS

Please see footnotes page 169

- Incidence, prevalence and mortality estimates include national TB prevalence survey
- MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DDTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 438/100 000 pop and mortality 90/000 000 popyr. For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss=/HIV+TB, as well as DST for
- re-treatment and failure cases, there should be at least one culture facility and one DST facility in each of the 30 states. Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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.
- NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

# Kenya

A reassessment of the case detection rate in Kenya suggests that it is higher than was previously estimated, and that the 70% target was probably met in 2006. Treatment success rates, however, are below target, due in part to high default rates. Collaborative TB/HIV activities are now in place across the country, despite constraints in terms of financing, staffing and infrastructure. These constraints will also affect the planned introduction of programmatic management of MDR-TB, and the scaling up of community-based TB care and PPM initiatives. Funding for TB control in 2007 was almost double that in 2006, but a significant gap remains. Improving the infrastructure of laboratories and their performance will be essential to improving the standards of diagnosis for all TB cases, both drug sensitive and drug resistant.

# SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	36 553
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	384
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-9.2
Incidence (ss+/100 000 pop/yr)	153
Prevalence (all cases/100 000 pop) <sup>2</sup>	334
Mortality (deaths/100 000 pop/vr) <sup>2</sup>	72
Of new TB cases. % HIV+ <sup>b</sup>	52
Of new TB cases, % MDR-TB (1995)°	0.0
Of previously treated TB cases, % MDR-TB (1995)°	0.0
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	296
Notification rate (new ss+/100 000 pop/yr)	107
DOTS case detection rate (new ss+, %)	70
DOTS treatment success (new ss+, 2005 cohort, %)	82
Of new pulmonary cases notified under DOTS, % ss+	45
Of new cases notified under DOTS, % extrapulmonary	17
Of new ss+ cases notified under DOTS, % in women	43
Of sub-national reports expected, % received at next reporting leve	l <sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	770
Number of laboratories performing culture	2
Number of laboratories performing DST	2
Of laboratories performing smear microscopy, % covered by EQA	52
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	0.0
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	10
Of re-treatment cases receiving DST, % MDR-TB	8.5
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
(to	all patients)
National surveillance system for HIV-infection in TB patients?	Yes
Of TB patients (new and re-treatment) notified, % tested for HIV	60
Of TB patients tested for HIV, % HIV+	52
Of HIV+ TB patients detected, % receiving CPT	141
Ut HIV+ IB patients detected, % receiving ART	43

WHO Africa Region (AFR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notifications increased steadily over many years of full DOTS coverage, stabilizing in the past 3 years with an increase in reported re-treatment cases



#### **Unfavourable treatment outcomes, DOTS**

Treatment success rate still below target, but higher than in other high-HIV prevalence settings in Africa; reducing default rate could help in achieving target



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	15	100	100	100	100	100	100	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	103	124	137	165	188	186	228	244	271	290	288	296
DOTS notification rate (new ss+/100 000 pop)	51	60	66	81	89	84	98	104	113	119	113	107
DOTS case detection rate (all new cases, %)	43	45	43	45	46	43	52	54	58	61	66	75
DOTS case detection rate (new ss+, %)	57	58	54	59	58	51	59	61	63	66	68	70
Case detection rate within DOTS areas (new ss+, %)e	377	58	54	59	58	51	59	61	63	66	68	70
DOTS treatment success (new ss+, %)	75	77	65	77	78	80	80	79	80	80	82	_
DOTS re-treatment success (ss+, %)	72	59	55	64	73	76	77	77	75	76	77	-

# **KENYA**

#### IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> DOTS EXPANSION AND ENHANCEMENT

#### Political commitment, standardized treatment, and monitoring and evaluation system **Achievements Planned activities**

- NTP established as separate division within Ministry of Health, ensuring greater visibility of programme
- Finalized plan for monitoring and evaluating programme performance, based on national strategic plan and including management of MDR-TB Organized national award ceremony for best performing facilities,
- districts and provinces, attended by the Permanent Secretary for Health
- Produced 27th annual report of activities of NTP

# **Quality-assured bacteriology**

# **Achievements**

- Trained 570 laboratory personnel in EQA
- Enabled NRL to increase supervision of provincial microscopy centres by providing per diems, vehicles and additional staff
- Introduced EQA in all 8 provinces
- Established culture centres at Moi Teaching and Referral Hospital and at Homa Bay Hospital in 2007
- Renovated infrastructure in 13 diagnostic centres

#### Drug supply and management system **Achievements**

- Appointed pharmacist to manage anti-TB drug supply and distribution
- Implemented the logistics management information system (LMIS) in Eastern South Province
- Introduced 6-month regimen in 1 out of 12 regions
- NTP pharmacist participated in the development of pharmacovigilance auidelines

#### TB/HIV, MDR-TB AND OTHER CHALLENGES

# **Collaborative TB/HIV activities**

# **Achievements**

- Established good working relationship with NAP, including some shared funding
- Scaled up collaborative TB/HIV activities to whole country, including prisons; offered HIV testing to all TB patients; referred HIV-positive patients to HIV care centres
- Trained health-care workers at service delivery points to ensure comprehensive care for TB/HIV patients

#### Diagnosis and treatment of multidrug-resistant TB **Achievements**

- Developed national guidelines for the management of MDR-TB (printed December 2007)
- Increased staff of NRL from 3 to 5 and purchased equipment for DST
- Trained 5 MDR-TB core group members in Latvia, 3 MDR-TB staff trained by WHO office in Dar es Salaam and 30 staff trained in-country
- Introduced policy of routine DST for re-treatment cases nationwide

#### High-risk groups and special situations **Achievements**

- · Pilot tested screening of prisoners for TB on admission
- HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

# **Achievements**

- Collaborated with Ministry of Justice and with NGOs in the process of planning for TB control
- Provided microscopes and slides to laboratories, which are used for other diseases as well as for TB
- Trained over 500 laboratory staff on AFB microscopy, improving motivation of those staff

All planned activities reported for 2007 are described under the headings below.

# **Planned activities**

- Continue strengthening the NRL through recruitment of additional staff
- Renovate and equip the NRL to level 3 when earmarked funds are released
- Introduce rapid diagnosis of MDR-TB using molecular diagnostic techniques

# **Planned** activities

- Roll out the LMIS to the rest of the country with on-the-job training; formal training planned for 2008
- Introduce anti-TB paediatric dispersible formulations; meeting on paediatric anti-TB drugs to be held in January 2008, involving Measure Evaluation and University of Turin
- Introduce 6-month regimen in remaining 11 regions
- Begin post-marketing surveillance of anti-TB drugs

# **Planned activities**

- Collaborate with the NAP to ensure that all HIV patients are screened for TB before initiation of treatment
- Improve TB infection control in hospitals by effective triage of patients, and in prisons by screening new inmates then isolating TB suspects
- Pilot provision of ART in TB clinics

# Planned activities

- Distribute MDR-TB guidelines
- Begin treating 40 MDR-TB patients as outpatients of Kenyatta National Hospital: delivery of second-line drugs expected for January 2008
- Introduce treatment of MDR-TB in 3 additional hospitals
- Construct isolation facilities for MDR-TB treatment at Kenyatta National Hospital and in Kisumu, Nakuru, Eldoret and Mombasa

# **Planned activities**

• Introduce routine screening of prisoners for TB on admission

- Hire 100 laboratory technicians, 40 nurses and 15 clinical officers using Global Fund money
- Renovate and replace broken equipment in TB clinics and laboratories in general health facilities
- Provide integrated support and supervision at all levels of the health system

Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

- Renovated 20 high-volume facilities, the majority in TB laboratories
- Deployed 3 additional staff at central unit
- Strengthened use of TB supervision tool at all levels

### ENGAGING ALL CARE PROVIDERS

#### Achievements

- Carried out PPM activities in 31 of 136 districts
- Conducted situation analysis for PPM, developed PPM operational guidelines and training material and trained private health-care providers in management of TB
- ISTC formally endorsed by the Kenya Medical Association and by Kenya Clinical Officers Association
- Introduced the ISTC to all care providers and training institutions

#### **EMPOWERING PEOPLE WITH TB, AND COMMUNITIES**

# Advocacy, communication and social mobilization Achievements

- Developed and disseminated the communication strategy, and drafted advocacy strategy
- Commemorated World TB Day
- Conducted training for employers on TB control in the workplace
- Trained groups on use of "Magnet Theatre" (initiative of PATH)
- Broadcast TB control messages through radio, TV and quarterly newspaper advertisements
- Sensitized provincial and district public health officers on ASCM in 90% of the country
- Developed and printed IEC materials

# Community participation in TB care

#### Achievements

- Increased number of districts implementing community-based DOTS to 37 by December 2007
- Printed community-based DOTS materials and developed recording and reporting tools for community health workers
- Held meetings with community leaders in 31 out of 136 districts; individuals were selected for training as community health-care workers following these meetings
- Enhanced community participation in development of annual plans which are used to guide NTP activities and funding

# Patients' Charter

# Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

 Developed and began distributing general patients' charter, covering many of the issues contained in the Patients' charter for tuberculosis care

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### Achievements

- · Conducted study on dispensing practices in the private sector
- Carried out study on commodity management in community-based DOTS initiatives

- Pilot use of human resource quantification tool for collaborative TB/HIV activities
- Introduce PAL in 2009

# Planned activities

- Train additional non-NTP health-care providers in order to expand PPM activities
- Provide anti-TB drugs free of charge to selected collaborating non-NTP health-care providers
- Sensitize pharmacists and more private practitioners on TB to encourage referral of TB suspects for diagnosis
- Introduce accreditation system for health-care facilities offering TB care in line with ISTC

#### **Planned activities**

- Use case histories to communicate positive messages about the availability of effective treatment for TB
- Continue broadcasting TB control messages through various media
- Continue sensitization of community leaders
- Initiate school health education programmes with a module on TB control
- Continue Magnet Theatre training
- Finalize, print and disseminate the advocacy strategy
- Review existing IEC materials and develop new ones
- Finalize the community sensitization manual

# **Planned activities**

- Scale up community-based DOTS activities to 10 more districts
- Revise, print and distribute materials to the new districts implementing community-based DOTS

# **Planned activities**

 Print and disseminate flyers on the Patients' charter for tuberculosis care

- Conduct survey on MDR-TB among smear-positive cases, establish sentinel sites for routine surveillance of drug resistance among new TB cases and conduct a rapid assessment of XDR-TB among identified and suspected MDR-TB cases (training completed in 2007)
- Identify private providers (nurses, medical assistants and traditional healers) providing or willing to provide free-of-charge treatment in collaboration with the NTP
- Study the micro- and macro-economic impact of TB
- Conduct annual surveys of impact of ACSM activities
- Support testing of data quality assessment tool in 24 districts
- Examine the role of the private sector in provision of TB diagnosis and treatment in Nairobi

#### NTP budget by source of funding

NTP has developed plan and budget for 2006-2010 that covers all elements of the Stop TB Strategy and that is in line with or ahead of Global Plan targets; budget requirement is now much higher than previous years and while funding has grown, large funding gaps remain



#### NTP budget by line item

Increased budget for collaborative TB/HIV activities, MDR-TB and ACSM in 2007-2008; MDR-TB budget 2008 mainly for the construction of an infection control facility



#### Total TB control costs by line item<sup>4</sup>

NTP accounts for the largest share of total TB control costs



#### Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007-2008

ACSM country plan ahead of Global Plan; TB/HIV activities implemented at scale of Global Plan but some of these costs not part of NTP budget, which explains lower amounts for TB/HIV in the country report



#### NTP budget by line item, 2008

The largest components of the budget are DOTS (40%) and ACSM including community TB care



NTP funding gap by line item Large funding gap for ACSM; funding gap within DOTS component mainly for first-line drugs and routine programme management and supervision activities



#### Per patient costs, budgets and expenditures<sup>5</sup>

Budget per patient much higher since 2006 and available funding per patient much higher in 2007 and 2008 compared with previous years



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	2008		
(US\$ millions)	BUDGET	GAP	BUDGET	GAP	
DOTS expansion and enhancement	13	4.0	14	4.5	
TB/HIV, MDR-TB and other challenges	5.9	-1.5	9.1	1.7	
Health system strengthening	0	0	0	0	
Engage all care providers	0.3	0.01	0.3	0.01	
People with TB, and communities	8.2	6.9	8.6	7.3	
Research	0.4	0.3	0.1	0.02	
Other	1.9	1.2	1.8	1.0	
Financial indicators for TB					
Government contribution to NTP budget (including loans)	4.	3%	4	.7%	
Government contribution to total cost TB control (including loans)	10	%	10	%	
NTP budget funded	63	%	56	%	
Per capita health financial indicators (US\$)					
NTP budget per capita	0.	8	0	.9	
Total costs for TB control per capita	0.	9	1	.0	
Funding gap per capita	0.	3	0	.4	
Government health expenditure per capita (2004)			8.6		
Total health expenditure per capita (2004)		2	20		

#### SOURCES, METHODS AND ABBREVIATIONS

#### a-h Please see footnotes page 169

Incidence, prevalence and mortality estimates include patients infected with HIV. Estimates revised based on assessment of ss+ and ss- notifications and an assumption of improved case detection since 2000 following stabilization of HIV prevalence and expansion of NTP.

MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 133/100 000 pop and mortality 29/100 000 pop/yr.

For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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. Total TB control costs for 2002-2003 are based on available funding, whereas those for 2004-2006 are based on expenditure, and those for 2007-2008 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

NTP available funding for 2004-2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002-2003 and 2007-2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

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

# Mozambique

The national tuberculosis control programme is a priority programme of the Mozambique Ministry of Health. However, shortage of skilled human resources, and slow disbursement and absorption of funds continue to be obstacles to the progress of the NTP in Mozambique. While all districts are implementing DOTS, access to primary health care is poor, which may explain the low case detection rate, and high death rate among patients on treatment. Nonetheless, collaborative TB/HIV activities are now in place, and management of MDR-TB is being introduced, following WHO recommendations.

# SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	20	20 971			
Estimates of epidemiological burden <sup>1</sup>					
Incidence (all cases/100 000 pop/yr)			443		
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>			-1.4		
Incidence (ss+/100 000 pop/vr)		186			
Prevalence (all cases/100.000 non) <sup>2</sup>		624			
Mortality (deaths/100 000 non/yr) <sup>2</sup>			117		
Of new TB cases % HIV+b			.30		
Of new TB cases % MDR-TR (1999)			35		
Of previously treated TB cases, % MDR-TB (1999) <sup>c</sup>			3.3		
Surveillance and DOTS implementation					
Notification rate (new and relapse/100 000 pop/yr)			168		
Notification rate (new ss+/100 000 pop/yr)			87		
DOTS case detection rate (new ss+, %)			47		
DOTS treatment success (new ss+, 2005 cohort, %)			79		
Of new pulmonary cases notified under DOTS. % ss+			63		
Of new cases notified under DOTS, % extrapulmonary			15		
Of new ss+ cases notified under DOTS, % in women			_		
Of sub-national reports expected, % received at next re	eporting	level <sup>d</sup>	100		
Laboratory services <sup>3</sup>					
Number of laboratories performing smear microscopy			250		
Number of laboratories performing culture			1		
Number of laboratories performing DST			1		
Of laboratories performing smear microscopy, % cover	red by El	QA	4		
Management of MDR-TB					
Of new cases notified, % receiving DST at start of treat	ment		0.2		
Of new cases receiving DST at start of treatment, % MI	DR-TB		100		
Of re-treatment cases notified, % receiving DST			8.2		
Of re-treatment cases receiving DST, % MDR-TB			33		
Collaborative TB/HIV activities					
National policy of counselling and testing TB patients f	or HIV?		Yes		
		(to al	patients)		
National surveillance system for HIV-infection in TB pa	tients?		Yes		
Of TB patients (new and re-treatment) notified, % teste	d for HI\	/	24		
Of TB patients tested for HIV, % HIV+			70		
Of HIV+ TB patients detected, % receiving CPT			17		
Of HIV+ TB patients detected, % receiving ART					
DOTS expansion and enhancement	1995	1996	1997		
DOTS coverage (%)	97	100	84		
DOTS notification rate (new and relapse/100 000 non)	112	112	112		
DOTS notification rate (new ss+/100 000 pop)	66	64	66		
DOTS case detection rate (all new cases, %)	40	38	35		
DOTS case detection rate (new ss+, %)	57	52	50		
Case detection rate within DOTS areas (new ss+, %) $^{\rm e}$	59	52	59		
DOTS treatment success (new ss+ %)	30	54	67		

WHO Africa Region (AFR)

Rank based on estimated number of incident cases (all forms) in 2006



#### Case notifications

Gradual increase in notifications over past 5 years



# Unfavourable treatment outcomes, DOTS

Reported death rate continues to be high, but treatment success has increased since 2004 cohort



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	97	100	84	95	_	100	100	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	112	112	112	114	_	116	118	134	146	155	162	168
DOTS notification rate (new ss+/100 000 pop)	66	64	66	70	_	73	75	80	82	85	87	87
DOTS case detection rate (all new cases, %)	40	38	35	33	_	28	27	29	31	33	35	36
DOTS case detection rate (new ss+, %)	57	52	50	49	_	45	43	43	43	44	46	47
Case detection rate within DOTS areas (new ss+, %)e	59	52	59	52	_	45	43	43	43	44	46	47
DOTS treatment success (new ss+, %)	39	54	67	_	71	75	78	78	76	77	79	_
DOTS re-treatment success (ss+, %)	_	70	64	_	71	71	68	67	68	_	70	_

# MOZAMBIQUE

#### IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

# Political commitment, standardized treatment, and monitoring and evaluation system Achievements Planned activities

- Developed national strategy and training materials for introduction of community-based DOTS
- Published new manual on management of paediatric TB
- Produced annual report of NTP activities

#### Quality-assured bacteriology Achievements

- Commenced preparation for the DRS
- Conducted refresher laboratory training for 80 laboratory technicians in 4 out of 10 provinces
- Recruited 2 laboratory technicians and 2 biologists

#### Drug supply and management system Achievements

 Established quality control measures for non-GDF first-line anti-TB drugs

- Finalize the National Strategic Plan for TB Control 2008–2012
- Disseminate paediatric TB manual and begin implementation of recommendations, including training of doctors (to be continued in 2008)

# **Planned activities**

- Start drug resistance survey in February 2007, to be completed by April 2008
- Perform evaluation for renovation of reference laboratories in regional hospitals in Beira and Nampula
- · Conduct situation analysis for renovation of NRL in Maputo
- Recruit 2 additional biologists

# **Planned activities**

- Recruit pharmacist (part time) to support the NTP and to improve drug management
- Train staff in drug management and supervision
- Create technical working group (including WHO, National Drug Store and Regulatory Department of the MoH) to strengthen drug management by establishing buffer stocks at all levels, and revise TB manual to include use of FDCs and of rifampicin in the continuation phase of categories I and III regimens

#### TB/HIV, MDR-TB AND OTHER CHALLENGES

# **Collaborative TB/HIV activities**

#### Achievements

- Trained 22 TB supervisors/deputy supervisors in voluntary HIV counselling and testing for all TB patients, in CPT for TB/HIV patients and in referring these patients to public centres for access to ART
- Created a national TB/HIV task force including all TB, TB/HIV, MoH and partners supporting the TB control programme. Monthly meetings of the task force focus on planning, monitoring and evaluation, supervision, training and coordination of all TB/HIV activities. The task force was notably involved in drafting the round 7 grant proposal of the Global Fund and the finalizing the strategic plan
- Developed TB/HIV IEC materials and updated the TB/HIV module for clinicians
- Formulated a matrix to monitor HIV prevalence among TB patients
- Trained 237 TB health workers in all provinces including on HIV counselling and testing

### Diagnosis and treatment of multidrug-resistant TB Achievements

- Appointed a national MDR-TB focal point and 22 MDR-TB provincial focal points, following two training courses in management of MDR-TB
- Developed a national MDR-TB/XDR-TB operational plan
- Undertook two national MDR-TB training courses for 42 clinicians
- Initiated treatment for 70 MDR-TB patients
- Trained 42 clinicians (38 doctors and 4 medical technicians) in the management of MDR-TB patients

#### **Planned activities**

- In coordination with NAP, identify one TB/HIV coordinator for the NAP and one (full-time) for the NTP
- In collaboration with MoH, ensure inclusion of TB in NAP plan
- Expand implementation of regular TB screening and provision of IPT in HIV-positive people, to be expanded to all provinces in 2008
- Revise and update TB/HIV monitoring and evaluation forms

- Computerize data for ongoing DRS as well as laboratory data on MDR-TB/XDR-TB
- Conduct DRS and introduce new data collection system
- Continue training for clinicians and other health professionals in programmatic management of MDR-TB/XDR-TB
- Reinforce ongoing infection control measures by identifying more patient isolation wards at provincial level (at least 4 beds per provincial hospital) and distribute N95 respirators to all MDR-TB health facilities
- Apply to GLC for approval of projects planned for 2008–2009
- Train at least 100 health professionals (including doctors and nurses) in management of MDR-TB patients

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

#### High-risk groups and special situations Achievements

 Addressed TB control in situations of political unrest and following natural disasters

# **Planned activities**

- Disseminate new manual and train staff in management of paediatric TB
- Begin introduction of TB screening in national prison population and among other vulnerable groups

HEALTH SYSTEM	STRENGTHENING. INCLUDING HU	JMAN RESOURCE DEVELOPMEN

#### Achievements

- Distributed 45 microscopes to districts, to be used by other disease programmes including those for STIs, leprosy, malaria and HIV/AIDS
- Began renovation of the reference laboratory in the Beira provincial hospital; this laboratory serves the province and the central region not only for TB but also for diagnosis of other diseases
- Trained 11 medical coordinators responsible for malaria, HIV, STIs, leprosy and TB at provincial level (within framework designed to integrate services in order to maximize the use of the existing human resources)
- Trained 22 clinicians on infection control in 11 provincial hospitals

#### ENGAGING ALL CARE PROVIDERS

#### Achievements

• Conducted situation analysis for PPM

#### EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- All districts carried out ACSM activities
- Updated the leaflet on 10 causal factors for TB
- Produced ACSM materials on DOTS and on TB/HIV and distributed these to all levels
- Appointed an assistant (nurse) to support the central unit in ACSM

#### Community participation in TB care Achievements

- Performed a baseline assessment (during supervisory visits) on the existing conditions to reinforce community involvement
- Shared experiences with various NGOs in order to develop national strategy on community activities
- Developed the community-based DOTS strategy, with clear description of roles of volunteers, traditional healers and other stakeholders, and produced a variety of materials including the manual on community-based DOTS for health workers, the TB/HIV manual for community volunteers and the TB/HIV manual for family members of patients and others

#### **Patients' Charter**

#### **Achievements**

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### Achievements

None reported

#### **Planned activities**

- Further integrate training on TB control into general health system
- Purchase new microscopes for use by all programmes (TB, HIV, malaria, leprosy)
- With the support of NGOs, send two biologists for training (microbiology, bacteriology and other laboratory related areas) in Brazil
- Purchase 800 bicycles for use by community volunteers who, in addition to participating in community-based DOTS, work on leprosy, malaria and HIV/AIDS related activities

#### **Planned activities**

 Revise/update agreement on national policy for provision of TB services (diagnostics, treatment, etc.) with the private sector

#### **Planned activities**

- Produce a small integrated manual on health education and test it at provincial level in coordination with IEC department
- Make preparations for KAP study to be done in 2008
- Mobilize media (radio and TV) to disseminate information, educate population and raise awareness about TB on World TB Day and other occasions
- Identify IEC indicators and start collecting this information, which will be useful for improving programme performance and also for the KAP study to be done in 2008

#### **Planned activities**

- Introduce DOTS in the community followed by "training of trainers" for the 22 TB provincial supervisors/deputy supervisors and for members of NGOs
- Extract lessons learnt from the Manica project on the referral of suspects from traditional healers and expand it to other provinces

# **Planned activities**

None reported

- Carry out national DRS
- Conduct clinical trial on therapeutic efficacy and clinical safety of the nevirapine versus the standard efavirenz-based ART in HIV-positive TB patients
- Perform rapid survey of XDR-TB among confirmed MDR-TB cases in collaboration with WHO in 2008

#### NTP budget by source of funding

NTP has developed plan and budget for 2008-2012 covering all elements of the Stop TB Strategy and that is in line with Global Plan targets; funding needs and funding gaps have been reassessed: budget requirements now higher than in previous years and increased funding from successful application to Global Fund in round 7



#### NTP budget by line item

Re-assessment of needs in line with the Stop TB Strategy in 2008; "Other" includes patient support and international technical assistance



Total TB control costs by line item<sup>4</sup> Hospitalization costs 2006–2008 based on revised estimate of 2258 dedicated TB beds in the country; outpatient costs based on 90 visits to a health facility per new TB patient during treatment



#### Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007-2008

DOTS component similar in country report and Global Plan; country plan for TB/HIV component in 2008 reflects activities to be conducted by NAP as well as the NTP



#### NTP budget by line item, 2008

The largest components of the budget are DOTS (42%) and collaborative TB/HIV activities (32%); the TB/HIV budget includes costs of activities funded via the NAP



#### NTP funding gap by line item

Funding gap within DOTS mainly for routine programme management and supervision activities in 2007; funding gap within "Other" in 2008 is mainly for patient support



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increased budget and cost per patient as TB control activities are broadened in line with the Stop TB Strategy



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	08
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strengthening Engage all care providers People with TB, and communities Research Other	11 0.1 0.02 0.02 0.1 0.1 0.1	2.3 0.1 0.02 0.02 0.1 0.1 0.1	8.9 7.1 0.02 0.02 0.7 0.2 1.8	0.5 0.1 0.02 0.01 0.02 0.1 1.5
Financial indicators for TB Government contribution to NTP budget (including loans) Government contribution to total cost of TB control (including loans NTP budget funded	209 () 459 789	% %	11 32 88	% % %
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita Government health expenditure per capita (2004) Total health expenditure per capita (2004)	0. 0. 0.	6 8 1	0 1 0 8.4 2	.9 2 1

## SOURCES, METHODS AND ABBREVIATIONS

Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimate originally based on assumption of 70% ss+ case detection rate in 1997 (DOTS and non-DOTS). Trend in incidence estimated from 3-year moving average of notifications from those countries in region judged to be detecting an unchanging proportion of cases.
- MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 298/100 000 pop and mortality 36/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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.
- Total TB control costs for 2003-2005 are based on expenditure, whereas those for 2006 are based on available funding, and those for 2007-2008 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.
- NTP available funding for 2004–2005 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2006–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

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

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# Myanmar

Each year since 1999 the NTP of Myanmar has detected more TB cases, with improving treatment success rates since 2003. High notification rates, coupled with preliminary results of a disease prevalence survey in Yangon, suggest that the burden of TB is probably higher than currently estimated. Slightly less than half of the 2006 TB control budget was funded, and funding gaps for 2007 and 2008 are larger still. The absence of a secure supply of first-line drugs poses a serious threat to the work of the NTP, the possible consequences of which include increasing drug resistance and loss of public confidence in TB control services.

# SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	48 379
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	171
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	0.0
Incidence (ss+/100 000 pop/yr)	76
Prevalence (all cases/100 000 pop) <sup>2</sup>	169
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	13
Of new TB cases, % HIV+ <sup>b</sup>	2.6
Of new TB cases, % MDR-TB (2003)°	4.0
Of previously treated TB cases, % MDR-TB (2003)°	16
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	253
Notification rate (new ss+/100 000 pop/yr)	83
DOTS case detection rate (new ss+, %)	109
DOTS treatment success (new ss+, 2005 cohort, %)	85
Of new pulmonary cases notified under DOTS, % ss+	48
Of new cases notified under DOTS, % extrapulmonary	29
Of new ss+ cases notified under DOTS, % in women	34
Of sub-national reports expected, % received at next reporting	g level <sup>d</sup> 94
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	391
Number of laboratories performing culture	2
Number of laboratories performing DST	1
Of laboratories performing smear microscopy, % covered by E	EQA 13
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	9.4
Of re-treatment cases receiving DST, % MDR-TB	77
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes (to all natients)
National surveillance system for HIV-infection in TB natients?	Yes
Of TR natients (new and re-treatment) notified % tested for HI	V 2
Of TB patients tested for HIV % HIV $_{\pm}$	24
Of HIV+ TB nations detected % receiving CPT	76
Of HIV: TB patients detected, % receiving ABT	10
or network of patients detected, // receiving Ann	44
DOTS expansion and enhancement 1995	1996 1997
DOTS coverage (%) –	59 60
DOTS notification rate (new and relapse/100 000 pop) –	46 36
DOTS notification rate (new ss+/100 000 pop) –	20 20
DOTS case detection rate (all new cases %)	2/ 10

# WHO South-East Asia Region (SEAR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notifications continue to increase, suggesting that incidence may be higher than currently estimated



#### Unfavourable treatment outcomes, DOTS

Treatment success target achieved for first time with 2005 cohort



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	59	60	60	64	77	84	88	95	95	95	95
DOTS notification rate (new and relapse/100 000 pop	) –	46	36	33	43	67	89	122	161	203	223	253
DOTS notification rate (new ss+/100 000 pop)	_	20	20	22	25	38	45	52	58	66	76	83
DOTS case detection rate (all new cases, %)	_	24	19	17	23	36	48	67	88	113	125	142
DOTS case detection rate (new ss+, %)	_	26	27	29	33	49	58	68	76	86	100	109
Case detection rate within DOTS areas (new ss+, %)e	_	45	44	49	52	64	70	77	80	91	105	115
DOTS treatment success (new ss+, %)	66	79	82	82	81	82	81	81	81	84	85	_
DOTS re-treatment success (ss+, %)	64	78	74	76	71	74	74	75	70	74	73	_

## MYANMAR

#### IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

# Political commitment, standardized treatment, and monitoring and evaluation system Achievements Planned activities

- Published national guidelines on management of paediatric TB and clinical pocket manual on paediatric TB
- Intensified supervision, monitoring and evaluation at all levels through increased funding for these activities
- Conducted quarterly evaluation meetings at township level
- Hosted 2-yearly external review in January 2007
- Produced 14th annual report of activities of NTP

#### Quality-assured bacteriology Achievements

- Drafted guidelines on EQA for AFB microscopy
- Established sputum collection points in 10 sites in Ayeyarwaddy, Mandalay, Sagaing and Yangon divisions

#### Drug supply and management system Achievements

- Published SOPs for management of drugs and supplies
- Trained health-care staff on pre-packed patient kits; introduced these kits in 38 townships
- Received GDF approval of 3-year grant for first-line anti-TB drugs, including paediatric formulations

#### TB/HIV, MDR-TB AND OTHER CHALLENGES

# **Collaborative TB/HIV activities**

#### Achievements

- Implemented collaborative TV/HIV activities in 7 townships in 2005 and 2006; 11 in 2007
- Introduced provider-initiated HIV counselling and testing in 3 TB clinics
- Included TB patients as subgroup for HIV sentinel surveillance by NAP; 150 TB patients tested from each of 10 sites

#### Diagnosis and treatment of multidrug-resistant TB Achievements

- Successfully applied to GLC for second-line anti-TB drugs for start up of MDR-TB programme (NTP/MSF-Holland)
- Received approval for national framework for management of drug-resistant TB

#### High-risk groups and special situations Achievements

- Conducted TB prevention and control activities among cross-border populations in 16 townships along the Myanmar–Thai border; activities included case-finding, DOT, cross-referral, exchange of information and health education activities
- Provided, through township TB centres, TB diagnosis and treatment for prisoners
- Provided food to patients receiving community-based home care (severely ill patients)

- Conduct training course on management of TB for health facility staff in all states/divisions
- Continue supervision, monitoring and quarterly evaluation meetings with support from Three Diseases Fund

#### **Planned activities**

- Expand culture and DST at Mandalay laboratory
- Gradually expand EQA system from Yangon and Mandalay divisions to other states/divisions
- Decentralize sputum microscopy centres to station hospital units, and arrange sputum collection points for rural health centres, particularly in townships with where case-finding is low

#### **Planned activities**

- Proactively mobilize resources to ensure first-line anti-TB drug supply beyond GDF support in 2008
- Develop monitoring system on drug management at all levels to ensure uninterrupted supply and stocks
- Train all health staff on SOPs for management of drugs and supplies
- Improve infrastructure and civil works for better storage of drugs
- NTP to cover all costs associated with distribution of drugs and consumables to townships, including transport of staff where necessary

#### **Planned activities**

- Develop national guidelines and training materials on TB/HIV
- Pilot test provision of IPT to HIV-positive people
- Scale up collaborative TB/HIV activities, beginning with counselling and testing, and CPT at TB clinics, followed by ART
- Strengthen joint monitoring, supervision and evaluation of collaborative TB/HIV activities

# **Planned activities**

- Study patterns of susceptibility to first- and second-line anti-TB drugs in Category II failures in order to determine most appropriate regimen for treatment of MDR-TB
- Develop MDR-TB training materials and implement training in Yangon and Mandalay divisions
- Launch GLC-approved MDR-TB management programmes in Yangon and Mandalay divisions; 75 patients to be treated in 2008

# **Planned activities**

• Conduct KAP survey and DRS in border townships, in coordination with the TB cluster in Thailand

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

# MYANMAR

#### HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

#### Achievements

- Involved broad range of partners from health and other sectors in planning for TB control
- In townships where no NTP laboratory exists, trained laboratory technicians in general laboratories of township hospitals to perform smear microscopy
- Distributed binocular microscopes to townships
- Trained basic health staff on TB control management
- Equipped X-ray facilities in 13 state/divisional TB centres
- Conducted training-of-trainers courses on TB management: "Management of TB at district level" and "Management of TB for health facility staff"
- Provided training-of-trainers courses for central, state and divisional staff on data management and analysis
- Drafted training manuals for diagnosis and treatment of TB, collaborative TB/HIV activities and management of MDR-TB
- Began partial implementation of PAL in 4 teaching hospitals in Yangon

# ENGAGING ALL CARE PROVIDERS

# Achievements

- Scaled up PPM activities to 81 townships
- Established Central Coordinating Committee for PPM with all partners
- Drafted PPM guidelines and training modules
- Initiated public-public mix with 4 major hospitals in Yangon Division
- Held annual evaluation workshop on public-private and public-public mix initiatives

# EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- Carried out ACSM activities in 176 out of 325 townships
- Organized World TB Day commemoration activities and health talks at health centres for general public
- Broadcast TB messages using TV spots

#### Community participation in TB care Achievements

- Community members participated in TB care in 311 out of 325 townships
- Developed guide for community supporters (treatment observers)
- Implemented community-based Fidelis project "Reaching the unreached" in hilly regions of Sagaing Division
- Advocated for TB control to local authorities, leading to the organization of over 7000 health education sessions

# **Patients' Charter**

# Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMEN

# Achievements

- Carried out prevalence of disease survey in Yangon Division and pilot tested survey in Mandalay Division
- Included KAP questionnaires in Yangon and Mandalay TB prevalence surveys
- Conducted 2nd DRS
- Screened factory workers for TB in Yangon, Mandalay and Magway divisions
- Conducted study on involvement of general practitioners in TB control

### **Planned activities**

- Use 3 Disease Fund to address general health system weaknesses. Activities to include: capital investments to strengthen infrastructure, communication and transportation; establishment of mobile teams for outreach in remote areas; planning, budgeting and management training for township medical officers to improve management of public health interventions across TB, HIV, malaria and other programmes; strengthening Myanmar Medical Association supervision capacity at central level and establishment of divisionallevel public health coordinator from Myanmar Medical Association
- Decentralize TB control activities from townships to station hospital units and rural health centres
- Establish health centre in Kayah State
- Continue training of basic health-care staff

#### **Planned activities**

- Evaluate and scale up public—public mix activities
- Conduct national workshop on ISTC and initiate implementation
- Standardize PPM recording and reporting practices to include casefinding and treatment outcome data from different providers
- Jointly supervise, with Myanmar Medical Association, PPM activities

# **Planned activities**

- Identify and develop messages and targeted materials
- Develop ACSM strategy and activities

# Planned activities

- Strengthen collaboration with local NGOs
- Scale up advocacy to local authorities, teachers and religious leaders
- Evaluate Fidelis project for replication in other states/divisions with
- funding from 3DF
- Develop policy on volunteer involvement in TB control
- Encourage TB patients to get involved in TB control
- Form a network of people living with TB

# **Planned activities**

None reported

- Conduct national TB prevalence survey
- Carry out national KAP survey
- Conduct DRS at Myanmar–Thailand border area
- Study provision of IPT to HIV-positive people at pilot site for collaborative TB/HIV activities
- Carry out operational research on IPT for children aged under 4 years
- Investigate factors associated with non-compliance among new pulmonary TB patients

#### NTP budget by source of funding

Funding situation critical in Myanmar: most of budget requirements not funded



#### NTP budget by line item

Decreased budget in 2008 mainly because buffer stock of first-line drugs included in 2007 budget; increased budget for MDR-TB



#### Total TB control costs by line item<sup>4</sup>

Hospitalization costs are for 1500 dedicated TB beds; costs for clinic visits based on 28 outpatient clinic visits during TB treatment for 2002-2005 and 3 visits for 2006-2008, which reflects more reliance on community-based DOT



#### Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007-2008

DOTS component lower in Global Plan because projections of patients to be treated lower than country forecasts; targets for MDR-TB patients to be treated in Global MDR/XDR Response Plan much higher than scaling-up planned by NTP



#### NTP budget by line item, 2008

Of the total NTP budget, 80% is for component 1 of the Stop TB Strategy (DOTS expansion and enhancement)



#### NTP funding gap by line item

70% of first-line drugs budget unfunded in 2007-2008; funding gaps mainly for DOTS and initiatives to increase case detection



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increased expenditures per patient since 2002, indicating good absorption capacity; high first-line drugs budget per patient 2006-2007 reflects planned purchase of buffer stock



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	08	
(US\$ millions)	BUDGET	GAP	BUDGET	GAP	
DOTS expansion and enhancement	14	11	11	7.7	
TB/HIV, MDR-TB and other challenges	1.0	0.8	1.0	0.6	
Health system strengthening	0	0	0	0	
Engage all care providers	0.05	0.03	0.05	0.02	
People with TB, and communities	0.7	0.7	1.0	1.0	
Research	0.4	0.3	0.3	0.3	
Other	0.4	0.3	0.4	0.3	
Financial indicators for TB					
Government contribution to NTP budget (including loans)	5.	9%	7	.4%	
Government contribution to total cost of TB control (including loans	s) 15	%	18%		
NTP budget funded	19	%	27%		
Per capita health financial indicators (US\$)					
NTP budget per capita	0.	.3	0	.3	
Total costs for TB control per capita	0.	.4	0	.3	
Funding gap per capita	0.	.3	0	.2	
Government health expenditure per capita (2004)			0.6		
Total health expenditure per capita (2004)			4.5		

#### SOURCES, METHODS AND ABBREVIATIONS

#### Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Estimates of burden based on prevalence surveys carried out up to 1994. Incidence rate assumed to be constant in absence of contrary
- widence, but estimated prevalence and mortality rates declining with growing proportion of cases treated. MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DDTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 411/100 000 pop and mortality 50/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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. 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. To 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.
- NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data; and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

# Nigeria

As DOTS has become available to an increasing proportion of the population, the case notification rate in Nigeria has increased. However, the case detection rate, even within DOTS areas, is still well below target. A planned prevalence survey, combined with increasingly well managed routinely collected surveillance data, will help determine more precisely how many people with TB go untreated in Nigeria. Treatment outcomes in Nigeria are typical of countries in Africa: many patients die while on treatment or are reported as having defaulted (the latter may include patients who have actually died). The planned expansion of activities targeted at HIV-positive TB patients is likely to lead to improved treatment outcomes, if the necessary funds can be raised. Large funding gaps exist, and there have been delays in the release of funding.

#### SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	144 720
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	311
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-1.3
Incidence (ss+/100 000 pop/yr)	137
Prevalence (all cases/100 000 pop) <sup>2</sup>	616
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	81
Of new TB cases, % HIV+ <sup>b</sup>	9.6
Of new TB cases, % MDR-TB <sup>c</sup>	1.9
Of previously treated TB cases, % MDR-TB $^{\circ}$	9.3
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	49
Notification rate (new ss+/100 000 pop/yr)	28
DOTS case detection rate (new ss+, %)	20
DOTS treatment success (new ss+, 2005 cohort, %)	75
Of new pulmonary cases notified under DOTS, % ss+	61
Of new cases notified under DOTS, % extrapulmonary	4
Of new ss+ cases notified under DOTS, % in women	40
Of sub-national reports expected, % received at next reporting le	vel <sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	694
Number of laboratories performing culture	0
Number of laboratories performing DST	0
Of laboratories performing smear microscopy, % covered by EQA	60
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	_
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	-
Of re-treatment cases receiving DST, % MDR-TB	_
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
	(to all patients)
National surveillance system for HIV-infection in TB patients?	Yes
Of TB patients (new and re-treatment) notified, % tested for HIV	10
Of TB patients tested for HIV, % HIV+	21

Of HIV+ TB patients detected, % receiving CPT

Of HIV+ TB patients detected, % receiving ART

#### WHO Africa Region (AFR)





#### **Case notifications**

Notifications continue to increase alongside expanding DOTS coverage



#### Unfavourable treatment outcomes, DOTS

Treatment success rate remains below the target; increase in reported deaths may be result of improved reporting; default rate continues to be high



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	47	30	40	45	45	47	55	55	60	65	65	75
DOTS notification rate (new and relapse/100 000 pop	) 12	13	14	17	20	21	23	23	33	41	44	49
DOTS notification rate (new ss+/100 000 pop)	8.7	9.5	9.8	11	13	14	15	15	21	24	25	28
DOTS case detection rate (all new cases, %)	6.5	8.3	6.5	7.1	7.5	7.5	7.8	7.1	10	13	14	15
DOTS case detection rate (new ss+, %)	11	11	10	11	12	12	12	11	15	17	18	20
Case detection rate within DOTS areas (new ss+, %)e	22	36	26	24	27	25	21	20	25	27	27	27
DOTS treatment success (new ss+, %)	49	32	73	73	75	79	79	79	78	73	75	_
DOTS re-treatment success (ss+, %)	-	71	-	_	74	71	71	73	-	73	-	-

#### IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> DOTS EXPANSION AND ENHANCEMENT

<ul> <li>Political commitment, standardized treatment, and monitoring Achievements</li> <li>Adopted DOTS in 102 additional local government areas (LGAs) in 17 states (2 health facilities per LGA), bringing the total number of DOTS LGAs to 701</li> <li>Provided 50 additional motorcycles to states to strengthen supervision and defaulter tracing at LGA level</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Expand DOTS to cover all 774 LGAs (100%) and TB/HIV activities to 50 additional LGAs within the country in 2008</li> </ul>
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Expanded AFB diagnostic services to 102 additional LGAs</li> <li>Identified 2 national and 6 zonal reference laboratories</li> </ul>	<ul> <li>Planned activities</li> <li>Equip 2 NRL and 6 zonal reference laboratories</li> <li>NRL to supervise activities of zonal reference laboratories, which in turn will provide EQA of peripheral laboratories</li> <li>Supranational laboratory in South Africa to provide EQA for DST in NRL</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Computerized central medical store at Oshodi and developed quarterly maintenance system</li> <li>Identified 6 zonal drug stores</li> <li>Deployed 2 pharmacists and a logistician to NTP from federal MoH</li> </ul>	<ul> <li>Planned activities</li> <li>Equip 6 zonal drug stores</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Set up functional TB/HIV working groups at national level and in 6 states (Adamawa, Benue, Ebonyi, Rivers, Sokoto and Ogun)</li> <li>Trained 72 general health workers (GHWs) from 36 DOTS centres on HIV counselling, 36 microscopy staff on HIV testing and 108 staff (from 6 ART centres, 36 DOTS centres and 6 community support groups) on the implementation of collaborative TB/HIV activities</li> <li>Produced national strategic framework for implementation of collaborative TB/HIV activities</li> <li>Commenced HIV counselling and testing for TB suspects and patients</li> <li>Trained 44 LGA health educators in TB and collaborative TB/HIV activities</li> <li>Trained 25 GHWs from ART facilities to diagnose and treat TB in line with NTP guidelines</li> <li>Trained 120 GHWs from 30 additional DOTS centres in 6 states to implement collaborative TB/HIV activities</li> </ul>	<ul> <li>Planned activities</li> <li>Expand collaborative TB/HIV activities to 6 additional states and ensure continuous functioning of collaborative activities at national level and in 6 states already implementing them</li> <li>Train DOTS providers from additional 36 DOTS centres as HIV counsellors</li> <li>Begin offering IPT in selected health facilities</li> </ul>
Diagnosis and treatment of multidrug-resistant TB	

### **Achievements**

- Established national MDR-TB committee to support MoH in coordinating MDR-TB activities in Nigeria, planning for DRS, finalizing and distributing guidelines for management of MDR-TB, and establishing national and zonal reference laboratories
- Developed draft national guidelines for management of MDR-TB
- Identified 2 national and 6 zonal reference laboratories

#### High-risk groups and special situations **Achievements**

- Introduced DOTS in 26 military and 7 prisons hospitals; trained 116 health-care staff in these hospitals
- Established DOTS centre within refugee camp in Oru, Ogun State

# **Planned activities**

• Finalize and distribute national guidelines for management of MDR-TB

#### **Planned activities**

• Train 90 GHWs from prisons service and armed forces to provide DOTS services

ities to

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

#### HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

#### Achievements

- Reviewed curricula of nursing schools, health technology schools and medical colleges to include current TB control strategies
- Planning for TB control involved sector-wide and inter-sectoral collaboration

#### ENGAGING ALL CARE PROVIDERS

#### Achievements

- Implemented formal PPM activities in 54 of 774 LGAs
- Completed situation analyses and advocacy visits on PPM in 6 states
- Developed national guidelines on PPM activities
- Trained private-for-profit providers in 6 states
- Trained 578 GHWs from 202 private health-care facilities, including mission hospitals, in diagnosis and treatment of TB in line with NTP quidelines

#### EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- Implemented ACSM strategy at state and national levels
- Aired jingles on TB control on radio and television at national and state levels
- Developed advocacy kits on TB/HIV
- Organized advocacy visits to policy-makers at state and national levels
- Celebrated World TB Day
- Established functional advocacy committees at state and LGA levels
- Engaged 50 civil society organizations in social mobilization
- Trained 25 journalists on TB/HIV reporting
- Provided sensitization and orientation training on TB and TB/HIV for 2403 community and religious leaders and 2113 youth leaders

# **Community participation in TB care**

#### Achievements

- Carried out situation analysis and advocacy visits on community participation in TB care in 6 states (Adamawa, Benue, Delta, Ebonyi, Kebbi and Ogun)
- Identified 24 communities in 12 LGAs for implementation of community-based TB care
- Trained members of 6 HIV community support groups from 6 states (Adamawa, Benue, Ebonyi, Ogun, Rivers and Sokoto) in referral and treatment support for HIV-positive TB patients
- Developed national guidelines for community participation in TB care
- Held national consensus meetings on community involvement in TB
  - care

# **Patients' Charter**

### Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMEN

#### Achievements

- Drafted protocol for national prevalence of disease survey
- Drafted protocol for survey of prevalence of HIV among TB patients for use during 2008 national survey among ANC attendees and high-risk groups

#### **Planned activities**

- Renovate and computerize central medical store
- Equip 38 computers with accessories to strengthen monitoring and evaluation and health information management system at state level

# **Planned activities**

- Expand PPM activities to 15 private health-care facilities per state in 12 states
- Train staff from private for-profit health providers on DOTS implementation
- Promote use of ISTC among private-for-profit health-care providers in TB control
- Set up national PPM steering committee

#### **Planned activities**

- Broadcast TB and TB/HIV messages and documentaries on TV and radio
- Organize community mobilization activities at LGA level

### **Planned activities**

- Involve treatment supporters and community volunteers in 15 states in providing treatment support, identification of suspects, community education and social mobilization
- Develop national training curriculum for community volunteers and treatment supporters

#### **Planned activities**

Adopt Patients' Charter, with input from all stakeholders

#### **Planned activities**

- Conduct national DRS
- Carry out national infection survey and prevalence of disease survey
- Conduct operational research in 5 states on programme-related issues, including health-seeking behaviour of people with TB

ity involvement in TB

#### NTP budget by source of funding

Substantial increase in budget requirement for 2008 compared with previous years, with large funding gap



#### NTP budget by line item

Increased budget for DOTS mainly for laboratory supplies and equipment, reflecting planned DOTS expansion; large investments for TB/HIV and ACSM from 2006 onwards, and for MDR-TB in 2008



#### Total TB control costs by line item<sup>4</sup>

Hospitalization costs assume 20% of new ss+ patients and 30% of new ss-/ extrapulmonary patients are hospitalized for an average of 56 days (2005–2008); larger costs in 2008 due to large increase in expected number of patients to be treated



#### Comparison of country report and Global Plan:9 total TB control costs, 2007-2008

Budget for DOTS component higher in country plan compared with Global Plan, because of higher expected number of patients to be treated; targets for MDR-TB patients to be treated in Global MDR/XDR Response Plan much higher than scaling up planned by NTP



#### NTP budget by line item, 2008

The largest components of the budget are DOTS (46%) and ACSM/CTBC (22%)



#### NTP funding gap by line item

Big increase in funding gap for 2008 compared with previous years; funding gap within DOTS component mainly for laboratory supplies and equipment



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increased expenditures per patient; available funding similar to expenditures reflecting good absorption capacity



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	80
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges	14 4.6	2.6 3.2	23 13.6	9.5 12.4
Health system strengthening Engage all care providers	0.2 1.6	0.2 0.9	0.3 1.4	0.3 0.7
People with TB, and communities Research	6.0 2.0	0.5 1.3	11 0.3	6.5 0.3
Other	0	0	0	0
Financial indicators for TB				
Sovernment contribution to NTP budget (including loans) Sovernment contribution to total cost of TB control (including loans NTP budget funded	20° 3) 45° 69°	% % %	12 46 39	% % %
Per capita health financial indicators (US\$) NTP budget per capita	0.	2	0	.4
Total costs for TB control per capita Funding gap per capita	0. 0.	3 1	0 0	.6 .2
Government health expenditure per capita (2004) Total health expenditure per capita (2004)		:	7.0 23	

#### SOURCES, METHODS AND ABBREVIATIONS

Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimate originally based on assumption of 10% ss+ case detection rate in 1997 (DOTS and non-DOTS). Trend in incidence estimated from 3-year moving average of notifications from those countries in region judged to be detecting an unchanging proportion of cases.
- MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 279/100 000 pop and mortality 32/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+TB, as well as DST for re-treatment and failure cases, there should be at least one culture facility and one DST facility in each of the 37 states. Total TB control casts of costs of costs and hospitalization are WHO estimates based on based on expenditure, whereas those for 2007–2008 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. 4
- NTP available funding for 2004-2006 is based on the amount of funding actually received, using retrospective data; available funding for 2003 and 2007-2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.

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

# Pakistan

Case notifications have continued to increase in Pakistan, where full DOTS coverage was reached in 2005. It is likely that initiatives to involve private practitioners, along with the use of community volunteers to identify and refer TB suspects, and increased efforts to inform the general public about TB, have all contributed to this improvement in case-finding. The proportion of patients defaulting has decreased steadily over the past 8 years, bringing the treatment success rate close to the target of 85%. The number of districts where laboratories are subject to external quality did not increase from 2005 to 2006, but plans are under way to increase coverage in 2007. In Pakistan, as in several other high-burden countries, lack of technical expertise in MDR-TB and TB/HIV is identified as one of the challenges in broadening the activities of the NTP beyond basic DOTS.

#### SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup> 1	60 943
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	181
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	0.0
Incidence (ss+/100 000 pop/yr)	82
Prevalence (all cases/100 000 pop) <sup>2</sup>	263
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	34
Of new TB cases, % HIV+ <sup>b</sup>	0.3
Of new TB cases, % MDR-TB <sup>c</sup>	3.4
Of previously treated TB cases, % $MDR\text{-}TB^c$	36
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	110
Notification rate (new ss+/100 000 pop/yr)	41
DOTS case detection rate (new ss+, %)	50
DOTS treatment success (new ss+, 2005 cohort, %)	83
Of new pulmonary cases notified under DOTS, % ss+	44
Of new cases notified under DOTS, % extrapulmonary	15
Of new ss+ cases notified under DOTS, % in women	48
Of sub-national reports expected, % received at next reporting level	<sup>1</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	982
Number of laboratories performing culture	3
Number of laboratories performing DST	1
Of laboratories performing smear microscopy, % covered by EQA	32
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	-
Of re-treatment cases receiving DST, % MDR-TB	-
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	No policy
National surveillance system for HIV-infection in TB patients?	No
Of TB patients (new and re-treatment) notified, % tested for HIV	-
Of TB patients tested for HIV, % HIV+	-

Of HIV+ TB patients detected	, % receiving CPT

Of HIV+ TB patients detected, % receiving ART

#### WHO Eastern Mediterranean Region (EMR) Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notifications continue to increase even after reaching 100% DOTS coverage in 2005



#### Unfavourable treatment outcomes, DOTS

Treatment success remains below global target largely because of default rate that is still nearly 10%, though declining



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	2.0	8.0	_	8.0	8.0	9.0	24	44	66	79	100	100
DOTS notification rate (new and relapse/100 000 pop	) 2.8	3.3	_	6.9	3.3	7.7	12	32	46	61	90	110
DOTS notification rate (new ss+/100 000 pop)	0.8	1.4	-	3.0	1.6	2.3	4.3	10	14	20	31	41
DOTS case detection rate (all new cases, %)	1.5	1.8	_	3.6	1.7	4.1	6.3	17	25	33	49	59
DOTS case detection rate (new ss+, %)	1.0	1.7	_	3.7	2.0	2.8	5.2	13	17	25	38	50
Case detection rate within DOTS areas (new ss+, %)e	51	22	-	46	25	31	22	29	26	32	38	50
DOTS treatment success (new ss+, %)	70	-	67	66	70	75	77	78	79	82	83	-
DOTS re-treatment success (ss+, %)	70	_	57	92	75	54	_	76	65	78	76	_

# PAKISTAN

# IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

<ul> <li>Political commitment, standardized treatment, and monitoring Achievements</li> <li>Strengthened monitoring and supervision system through quarterly surveillance meetings and appointment of national programme officers</li> <li>Trained staff in data management and analysis</li> <li>Initiated web-based reporting for laboratories, including EQA data (district-level data for 40 districts entered on-line at provincial reference laboratories)</li> <li>Published annual report of NTP activities</li> <li>Analysed subnational data</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Revise national guidelines to bring them in line with the Stop TB Strategy</li> <li>Continue strengthening managerial capacities of staff at provincial and district levels</li> <li>Strengthen collaboration and coordination capacities with partners involved in TB control</li> <li>Closely monitor implementation of action plans of federal and provincial governments, WHO/JRM workplan and Global Fund round 6 activities workplan</li> <li>Develop technical capacities at provincial level to ensure appropriate and relevant analysis of routinely collected data</li> </ul>
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Implemented EQA in 40 out of 134 districts, covering 318 diagnostic centres and a population of 48 million people</li> <li>Established intermediate-level laboratories in above-mentioned 40 districts</li> <li>Initiated web-based reporting for laboratories, including EQA data (district-level data for 40 districts entered on-line at provincial reference laboratories)</li> </ul>	<ul> <li>Planned activities</li> <li>Expand EQA sputum smear microscopy to an additional 40 districts</li> <li>Strengthen and build technical capacity of reference laboratories for standardized culture and DST</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Carried out drug management study in selected districts of Punjab and North-West Frontier Province</li> <li>Introduced patient-wise boxes in one district of Punjab</li> <li>Held coordination meeting on development of national guidelines for drug management</li> </ul>	<ul> <li>Planned activities</li> <li>Prepare procurement plan for anti-TB drugs</li> <li>Develop national policy and national guidelines for drug management</li> <li>Train provincial TB control programme managers, district TB coordinators, provincial staff responsible for drug management, and storekeepers at district and provincial levels in drug management in line with national guidelines</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>None mentioned, but both NTP and NAP had person responsible for collaborative TB/HIV activities</li> </ul>	<ul> <li>Planned activities</li> <li>Launch activities outlined in Global Fund round 6 grant</li> <li>Establish steering committee for collaborative TB/HIV activities</li> <li>Develop national guidelines on collaborative TB/HIV activities and conduct training on their implementation</li> <li>Establish sentinel surveillance for HIV infection among TB patients</li> <li>Begin implementation of collaborative TB/HIV activities</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB</li> <li>Achievements</li> <li>Established 3 laboratories with capacity for culture and DST</li> <li>Provided culture and DST services to patients failing Category II treatment</li> </ul>	<ul> <li>Planned activities</li> <li>Establish national steering committee for DST</li> <li>Develop guidelines for management of drug-resistant TB</li> <li>Develop guidelines for culture and DST</li> <li>Establish routine monitoring system for chronic TB cases and analyse data collected through this system</li> <li>Implement management of MDR-TB on pilot scale (200 patients per year)</li> </ul>
<ul> <li>High-risk groups and special situations</li> <li>Achievements</li> <li>Provided TB control in earthquake-affected areas</li> </ul>	<ul> <li>Planned activities</li> <li>Adapt and develop strategy to make TB control services accessible to populations living in poor neighbourhoods of big cities</li> <li>Collaborate and coordinate with NGOs and NTP of Afghanistan in order to provide TB control services to refugees</li> </ul>

<sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

# PAKISTAN

#### HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

#### Achievements

- Involved broad range of partners from health and other sectors in planning for TB control
- Rehabilitated health services in earthquake-affected areas
- Scaled up PPM initiatives, creating linkages between private and public health sectors

# ENGAGING ALL CARE PROVIDERS

### Achievements

- Appointed full-time focal person for PPM activities
- Conducted situation analysis and pilot projects on PPM
- Established formal PPM activities in 50 of 134 districts
- Developed guidelines on TB management for medical practitioners working outside public health clinics
- Included tertiary care hospitals in Lahore and Karachi in PPM activities, resulting in increased case-finding
- NTP represented by NGOs in several PPM initiatives
- Continued the GreenstarTB control franchise (branded as "Goodlife") involving private practitioners in 5 major urban areas

# EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- Implemented ACSM activities in 57 of 134 districts targeting general public, TB suspects and patients, health-care providers, and policy-makers and planners
- Communicated messages about TB control using television, radio and print media
- Initiated social mobilization activities through NGOs, religious groups, local media and community health workers
- Promoted advocacy efforts at provincial and district levels

#### Community participation in TB care Achievements

- Involved community health workers, including "lady health workers", in identifying and referring TB suspects and in patient support in 79 of 134 districts
- Provided community-based treatment support through NGOs in 20 districts
- Generated mass public awareness through community events organized by NGOs

# **Patients' Charter**

## Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

# RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### Achievements

- Conducted KAP survey
- · Carried out study on gender disparity among TB suspects
- Conducted cross-sectional survey of HIV prevalence among TB patients diagnosed
- Completed research project to identify ways of collaboration between NTP and NAP and identify challenges in implementation
- Completed research project to assess acceptability of HIV diagnostic testing in TB patients
- Supported attendance of 2 participants from Pakistan in scientific writing skills workshop organized by WHO office for the Eastern Mediterranean Region to develop manuscripts originating from completed operational research projects
- Submitted 2 proposals for possible funding

#### **Planned activities**

- Strengthen human resource capacities for more effective implementation of Stop TB strategy
- Strengthen training capacities at provincial and district levels

# **Planned activities**

- Develop operational plan for implementing and scaling up PPM activities
- Document PPM experiences in country
- Develop national operational guidelines for PPM
- Expand PPM activities in line with operational plan

#### **Planned activities**

- Strengthen ACSM strategy and NTP, provincial TB control programmes and partner capacity to carry out evidence-based ACSM activities
- Continue using mass media, including television, radio and print, to create TB awareness
- Pursue social mobilization and district level advocacy through NGOs, local media, religious groups and community health workers in 57 districts

# **Planned activities**

- Mobilize community-based NGOs to refer TB suspects to health facilities in 55 districts
- Maintain community events organized by NGOs
- Continue training community health workers and involving them in identification and referral of TB suspects to health facilities

# **Planned activities**

- Adapt and translate Charter into national and local languages
- Display Charter at NTP, provincial TB control programme and district health management offices
- Promote Charter through NTP activities, provincial TB programmes and partner NGOs

- Evaluate extent of underreporting by non-NTP providers
- Participate in or hold workshops on research methods, proposal development and scientific writing
- Track respiratory patients entitled for TB assessment in PHC settings
- Conduct prevalence of TB infection and disease surveys
#### NTP budget by source of funding

Increased funding from the government, showing increased political commitment for TB control, and from the Global Fund 2007-2008 after successful Round 6 application



#### NTP budget by line item

Large increase in budget for DOTS in 2007, especially for first-line drugs, recruitment of additional staff and additional supervision activities



#### Total TB control costs by line item<sup>4</sup>

Lower use of hospitalization as DOTS expands; hospitalization costs based on estimate that 12-36% (2002-2005) and 3% (2006-2008) of new TB patients are hospitalized for an average of 45 days (2002-2008)



#### Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007-2008

Costs based on country report lower than anticipated by Global Plan, even though expected number of patients to be treated is higher in country report; Global Plan allows budget for DOTS to increase in line with expected number of patients



#### NTP budget by line item, 2008

Of the total budget, 75% is for DOTS implementation



#### NTP funding gap by line item

Funding gap within DOTS mainly for first-line drugs: 80% of first-line drug budget not funded in 2007 and 50% of first-line drug budget not funded in 2008



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increasing expenditures per patient, suggesting improvement in absorption capacity; large budget for first-line drugs per patient in 2007



## NTP budget and funding gap by Stop TB Strategy component

	20	07	2008			
(US\$ millions)	BUDGET	GAP	BUDGET	GAP		
DOTS expansion and enhancement	24	10	18	6.4		
Health system strengthening	0.0	0	0	0		
Engage all care providers People with TB, and communities	2.0 1.5	0.1 0.4	2.2 1.5	0.4 0.4		
Research Other	0.2 0.7	0.1 0.2	0.7 0.7	0.5 0.7		
Financial indicators for TB						
Government contribution to NTP budget (including loans) Government contribution to total cost of TB control (including loans NTP budget funded	31 38 62	% % %	41% 48% 66%			
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita	0. 0. 0.	0 0 0	.1 .2 .5			
Government health expenditure per capita (2004) Total health expenditure per capita (2004)			2.7 14			

### SOURCES, METHODS AND ABBREVIATIONS

#### Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Estimates of TB burden based on 1987–1988 prevalence survey and on notifications in DOTS areas in 1996. Incidence rate assumed to
- be constant in absence of contrary evidence, but estimated prevalence and mortality rates declining with growing proportion of cases treated. MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 428/100 000 pop and mortality 49/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+TB, as well as DST for re-treatment and failure cases, there should be at least one culture facility and one DST facility in each of the 7 provinces.
- Total TB control costs for 2002-2006 are based on expenditure, whereas those for 2007-2008 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.
- NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

# Philippines

Case notification rates continue to increase in the Philippines as PPM initiatives are expanded and community task forces become involved in case-finding. The quality of treatment continues to improve; the success rate for new smear-positive cases has been above target for the past 7 years. EQA has been extended to all diagnostic facilities, and culture is becoming more widely available. Management of MDR-TB is expanding, much of it with GLC approval. The diagnosis and treatment of TB in children was an important focus for the NTP in 2006; at least one city in each region was equipped in 2006 to manage paediatric TB. A national prevalence survey was completed in 2007, the results of which will help inform estimates of the burden of TB in the Philippines. The introduction of an electronic TB register may result in improvements in the quality of routine data, which can then be better used to monitor programme performance and impact. However, the NTP has no specific plans to perform special analyses of routinely collected data.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	86	5264
Estimates of epidemiological burden <sup>1</sup>		
Incidence (all cases/100 000 pop/yr)		287
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>		-1.0
Incidence (ss+/100 000 pop/yr)		129
Prevalence (all cases/100 000 pop) <sup>2</sup>		432
Mortality (deaths/100 000 pop/yr) <sup>2</sup>		45
Of new TB cases, % HIV+ <sup>b</sup>		0.1
Of new TB cases, % MDR-TB (2004)°		4.0
Of previously treated TB cases, % MDR-TB (2004) <sup>c</sup>		21
Surveillance and DOTS implementation		
Notification rate (new and relapse/100 000 pop/yr)		171
Notification rate (new ss+/100 000 pop/yr)		99
DOTS case detection rate (new ss+, %)		77
DOTS treatment success (new ss+, 2005 cohort, %)		89
Of new pulmonary cases notified under DOTS, % ss+		61
Of new cases notified under DOTS, % extrapulmonary		1
Of new ss+ cases notified under DOTS, % in women		31
Of sub-national reports expected, % received at next reporting levels	veld	94
Laboratory services <sup>3</sup>		
Number of laboratories performing smear microscopy		2 374
Number of laboratories performing culture		3
Number of laboratories performing DST		3
Of laboratories performing smear microscopy, % covered by EQA		100
Management of MDR-TB		
Of new cases notified, % receiving DST at start of treatment		0.0
Of new cases receiving DST at start of treatment, % MDR-TB		58
Of re-treatment cases notified, % receiving DST		8.4
Of re-treatment cases receiving DST, % MDR-TB		91
Collaborative TB/HIV activities		
National policy of counselling and testing TB patients for HIV?		No policy
National surveillance system for HIV-infection in TB patients?		No
Of TB patients (new and re-treatment) notified, % tested for HIV		-
Of TB patients tested for HIV, % HIV+		_
Of HIV+ TB patients detected, % receiving CPT		-
Of HIV+ TB patients detected, % receiving ART		-
DOTS expansion and enhancement 1995	1996	1997
DOTC	0.0	40



#### **Case notifications**

Notifications, particularly ss-, fell dramatically in the late 1990s, but are now fairly stable; proportion of new pulmonary cases that are ss+ has risen to about 60%



#### **Unfavourable treatment outcomes, DOTS**

Outcomes not evaluated for all patients in last two years, but treatment success remains above  $85\%\ target$ 



□ Not evaluated □ Transferred □ Defaulted ■ Failed □ Died □ Target <15%

DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	4.3	2.0	15	17	43	90	95	98	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	1.4	2.5	10	25	43	118	138	149	164	158	162	17
DOTS notification rate (new ss+/100 000 pop)	0.6	0.7	4.5	14	27	66	76	82	90	94	97	99
DOTS case detection rate (all new cases, %)	0.4	0.8	3.2	7.7	13	39	43	48	54	52	54	58
DOTS case detection rate (new ss+, %)	0.4	0.5	3.2	10	20	48	56	61	67	72	74	77
Case detection rate within DOTS areas (new ss+, %)e	9.7	23	21	60	46	53	59	62	67	72	74	77
DOTS treatment success (new ss+, %)	_	82	83	84	87	88	88	88	88	87	89	-
DOTS re-treatment success (ss+, %)	_	66	26	83	_	_	_	_	76	53	-	-

## PHILIPPINES

IMPLEMENTING THE STOP TB STRATEGY	1
DOTS EXPANSION AND ENHANCEMENT	

<ul> <li>Political commitment, standardized treatment, and monitoring a Achievements</li> <li>Introduced management of paediatric TB in one city in each region; trained NTP coordinators who in turn trained health-care staff; Department of Health provided paediatric anti-TB drugs, PPD reagents and syringes</li> <li>Revised NTP manual (4th edition) to include new initiatives; conducted orientation and training of doctors and nurses at all levels on 4th edition of manual</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Continue training health personnel at all levels on 4th edition of NTP manual</li> <li>Regularly monitor and evaluate NTP initiatives at regional and local levels through NTP coordinators and partners</li> <li>Pilot test electronic TB register</li> </ul>
<ul> <li>Contracted external consultant to conduct evaluation of national monitoring and evaluation and information systems for TB, malaria and HIV</li> <li>Produced annual report of NTP activities</li> </ul>	
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Completed nationwide expansion of EQA (including capacity building and logistics); results of EQA not available</li> </ul>	<ul> <li>Planned activities</li> <li>Conduct regular monitoring of laboratory activities</li> <li>Build capacity for culture needed for programmatic management of MDR-TB</li> <li>Strengthen culture capacities of public laboratories identified to collaborate with NTP</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Ensured uninterrupted supply of first-line anti-TB drugs to regional and peripheral levels</li> </ul>	<ul> <li>Planned activities</li> <li>Integrate management of second-line anti-TB drugs with Department of Health's drug distribution system to avoid stocks-outs of second-line drugs as experienced in 2006</li> <li>Monitor drug supply and distribution at regional level</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Set up TB/HIV coordination committee with formal endorsement of Secretary of Health; held meetings to discuss roles and function of committee (NTP managers, NAP managers, NGOs and partners of both NTP and NAP invited)</li> </ul>	<ul> <li>Planned activities</li> <li>Formulate policies on collaborative TB/HIV activities</li> <li>Implement provider-initiated HIV counselling and testing for TB patients in selected areas in Metro Manila after training relevant health staff</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB Achievements</li> <li>Expanded management of MDR-TB services to Lung Centre of the Philippines (public facility)</li> <li>Decentralized treatment of MDR-TB to health centres</li> <li>GLC evaluated management of MDR-TB at Lung Centre of the Philippines and at Makati Medical Center</li> </ul>	<ul> <li>Planned activities</li> <li>Train health personnel and develop modules to standardize and mainstream implementation of programmatic management of MDR-TB</li> <li>Formulate policy for programmatic management of MDR-TB and incorporate management of MDR-TB fully into routine activities of NTP</li> <li>Prepare those public health facilities that will be participating in management of MDR-TB; train staff and equip additional laboratories for culture and DST</li> </ul>

Achievements

- Worked with medical staff of National Bilibid and Women's Correctional prisons, and with Bureau of Corrections
- Coordinated with faith-based NGOs and other government organizations to implement TB control in selected urban areas with poor populations

## **Planned activities**

• Explore possibility of introducing management of MDR-TB in prisons

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## PHILIPPINES

## HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMEN

## Achievements

- Involved broad range of partners from health and other sectors in planning for TB control
- Aligned NTP plan and budget with national plan for health development, poverty reduction strategy paper, medium-term framework for health and SWAp
- Completed planning of Comprehensive and Unified policy on TB Control (CUP) for other government bodies (including departments of education and of labour)

## ENGAGING ALL CARE PROVIDERS

## Achievements

- Increased number of formal PPM projects from 48 in 2005 to 149 in 2006, in coordination with Philippine Coalition Against Tuberculosis (PhilCAT) and with support from Global Fund
- Initiated sustainability planning of project-supported PPM sites through PhilCAT
- Conducted DOTS training for staff of non-NTP health facilities participating in PPM activities

## EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- Commemorated World TB Day and National Lung Month
- Conducted ACSM training for selected NTP coordinators and partners
- Completed evaluation of social mobilization strategies in World Vision implementation sites

## **Community participation in TB care**

### Achievements

 Organized community task forces in 268 municipalities (those supported by World Vision); trained task forces in TB control; included contribution of task forces to case-finding in evaluation of task forces

## **Patients' Charter**

## Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

## RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

## Achievements

 Completed preliminary planning and preparation for 2007 national TB prevalence survey

## **Planned activities**

• Hire additional staff for central office of NTP through Global Fund

## **Planned activities**

- Establish additional PPM initiatives with support from Global Fund
- Conduct central and regional planning for sustainability of PPM projects
- Conduct joint monitoring and evaluation activities at regional level
- Support certification of NTP and non-NTP facilities providing TB diagnosis and treatment by regional certifier team in all regions

## **Planned activities**

- Develop and finalize NTP ACSM handbook
- Formulate national and regional ACSM plans

## **Planned activities**

- Involve communities in the observance of World TB Day and National Lung Month events
- Organize additional community task forces
- Conduct refresher courses for community task forces

## **Planned activities**

- Incorporate Patients' Charter in DOTS training for health workers
- Promote Patients Charter through advocacy events such as National Lung Month

## **Planned activities**

- Conduct national TB prevalence survey
- Conduct operational research on supply chain of anti-TB drugs
- Conduct TB KAP survey of communities, patients and health workers in collaboration with World Vision and University of the Philippines
- Conduct operational research on identification of clinical, radiographic and socio-demographic characteristics of smearnegative X-ray-positive TB

#### NTP budget by source of funding

Substantial increase in funding from the Global Fund 2007-2008; stable funding needs



#### NTP budget by line item

Increased funding needs for MDR-TB and ACSM; NTP expects to treat 340 MDR-TB patients in 2008 (double the number treated in 2007)



#### Total TB control costs by line item<sup>4</sup>

Cost of clinic visits based on  $12\bar{0}$  visits per new ss+ patient during treatment and 24 visits per new ss-/extrapulmonary patient



## Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007–2008

Country report for DOTS and PPM/PAL/ACSM/CTBC ahead of Global Plan; NTP plan for MDR-TB was well-aligned with Global Plan before revision of Global Plan in mid-2007, but targets included in Global MDR/XDR Response Plan are more ambitious



#### NTP budget by line item, 2008

Largest components of budget are DOTS (49%) and MDR-TB (24%)



#### NTP funding gap by line item

Persistent funding gaps for management of MDR-TB since 2005; funding gap for DOTS mainly for dedicated NTP staff



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increasing costs and budget per patient; lowest expenditure per patient in 2006



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	08
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strengthening Engage all care providers People with TB, and communities Research Other	10 2.1 0 3.8 1.2 1.6 0.2	0.9 0.8 0 0.1 0.3 0.1	9.0 4.6 0 2.1 2.1 0.3 0.2	0.9 0.6 0 0.1 0.3 0.1
Financial indicators for TB Government contribution to NTP budget (including loans) Government contribution to total cost TB control (including loans) VTP budget funded	439 649 899	% % %	45 64 89	% %
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita Government health expenditure per capita (2004) Total health expenditure per capita (2004)	0. 0. 0.	2 3 002	0 0 0 14 36	.2 .3 .002

## SOURCES, METHODS AND ABBREVIATIONS

<sup>a-h</sup> Please see footnotes page 169.

- <sup>1</sup> Incidence, prevalence and mortality estimates include patients infected with HIV. Estimates of TB burden based on 1997 prevalence survey. Incidence assumed to be declining at 1% per year as in other countries in WPR.
- <sup>2</sup> MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 819/100 000 pop and mortality 80/100 000 pop/yr.
- <sup>3</sup> For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+TB, as well as DST for re-treatment and failure cases, there should ideally be at least one culture facility and one DST facility in each province.
- <sup>4</sup> Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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.
- 5 NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

# **Russian Federation**

Despite a high nominal DOTS coverage in the Russian Federation, the case detection rate under DOTS remains low, particularly for smear-positive cases. Death, defaulting and treatment failure contribute almost equally to the very low treatment success rate. Plans to provide second-line treatment to 24 000 MDR-TB patients in 2007 and in 2008 (up from 4000 in 2006) are not yet fully funded. In order to implement these plans, the NTP will need to train the appropriate staff, ensure a high-quality laboratory service and a secure supply of second-line drugs. If successfully implemented, they will make a significant contribution to improving the welfare of people with TB in the Russian Federation and in reducing the further spread of MDR-TB.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	143 221
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	107
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	0.7
Incidence (ss+/100 000 pop/yr)	48
Prevalence (all cases/100 000 pop) <sup>2</sup>	125
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	17
Of new TB cases, % HIV+ <sup>b</sup>	3.8
Of new TB cases, % MDR-TB <sup>c</sup>	13
Of previously treated TB cases, % MDR-TB <sup>c</sup>	49
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	87
Notification rate (new ss+/100 000 pop/yr)	23
DOTS case detection rate (new ss+, %)	44
DOTS treatment success (new ss+, 2005 cohort, %)	58
Of new pulmonary cases notified under DOTS, % ss+	35
Of new cases notified under DOTS, % extrapulmonary	10
Of new ss+ cases notified, % in women (DOTS and non-DOTS)	26
Of sub-national reports expected, % received at next reporting lev	rel <sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	4 953
Number of laboratories performing culture	978
Number of laboratories performing DST	302
Of laboratories performing smear microscopy, % covered by EQA	20
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	20
Of new cases receiving DST at start of treatment, % MDR-TB	11
Of re-treatment cases notified, % receiving DST	20
Of re-treatment cases receiving DST, % MDR-TB	23
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
	(to all patients)
National surveillance system for HIV-infection in TB patients?	Yes
Of TB patients (new and re-treatment) notified, % tested for HIV	57
Of TB patients tested for HIV, % HIV+	2.3
Of HIV+ TB patients detected, % receiving CPT	-
Of HIV+ TB patients detected, % receiving ART	-

WHO European Region (EUR)

Rank based on estimated number of incident cases (all forms) in 2006



## **Case notifications**

Very high proportion of ss- notifications among new cases suggests under-use of microscopy for diagnosis; high and variable proportion of re-treatment cases



#### **Unfavourable treatment outcomes, DOTS**

Death, treatment failure and default rates all continue to be high and contribute to low treatment success rate



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	2.3	2.3	5.0	5.0	12	16	25	25	45	83	84
DOTS notification rate (new and relapse/100 000 pop)	-	0.6	1.2	1.2	2.6	7.7	9.9	12	14	24	57	72
DOTS notification rate (new ss+/100 000 pop)	-	0.2	0.4	0.5	0.9	2.5	2.8	3.5	4.4	6.9	16	21
DOTS case detection rate (all new cases, %)	-	0.7	1.2	1.1	2.3	6.4	8.3	11	13	21	50	63
DOTS case detection rate (new ss+, %)	-	0.5	1.0	1.0	1.8	4.9	5.6	7.4	9.3	15	33	44
Case detection rate within DOTS areas (new ss+, %)e	_	21	45	20	36	41	35	29	37	32	40	53
DOTS treatment success (new ss+, %)	65	62	67	68	65	68	67	67	61	59	58	-
DOTS re-treatment success (ss+, %)	58	64	_	49	45	49	48	46	45	34	31	_

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## IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> DOTS EXPANSION AND ENHANCEMENT

#### Political commitment, standardized treatment, and monitoring and evaluation system **Achievements Planned activities**

- Ensured adequate supply of TB diagnostic equipment (microscopes, X-ray including mobile equipment disposables)
- Provided social support for TB patients in 80 out of 86 regions to improve treatment adherence, including provision of food parcels, psychological advice and legal support through Red Cross and/or regional TB services
- Produced annual report of NTP activities

## Quality-assured bacteriology

## **Achievements**

- Provided free-of-charge diagnosis through network of 4953 smear microscopy units, 978 culture units and 302 DST units
- Supplied equipment and consumables to microscopy points and bacteriological laboratories to improve access to and quality of laboratory diagnostics, culture, identification and DST for TB diagnosis and treatment control
- Trained 345 laboratory staff trainers at federal level to provide training in their regions on microscopy and bacteriological diagnostics
- Implemented EQA in 998 laboratories (data on performance not available)

## Drug supply and management system

## **Achievements**

- Established 6-month buffer stock for first-line anti-TB drugs at all regional TB facilities
- Trained TB managers in rational management of anti-TB drugs

## TB/HIV, MDR-TB AND OTHER CHALLENGES

## **Collaborative TB/HIV activities**

## **Achievements**

- Established TB/HIV Coordination Board within the Ministry of Health and Social Development
- Increased TB and HIV detection through new guidelines, improved TB/HIV recording/reporting system and appointed TB/HIV coordinators
- Implemented policy of testing all new TB patients for HIV
- Initiated development of TB/HIV prevention and treatment strategies
- Expanded system for specialized medical care for TB/HIV patients and improved access to treatment
- Established TB/HIV surveillance system
- Established and equipped TB/HIV counselling and testing units
- Trained 4116 TB and HIV staff in collaborative TB/HIV activities

### Diagnosis and treatment of multidrug-resistant TB **Achievements**

- Procured second-line drugs for all 86 regions and 5 federal TB research institutes
- Trained 452 regional TB specialists on management of MDR-TB
- Began selective DRS in 11 sites
- Introduced quality control for DST
- Secured GLC approval of projects in 13 regions to treat a total of 4546 MDR-TB patients
- Applied to GLC for projects in 9 regions and 2 research TB institutes to treat a total of 1782 MDR-TB patients

## High-risk groups and special situations **Achievements**

- Initiated TB case-finding among high-risk groups (household contacts, migrants, homeless, prisoners and HIV patients)
- Introduced infection control measures for hospitals and outpatient clinics
- Implemented quality control measures for DST in prison laboratories
- Started selective DRS in 11 sites in prisons

- Develop national plan for TB control to reach MDGs
- Improve TB case detection through PHC services by improved training in TB detection and treatment, development of IEC material and monetary incentives for health workers and TB patients
- Increase the number of regions offering social support to TB patients, and improve the support offered in order to increase adherence to TB treatment

## **Planned activities**

- Continue EQA for microscopy and culture
- Purchase consumables for 2700 existing microscopy centres

## **Planned activities**

- Ensure regular supply of anti-TB drugs for civil and prison TB services
- Conduct quality control for anti-TB drugs procured
- Support development of new anti-TB drugs and vaccines

## **Planned activities**

- Continue working towards improving accuracy of diagnosis and of reporting of HIV in TB patients
- Finalize development of TB/HIV treatment and prevention strategies
- Continue social rehabilitation and introduce psychological rehabilitation
- Improve TB case-finding among HIV patients
- Further strengthen TB/HIV surveillance system
- Continue training on clinical and managerial aspects TB/HIV
- Maintain coordination between TB and HIV control services

## **Planned activities**

- Ensure adequate supply of second-line drugs, equipment and consumables for MDR-TB management
- Set up reporting and recording system for MDR-TB
- Start new MDR-TB management projects approved by GLC
- Set up drug resistance surveillance system
- Expand and strengthen quality control system for DST
- Establish 5 centres of excellence for MDR-TB management in civilian TB services

## **Planned activities**

- Continue TB case-finding among high-risk groups
- Establish 8 centres of excellence on MDR-TB management in prisons
- Increase stock of first-line anti-TB drugs in prisons
- Initiate treatment for at least 400 MDR-TB patients within the Global Fund TB control project in prisons

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

## **Achievements**

- Involved broad range of partners from health and other sectors in planning for TB control
- Developed guidelines and training materials on TB control for PHC workers
- Involved PHC services in TB control at municipal level
- Trained 2146 TB and PHC staff in TB control in general management
- Trained master trainers in TB management and on TB for PHC and laboratory diagnosis

## ENGAGING ALL CARE PROVIDERS

## Achievements

- Conducted situation analysis for TB projects supported by non-profit organizations; initiated new pilot projects; developed guidelines and scaled up PPM
- Secured endorsement of ISTC by professional organizations
- Involved NGOs and social services in TB control to support TB patients
- Improved collaboration with Ministry of Justice and Ministry of Defence for TB control

## EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

## Advocacy, communication and social mobilization Achievements

- Implemented ACSM activities in all 386 basic TB service units
- Provided general public with information on TB control
- Organized educational, media and advocacy campaign on TB control countrywide to commemorate World TB Day
- Organized contests and training for media on TB

## Community participation in TB care

#### Achievements

- Involved communities in TB control in 91 out of 386 TB service units
- Conducted activities with TB patients, their relatives and other people affected through system of "TB schools" that provide health education and psychological support
- Involved communities in organizing national anti-TB day

## **Patients' Charter**

#### **Achievements**

• Translated Patients' Charter into Russian

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREME

## Achievements

- Initiated 14 operational research projects
- Completed studies on social status of patients, MTB typing, TB mortality and new surgical methods for treatment of extrapulmonary TB

#### **Planned activities**

- Perform assessment/mapping of available human resources within TB services, their distribution, qualifications and duties
- Develop human resources development plan for TB control which will be linked to a sector-wide HRD plan
- Identify monetary and other incentives and motivators to attract medical doctors to work for TB control
- Further increase role of PHC in TB control
- Revise postgraduate and graduate curricula in line with revised national TB control strategy

## **Planned activities**

 Involve non-profit organizations in TB case-finding, treatment observation and defaulter tracing

## **Planned activities**

- Continue TB education for general public
- Evaluate population awareness of TB and assess priority sources of information
- Engage media in TB education and advocacy through contests for journalists, training and roundtable meetings on TB
- Organize educational and media/advocacy campaigns on TB

## **Planned activities**

- Continue organizing activities with relatives of TB patients
- Involve communities in organizing events for World TB Day such as competitions for children, educational campaigns by volunteers, NGOs and former TB patients

## **Planned activities**

Introduce and endorse the Patient's Charter

## **Planned activities**

 60 studies planned, with a focus on epidemiology, high-risk groups, social rehabilitation, psycho-socio rehabilitation and medical rehabilitation

#### NTP budget by source of funding

Substantial increase in funding needs in 2007 and 2008; while funding from the government has grown, large funding gaps remain



#### NTP budget by line item

Large increase in funding needs for MDR-TB 2007-2008, to cover treatment for 24 000 MDR-TB patients in each year; cost per MDR-TB patient for second-line drugs US\$ 11 000



#### Total TB control costs by line item<sup>4</sup>

Hospitalization costs are for about 80 000 dedicated TB beds



#### Comparison of country report and Global Plan:9 total TB control costs, 2007-2008

Cost of country report far exceeds costs estimated in Global Plan; targets for MDR-TB patients to be treated in country report, as well as costs, similar to those in Global MDR/ XDR Response Plan



## NTP budget by line item, 2008

The largest share of the budget is for dedicated NTP staff and MDR-TB



#### NTP funding gap by line item

Persistent and large funding gaps for second-line drugs since 2004



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increasing cost, budget and expenditure per patient, highest costs and budget among all HBCs; increasing budget for first-line drugs per patient



#### NTP budget and funding gap by Stop TB Strategy component

	20	107	20	80
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strengthening Engage all care providers People with TB, and communities Research Other	383 269 1.0 2.0 10 5.0 51	6.4 122 0.7 1.5 7.4 2.1 32	384 269 1.0 2.0 10 5.0 51	0.8 112 0.7 1.4 6.9 1.7 30
Financial indicators for TB Government contribution to NTP budget (including loans) Government contribution to total cost of TB control (including loans NTP budget funded	72 ) 75 76	% %	74 77 79	% %
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita Government health expenditure per capita (2004) Total health expenditure per capita (2004)	5 5 1	.1 .7 .2 15 24	5 5 1 50 15	.1 .7 .1

#### SOURCES, METHODS AND ABBREVIATIONS

#### a-h Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimates based on the assumption that 78% of cases (new and relapse) were detected in 1995 (DOTS and non-DOTS) Moving average of notification rate (new and relapse) DOTS and non-DOTS or black as tend in incidence. MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce
- incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 82/100 000 pop and mortality 10/100 000 pop/yr. For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+TB, as well as DST for re-treatment and failure cases, there should be at least one culture facility and one DST facility in each of the 88 oblasts and equivalent administrative regions. Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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
- NTP available funding for 2004-2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002-2003 and 2007-2008 is based on prospectively reported budget data and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

# South Africa

Treatment success rates in South Africa remain low, with death and default the most frequent negative outcomes. Case notification rates continue to increase; a reassessment of the incidence estimate, based on registered deaths, suggests that the 70% case detection rate target was reached for the first time in 2006. Activities related to HIV/TB and MDR-TB are being scaled up, but in 2006 only one third of TB patients were tested for HIV, and information about the number tested for MDR is not available to the NTP. A dramatic increase in funding is expected for 2007 and 2008, principally for investment in infrastructure associated with MDR-TB and XDR-TB.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	48 282
Estimates of enidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/vr)	940
Trend in incidence rate $(\%/yr, 2005-2006)^2$	1.6
Incidence (ss+/100 000 pop/yr)	382
Prevalence (all cases/100 000 pop) <sup>2</sup>	998
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	218
Of new TB cases, % HIV+ <sup>b</sup>	44
Of new TB cases, % MDR-TB (2002)°	1.8
Of previously treated TB cases, % MDR-TB (2002)^c	6.7
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	628
Notification rate (new ss+/100 000 pop/yr)	272
DOTS case detection rate (new ss+, %)	71
DOTS treatment success (new ss+, 2005 cohort, %)	71
Of new pulmonary cases notified under DOTS, % ss+	58
Of new cases notified under DOTS, % extrapulmonary	18
Of new ss+ cases notified under DOTS, % in women	45
Of sub-national reports expected, % received at next reporting leve	l <sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	143
Number of laboratories performing culture	13
Number of laboratories performing DST	8
Of laboratories performing smear microscopy, % covered by EQA	100
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	-
Of re-treatment cases receiving DST, % MDR-TB	_
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
(t	o all patients)
National surveillance system for HIV-infection in TB patients?	No
Of TB patients (new and re-treatment) notified, % tested for HIV	32
Of TB patients tested for HIV, % HIV+	53
Ut HIV+ IB patients detected, % receiving CP1	98
UI TIV+ IB PALIETIS DELECTED, % FECEIVING AKT	40
<b>DUIS expansion and enhancement</b> 1995 19	196 1997
DOTS coverage (%) – (0 DOTS notification rate (new and relapse/100 000 pop) – -	0.0 13 - 15

WHO Africa Region (AFR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notifications continue to rise; relapse and re-treatment cases comprise about 20% of total notifications



## Unfavourable treatment outcomes, DOTS

Treatment outcomes gradually improving; default still main barrier to reaching the target for treatment success



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	0.0	13	22	66	77	77	98	100	93	94	100
DOTS notification rate (new and relapse/100 000 pop)	_	-	15	50	202	193	263	456	483	543	543	628
DOTS notification rate (new ss+/100 000 pop)	_	-	9.6	37	122	137	156	210	247	254	250	272
DOTS case detection rate (all new cases, %)	_	0.0	3.7	11	38	34	36	52	52	54	52	60
DOTS case detection rate (new ss+, %)	—	-	6.3	22	61	58	56	66	71	70	67	71
Case detection rate within DOTS areas (new ss+, %)e	_	-	49	99	93	75	72	67	72	75	71	71
DOTS treatment success (new ss+, %)	_	69	73	74	60	66	65	68	67	70	71	-
DOTS re-treatment success (ss+, %)	_	67	68	71	47	52	53	53	52	56	58	-

## SOUTH AFRICA

IMPLEMENTING THE STOP TB STRATEGY <sup>1</sup>	
DOTS EXPANSION AND ENHANCEMENT	
<ul> <li>Political commitment, standardized treatment, and monitoring Achievements</li> <li>Revised TB data reporting and recording registers to include information on collaborative TB/HIV activities, and piloted use of revised registers</li> <li>Trained health-care workers on infection control</li> </ul>	<ul> <li>and evaluation system</li> <li>Planned activities</li> <li>Implement the TB strategic plan for 2007–2011</li> <li>Continue to train health-care workers on TB infection control</li> <li>Implement revised TB data reporting and recording registers in all 9 provinces</li> <li>Revise national TB control guidelines to include, among other things, recent recommendations on diagnosis of smear-negative and extrapulmonary TB</li> <li>Develop guidelines for paediatric TB in collaboration with the subgroup of the Stop TB Partnership</li> </ul>
<ul> <li>Quality-assured bacteriology Achievements</li> <li>Increased capacity for second-line DST</li> <li>Expanded the number of sputum smear examinations performed</li> <li>Included Kwazulu-Natal TB laboratory in the national health laboratory system (NHLS)</li> <li>Established NRL</li> </ul>	<ul> <li>Planned activities</li> <li>Strengthen the EQA programme for first- and second-line DST</li> <li>Establish re-checking for microscopy across the country</li> <li>Provide DST for first-line drugs in a total of 9 laboratories, and for second-line drugs in a total 5 laboratories</li> <li>Move from a sample-based to a patient-based MDR-TB recording and reporting system to improve reporting of numbers of cases of MDR-TB and XDR-TB and cross-checking between laboratory and health-facility registers</li> </ul>
Drug supply and management system Achievements None reported	<ul> <li>Planned activities</li> <li>Train workers in health facilities in management of drug stocks</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Strengthened integration of HIV/AIDS, STI and TB services at sub-district and facility levels through training</li> <li>Improved reporting and recording of TB/HIV activities through the implementation of the revised TB registers</li> </ul>	<ul> <li>Planned activities</li> <li>Ensure that routine screening for TB among HIV patients is included as policy for NAP</li> <li>Initiate reporting on collaborative TB/HIV activities</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB Achievements</li> <li>9 doctors trained in Latvia on clinical management of drug-resistant TB</li> </ul>	<ul> <li>Planned activities</li> <li>Develop training material on MDR-TB and infection control</li> <li>Continue collaboration with WHO on training doctors and nurses in MDR-TB and XDR-TB</li> <li>Strengthen collaboration between MDR-TB units and laboratories for better follow-up of MDR-TB patients once discharged</li> <li>Revise guidelines for management of MDR-TB and XDR-TB</li> <li>Develop national guidelines on infection control for implementation in all health-care facilities</li> <li>Conduct a rapid assessment for infection control in 11 MDR-TB units</li> <li>Establish drug-resistance surveillance system</li> </ul>

## High-risk groups and special situations Achievements

• Focused work on TB control in prison populations, among migratory workers

## **Planned activities**

• Provide special incentives to TB patients, such as food and transport to health facilities

## SOUTH AFRICA

	ADUENT
<ul> <li>Achievements</li> <li>Planning for TB control involved sector-wide and inter-sectoral collaboration</li> <li>Expanded PAL (PALSA) activities in Western Cape and Free State provinces</li> <li>Updated PALSA guidelines</li> </ul>	<ul> <li>Planned activities</li> <li>Monitor implementation of infection control in all health-care facilities</li> <li>Expand PALSA activities to additional provinces</li> </ul>
ENGAGING ALL CARE PROVIDERS	
<ul> <li>Achievements</li> <li>Conducted training specifically for non-NTP health-care providers with particular emphasis on the mining sector</li> </ul>	<ul> <li>Planned activities</li> <li>Improve reporting of all TB cases from the mining sector to the NTP and harmonize referral between mining health facilities and NTP facilities</li> </ul>
EMPOWERING PEOPLE WITH TB, AND COMMUNITIES	
<ul> <li>Advocacy, communication and social mobilization</li> <li>Achievements</li> <li>Implemented ACSM activities in all 53 districts</li> <li>Engaged political and traditional structures</li> <li>Advocated for additional human and financial resources for TB</li> </ul>	<ul> <li>Planned activities</li> <li>Develop a national ACSM strategic plan</li> <li>Improve human resource capacity and ACSM at national level (1 ACSM unit) and at provincial level (1 dedicated ACSM staff member per province)</li> </ul>
<ul> <li>Community participation in TB care Achievements</li> <li>Involved communities in all 53 districts in TB control; provided care for TB patients, and counselling and patient education</li> <li>Included poverty alleviation as part of the long-term planning of Stop TB activities</li> </ul>	<ul> <li>Planned activities</li> <li>Target advocacy campaign for patient education and counselling</li> <li>Increase community awareness about TB through targeted communication campaigns in particular around World TB Day</li> </ul>
<ul> <li>Patients' Charter</li> <li>Achievements</li> <li>The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.</li> <li>Disseminated a general patients' charter (not TB-specific) in health facilities</li> </ul>	<ul> <li>Planned activities</li> <li>NTP to support dissemination of general patients' charter</li> </ul>
RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT	
Achievements <ul> <li>None reported</li> </ul>	<ul> <li>Planned activities</li> <li>Pilot PPM initiative with the private medical sector</li> </ul>

- Conduct a demonstration project on rapid MDR-TB tests FIND project (results available in 2008)
- Conduct a rapid assessment of XDR-TB in all MDR-TB units and TB hospitals (results available mid-2008)
- Assess current strategies to support TB patients
- Conduct a feasibility study on use of incentives for TB patients
- Study the cost of community TB care and best practice models for MDR -TB
- Carry out a national prevalence of disease survey
- Conduct a drug-resistance survey

#### NTP budget by source of funding

Substantial increase in funding needs for 2007–2008 with full funding expected from the government



#### NTP budget by line item

Enormous increase in budget for 2007–2008, mainly for investments in hospital infrastructure for MDR-TB and XDR-TB patients



#### Total TB control costs by line item<sup>4</sup>

NTP budget will account for largest share of TB control costs in 2007–2008 if MDR-TB activities and capital investments are implemented as planned



## Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007–2008

Projected number of new patients to be treated 2007–2008 higher in Global Plan, therefore higher budget for DOTS; much larger investment in MDR-TB in country plan mainly due to national policy to hospitalize patients for at least 6 months and associated need for renovation and expansion of hospital infrastructure



#### SOURCES, METHODS AND ABBREVIATIONS

#### a-h Please see footnotes page 169.

- Incidence, prevalence and mortality estimates include patients infected with HIV. Estimates revised in 2006 following analysis of TB mortality data from vital registration system for years 1997–2005. Incidence pre-1997 and post-2005 estimated extrapolated using logistic curve fitted to 1997–2005 estimates.
   MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce
- <sup>2</sup> MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 774/100 000 pop and mortality 78/100 000 pop/yr.
- <sup>3</sup> To ensure adequate laboratory services coverage there should be at least one laboratory providing smear microscopy per 100 000 population, one culture facility per 5 million population and one DST facility per 10 million population.
- <sup>4</sup> Total T8 control costs for 2005–2006 are based on expenditure, whereas those for 2007–2008 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.
- <sup>5</sup> NTP available funding for 2005–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

#### NTP budget by line item, 2008

By far the largest share of the budget is for diagnosis and treatment of MDR-TB



#### NTP funding gap by line item

No funding gaps have been reported since 2006

Per patient costs, budgets and expenditures<sup>5</sup> Highest cost for TB control per patient in Africa



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	2008			
(US\$ millions)	BUDGET	GAP	BUDGET	GAP		
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strennthening	78 294 0.9	0 0 0	77 267 1.8	0 0 0		
Engage all care providers People with TB, and communities	0 2.9	0 0	0 5.5	0 0		
Research Other	2.3 0	0 0	1.1 0	0 0		
Financial indicators for TB						
Government contribution to NTP budget (including loans) Government contribution to total cost of TB control (including loans NTP budget funded	100° () 100° 100°	% % %	99 100 100	% % %		
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita	7. 12	9	7 11	.4		
Funding gap per capita Government health expenditure per capita (2004) Total health expenditure per capita (2004)	0	1! 3!	0 58 90			

# Thailand

Although the NTP has begun to introduce PPM activities and to address the specific challenges posed by border areas and urban areas, case detection and treatment success rates have not improved substantially over the past 5 years. Routine data collection and budgeting are still hampered by decentralization following the reform of national health services. Collaborative HIV/TB activities are in place and, for 2006, data were available for the first time; 42% of TB patients were tested for HIV, and 80% of HIV patients were screened for TB. Management of MDR-TB has begun in some settings but does not follow WHO guidelines, and data on the number of patients tested and treated are not available.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>		63	444
Estimates of epidemiological burden <sup>1</sup>			
Incidence (all cases/100 000 pop/yr)			142
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>			0.0
Incidence (ss+/100 000 pop/yr)			62
Prevalence (all cases/100 000 pop) <sup>2</sup>			198
Mortality (deaths/100 000 pop/yr) <sup>2</sup>			20
Of new TB cases, % HIV+b			11
Of new TB cases, % MDR-TB) <sup>c</sup>			1.7
Of previously treated TB cases, % $\rm MDR-TB^{c}$			35
Surveillance and DOTS implementation			
Notification rate (new and relapse/100 000 pop/yr)			89
Notification rate (new ss+/100 000 pop/yr)			46
DOTS case detection rate (new ss+, %)			73
DOTS treatment success (new ss+, 2005 cohort, %)			75
Of new pulmonary cases notified under DOTS, % ss+			62
Of new cases notified under DOTS, % extrapulmonary			14
Of new ss+ cases notified under DOTS, % in women			29
Of sub-national reports expected, % received at next re	eporting lev	/el <sup>d</sup>	96
Laboratory services <sup>3</sup>			
Number of laboratories performing smear microscopy			937
Number of laboratories performing culture			65
Number of laboratories performing DST			18
Of laboratories performing smear microscopy, % cover	red by EQA		92
Management of MDR-TB			
Of new cases notified, % receiving DST at start of treat	ment		-
Of new cases receiving DST at start of treatment, % MI	DR-TB		-
Of re-treatment cases notified, % receiving DST			-
Of re-treatment cases receiving DST, % MDR-TB			-
Collaborative TB/HIV activities			
National policy of counselling and testing TB patients for	or HIV?	to all	Yes
National surveillance system for HIV-infection in TB na	tients?	iu ali	μαιισπιο) Υρς
Of TR natients (new and re-treatment) notified % teste	d for HIV		42
Of TR patients tested for HIV % HIV+			26
Of HIV+ TB patients detected % receiving CPT			65
Of HIV+ TB patients detected, % receiving ART			32
			<u> </u>
DOTS expansion and enhancement	1995	1996	1997
DOTS coverage (%)	_	11	4.0

#### WHO South-East Asia Region (SEAR)

Rank based on estimated number of incident cases (all forms) in 2006



#### **Case notifications**

Notification rates rose steeply from 1997 to 2001, but have stablilized since then



Unfavourable treatment outcomes, DOTS

Treatment success rate remains well below the target; significant increase in treatment failures in 2005 cohort



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	1.1	4.0	32	59	70	82	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	_	0.4	6.0	27	49	56	81	80	88	88	92	89
DOTS notification rate (new ss+/100 000 pop)	-	0.2	3.2	13	25	29	46	42	46	45	47	46
DOTS case detection rate (all new cases, %)	-	0.3	4.0	18	33	38	55	55	60	60	63	60
DOTS case detection rate (new ss+, %)	-	0.3	5.1	22	40	47	74	67	73	73	76	73
Case detection rate within DOTS areas (new ss+, %)e	-	29	128	67	68	67	91	67	73	73	76	73
DOTS treatment success (new ss+, %)	-	78	62	68	77	69	75	74	73	74	75	_
DOTS re-treatment success (ss+, %)	-	57	55	55	68	_	49	62	62	56	58	_

IMPLEMENTING THE STOP TB STRATEGY <sup>1</sup>	
DOTS EXPANSION AND ENHANCEMENT	
<ul> <li>Political commitment, standardized treatment, and monitoring</li> <li>Achievements</li> <li>Produced 5th annual report of NTP activities</li> </ul>	<ul> <li>J and evaluation system</li> <li>Planned activities</li> <li>Revise national TB control manual</li> <li>Host 4th external review of NTP</li> </ul>
<ul> <li>Quality-assured bacteriology</li> <li>Achievements</li> <li>Revised national guidelines for sputum smear microscopy</li> </ul>	<ul> <li>Planned activities</li> <li>Establish culture and DST facilities in 5 additional laboratories</li> <li>Strengthen EQA programme</li> <li>Translate training packages into Thai language</li> </ul>
<ul> <li>Drug supply and management system</li> <li>Achievements</li> <li>Provided first- and second-line anti-TB drugs free of charge to all Thai citizens in collaboration with NHSO</li> </ul>	<ul> <li>Planned activities</li> <li>Make anti-TB drugs available free of charge to non-Thai citizens</li> </ul>
TB/HIV, MDR-TB AND OTHER CHALLENGES	
<ul> <li>Collaborative TB/HIV activities</li> <li>Achievements</li> <li>Improved reporting on collaborative TB/HIV activities; data now available to central NTP</li> <li>Introduced provider-initiated HIV counselling and testing for TB patients</li> <li>Introduced intensified TB case-finding among people with HIV/AIDS</li> <li>Referred HIV-positive TB patients to NAP for ART and CPT</li> </ul>	<ul> <li>Planned activities</li> <li>Revise guidelines for collaborative TB/HIV activities</li> <li>Improve recording and reporting system</li> <li>Strengthen TB/HIV coordinating body</li> </ul>
<ul> <li>Diagnosis and treatment of multidrug-resistant TB Achievements</li> <li>Developed guidelines for management of MDR-TB and implemented them in selected health facilities</li> <li>Initiated DRS of new and re-treatment cases</li> </ul>	<ul> <li>Planned activities</li> <li>Revise MDR-TB guidelines and recording and reporting forms</li> <li>Field-test recording and reporting system in selected provinces</li> <li>Assess magnitude of XDR-TB among MDR-TB cases based on DRS data</li> <li>Conduct training in management of MDR-TB in large hospitals</li> </ul>
<ul> <li>High-risk groups and special situations</li> <li>Achievements</li> <li>Included screening for TB in prisons and among other vulnerable groups in NTP plan</li> <li>Initiated special project for TB control in urban areas</li> </ul>	<ul> <li>Planned activities</li> <li>Develop referral system to allow follow up of TB patients after release from prison</li> </ul>
HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEV	ELOPMENT
<ul> <li>Achievements</li> <li>Involved Ministry of Justice, NAP and NGOs in process of planning for TB control</li> <li>Built capacity through pilot testing of electronic database management system in some provinces</li> <li>Set up indicators to monitor certified hospitals</li> <li>Advocated for inclusion of TB treatment success rate as one of the indicators used by the office of health inspectors</li> </ul>	<ul> <li>Planned activities</li> <li>Introduce SMART electronic recording and reporting system, developed by National Health Security Office, in hospitals</li> <li>Implement human resource development plan for TB</li> <li>Strengthen laboratory facilities in a phased manner</li> </ul>

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## THAILAND

Conducted 3rd national DRS

Carried out DRS on the Thai–Myanmar border

#### ENGAGING ALL CARE PROVIDERS **Achievements Planned activities** Pilot tested implementation of PPM in 15 hospitals in Bangkok, Strengthen referral system between hospitals where PPM is being including provision of first- and second-line anti-TB drugs pilot tested and existing health centres • Scaled up involvement of private hospitals in TB control • Introduce ISTC to collaborating private hospitals • Used ISTC to promote involvement of non-NTP providers in TB • Strengthen monitoring of PPM collaborators to ensure that guidelines are followed control • Engage doctors in private hospitals in TB control activities • Launch recording and reporting systems in private hospitals EMPOWERING PEOPLE WITH TB, AND COMMUNITIE Advocacy, communication and social mobilization **Achievements Planned activities** Organized campaign for World TB Day Organize World TB Day campaign • Engage various media to promote TB control **Community participation in TB care Achievements Planned activities** Involved community members in suspect identification and referral Develop model for community involvement in slum area of Bangkok in some areas, following training • Launch "Royal Project" on King's birthday, focusing on community participation in TB care Continue training community members in suspect identification and referral Encourage cured patients to act as treatment supervisors **Patients' Charter Achievements Planned activities** The Patients' Charter was published in 2006 and was therefore not None reported available for use in countries until then. RESEARCH, INCLUDING SPECIAL SURVEYS AND **Achievements** Planned activities Implemented active population-based surveillance and enhanced TB Conduct prevalence of disease survey control in collaboration with Thailand TB active surveillance network • Finalize DRS along Thai-Cambodia border area Studied technical capacity of provincial health staff on HIV surveillance, prevention and treatment among TB patients

#### NTP budget by source of funding

NTP budget data since 2004 are for the TB cluster in Bangkok only; at this level most funding is from the government



#### NTP budget by line item

Since 2004 NTP budget data are for the TB cluster in Bangkok only; at this level most of the budget is for DOTS



In 2002, the NTP budget was managed at central level and covered all inputs specific to TB control for the entire country. This changed in 2003, when a new health insurance system was introduced. As part of this system, budgets for clinical care (including TB diagnosis and treatment) are allocated to provincial and district hospitals on the basis of fixed per capita rates. It is not known how much of these budgets is being used for TB control, and therefore the total budget for TB control in Thailand cannot be estimated. The full cost of TB control (including costs associated with use of general health facilities) cannot be calculated accurately either, because the most recent costing study was undertaken more than 10 years ago.

Progress made with the reporting of financial data in South Africa since 2006, which like Thailand has a decentralized system for management of TB control, illustrates two ways in which an up-to-date and comprehensive assessment of the cost of TB control in Thailand could be made. The first would be to send the WHO financial data collection form to each province in Thailand, and to aggregate these reports at national level. A second approach would be to use the WHO planning and budgeting tool to carry out a detailed costing study, as was done for all provinces in South Africa in 2007.

#### SOURCES, METHODS AND ABBREVIATIONS

-h Please see footnotes page 169.

<sup>2</sup> MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 347/100 000 pop and mortality 27/100 000 pop/yr.

<sup>3</sup> To ensure adequate laboratory services coverage there should be at least one laboratory providing smear microscopy per 100 000 population, one culture facility per 5 million population and one DST facility per 10 million population.

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

<sup>1</sup> Incidence, prevalence and mortality estimates include patients infected with HIV. Estimates of burden based on prevalence survey in 1991–1992. Incidence rate assumed to be constant in absence of contrary evidence, but estimated prevalence and mortality rates declining with growing proportion of cases treated.

# Uganda

Two of the core components of DOTS (smear microscopy for diagnosis and direct observation of treatment) are still not routinely performed in all districts of Uganda. Treatment outcomes were reported for almost all patients included in the 2004 and 2005 cohorts of new smear-positive cases. However, in both years Uganda had the highest default rate of any high-burden country, despite the use of community-based TB care. Collaborative TB/HIV activities are expanding, but still in 2006 only one quarter of TB patients were tested for HIV. Although funding needs for 2007–2008 are higher than for previous years, the amount available is lower and limited funding is expected from central government for 2007–2008, resulting in increasing funding gaps. Even where funds are allocated, disbursement and absorption are problematic.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	29 899
Estimates of epidemiological burden1	
Incidence (all cases/100 000 pop/yr)	355
Trend in incidence rate (%/yr, 2005–2006)2	-4.1
Incidence (ss+/100 000 pop/yr)	154
Prevalence (all cases/100 000 pop)2	561
Mortality (deaths/100 000 pop/yr)2	84
Of new TB cases, % HIV+ <sup>b</sup>	16
Of new TB cases, % MDR-TB (1997) <sup>c</sup>	0.5
Of previously treated TB cases, % MDR-TB (1997) $^\circ$	4.4
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	136
Notification rate (new ss+/100 000 pop/yr)	68
DOTS case detection rate (new ss+, %)	44
DOTS treatment success (new ss+, 2005 cohort, %)	73
Of new pulmonary cases notified under DOTS, % ss+	58
Of new cases notified under DOTS, % extrapulmonary	10
Of new ss+ cases notified under DOTS, % in women	40
Of sub-national reports expected, % received at next reporting level	l <sup>d</sup> 97
Laboratory services3	
Number of laboratories performing smear microscopy	726
Number of laboratories performing culture	3
Number of laboratories performing DST	2
Of laboratories performing smear microscopy, % covered by EQA	71
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	-
Of new cases receiving DST at start of treatment, % MDR-TB	-
Of re-treatment cases notified, % receiving DST	-
Of re-treatment cases receiving DS1, % MDR-1B	_
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
(t	o all patients)
National surveillance system for HIV-Infection in I B patients?	Yes
OF TR patients (new and re-treatment) notified, % lested for HIV	20
OF LIVE TR patients detected of receiving CDT	29
OF HIVE TO Patients detected, % (CCCIVIII) UP1	23 0
or my + ro patients detected, % receiving An I	0

## WHO Africa Region (AFR)



## **Case notifications**

Notification rates peaked around 2003 and are now declining



#### **Unfavourable treatment outcomes, DOTS**

Low cure rate and high default rate continue to hinder achievement of treatment success rate target; outcomes reported for almost all new ss+ patients



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	0.0	100	100	100	100	100	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	-	-	126	126	132	123	145	155	154	156	142	136
DOTS notification rate (new ss+/100 000 pop)	_	-	76	78	77	70	68	73	75	75	71	68
DOTS case detection rate (all new cases, %)	_	0.0	37	37	44	34	38	38	37	39	37	37
DOTS case detection rate (new ss+, %)	_	_	56	56	56	48	44	44	44	45	44	44
Case detection rate within DOTS areas (new ss+, %)e	_	_	56	56	56	48	44	44	44	45	44	44
DOTS treatment success (new ss+, %)	-	33	40	62	61	63	56	60	68	70	73	-
DOTS re-treatment success (ss+, %)	-	32	58	60	48	64	63	55	60	68	_	-

## UGANDA

## IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> Dots expansion and enhancement

## Political commitment, standardized treatment, and monitoring and evaluation system Achievements Planned activities

- Uganda Stop TB Partnership contracted 3 NGOs to provide additional human resources and to support TB control in 8 districts, general TB control activities in 7 districts and external quality assurance of sputum smear microscopy in Kampala
- Received approval for Global Fund round 6 proposal for TB control activities
- Printed more TB registers and reporting forms incorporating 2005 revisions to capture information about collaborative TB/HIV activities
   Produced 4th annual report of NTP activities

## Quality-assured bacteriology

## Achievements

- Expanded external quality assurance of sputum smear microscopy using blinded rechecking
- Conducted refresher training courses on AFB smear microscopy at NRL and Buluba training centre, with participation of 127 laboratory technicians
- Expanded QA to 73 out of 80 districts
- Conducted monthly supervisory visits to districts by laboratory team

## Drug supply and management system Achievements

TB/HIV, MDR-TB AND OTHER CHALLENGES Collaborative TB/HIV activities

- Carried out quality control of imported anti-TB drugs
- Conducted training in all districts on new logistic management information system (LMIS), which was operational in all districts in 2006

- Expand DOTS by involving more private-for-profit health providers in referral of TB suspects, diagnosis and treatment
- Use the MSH "management and organizational sustainability tool" (MOST) to assess management of NTP

## **Planned activities**

- Complete expansion of external quality control and assurance of microscopy services to remaining 7 districts: Abim, Apac, Kabong, Kotido, Lira, Moroto and Nakapirpirit
- Establish specimen referral system for DST
- Continue to retrain staff identified during supervisory visits in AFB smear microscopy and replace 200 old microscopes
- Together with FIND, establish a molecular laboratory for testing validating new technologies in the NRL by March 2008
- Introduce use of liquid culture media

## **Planned activities**

- Provide adequate stationery to enable districts and health facilities to record drug use and make drug requisitions
- Support supervision to monitor and motivate peripheral-level health workers to use LMIS appropriately. This includes identification of problems and helping health workers to find solutions, collaborative work on job training, assistance for missing equipment and repair of microscopes.
- Procure HPLC machine for national drug authority to increase capacity for batch testing
- Initiate discussions with manufacturer and NDA for fast-tracking registration of anti-TB drugs

## Achievements

- Expanded collaboration to more districts through training of district health workers on TB/HIV collaborative activities
- Developed and utilized training modules (health workers from 13 districts trained on these modules)
- Developed and adapted IEC materials to district settings

## Diagnosis and treatment of multidrug-resistant TB Achievements

- Applied to Global Fund for funds for second-line anti-TB drugs and for DRS
- Established collaboration between MSF France, CDC, Medical Research Council, Cape Western University and the Mulago hospital, other regional hospitals and NRL to collect data on drug-resistant TB
- Managed 14 identified cases of MDR-TB
- Mulago hospital initiated treatment of 6 MDR-TB patients (14 patients known to be on second-line drug treatment in December 2007)
- Obtained, through GLC, second-line drugs to treat 50 MDR-TB patients

## **Planned activities**

- Continue training to expand collaborative TB/HIV activities to 20 more districts with TBCAP/IUATLD support
- Increase proportion of TB patients tested for HIV, and proportion of HIV patients screened for TB
- Improve referral mechanisms between NTP and NAP services so that HIV-positive TB patients obtain appropriate care

## **Planned activities**

- Develop management protocol for drug-resistant cases
- Train clinicians and nurses to manage drug-resistant TB
- Conduct DST tests by NRL
- Apply to GLC for technical assistance
- Procure from GLC 100 courses of second-line drugs under Global Fund round 6 grant

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

<ul> <li>High-risk groups and special situations</li> <li>Achievements</li> <li>Set up additional TB service points in camps for internally displaced people in 5 districts: Amuru, Gulu, Kaberamaido, Kitgum and Pader</li> </ul>	<ul> <li>Planned activities</li> <li>Establish TB services in 3 regional prisons of Gulu, Kabarole and Luzira in collaboration with ICRC</li> <li>Establish ACSM meetings with regional prisons and national army</li> </ul>
HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVE	LOPMENT
<ul> <li>Achievements</li> <li>Involved broad range of partners from health and other sectors, including NGOs, in planning for TB control</li> <li>Held refresher training courses on AFB smear microscopy for 127 laboratory technicians at NRL and at Buluba training centre</li> <li>Supervised peripheral-level health workers, identifying gaps and finding appropriate solutions</li> <li>Developed PAL guidelines for clinical officers</li> </ul>	<ul> <li>Planned activities</li> <li>Recruit additional staff to address human resource shortages</li> </ul>
ENGAGING ALL CARE PROVIDERS	
<ul> <li>Achievements</li> <li>Conducted training on DOTS and community-based DOTS strategies for non-NTP health-care providers</li> <li>Continued collaboration with private not-for-profit faith-based organizations</li> <li>Initiated agreements for collaboration with private providers</li> </ul>	<ul> <li>Planned activities</li> <li>Conduct situation analysis for PPM</li> <li>Design collaboration mechanism between NRL and districts to improve communication between private health providers and district supervisors by better defining roles and responsibilities</li> <li>Train and engage more private health providers (100 private practitioners in Kampala)</li> <li>Disseminate ISTC through planned regional workshops and meetings</li> </ul>
EMPOWERING PEOPLE WITH TB, AND COMMUNITIES	
<ul> <li>Advocacy, communication and social mobilization Achievements</li> <li>Carried out advocacy activities during commemoration of World TB Day in Mpigi District in 2007</li> <li>Held radio talk shows on TB and TB/HIV</li> </ul>	<ul> <li>Planned activities</li> <li>Commemorate World TB Day 2007 by organizing radio talk shows to mobilize community, especially in dancing and drama schools</li> <li>Continue monthly radio talk show to inform general public that TB is curable, that treatment is available at health centres and that it is important to complete treatment</li> <li>Provide daily information on TB/HIV</li> <li>Finalize TB communication strategy</li> <li>Activate ACSM Working Group of Uganda Stop TB Partnership</li> </ul>
<ul> <li>Community participation in TB care Achievements</li> <li>Involved communities in TB control in all 78 districts; community volunteers selected as treatment supporters</li> <li>Community volunteers used in some districts to identify and refer TB suspects for sputum examination</li> </ul>	<ul> <li>Planned activities</li> <li>Mobilize communities on TB control, especially in referral of suspects and selection of TB volunteers</li> </ul>
<b>Patients' Charter</b> <b>Achievements</b> The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.	<ul> <li>Planned activities</li> <li>Adapt, print and disseminate Patients' Charter in clinics and during all meetings</li> <li>Develop methodology to strengthen collaboration with Uganda National Health Consumers' Organisation</li> </ul>
RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT	
<ul> <li>Achievements</li> <li>Completed "Barriers to TB/HIV collaborative activities" study supported by IUATLD and USAID</li> </ul>	<ul> <li>Planned activities</li> <li>Conduct DRS to establish prevalence of and patterns of resistance</li> <li>Carry out national census of laboratories with support from FIND</li> </ul>

- Initiated recruitment of patients for study of HAART in TB patients in Buluba
- Conduct disease prevalence survey in 2008
  Commence in-depth analysis of routine surveillance data in 2008

#### NTP budget by source of funding

Decreased government funding and persistently large funding gaps



#### NTP budget by line item

Increasing funding needs for all components of the Stop TB Strategy



#### Total TB control costs by line item<sup>4</sup>

Cost of clinic visits for DOT per TB patient based on 12 visits (2003-2005) and 3 visits (2006-2008); small number of visits to health facilities reflects role of community volunteers



#### Comparison of country report and Global Plan:9 total TB control costs, 2007-2008

Global Plan and country report similar for DOTS component; costs in Global Plan much higher than country report for other components of the Stop TB Strategy, especially TB/HIV



#### NTP budget by line item, 2008

The largest components of the NTP budget are DOTS (58%) and collaborative TB/HIV activities (16%)



## NTP funding gap by line item

Almost all budget for TB/HIV, PPM, ACSM and community involvement is unfunded



#### Per patient costs, budgets and expenditures<sup>5</sup>

Increasing costs per patient but decreasing available funding per patient



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	80
(US\$ millions)	BUDGET	GAP	BUDGET	GAP
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strengthening Engage all care providers People with TB, and communities Research Other	6.8 2.2 0.02 0.5 1.5 0.3 0	2.4 1.8 0.02 0.5 1.5 0.3 0	7.5 2.3 0.02 0.6 1.6 1.1 0	4.0 2.0 0.02 0.6 1.6 0.2 0
Financial indicators for TB Government contribution to NTP budget (including loans) Government contribution to total cost of TB control (including loans NTP budget funded	4. 6) 8. 420	6% 6% %	4 7 36	.0% .9% %
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita Government health expenditure per capita (2004) Total health expenditure per capita (2004)	0. 0. 0.	4 4 2	0 0 6.2 19	.4 .4 .3

#### SOURCES, METHODS AND ABBREVIATIONS

Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimate originally based on assumption of 65% ss+ case detection rate in 1997. Trend in incidence estimated from 3-year moving average of notification rate (new and relapse).
- MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 296/100 000 pop and mortality 56/100 000 pop/yr. 3
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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. Total TB control costs for 2003–2006 are based on available funding, and those for 2007–2008 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.
- 5
- NTP available funding for 2003–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap. indicates not available; pop, population; ss+, sputum smear-positive; ss–, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

# United Republic of Tanzania

In 2008 the United Republic of Tanzania will benefit from a massive increase in the budget for TB control that is almost met by a corresponding increase in available funding. The planned expansion of collaborative TB/HIV activities to the whole country in 2007, use of community-based TB care in more districts and formal collaboration with private practitioners should improve both the case detection rate and treatment success. The provision of ART to HIV-positive TB patients is likely to reduce the currently high death rate, and plans to improve the recording and reporting system may help reduce the number of patients lost to follow up after transfer. Management of MDR-TB was begun in 2007; preparations began in 2006 with the construction of laboratories and hospital wards and the recruitment of personnel.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>	39 459
Estimates of epidemiological burden <sup>1</sup>	
Incidence (all cases/100 000 pop/yr)	312
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>	-3.9
Incidence (ss+/100 000 pop/yr)	135
Prevalence (all cases/100 000 pop) <sup>2</sup>	459
Mortality (deaths/100 000 pop/yr) <sup>2</sup>	66
Of new TB cases, % HIV+ <sup>b</sup>	18
Of new TB cases, % MDR-TB (2007) <sup>c</sup>	1.1
Of previously treated TB cases, % MDR-TB (2007) <sup>c</sup>	0.0
Surveillance and DOTS implementation	
Notification rate (new and relapse/100 000 pop/yr)	150
Notification rate (new ss+/100 000 pop/yr)	63
DOTS case detection rate (new ss+, %)	46
DOTS treatment success (new ss+, 2005 cohort, %)	82
Of new pulmonary cases notified under DOTS, % ss+	55
Of new cases notified under DOTS, % extrapulmonary	22
Of new ss+ cases notified under DOTS, % in women	37
Of sub-national reports expected, % received at next reporting leve	l <sup>d</sup> 100
Laboratory services <sup>3</sup>	
Number of laboratories performing smear microscopy	690
Number of laboratories performing culture	3
Number of laboratories performing DST	1
Of laboratories performing smear microscopy, % covered by EQA	100
Management of MDR-TB	
Of new cases notified, % receiving DST at start of treatment	0.6
Of new cases receiving DST at start of treatment, % MDR-TB	1
Of re-treatment cases notified, % receiving DST	3.7
Of re-treatment cases receiving DST, % MDR-TB	5.3
Collaborative TB/HIV activities	
National policy of counselling and testing TB patients for HIV?	Yes
(t	o all patients)
National surveillance system for HIV-infection in IB patients?	Yes
Ut I B patients (new and re-treatment) notified, % tested for HIV	11
UT I B patients tested for HIV, % HIV+	50
Ut HIV+ IB patients detected, % receiving CP1	57
UT HIV+ IB PATIENTS DETECTED, % RECEIVING AKI	26

#### WHO Africa Region (AFR)

Rank based on estimated number of incident cases (all forms) in 2006



## **Case notifications**

Notification rates for all case types declining



#### **Unfavourable treatment outcomes, DOTS**

Making slow progress towards treatment success rate target but death rate remains high



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	98	100	100	100	100	100	100	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	133	145	147	159	159	161	177	169	168	167	159	150
DOTS notification rate (new ss+/100 000 pop)	67	70	70	74	73	71	71	68	68	69	66	63
DOTS case detection rate (all new cases, %)	47	48	46	49	47	46	48	47	47	48	47	47
DOTS case detection rate (new ss+, %)	57	56	53	54	52	49	48	45	46	47	47	46
Case detection rate within DOTS areas (new ss+, %)e	58	56	53	54	52	49	48	45	46	47	47	46
DOTS treatment success (new ss+, %)	73	76	77	76	78	78	81	80	81	81	82	_
DOTS re-treatment success (ss+, %)	76	75	75	73	74	73	76	77	75	76	77	-

#### IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> DOTS EXPANSION AND ENHANCEMENT Political commitment, standardized treatment, and monitoring and evaluation system **Achievements Planned activities** • Declared TB a national emergency in August 2006 • Changed TB treatment regimen countrywide from 8 to 6 months by emergency introducing rifamipicin in the continuation phase Set up quarterly meetings to computerize district TB recording and reporting countrywide, with support from CDC specific indicators • Revised TB reporting and recording forms and TB register in line with WHO recommendations Produced 11th annual report of NTP activities **Quality-assured bacteriology Achievements Planned activities** Completed national DRS Drug supply and management system **Planned activities Achievements** Introduced FDCs in priority areas, with support from GDF • Distributed anti-TB drugs free of charge to all collaborating service facilities providers, including NGOs and major private-for-profit health facilities TB/HIV, MDR-TB AND OTHER CHALLENGES **Collaborative TB/HIV activities Achievements Planned activities** Developed national guidelines for collaborative TB/HIV activities • Trained more than 1500 health workers to implement collaborative **TB/HIV** activities • Scaled up HIV testing and counselling for TB patients, and provided **TB/HIV** activities ART and CPT to identified HIV-infected TB patients Diagnosis and treatment of multidrug-resistant TB **Achievements Planned activities** Built new TB wards and laboratory unit for management of MDR-TB Recruited 6 medical officers, 16 nurses, 1 pharmacist and 2 laboratory technologists for management of MDR-TB MDR-TB Strengthened laboratories in order to perform culture and DST Introduce EQA for culture and DST High-risk groups and special situations **Planned activities Achievements**

Initiated screening for TB in prisons and among refugee populations

HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

## **Achievements**

- Collaborated with planning department of MoH, ministries of justice and of defence, NAP and NGOs in planning for TB control
- Trained over 4000 general health workers in clinical management of TB and leprosy (1 health centre established in each village)
- Renovated 12 TB diagnostic centres in 7 districts
- Provided 60 microscopes and other laboratory supplies to diagnostic centres and to public and private health facilities in 18 districts, as part of FIDELIS programme
- Developed draft modules on TB control for inclusion in curricula for medical doctors and nurses of 4 medical schools

## **Planned activities**

- Continue to renovate health infrastructure and increase supply of microscopes
- Develop long-term HRD plan for TB, with technical support from partners
- Train additional 600 general health workers

## • Develop strategic plan, including component on national TB

- Monitor treatment outcomes and adverse drug reactions nationally
- Monitor accuracy and completeness of TB data by development of
- Pilot test use of liquid culture media and introduce LED microscopy in 3 regions: Dar el Salaam, Mwanza and Tanga
- Conduct physical inspection of drugs and drug stores in health
- Provide CPT to 80% of HIV-positive TB patients
- Provide ART in TB clinics in 31 out of 156 districts
- Train 700 health workers at district level to implement collaborative
- Apply for second-line drugs for treatment of MDR-TB through GLC
- Train 26 clinicians, nurses and laboratory staff in management of
- Introduce drug resistance surveillance by providing DST for all previously treated cases and 10% of new cases

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

None reported

## UNITED REPUBLIC OF TANZANIA

## ENGAGING ALL CARE PROVIDERS

## Achievements

- Carried out national assessment of involvement of non-NTP providers in diagnosis and treatment of TB, with WHO technical support
- Supplied anti-TB drugs free of charge to private health centres

### EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

#### Advocacy, communication and social mobilization Achievements

- Collaborated with NGOs and influential community leaders in advocacy and sensitization about TB
- Developed new ACSM messages for TB/HIV

## Community participation in TB care

- Achievements
- Involved communities in TB control in 11 districts
- Introduced patient-centred treatment and community-based DOT
- Supported creation of club for former TB patients
- Introduced community-based TB control activities in 3 districts with nomadic populations

## Patients' Charter

## Achievements

Distributed 500 copies of Patient's Charter to districts

## RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

## Achievements

- Conducted national DRS
- Began research projects on treatment of HIV in TB patients
- Initiated national survey of prevalence of infection (3 health workers attended workshops in Botswana and Latvia) and began preparations for national prevalence of disease survey

## **Planned activities**

- Introduce patient-centred treatment approach to all districts, in close collaboration with PATH
- Strengthen PPM by involving major private providers in urban areas in TB control
- Introduce ISTC in medical school curriculum

## **Planned activities**

Conduct social marketing of TB

## **Planned activities**

- Involve former TB patients in TB centres in 31 districts
- Recruit focal persons at central level to coordinate community and empowerment activities
- Support creation of additional associations for former TB patients
- Monitor community-based DOTS in nomadic populations

## **Planned activities**

• Develop mechanisms to involve TB patients and former TB patients, recognizing their potential to contribute to TB control activities

## **Planned activities**

• Continue preparation for prevalence of disease survey

#### NTP budget by source of funding

NTP has developed plan and budget for 2008-2012 that covers all elements of the Stop TB Strategy; funding needs now much higher than previous years; while funding has grown, mostly from external donors and Global Fund, funding gaps remain



#### NTP budget by line item

Increased budget for DOTS component, mainly for supervision activities and training at peripheral level; 85% of TB/HIV budget is for activities conducted by the NAP



#### Total TB control costs by line item<sup>5</sup>

NTP budget will account for largest share of total TB control costs in 2008 if fully funded, whereas the use of general health services by TB patients accounts for the largest share of total TB control costs 2002-2005



#### Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007-2008

Planned implementation of DOTS and TB/HIV in 2008 ahead of Global Plan expectations; full costing of TB/HIV activities has brought costs reported by country in line with Global Plan; this might happen for other HBCs if similarly comprehensive assessments of costs were undertaken



#### NTP budget by line item, 2008

Largest components of budget are TB/HIV (53%) and DOTS (37%); the NTP has estimated and reported a comprehensive budget for collaborative TB/HIV activities, including activities funded through the NAP



#### NTP funding gap by line item

Funding gap within DOTS mainly for training and laboratory supplies and equipment



#### Per patient costs, budgets and expenditures<sup>6</sup>

Substantial increase in cost and budget per patient as TB control broadened in line with the Stop TB Strategy; increase in available funding per patient



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	2008		
US\$ millions)	BUDGET	GAP	BUDGET	GAP	
DOTS expansion and enhancement	3.3	-	19	5.8	
FB/HIV, MDR-TB and other challenges	3.2	-	29	2.5	
Health system strengthening	0	-	0	0	
Engage all care providers	0	-	0.4	0.3	
People with TB, and communities	0	-	1.8	0.3	
Research	1.7	-	1.8	1.8	
Other	0	-	0.4	0.3	
Financial indicators for TB					
Government contribution to NTP budget (including loans)	-		8	.0%	
Government contribution to total cost of TB control (including loans	s) –		16%		
NTP budget funded	-		79	%	
Per capita health financial indicators (US\$)					
NTP budget per capita	0.	.2	1	.3	
Total costs for TB control per capita	0.	.3	1	.4	
Funding gap per capita	-		0	.3	
Government health expenditure per capita (2004)			5.2		
Total health expenditure per capita (2004)			12		

#### SOURCES, METHODS AND ABBREVIATIONS

#### <sup>a−h</sup> Please see footnotes page 169

Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimate originally based on assumption of 55% ss+ case detection rate in 1997 (DOTS and non-DOTS). Trend in incidence

microtice, prevalence and mortality summars microte particular providence extension of the second state of assumption of 50 % 354 case detection rate in rs97 (b) road non-D0TS). MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 270/100 000 pop and mortality 36/100 000 pop/yr.

For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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.

Funding channelled through the NAP is mostly external financing, e.g. other donors or Global Fund. The split of these funds before Global Fund and other donors was not known This figure assumed a 50/50 split. Total TB control costs for 2002 are based on available funding, whereas those for 2003–2006 are based on expenditure, and those for 2007–2008 are based on budgets. Estimates of the costs of clinic visits and 5 hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details

NTP available funding for 2004-2005 is based on the amount of funding actually received, using retrospective data; available funding for 2002-2003, 2006 and 2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap. indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary – sputum smear not done or result unknown; yr, year

## Viet Nam

The national disease prevalence survey currently under way will provide a reassessment of the burden of TB in Viet Nam, and may also help explain the apparent lack of impact of the programme, despite having met the targets for case detection and treatment success for the past 10 years. Collaborative TB/HIV activities and management of MDR/TB are relatively new areas of work, demanding new skills and more funding. Despite increased funding for 2007 and 2008, gaps remain. Formal PPM activities are being scaled up, in an attempt to address the problems of poor TB treatment in the private sector.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>		86	206
Estimates of epidemiological burden <sup>1</sup>			
Incidence (all cases/100 000 pop/yr)			173
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>			-1.0
Incidence (ss+/100 000 pop/vr)			77
Prevalence (all cases/100 000 pop) <sup>2</sup>			225
Mortality (deaths/100 000 non/yr) <sup>2</sup>			23
Of new TB cases % HIV+b			50
Of new TB cases % MDB-TB <sup>c</sup>			27
Of previously treated TB cases, % MDR-TB <sup>c</sup>			19
Surveillance and DOTS implementation			
Notification rate (new and relapse/100 000 pop/yr)			113
Notification rate (new ss+/100 000 pop/vr)			65
DOTS case detection rate (new ss+, %)			85
DOTS treatment success (new ss+, 2005 cohort, %)			92
Of new pulmonary cases notified under DOTS % ss+			77
Of new cases notified under DOTS % extranulmonary			20
Of new ss+ cases notified under DOTS % in women			27
Of sub-national reports expected, % received at next re	eporting le	eveld	100
Laboratory services <sup>3</sup>			
Number of laboratories performing smear microscopy			874
Number of laboratories performing culture			18
Number of laboratories performing DST			2
Of laboratories performing smear microscopy, % cover	red by EQ/	Ą	85
Management of MDR-TB			
Of new cases notified, % receiving DST at start of treat	ment		-
Of new cases receiving DST at start of treatment, % MI	DR-TB		-
Of re-treatment cases notified, % receiving DST			-
Of re-treatment cases receiving DST, % MDR-TB			-
Collaborative TB/HIV activities			
National policy of counselling and testing TB patients f	or HIV?		Yes
		(to all	patients)
National surveillance system for HIV-infection in TB pa	itients?		Yes
Of TB patients (new and re-treatment) notified, % teste	d for HIV		14
Of TB patients tested for HIV, % HIV+			5
Of HIV+ TB patients detected, % receiving CPT			-
Of HIV+ TB patients detected, % receiving ART			_
DOTS expansion and enhancement	1995	1996	1997
DOTS coverage (%)	50	95	03
DOTS notification rate (new and relapse/100 000 non)	38	68	103
DOTS notification rate (new ss+/100 000 pop)	26	51	66
DOTC asso detection rate (all now assos 0/)	10	00	<b>F</b> 4

## WHO Western Pacific Region (WPR)

Rank based on estimated number of incident cases (all forms) in 2006



## **Case notifications**

Notification rates fairly stable since late 1990s, despite consistently high case detection and treatment success rates



#### **Unfavourable treatment outcomes, DOTS**

Treatment success rates consistently at or above target for more than 10 years



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	50	95	93	96	99	100	100	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	38	68	103	110	113	114	113	117	112	117	112	113
DOTS notification rate (new ss+/100 000 pop)	26	51	66	69	69	67	68	70	68	70	65	65
DOTS case detection rate (all new cases, %)	18	33	51	55	58	58	59	61	59	62	60	61
DOTS case detection rate (new ss+, %)	30	59	78	82	83	82	83	87	85	89	84	85
Case detection rate within DOTS areas (new ss+, %)e	59	62	84	86	84	82	83	87	85	89	84	85
DOTS treatment success (new ss+, %)	91	90	85	93	92	92	93	92	92	93	92	-
DOTS re-treatment success (ss+, %)	81	84	80	84	87	79	85	85	85	84	83	-

## IMPLEMENTING THE STOP TB STRATEGY<sup>1</sup> DOTS EXPANSION AND ENHANCEMENT

#### Political commitment, standardized treatment, and monitoring and evaluation system **Achievements Planned activities**

- Hosted end-term external evaluation of the NTP (2001–2005)
- Produced 21st annual report of NTP activities

## **Quality-assured bacteriology**

## **Achievements**

• Piloted laboratory quality assurance services (LQAS) in 4 provincial laboratories: Quang Ninh, Da Nang, Ho Chi Minh, and Tien Giang

### **Drug supply and management system Achievements**

• Ensured uninterrupted supply of quality-assured first-line drugs, provided free-of-charge to patients

## TB/HIV. MDR-TB AND OTHER CHALLENGES

## **Collaborative TB/HIV activities**

## **Achievements**

- Pilot tested HIV counselling and testing in TB units in 3 provinces with high HIV prevalence
- Developed forms and registers for collaborative TB/HIV activities and trained TB/HIV staff in use of new forms and registers
- Initiated development of national policy guidelines on collaborative **TB/HIV** activities

## Diagnosis and treatment of multidrug-resistant TB Achievements

- Established focus group for MDR-TB
- Conducted situation analysis on availability of second-line anti-TB drugs outside NTP
- Studied treatment history of failures, relapse and chronic TB cases and investigated anti-TB drug resistance patterns among re-treatment TB cases

## High-risk groups and special situations Achievements

 Included special activities for TB among prisoners and in ethnic minority groups, and initiatives to address gender-related issues in NTP development plan 2007-2011

HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVELOPMENT

## **Achievements**

- Expanded "Strengthening primary health-care network and TB control" project to remote and mountainous areas
- Conducted training on TB for general health staff
- Completed PPM scale up in the country, which is a pathfinder for creating linkages between the private and public health sectors

All planned activities reported for 2007 are described under the headings below.

## **Planned activities**

- Implement LQAS in 17 provincial laboratories (bringing total to 21 out of 64 provinces)
- Establish DST services required for management of MDR-TB

## **Planned activities**

- Organize a meeting with MOH on procurement of anti-TB drugs, especially second-line drugs
- Obtain technical support from MSH on procurement, management and distribution of anti-TB drugs

## **Planned activities**

- Establish HIV counselling and testing centres in additional TB units
- Complete development of national policy guidelines on collaborative TB/HIV activities
- Introduce routine screening for TB in HIV-positive people

## **Planned activities**

- Implement management of MDR-TB in pilot sites
- Initiate DRS and computerize data for ongoing DRS as well as laboratory data on MDR-TB and XDR-TB
- Submit proposal to GLC
- Develop guidelines for management of MDR-TB and implement them in Ho Chi Minh City

## **Planned activities**

 Increase access to and use of health services for ethnic minority groups and poor people by expanding integrated community health services to remote and mountainous districts/areas

## **Planned activities**

- Continue capacity-building on TB control for TB staff, HIV workers, the private sector and general health-care workers
- Develop plan for PAL adaptation and implementation and PAL quidelines

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## ENGAGING ALL CARE PROVIDERS

#### **Achievements**

 Instituted formal PPM activities in 17 out of 64 provincial TB units; trained private practitioners in TB control, and signed agreements
 EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

## EMPOWERING FEOFLE WITH TB, AND GOMMONTTES

#### Advocacy, communication and social mobilization Achievements

- Undertook ACSM activities in all 64 provincial TB units
- Conducted workshop on TB with the Viet Nam Women's Union, Viet Nam Farmer's Union and Ministry of Education
- Conducted communication campaign on World TB Day
- Developed IEC material on TB for communes

## Community participation in TB care Achievements

 Involved communities in TB control in all 673 district TB units; in suspect identification and referral, and patient treatment support

## **Patients' Charter**

#### Achievements

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

## Achievements

 Developed protocol and commenced disease prevalence survey; completed sampling in all 70 clusters

## **Planned activities**

- Establish PPM advisory board at national level
- Develop PPM strategy and operational guidelines

## **Planned activities**

- Strengthen cooperation on IEC with the Viet Nam Women's Union, Viet Nam Farmer's Union and the Ministry of Education
- Communicate knowledge on TB to communities through TV, radio, newspapers, posters, leaflets and other media
- Develop IEC material for ethnic minorities in mountainous provinces
- Develop IEC material for mass media

## **Planned activities**

Develop IEC material for communes, including booklet on TB and TB/HIV

## **Planned activities**

None reported

## **Planned activities**

- Analyse results of disease prevalence survey
- Conduct surveys on TB/HIV morbidity and mortality

#### NTP budget by source of funding

Increased funding from the Global Fund and other donors in 2007 and 2008, reducing



#### NTP budget by line item

Increased funding needs for new components of the Stop TB Strategy in 2007–2008, such as MDR-TB, PPM and ACSM; increased budget for DOTS reflects plan to establish 5 new culture laboratories



#### Total TB control costs by line item<sup>4</sup>

Cost of outpatient visits during TB treatment based on 66 visits; hospitalization costs based on estimate that 60% of TB patients are admitted for an average of 30 days



## Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007–2008

Targets for MDR-TB patients to be treated in Global MDR/XDR response plan much higher than scaling-up planned by NTP  $\,$ 



#### NTP budget by line item, 2008

Largest component of budget is for DOTS (65%), followed by collaborative TB/HIV activities (10%)



#### NTP funding gap by line item

Funding gap within DOTS component mainly for first-line drugs and routine programme management and supervision activities; funding gap in 2008 much smaller than in 2007



#### Per patient costs, budgets and expenditures<sup>5</sup>

Expenditure per patient in 2006 lowest since 2003; highest first-line drugs budget per patient in 2007



#### NTP budget and funding gap by Stop TB Strategy component

	20	07	20	2008		
(US\$ millions)	BUDGET	GAP	BUDGET	GAP		
DOTS expansion and enhancement	12	3.2	9.4	0.3		
Health system strengthening	0	0.2	0.01	0		
Engage an care providers People with TB, and communities Research Other	0.02 0.5 0.9 1.0	0.01 0 0.3 0	0.1 0.7 0.2 2.2	0 0 0.01 0		
Financial indicators for TB Government contribution to NTP budget (including loans) Government contribution to total cost of TB control (including loans)	45°	%	49 70	49% 70%		
NTP budget funded	779	97	97%			
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Funding gap per capita Covernment health expanditure per capita (2004)	0. 0. 0.	2 3 005	0 0 0 8 1	0.2 0.3 0.001		
Total health expenditure per capita (2004)	30					

#### SOURCES, METHODS AND ABBREVIATIONS

#### <sup>a-h</sup> Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimate based on assumption of ARTI of 1.7% in 1997, and assumed to be declining at 1% per year as in other countries in WPR.
   MDG and STB Partnership indicators shown in bold. Targets are 70% case detection of smear-positive cases under DOTS, 85% treatment success, to ensure that the incidence rate is falling by 2015, and to reduce
- incidence rates and halve 1990 prevalence and mortality rates by 2015. Estimates for 1990 are prevalence 444/100 000 pop and mortality 39/100 000 pop/yr.
- For routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. 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.
   Total TB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided
- <sup>4</sup> Total IB control costs for 2002–2006 are based on expenditure, whereas those for 2007–2008 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.
- <sup>5</sup> NTP available funding for 2004–2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002–2003 and 2007–2008 is based on prospectively reported budget data, and estimated as the total budget minus any reported funding gap.
- indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary sputum smear not done or result unknown; yr, year

## Zimbabwe

While the Zimbabwe NTP has a policy of testing TB patients for HIV, and providing ART and CPT to HIV-positive patients, no data are available on the number of patients tested or treated. There is no designated TB/HIV coordinator in either the NTP or the national AIDS control programme. Treatment outcomes are poor and have shown no improvement over the past 8 years; large proportions of patients die, default or are lost to follow-up during transfer. Funding and disbursement problems continue; budgets and funding for 2007 and 2008 are considerably lower than in previous years.

## SURVEILLANCE AND EPIDEMIOLOGY, 2006

Population (thousands) <sup>a</sup>		13 :	228
Estimates of epidemiological burden <sup>1</sup>			
Incidence (all cases/100 000 pop/yr)		!	557
Trend in incidence rate (%/yr, 2005–2006) <sup>2</sup>			-6.8
Incidence (ss+/100 000 pop/vr)			227
Prevalence (all cases/100.000 pop) <sup>2</sup>		5	597
Mortality (deaths/100 000 non/yr) <sup>2</sup>		-	131
Of new TB cases % HIV+b			43
Of new TB cases % MDB-TB (1995)			19
Of previously treated TB cases, % MDR-TB (1995) <sup>c</sup>			8.3
Surveillance and DOTS implementation			
Notification rate (new and relapse/100 000 pop/yr)			335
Notification rate (new ss+/100.000 pop/yr)			96
DOTS case detection rate (new ss $+$ %)			42
DOTS treatment success (new ss $\pm$ 2005 cohort %)			68
Of new pulmonary cases notified under DOTS % ss+			35
Of new cases notified under DOTS, % extrapulmonary			15
Of new set, cases notified under DOTS, % extrapulationary			13
Of sub-patienal reports expected % received at payt re	portina la	hlov	4/ 100
	porting ie	101-	100
Laboratory services <sup>3</sup>			
Number of laboratories performing smear microscopy			180
Number of laboratories performing culture			1
Number of laboratories performing DST			1
Of laboratories performing smear microscopy, % cover	ed by EQA	١	6
Management of MDR-TB			
Of new cases notified, % receiving DST at start of treatment	ment		0.0
Of new cases receiving DST at start of treatment, % ME	R-TB		-
Of re-treatment cases notified, % receiving DST			0.0
Of re-treatment cases receiving DST, % MDR-TB			-
Collaborative TB/HIV activities			
National policy of counselling and testing TB patients for	or HIV?		Yes
		(to all	patients)
National surveillance system for HIV-infection in TB pat	tients?		No
Of TB patients (new and re-treatment) notified, % tested	d for HIV		0
Of TB patients tested for HIV, % HIV+			-
Of HIV+ TB patients detected, % receiving CPT			0
Of HIV+ TB patients detected, % receiving ART			0
DOTS expansion and enhancement	1995	1996	1997
	_	0.0	0.0
DOTS notification rate (new and relanse/100.000 non)	_	0.0	0.0
DOTS notification rate (new ss+/100 000 pop)	_	_	_

WHO Africa Region (AFR)



#### **Case notifications**

Significant decline in ss- notifications in recent years



#### Unfavourable treatment outcomes, DOTS

Reporting of outcomes rate improved over 2004 cohort, but outcomes of treatment showing no improvement since 1998



DOTS expansion and enhancement	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
DOTS coverage (%)	_	0.0	0.0	100	12	100	100	100	100	100	100	100
DOTS notification rate (new and relapse/100 000 pop)	_	_	-	381	400	402	440	460	411	431	385	335
DOTS notification rate (new ss+/100 000 pop)	_	-	-	117	115	114	120	124	112	112	100	96
DOTS case detection rate (all new cases, %)	_	0.0	0.0	65	65	62	63	66	59	65	63	58
DOTS case detection rate (new ss+, %)	_	-	-	50	47	45	45	46	41	44	41	42
Case detection rate within DOTS areas (new ss+, %)e	_	-	-	50	409	45	45	46	41	44	41	42
DOTS treatment success (new ss+, %)	_	-	-	70	73	69	71	67	66	54	68	_
DOTS re-treatment success (ss+, %)	-	-	_	-	66	65	61	63	62	53	60	_

## ZIMBABWE

IMPLEMENTING THE STOP TB STRATEGY <sup>1</sup>	
DOTS EXPANSION AND ENHANCEMENT	
Political commitment, standardized treatment, and monitoring	and evaluation system
Achievements	Planned activities
Revised NTP manual	Distribute new NTP manual
<ul> <li>Produced annual report of NTP activities</li> </ul>	
Quality-assured bacteriology	
Achievements	Planned activities
<ul> <li>Developed plan for training of laboratory technicians, including training by NRL of 45 microscopists in smear microscopy, malaria microscopy and HIV rapid testing</li> </ul>	<ul> <li>Train laboratory technicians</li> <li>Secure external technical assistance for DST</li> </ul>
<ul> <li>Procured reagents and materials to resume culture and DST</li> </ul>	
<ul> <li>Provided support and supervision to peripheral-level laboratories</li> </ul>	
Drug supply and management system	
Achievements	Planned activities
<ul> <li>Developed plan for nationwide adoption of FDCs</li> </ul>	<ul> <li>Train health workers on FDC management and initiate distribution of FDCs</li> </ul>
	Carry out forecasting and quantification exercise to guide improved
	Train health providers on drug stocks
TB/HIV. MDR-TB AND OTHER CHALLENGES	
Collaborative TB/HIV activities	
Achievements	Planned activities
Developed plan to strengthen collaboration between NTP and NAP     Set up a rational accordination body	<ul> <li>Develop comprehensive policy on collaborative TB/HIV activities</li> <li>Develop cuidelines on TB/HIV for health providers</li> </ul>
<ul> <li>Set up a national coordinating body</li> <li>Bevised monitoring and evaluation tools to capture HIV information</li> </ul>	<ul> <li>Develop guidelines on TB/HIV for nealth providers</li> <li>Pilot test provision of IPT in selected health centres</li> </ul>
Diagnosis and treatment of multidrug-resistant TB	
Achievements	Planned activities
<ul> <li>Published national guidelines for treatment of MDR-TB</li> </ul>	<ul> <li>Update MDR-TB guidelines</li> </ul>
Developed MDR-TB/XDR-TB emergency strategic plan	<ul> <li>Finalize MDR-TB/XDR-TB response plans</li> </ul>
High-risk groups and special situations	Planned activities
Screened prisoners for TB on admission	Provide transport free of charge to TB patients
Implemented TB diagnosis and treatment in prisons	
HEALTH SYSTEM STRENGTHENING, INCLUDING HUMAN RESOURCE DEVE	LOPMENT
Achievements	Planned activities
<ul> <li>Involved broad range of partners from health and other sectors in planning for TP control</li> </ul>	<ul> <li>None reported</li> </ul>
Achievements	Planned activities
<ul> <li>None reported; no formal PPM activities in place</li> </ul>	<ul> <li>Revise PPM policy and guidelines</li> <li>Train private health providers on TB diagnosis and treatment in line</li> </ul>

with NTP guidelinesDisseminate ISTC

<sup>&</sup>lt;sup>1</sup> Unless otherwise specified, achievements are for financial year 2006; planned activities are for financial year 2007.

## EMPOWERING PEOPLE WITH TB, AND COMMUNITIES

### Advocacy, communication and social mobilization Achievements

Commemorated World TB Day

## **Community participation in TB care**

### **Achievements**

- Involved community members in some districts in referral of suspects and DOT, but without formal training
- Provided travel warrants enabling patients to travel to hospital for follow-up

## **Patients' Charter**

## **Achievements**

The Patients' Charter was published in 2006 and was therefore not available for use in countries until then.

RESEARCH, INCLUDING SPECIAL SURVEYS AND IMPACT MEASUREMENT

#### **Achievements**

None reported

## **Planned activities**

- Commemorate World TB Day
- Develop ACSM strategy
- Develop multimedia information package to raise awareness of TB

## **Planned activities**

- Develop strategy for community-based TB care
- Involve communities in all districts in TB suspect referral and DOT, with support from NGOs and formal training for community members
- Develop alternative mechanism to provide transport to patients, as current system relies on transport operators accepting warrants, which they are reluctant to do given reimbursement delays

## **Planned activities**

- None reported
- **Planned activities**
- None reported

#### NTP budget by source of funding

Decreased budget reported in 2007 and 2008 despite 27% increase in expected number of patients to be treated in 2007 compared with 2006



#### NTP budget by line item

Decreased funding within DOTS component mainly due to reduced budget for first-line drugs and routine programme management and supervision activities



### Total TB control costs by line item<sup>4</sup>

Hospitalization costs are for 1660 estimated dedicated TB beds



#### Comparison of country report and Global Plan:<sup>9</sup> total TB control costs, 2007-2008

Substantial differences between country report and Global Plan; Global Plan allows DOTS budget to increase in line with expected number of patients whereas country report does not; big discrepancy in TB/HIV costs, as in several other HBCs



#### NTP budget by line item, 2008

Largest share of budget is for DOTS component (45%) and collaborative TB/HIV activities (25%)



#### NTP funding gap by line item

Funding gap within DOTS component mainly for dedicated NTP staff and first-line drugs



#### Per patient costs, budgets and expenditures<sup>5</sup>

Cost and budget per patient substantially lower in 2007 and 2008 compared with the previous two years



#### NTP budget and funding gap by Stop TB Strategy component

	20	2007		2008		
(US\$ millions)	BUDGET	GAP	BUDGET	GAP		
DOTS expansion and enhancement TB/HIV, MDR-TB and other challenges Health system strengthening Engage all care providers People with TB, and communities Research Other	2.6 1.0 0.02 0.1 0.1 0.1 0.05	0.6 0.02 0.02 0.03 0.04 0.03	3.0 2.2 0.1 0.1 0.4 0.6 0.1	0.9 0.1 0.05 0.03 0.3 0.04		
Financial indicators for TB						
Sovernment contribution to NTP budget (including loans) Sovernment contribution to total cost of TB control (including loans NTP budget funded	9. ) 59° 68°	1% % %	21 55 78	% %		
Per capita health financial indicators (US\$) NTP budget per capita Total costs for TB control per capita Fundino nan per capita	0.3 0.7 0.1			1.5 1.9		
Government health expenditure per capita (2004) Total health expenditure per capita (2004)	13 27					

#### SOURCES, METHODS AND ABBREVIATIONS

Please see footnotes page 169

- Incidence, prevalence and mortality estimates include patients infected with HIV. Incidence estimate originally based on assumption of 60% ss+ case detection rate in 1997 (DOTS and non-DOTS). Trend in incidence
- bit decision of the second of 3
- re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population 4 Total TB control costs for 2003 and 2006 are based on expenditure, whereas those for 2004–2005 are based on available funding, and those for 2007–2008 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 NTP available funding for 2004-2006 is based on the amount of funding actually received, using retrospective data; available funding for 2002-2003 and 2007-2008 is based on prospectively reported budget data;
- and estimated as the total budget minus any reported funding gap. indicates not available; pop, population; ss+, sputum smear-positive; ss-, sputum smear-negative pulmonary; unk, pulmonary - sputum smear not done or result unknown; yr, year

## Footnotes

- <sup>a</sup> World population prospects the 2006 revision. New York, United Nations Population Division, 2007.
- <sup>b</sup> Estimates of HIV prevalence in incident TB cases (all ages). Estimates in regular type are based on national surveillance or survey data. Those in italics are derived from the UNAIDS estimate of HIV prevalence in the general population, using an incidence rate ratio of 6.
- <sup>c</sup> Estimates of prevalence of MDR-TB are from Anti-tuberculosis drug resistance in the world. Fourth global report. The WHO/IUATLD Global Project on Anti-tuberculosis Drug Resistance Surveillance. Geneva, 2008. World Health Organization. WHO/HTM/TB/2008.394. Estimates shown in regular type are survey data. Estimates in italics are estimates based on several sub-national surveys or on a multivariate regression analysis.
- <sup>d</sup> Completeness of reporting assessed at lowest level in reporting hierarchy for which information is available.
- <sup>e</sup> Case detection within DOTS areas calculated by dividing national case detection rate (new ss+) by DOTS coverage.
- <sup>f</sup> DOTS includes the following components shown in the pie chart above: first-line drugs, NTP staff, programme management and supervision, and laboratory supplies and equipment.
- <sup>9</sup> Estimates in the Global Plan were presented for regions rather than countries. See Methods for explanation of calculation of individual country estimates from regional estimates.
- <sup>h</sup> 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 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 Monitoring the global TB epidemic and progress in TB control (1995–2006)

### A2.1.1 Data collection and verification

Every year, WHO requests information from NTPs or relevant public health authorities in 212 countries or territories via a standard data collection form.<sup>1</sup> The latest form was distributed in mid-2007. The section on monitoring and surveillance requested data including the following: TB case notifications in 2006 (from DOTS and non-DOTS areas, each with 12 categories; new pulmonary smear-positive cases by age and sex); TB patients tested for HIV and MDR-TB in 2006; and treatment outcomes for TB patients registered during 2005 (DOTS, non-DOTS, HIV-infected, each with seven categories) and MDR-TB patients registered during 2003 (GLC-approved and other, each with three categories). 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, geographical origin (e.g. born outside country/non-citizen), and result of mycobacterial culture testing; and HIV-positive TB cases by sex and age.

NTPs that respond to WHO are also asked to update information for earlier years where possible. As a result of such revisions, the data (case notifications, treatment outcomes, etc.) presented in this report for years preceding 2005 and 2006 may differ from those published in previous reports.

The standard data collection form is used to compile aggregated national data. The process of national and international reporting is distinct from WHO's recommendations about procedures for recording and reporting data by NTPs within countries, from district level upwards.<sup>2</sup>

Completed forms are collected and reviewed at all levels of WHO, by country offices, regional offices and at headquarters. An acknowledgement form that tabulates all submitted data is sent back to the NTP correspondent in order to complete any missing responses and to resolve any inconsistencies. Then, using the complete set of data for each country, we construct a profile that tabulates all key indicators, including epidemiological and financial data and estimates, and this too is returned to each NTP for review. In the WHO European Region only, data collection and verification are performed jointly by the regional office and a WHO collaborating centre, EuroTB (Paris). EuroTB subsequently publishes an annual report with additional analyses, using more detailed data for the European Region (www.eurotb.org).

### 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 two sputum smears 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 culturepositive 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 smearnegative 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.

<sup>&</sup>lt;sup>1</sup> Posted at www.who.int/tb/country/en/

<sup>&</sup>lt;sup>2</sup> Revised WHO procedures for recording and reporting at district level are described at www.who.int/tb/publications/recording\_and\_reporting\_draft/en/index.html

### A2.1.2 High-burden countries, WHO regions and other subregions of the world

Much of the data submitted to WHO is shown, country by country, in the annexes of this report. The analysis and interpretation that precede these annexes focus on 22 HBCs and the six WHO regions. The 22 HBCs account for approximately 80% of the estimated number of new TB cases (all forms) arising worldwide each year. These countries are the focus of intensified efforts to implement the Stop TB Strategy (**Annex 1**). The HBCs are not necessarily those with the highest incidence rates per capita; many of the latter are medium-sized African countries with high rates of TB/HIV coinfection.

The WHO regions are 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. All essential statistics are summarized for each of these regions and globally. However, to make clear the differences in epidemiological trends within regions, we divide the African Region into countries with low and high rates of HIV infection ("high" is an infection rate of  $\geq 4\%$  in adults aged 15–49 years, as estimated by UNAIDS in 2004). We also distinguish central from eastern Europe (countries of the former Soviet states plus Bulgaria and Romania), and combine western European countries with the other high-income countries.<sup>1</sup> The countries within each of the resulting nine subregions are listed in the legend to **Figure 1.7**.

### A2.1.3 Estimating TB incidence, prevalence and death rates

### General principles for estimating incidence rates

Estimates of TB incidence, prevalence and deaths 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 infection and disease). The details of estimation are described in publications in peerreviewed journals.<sup>2,3,4</sup> In 2007, WHO has 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 document that provides an overview of the methods in a format that is designed to be accessible to nonepidemiologists. These documents are available upon request.

In brief, estimates of incidence (number of new cases arising each year) for each country are derived using one or more of four approaches, depending on the available data:



The Stýblo coefficient in equation (3) is taken to be a constant, with an empirically derived value in the range 40– 60, relating risk of infection (% per year) to the incidence of sputum smear-positive cases (per 100 000 per year). Given two of the quantities in any of these equations, we can calculate the third, and these formulae can be rearranged to estimate incidence, prevalence and death rates. The available data differ from country to country, and not all methods can be applied in every country.

### Estimates of the incidence of HIV-positive TB

Among all new, HIV-negative TB patients, 45% are assumed to be smear-positive (ranging uniformly between 40% and 50% in uncertainty analysis). Among HIV-positive TB patients, the fraction is smaller (35%, range 30–40%).

To estimate the prevalence of HIV among new TB cases, we mostly use an indirect method based as set out in the following equation:

prevalence of HIV in new = 
$$\frac{p_{\text{HIV}} \cdot \text{IRR}}{1 + p_{\text{HIV}} (\text{IRR} - 1)}$$
 (5)

where  $p_{HIV}$  is HIV prevalence in the general population and IRR is the incidence rate ratio, i.e. the TB incidence rate in HIV-positive people divided by the TB incidence rate in HIV-negative people.<sup>5</sup> IRR takes values of 30 (range 21–39, with a triangular distribution in uncertainty analysis) for high-income countries and 6.0 (range

<sup>1</sup> 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.

- <sup>2</sup> 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.
- <sup>3</sup> 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.
- <sup>4</sup> 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.
- <sup>5</sup> Data on HIV prevalence in the general population are unpublished data provided to WHO by UNAIDS.

3.5–8.0) for all other countries.<sup>1</sup> This method was used for 184 (out of 212) countries and territories.

For an increasing number of countries, however, we can estimate HIV prevalence in TB cases more directly. This is because HIV-testing of TB patients is becoming a routine practice in several countries, and some countries have carried out surveys of HIV prevalence in TB patients. For 15 countries that met one of two sets of criteria, we used surveillance or survey data to estimate the prevalence of HIV in incident TB cases in 2006, instead of the indirect method described above. The criteria were:

- At least 60% of notified TB cases had been tested for HIV in 2006 and at least 1000 cases had been tested. This set of criteria was met by 13 countries (Benin, El Salvador, Hong Kong Special Administrative Region of China, Kazakhstan, Kenya, the Lao People's Democratic Republic, Latvia, Malawi, Malaysia, Panama, the Republic of Moldova, Rwanda and Uzbekistan);
- Surveys had been undertaken in a representative sample of TB patients (rather than, for example, specific risk groups). This criterion was met in Cambodia and Viet Nam.

In addition, we identified two groups of countries where the indirect estimate was not consistent with the results of routine testing. The first group consisted of countries where the number of cases predicted by the indirect method was less than the number of HIV-positive TB cases that were identified by testing (seven countries: Gambia, Guatemala, Honduras, the Islamic Republic of Iran, Portugal, Thailand and Venezuela). The second group consisted of six countries where the number of HIV-positive TB patients identified, divided by the number of notified TB cases, was more than 1.5 times the prevalence estimated using the indirect method (Armenia, Belize, Burkina Faso, Jamaica, Trinidad and Tobago, and Uruguay). For these two groups of countries, we estimated the prevalence of HIV among new TB cases by dividing the number of HIV-positive TB cases identified by the number of TB cases notified. This is still a conservative estimate of HIV prevalence, since some of the untested cases could be HIV-positive, but it produces an estimate that must be closer to the true value than the indirect method.

From these estimates of HIV prevalence in new TB cases and the estimated prevalence of HIV in the general population,<sup>2</sup> we calculated the IRR for each country. The IRR was then used to calculate the prevalence of HIV in TB cases for the years 1990–2005.

### Estimating incidence rates for the period 1995–2006

For each country, estimates of the incidence of TB for each year during the period 1995–2006 were made as follows. We first selected a reference year for which we have a best estimate of incidence; this may be the year in which a survey was carried out, or the year for which incidence was first estimated. We then use the series of case notifications (all new and relapse cases) to determine how incidence changed before and after that reference year. The time series of estimated incidence rates is constructed from the notification series in one of two ways: if the rate of change of case notifications is roughly constant through time, we fitted exponential trends to the notification series (subregions Africa low-HIV, Latin America, South-East Asia, Western Pacific); if the rate varies through time (subregions Africa high-HIV, Central Europe, Eastern Europe, Eastern Mediterranean, Established Market Economies), we used a three-year moving average of the notification rates. If the notifications for any country are considered to be an unreliable guide to trend (e.g. because the amount of effort invested in compiling and reporting data is known to have changed; or because reports are clearly erratic, changing in a way that cannot be attributed to TB epidemiology), we applied the aggregated trend for all other countries from the same epidemiological region that have reliable data. For some countries, we used an assessment of the trend in incidence based on risk of infection derived from other sources (tuberculin surveys for China and Nepal). For those countries that have no reliable data from which to assess trends in incidence (e.g. for countries such as Iraq and Pakistan for which data are hard to interpret and which are atypical within their own regions), we assumed that incidence is stable.

Estimates of incidence form the denominator of the case detection rate. Trends in incidence are governed by underlying epidemiological processes, modified by control programmes. The impact of control on prevalence is determined by the trend in incidence and by the estimated reduction in the duration of the condition, e.g. smear-positive disease.

### Estimates of prevalence and death rates

The prevalence of TB is calculated from the product of incidence and duration of disease (rearranging equation 2), and the TB mortality rate from the product of incidence and case fatality (proportion of incident cases that ever die from TB; equation 4). The duration of disease and the case fatality are estimated, country by country, for patients treated within or outside DOTS programmes and for patients who receive no recognized anti-TB treatment. Because the duration of disease and case fatality are typically shorter for patients treated

<sup>&</sup>lt;sup>1</sup> 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. The estimated IRR of 30 for the high-income countries was reduced from the original estimate of 60 based on 2001 data published by the United States Centers for Disease Control and Prevention. The estimate of six for all other countries was reviewed with a new compilation of data, made in January 2007, from approximately 200 studies. The new analysis gave a point estimate of IRR close to six, on which basis we retained the original estimate used by Corbett et al. Further details are available from tbdocs@who.int

<sup>&</sup>lt;sup>2</sup> UNAIDS, unpublished data provided to WHO in November 2007.

under DOTS than for patients who are treated elsewhere or untreated, the average duration of disease and average case fatality decrease as the proportion of patients treated under DOTS increases.<sup>1,2,3</sup>

Where population sizes are needed to calculate TB indicators, we use the latest revision of estimates provided by the United Nations Population Division.<sup>4</sup> These estimates sometimes differ from those made by the countries themselves, some of which are based on more recent census data. The estimates of some TB indicators, such as the case detection rate, are derived from data and calculations that use only rates per capita, and discrepancies in population sizes do not affect these indicators. Where rates per capita are used as a basis for calculating numbers of TB cases, these discrepancies sometimes make a difference. Some examples of important differences are given in the country notes in **Annex 3**.

Because accurate measurement is crucial in the evaluation of epidemic trends, a recent paper provides methodological guidance,<sup>5</sup> based on a review by the WHO Task Force on TB Impact Measurement. This paper can be read in conjunction with the list of countries that have done, or are planning, infection (tuberculin) and disease prevalence surveys, and with the set of countries that now register deaths by cause and provide these data to WHO (including TB; **Annex 4**).

### A2.1.4 Case notification and case detection

Sputum smear-positive cases are the focus of DOTS programmes because they are the principal sources of infection to others, because sputum smear microscopy is a highly specific (if somewhat insensitive) method of diagnosis, and because patients with smear-positive disease typically suffer higher rates of morbidity and mortality than smear-negative patients. As a measure of the quality of diagnosis, we calculate the proportion of new smear-positive cases out of all new pulmonary cases, which has an expected value of at least 65% in areas with negligible HIV prevalence.<sup>6</sup>

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 TB cases reported – smearpositive 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/episode (i.e. re-treatment after failure or default) are presented separately.

The case detection rate is calculated as the number of cases notified divided by the number of cases estimated for that year, expressed as a percentage. Detection is presented in four main ways: (a) for new smear-positive cases (excluding relapses); (b) for all new cases (all clinical forms of TB, excluding relapses); (c) for DOTS programmes only; or (d) for cases notified from all sources (DOTS and non-DOTS areas). For new smear-positive cases aggregated as in (c) and (d):

DOTS case		annual new smear–positive notifications (DOTS)	$(\mathbf{C})$
rate	=	estimated annual new smear–positive incidence (country)	(6)
Case	_	annual new smear–positive notifications (country)	(7)
rate		estimated annual new smear–positive incidence (country)	(7)

The target of 70% case detection applies to the DOTS case detection rate in formula (6). Even when a country is not 100% DOTS, we use the incidence estimated for the whole country as the denominator of the case detection rate, as in equation (6). The DOTS 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 detection rate can exceed 100% if case-finding has been intense in an area that has a backlog of existing cases, if there has been over-reporting (e.g. double-counting) or over-diagnosis, or if estimates of incidence are too low. If the expected number of cases per year is very low (e.g. 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 evalua-

<sup>&</sup>lt;sup>1</sup> 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.

<sup>&</sup>lt;sup>2</sup> 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.

<sup>&</sup>lt;sup>3</sup> 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.

<sup>&</sup>lt;sup>4</sup> World population prospects – the 2006 revision. New York, United Nations Population Division, 2007.

<sup>&</sup>lt;sup>5</sup> 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).

<sup>&</sup>lt;sup>6</sup> Tuberculosis handbook. Geneva, World Health Organization, 1998 (WHO/TB/98.253).

tion process with NTPs, which of these explanations is correct.

The ratio of the DOTS case detection rate to coverage is an estimate of the case detection rate within DOTS areas (as distinct from the case detection rate nationwide), assuming that the TB incidence rate is homogeneous across counties, districts, provinces or other administrative units. The detection rate within DOTS areas should exceed 70% as DOTS coverage increases within any country. The value of this indicator is low when the DOTS programme has been poorly implemented, when access to DOTS is limited or when TB incidence in DOTS areas has been overestimated. Changes in the value of this ratio through time are a measure of changes in the quality of TB control, after the DOTS programme has been established.

### A2.1.5 Outcomes of treatment

Treatment success in DOTS programmes is the percentage of new smear-positive patients who are cured (negative on sputum smear examination), plus the percentage that complete a course of treatment, without bacteriological confirmation of cure (**Table A2.1**). Cure and completion are among the six mutually exclusive treatment outcomes.<sup>1</sup> 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 (i.e. the treatment cohort).

We also compare the number of new smear-positive cases registered for treatment (for this report, in 2005) with the number of cases notified as smear-positive (also in 2005). All notified cases should be registered for treatment, and the numbers notified and registered should therefore be the same (discrepancies arise, for example, when subnational reports are not received at 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 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. A DOTS country must report treatment outcomes, unless it is newly-classified as DOTS, in which case it would take an additional year to report outcomes from the first cohort of patients treated.

NTPs should ensure high treatment success before expanding case detection. The reason is that a proportion of patients given less than a fully-curative course of treatment remain chronically infectious and continue to spread TB. Thus DOTS programmes must be shown to achieve high cure rates in pilot projects before attempting countrywide coverage.

### A2.1.6 Determinants of tuberculosis dynamics: comparisons among countries

For the first time, this report includes an analysis of the broader determinants of TB epidemics. Case notifications were used to calculate trends in new TB cases (all forms of disease), expressed as rates per 100 000 population, over the 10 years from 1997 to 2006. Among 212 countries and territories that routinely provide data, countries were excluded where three or more years of data were missing, where notifications were highly variable between years, or where the trend is likely to have been affected by efforts to improve case detection. The latter is based on a detailed knowledge of DOTS implementation in individual countries. Nine high-burden countries were excluded from the analysis based on these criteria: Afghanistan, Bangladesh, Cambodia, Indonesia, Myanmar, Nigeria, Pakistan, Thailand and Uganda, as were 69 other countries. The countries included in the analysis accounted for 70% of the regional number of estimated new cases of TB in the African Region, for 93% in central Europe, for 98% in the high-income countries, for 19% in the Eastern Mediterranean Region, for 100% in Latin America and the Caribbean, and for 75% in Asia (the South-East Asia and Western Pacific regions combined). The exponential trend in the incidence rate was then obtained by unweighted least squares regression for the remaining 134 countries that did meet the criteria.

Because data on TB trends and determinants were not available for all countries, the nine subregions defined in **Figure 1.7** (see **Chapter 1**) were regrouped as six. These were: the African Region (giving trend estimates for 28 of 49 countries), Central and Eastern Europe (25 of 28), the Eastern Mediterranean Region (12 of 19), high-income countries (26 in Western Europe and the United States of America, of 30), Latin America and the Caribbean (25 of 42), and the South-East Asia and Western Pacific regions combined (18 of 43).

We investigated the link between incidence trends and 30 independent variables. The variables describe, for each country, aspects of the economy, population, behavioural and biological risk factors, health services

<sup>&</sup>lt;sup>1</sup> Treatment of tuberculosis: guidelines for national programmes. 3rd ed. Geneva, World Health Organization, 2003 (WHO/CDS/TB/2003.313).

and the intensity of TB control.<sup>1</sup> For each region separately, we established which variables were associated with incidence trends by unweighted univariate least squares linear regression. This analysis was done as the precursor to a full multivariate analysis, which will be presented elsewhere.

### A2.2 Implementing the Stop TB Strategy (2006–2008)

The information on implementing and planning the Stop TB Strategy presented and analysed in this report reflects activities mostly carried out in the 2006–2007 fiscal year and planned for the 2007–2008 fiscal year (see also A2.3 Financing TB control). For the first time in 2007, all data were requested via the same questionnaire as that used for the collection of the surveillance, epidemiological and financial data described in A2.1 and A2.3.<sup>2</sup> In previous years, a separate questionnaire had been sent to HBCs. As with questions on surveillance, epidemiological and financial data, questions on planning and implementation of the Stop TB Strategy were sent to all countries, although there was a more extended set of questions for HBCs.

The questionnaire was structured around the major components and subcomponents of the Stop TB Strategy and included questions on: DOTS expansion and enhancement, including laboratory and diagnostic services, standardized treatment and patient support, drug management, and monitoring and evaluation including impact measurement; collaborative TB/HIV activities; drug-resistant TB; special populations and other high-risk groups; health system strengthening and TB control, including human resource development, the Practical Approach to Lung Health (PAL), the extent to which TB control activities are integrated into primary health-care services, and the links between planning for TB control and broader planning frameworks and initiatives at the level of the health or public sector as a whole; public-public and public-private mix (PPM) approaches; International Standards for Tuberculosis Care;3 advocacy, communication and social mobilization (ACSM); community TB care; Patients' Charter for Tuberculosis Care;<sup>4</sup> and operational research.

Completed questionnaires were reviewed at all levels of WHO by country offices, regional offices and at headquarters. The acknowledgement form described above in A2.1 included follow-up queries regarding missing data or questions of clarification from submitted questionnaires. For HBCs, data were also used to produce the strategy component of the country profiles presented in Annex 1. This profile was discussed with NTP managers during international and regional meetings wherever possible, and with WHO staff with particular expertise or knowledge of each country. These discussions are used to produce a final version of the profile, which is sent to the NTP for their review and approval. Any clarifications or corrections provided at this stage are incorporated by WHO staff at headquarters. Additional details about data collection or analysis that are specific to DOTS implementation, collaborative TB/HIV activities and diagnosis and treatment of MDR-TB are provided below.

### A2.2.1 Implementation of 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 DOTS in this report, a country must have officially accepted and adopted the DOTS strategy in 2006, and must have implemented its four technical components in at least part of the country (**Annex 3**). Based on NTP responses to standard questions about policy – and usually on further discussion with the NTP – we accepted or revised 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<sup>5</sup> 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 2006, 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 (e.g. 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 (e.g. nomads placed on longer courses of treatment), these are considered DOTS cases. Where possible, additional information about these special groups of patients is provided in the country notes in **Annex 3**. Ideally, the DOTS coverage in any one year should be calculated by evaluating the number of person-years covered in each quarter, and then summing across the four quarters of the year (although some countries simply report the population coverage achieved by the end of the year).

<sup>&</sup>lt;sup>1</sup> Dye C et al, Determinants of trends in tuberculosis incidence: an ecologic analysis for 134 countries. Unpublished paper available from the authors.

<sup>&</sup>lt;sup>2</sup> Posted at www.who.int/tb/country/en/

 <sup>&</sup>lt;sup>3</sup> Hopewell PC et al. International standards for tuberculosis care. *Lancet Infectious Diseases*, 2006, 6:710–725.
 <sup>4</sup> Posted at www.who int/th/mbligations/2006/inte/on/index.

<sup>&</sup>lt;sup>4</sup> Posted at www.who.int/tb/publications/2006/istc/en/index. html

<sup>&</sup>lt;sup>5</sup> The basic management unit is defined in terms of management, supervision and monitoring responsibility. 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.

DOTS coverage calculated as described above is a crude indicator of the actual proportion of people who have access to DOTS services, but it is easy to calculate and is most useful during the early stages of DOTS expansion. As a measure of patient access to diagnosis and treatment under DOTS, coverage is an approximation, and usually an overestimate. 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 **A2.1**) is a more precise measure of DOTS implementation but is also more demanding of data.

### A2.2.2 Collaborative TB/HIV activities

In 2002, questions on collaborative TB/HIV activities were introduced into the WHO data collection form for the first time, but were sent to 41 priority countries only. These countries were selected because they accounted for 97% of the estimated global number of HIV-positive TB cases.<sup>1</sup> 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 ART to those TB patients found to be HIV positive. In 2005, all questions were sent not only to the 41 countries described above, but also to a further 22 countries.<sup>2</sup> 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).<sup>3</sup> From 2006 onwards, all questions have been sent to all countries.

For some 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", i.e. reported figures are based on data from only those countries that provided data on both the numerator and the denominator.

Indicators for monitoring and evaluating collaborative TB/HIV activities are available from WHO.<sup>4</sup>

### A2.2.3 Diagnosis and management of MDR-TB

In addition to the standard data collection form, this report includes data on the prevalence of drug resistance among TB patients collected through the WHO/ IUATLD Global Project on Antituberculosis Drug Resistance Surveillance (Global DRS Project), which began in 1994.<sup>5</sup> The project carries out surveys of drug resistance, using established and agreed methods, among patients who present to clinics, hospitals and other health institutions. The fourth report on the global magnitude and trends of drug-resistant TB has recently been published.<sup>6</sup> The profiles of the 22 HBCs (**Annex 1**) contain estimates of the national prevalence of MDR-TB among both new and previously treated TB patients, based on survey data for those countries participating in the Global DRS Project and for which data are considered reliable. For those countries that have not carried out surveys, or that do not have representative data on new or previously-treated cases, the figures given in the country profiles are estimates based on a regression model described in detail elsewhere.<sup>7</sup>

This report also used data compiled through the Green Light Committee (GLC) monitoring process, which is separate from the annual WHO TB data collection form that is sent to all countries.

In **Chapter 2**, particular attention is given to 25 countries that have been identified to be high priority at global level. These countries were defined using the following criteria:

- the estimated number of MDR-TB cases is above 4000 per year; and/or
- the proportion of TB cases that is estimated to have MDR-TB is above 10%.

### A2.3 Financing TB Control (2002–2008)

### A2.3.1 Data collection

We collected data from five main sources: NTPs, the WHO-CHOICE team,<sup>8</sup> Global Fund proposals and databases, previous WHO reports in this series, and epidemiological and financial analyses carried out for the Global Plan.<sup>9</sup> In 2007, data were collected directly from countries using a two-page questionnaire included

- <sup>2</sup> The 22 countries are Bahamas, Barbados, Belize, Benin, Dominican Republic, Equatorial Guinea, Eritrea, Estonia, Gabon, Guatemala, Guinea, Guinea-Bissau, Guyana, Honduras, Jamaica, Liberia, Madagascar, Niger, Panama, Somalia, Suriname, and Trinidad and Tobago.
- <sup>3</sup> HIV prevalence estimates for 2004 (unpublished data) Geneva, Joint United Nations Programme on HIV/AIDS.
- <sup>4</sup> 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).
- <sup>5</sup> The WHO/IUATLD Global Project on Anti-tuberculosis Drug Resistance Surveillance. Anti-tuberculosis drug resistance in the world. Third global report. Geneva, World Health Organization, 2003 (WHO/HTM/TB/2004.343). More information about the project can be found at: www.who.int/tb/dots/dotsplus/surveillance/en/index.html.
- <sup>6</sup> 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).
- <sup>7</sup> Zignol M et al. Global incidence of multidrug-resistant tuberculosis. *Journal of Infectious Diseases*, 2006, 194:479–485.
- <sup>8</sup> The WHO-CHOICE (CHOosing Interventions that are Cost-Effective) team conducts work on the costs and effects of a wide range of health interventions.
- <sup>9</sup> 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).

<sup>&</sup>lt;sup>1</sup> The 41 countries are: Angola, Botswana, Brazil, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, China, Congo, Côte d'Ivoire, Djibouti, the Democratic Republic of the Congo, Ethiopia., Ghana, Haiti, India, Indonesia, Kenya, Lesotho, Malawi, Mali, Mozambique, Myanmar, Namibia, Nigeria, Russian Federation, Rwanda, Sierra Leone, South Africa, Sudan, Swaziland, Thailand, Togo, Uganda, Ukraine, the United Republic of Tanzania, Viet Nam, Zambia and Zimbabwe.

### TABLE A2.2

Categories used for presentation of financial analyses in this report and their relationship to the Stop TB Strategy, the Global Plan, budget lines used on the WHO data collection form and budget lines used in previous WHO reports

CATEGORIES USED FOR FINANCIAL ANALYSES IN THIS REPORT THAT COVER THE PERIOD 2002–2008	STOP TB STRATEGY	GLOBAL PLAN	BUDGET LINES IN 2006 AND 2007 DATA COLLECTION FORM	BUDGET LINES BEFORE 2006
DOTS	Component 1	DOTS	First-line drugs; NTP staff; routine programme management and supervision activities; laboratory supplies and equipment	First-line drugs; NTP staff; buildings, vehicles, equipment; all other budget lines for TB
MDR-TB	Component 2	MDR-TB/ DOTS-Plus <sup>a</sup>	Second-line drugs for MDR-TB; management of MDR-TB (excluding second-line drugs)	Second-line drugs
TB/HIV		TB/HIV	Collaborative TB/HIV activities	Collaborative TB/HIV activities
New approaches: PPM/PAL/ community TB	Components 3–5	New approaches to DOTS	PPM and PAL; ACSM and community TB care	New initiatives to increase case detection and cure rates
care/ACSM		ACSM		
Operational research	Component 6	Not included as specific categories	Operational research and special surveys of prevalence of disease and infection	Not included as specific category
Other	Not applicable	Satogonoo	All other budget lines for TB (e.g. technical assistance)	"Other" category existed; for this report it is included under DOTS

a 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.

in the standard WHO data collection form (described above in A2.1). NTP managers were asked to complete three tables. The first two tables required a summary of the NTP budget for fiscal years 2007 and 2008, in US\$, by line item and source of funding (including a column for funding gaps). The third table requested NTP expenditure data for 2006, by line item and source of funding. The form also requested information about infrastructure dedicated to TB control and the ways in which general health infrastructure is used for TB control (e.g. the number of dedicated TB beds 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). We also asked for an estimate of the number of patients who would be treated in 2007 and 2008, for (a) smear-positive and (b) smear-negative and extrapulmonary cases combined.

Line items for the budget tables were 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**.

### A2.3.2 Data entry and analysis

We created a standardized Microsoft Excel worksheet which generates financial tables and related figures for each country that reported data for each year 2002–2008. The workbook also contains additional worksheets for summary analyses and for the data required as inputs to the country-specific analyses (e.g. unit costs for beddays 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 12 tables and related figures:

- NTP budget by line item for each year 2002–2008. 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 2006–2008 and those used in 2002–2005, is explained in Table A2.2.
- NTP budget by line item for each year 2002–2008, according to the categories used in each round of data collection.
- NTP budget by source of funding for each year 2002–2008, with the funding sources defined according to the 2007 data collection form, i.e. government (excluding loans), loans, Global Fund, grants (excluding Global Fund) and budget gap.
- NTP expenditures by source of funding for 2002–2006, with funding sources as defined for NTP budgets.
- NTP expenditures by line item for each year 2002–2006. Lines 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 2002–2006, according to the categories used in each round of data collection.
- Total TB control costs by funding source for each year 2002–2008, with funding sources as defined for NTP budgets.
- Total TB control costs by line item for each year 2002–2008, 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 2003–2006 by line item.<sup>1</sup>
- Funding gap by line item for each year 2002–2008. Line items were grouped as for budget and expenditure tables (Table A2.2).
- Financial indicators for 2007 and 2008, 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– 2008.

Budget data for 2007 and 2008 were taken from the 2007 data collection form. Budget data for 2006 were taken from the 2006 data collection form, and budget data for 2005 were taken from the 2005 data collection form. Budget data for 2002-2004 were taken from the 2005 annual report. Expenditure data for 2002, 2003, 2004, 2005 and 2006 were based on the 2003, 2004, 2005, 2006 and 2007 data collection forms, respectively. Total TB control costs were estimated by adding costs for hospitalization and outpatient clinic visits to either NTP expenditures (for 2002-2006) or NTP budgets (for 2007-2008). Expenditures were used in preference to budgets for 2002-2006 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 2007 and 2008, 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 2002-2006. In this case, we estimated expenditures based on available funding, which was calculated as the total budget minus the funding gap. The exception was South Africa, which reported budget and expenditure data for the first time in 2006. In previous annual reports, costs in South Africa were based on costing studies undertaken in the mid to late 1990s. Given the availability of new information from the 2006 round of data collection, we revised previous cost estimates for 2002–2004 by assuming that per patient costs in these years would be as for 2006. Total costs were then estimated by multiplying total notifications in each year by the estimated cost per patient treated.

The total cost of outpatient clinic visits was estimated in two steps. First, the unit cost (in US\$)<sup>2</sup> 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, we multiplied the cost per patient treated by the number of patients notified (for 2002-2006) or the number of patients whom the NTP expects to treat (for 2007-2008). 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, we used dedicated TB beds 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 seven countries that have dedicated TB beds: Bangladesh, Brazil, Cambodia, India, Mozambique, Myanmar and the Russian Federation. 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 2002–2006) and the number of patients whom the NTP expects to treat (for 2007–2008). Since the total costs of TB control for 2002–2006 were based on expenditure data, it is possible for the total TB control cost per patient treated to be 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 2002–2006, expenditures per patient were sometimes higher than the available funding per patient. This can occur when the NTP budg-

<sup>&</sup>lt;sup>1</sup> Expenditure data are available for a larger set of countries in 2003 compared with 2002. For this reason, comparisons are with 2003.

<sup>&</sup>lt;sup>2</sup> 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.

et 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 2006 round of data collection, countries were able to update 2006 budget data originally reported in 2005).

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, we converted the regional costs that appear in the Global Plan 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 (e.g. number of TB patients to be treated or number of HIV-positive TB patients to be enrolled on ART) planned by countries in 2007 and 2008 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 round 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, 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 (i.e. prices are not adjusted for inflation) rather than constant prices (i.e. all prices are adjusted to a common year). This means that values given for individual countries in *Global tuberculosis control* reports for the years 2002–2007 do not have to be adjusted, which makes it easier for country staff to review the data for previous years. The adjustment makes only a small difference to the numbers reported (less than 20% to 2002 values for total costs and less for other 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 2002–2008; NTP budget line items in 2008, according to the line items used in the 2007 round of data collection; NTP budget by line item 2002–2008, 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 2002–2008; per patient costs, budgets, available funding, expenditures and budget for first-line drugs 2002-2008; costs according to country reports compared with costs implied by the Global Plan for 2007 and 2008; and a summary table including (a) the NTP budget and funding gap by component of the Stop TB Strategy for 2007 and 2008 and (b) financial indicators.<sup>1</sup> 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 2002–2007 reports.

To assess whether increased spending on TB control has resulted in an increase in the number of cases detected and treated in DOTS programmes, we compared the change in total NTP expenditures between 2003 and 2006 with the change between 2003 and 2006 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, we compared the total costs of TB control with total government health expenditure.<sup>2</sup> We also examined the association between GNI (gross national income) per capita in 2006 and government contributions to total NTP budgets and TB control costs. Data on GNI per capita were taken from *World development indicators 2006.*<sup>3</sup>

### Other countries

For countries other than the HBCs, we used the data provided on the 2007 data collection form to assess NTP budgets by region in 2008, and compared these data with the budgets reported by the HBCs. Only countries that submitted complete data of sufficient quality (e.g. data whose subtotals and totals were consistent by both line item and funding source) were used.

We also made estimates 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. We then aggregated these values 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 64. We then compared these aggregated values to costs according to country reports.

<sup>&</sup>lt;sup>1</sup> A full set of charts and data is available upon request to tbdocs@who.int.

<sup>&</sup>lt;sup>2</sup> See www.who.int/nha/country/en.

<sup>&</sup>lt;sup>3</sup> Accessed in December 2007: devdata.worldbank.org/dataquery.

TABLE A2,3 Mathode used to allocate regional costs in the Global Plan to individual countries

Methods use(	d to allocate regional cost	s in the Global Plan	to individual count	ries				
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 BUDGETFOR NEW APPROACHES ACSM TO DOTS IMPLEMENTATION	BUDGET FOR ART FOR HIV+ TB PATIENTS, AND OTHER COLLABORATIVE TB/HIV AGTIVITIES	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 Myanmar 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	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 hudrat per part of the	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 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	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	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
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.		was required.	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	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	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	in the doubar han per capita (except for the cost of drugs, which were assumed to be the same in all countries).	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 curb hore is not
DR Congo Ethiopia Kenya Mozambique Nigeria South Africa Uganda Ul Tanzania Zimbabwe	Global Plan regional numbers allocated to each country according to its share of regional cases treated under DOTS (in 2004).			the Global Plan regional calculations was then multiplied by the number of cases to be treated (estimated as explained in column 2).	were allocated to each country according to its share of the regional population.			data collection form).

DCPP indicates Disease control priorities project of the World Bank; DDTS-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.

### A2.3.3 Global Fund contribution to TB control

We evaluated funding available from the Global Fund for both HBCs and other countries, as announced after the first seven rounds of funding. We assessed total approved funding at the end of 2007, disbursements to the end of 2007, 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. We also assessed how the total value of grants awarded for TB control has evolved between rounds 1 and 7, 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 malaria and HIV.

### 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 contain summaries of country data grouped by WHO region.<sup>1</sup>

All rates given are per 100 000 population (i.e. the total population of a country or region), except for case notifications by age and sex, where the estimated population for each age and sex category is used. Population estimates are from the United Nations Population Division.<sup>2</sup>

### NTP manager (or equivalent); person responsible for completing data collection form (if different)

The people named on the data collection form returned to WHO in 2007. This list acknowledges the contribution of NTP managers and others; those named are not necessarily the current NTP managers.

### Table A3.1 Estimated burden of TB, 1990 and 2006

Estimates of incidence, prevalence and mortality for 1990 (baseline year for MDG) and 2006 (the latest year covered by this report). See Methods for details of calculations. Unless otherwise specified, estimates are for TB in HIV-negative and HIV-positive people.

### Table A3.2Case notifications and case detection rates,<br/>DOTS and non-DOTS combined, 2006

Case notifications by history (new or re-treatment), by site (pulmonary or extrapulmonary) and by smear status (smear-positive, 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 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), retreatment 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, 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 pulmonary cases in which diagnosis has been confirmed by smear and/or culture examination.
- *Detection rate, all new*: notified new cases divided by estimated incident cases (expressed as a percentage).
- Detection rate, new ss+: the number of notified new smear-positive cases divided by the number of estimated incident smear-positive cases (expressed as a percentage).
- *SS*+ (% *of pulm.*): the percentage of all new pulmonary cases who are smear-positive.
- *SS*+ (% *of new+relapse*): the percentage of new and relapse case who are new smear-positive.
- *Extrapulm. (% of new+relapse)*: the percentage of all new and relapse cases who are extrapulmonary.
- *Re-treat. (% of new+re-treat.)*: notified re-treatment cases as a percentage of all notified cases.

### Table A3.3DOTS coverage, case notifications and case<br/>detection rates, 2006

As for Table A3.3, but for DOTS notifications.

• *DOTS coverage*: the percentage of the national population living in areas where health services have adopted DOTS.

<sup>&</sup>lt;sup>1</sup> The WHO Global TB Database, which includes detailed data for previous years, is available at www.who.int/tb/country/ global\_tb\_database.

<sup>&</sup>lt;sup>2</sup> World population prospects – the 2006 revision. New York, United Nations Population Division, 2007.

### Table A3.4Laboratory services, collaborative TB/HIV<br/>activities and management of MDR-TB,<br/>2005–2006

### 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, 2005–2006

- *TB pts tested for HIV*: the number of TB patients tested for HIV.
- *TB pts HIV-positive*: the number of TB patients tested found to be HIV-positive.
- *HIV*+ *TB pts CPT*: the number of HIV-positive TB patients given co-trimoxazole preventive therapy.
- *HIV*+ *TB pts ART*: the number of HIV-positive TB patients given antiretroviral therapy during their anti-TB treatment.

Data for 2005 were requested in the data collection form in 2006 and in 2007. For those countries that provided 2005 data in 2006 but not in 2007, the data provided in 2006 are shown.

### Multidrug-resistant (MDR) TB, 2006

- *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 2006.
- *DST in new cases*: the number of new TB cases in 2006 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 start of treatment.
- *Re-treatment DST*: the number re-treatment cases registered in 2006 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 A3.5 Treatment outcomes, 2005 cohort

Treatment outcomes of new smear-positive cases treated under DOTS, non-DOTS and re-treatment cases under DOTS (all re-treatment cases combined).

### Table A3.6 Re-treatment outcomes, 2005 cohort

Re-treatment outcomes of smear-positive cases treated under DOTS after relapse, treatment failure or default.

### Table A3.7DOTS treatment success and case detection<br/>rates, 1994–2006

Treatment success rates (the proportion of registered cases who cured or completed treatment) for new smear-positive cases treated under DOTS from 1994 to 2005 and smear-positive case detection rates under DOTS from 1995 to 2006.

### Table A3.8New smear-positive case notification rates<br/>by age and sex, absolute numbers, DOTS<br/>and non-DOTS, 2006

Breakdown by age and sex of new smear-positive cases notified from whole country (DOTS and non-DOTS). Some countries cannot provide the breakdown for all new smear-positive notified cases; other countries provide the breakdown for all new cases or all notified cases (see country notes).

### Table A3.9New smear-positive case notification rates<br/>by age and sex, DOTS and non-DOTS, 2006

Notification rates of new smear-positive cases by age and sex (DOTS + non-DOTS). Rates are missing where the breakdown of smear-positive notified cases is not provided, or where age- and sex-specific population data are not available. In the regional summary table, rates are excluding those countries for which the breakdown of notified cases or population by age and sex is missing.

Table A3.10 Number of TB cases notified, 1980–2006Table A3.11 Case notification rates, 1980–2006Table A3.12 New smear-positive cases notified,<br/>numbers and rates, 1993–2006

### **Notes**

These notes include data provided to WHO in nonstandard formats, additional information reported by countries and other observations. **SUMMARY BY WHO REGION** 

AFRICA

**THE AMERICAS** 

**EASTERN MEDITERRANEAN** 

EUROPE

**SOUTH-EAST ASIA** 

**WESTERN PACIFIC** 

## Table A3.1 Estimated burden of TB, 1990 and 2006

ģ		~							
HIV prevalenc	in incident	TB cases (%)	22	6.4	1.1	3.0	1.3	1.2	7.7
	+/	rate	26	Ň	Ň	Ň	vi Vi	s 1	4
ty, 2006	All forms H	number	204 559	3 876	2 737	2 335	10 805	6 545	230 857
mortali	*	rate	83	4.5	20	7.0	30	17	25
TΒ	All forms	number	639 089	40 600	107 895	62 197	514 699	291 240	1 655 721
	+>	rate	39	1.2	v L	vi T	-	< 1	5
e, 2006	All forms HI	number	302 995	10 632	3 269	6421	19 778	11 412	354506
evalence		rate	547	4	152	54	289	199	219
Pre	All forms*	number	4 233 723	398 030	826 308	478 332	4 974 978	3 512 972	14 424 343
	HIV+	rate	27	1.1	۸ ۲	v t	v T	s 1	4
	mear-positive	number	212 096	9 508	2 288	4 495	13 844	7 988	250 220
	e* S	rate	155	18	47	22	81	49	62
se, 2006	Smear-positiv	number	1 202 861	164 952	255 715	193 683	1 391 204	859 596	4 068 011
Incidenc	+>	rate	78	2.4	1.2	1.4	2.3	1.3	11
	All forms HI	number	605 989	21 265	6 538	12 842	39 556	22 823	709 013
		rate	363	37	105	49	180	109	139
	All forms'	number	2 807 688	330 7 24	569 7 08	433 261	3 100 355	1 915 285	9 157 021
1990		rate	42	6	27	9	51	26	28
TB mortality,	All forms	number	212 228	61 973	102 432	46 898	669 167	387 894	1 480 592
066		rate	333	96	234	53	533	322	294
Prevalence, 1	All forms*	number	1 703 191	697 620	895 047	446 679	6 970 394	4 864 814	15 577 744
	ive*	rate	70	32	50	17	06	57	56
э, 1990	Smear-posit	number	359 978	233 967	191 950	142 953	1 173 978	862 944	2 965 770
ncideno	**	rate	162	65	111	37	200	127	124
-	All forms	number	829 377	469 150	427 069	318 540	2 612 643	1 919 985	6 576 763
			AFR	AMR	EMR	EUR	SEAR	WPR	Global

\* Incidence, prevalence and montatity estimates include patients with HLV. Estimates labelled "HLV+" are estimates of TB in HLV-positive people (all ages). 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 on page 187 for further details. Data can be downloaded from www.who.int/tb

# Table A3.2 Case notifications and case detection rates, DOTS and non-DOTS combined, 2006

	l				NOUTION	I D Cases, DO			nailio					Estillated	Indelice all	r case uelect	IOII I ale			0112	
				New puln	nonary	New extra-	Other		Re-treatment	cases			New pulm.	Estimated ir	cidence	Case detect	ion rate s	S+ SS	TX TX	apulm. F	Re-treat.
	Population .	All notified	New and relapse	SS+	ss-/unk.	pulmonary	new	Relapse Afte	er failure Afte	r default Oth	her re-treat.	Other la	b. 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	%	md %	lm.) new+re	elapse) new-	relapse) nev	v+re-treat.)
AFR	773 792	1 310 841	1 234 260 160	555 123 72	381 696	220 643	1 860	74 938	7 901	18 952	48 249	1 479	557 376	2 807 688	1 202 861	41	46	59 4	5	18	11
AMR	899 388	235 816	224 548 25	125 178 14	54 670	32 392	1 921	10 387	1 182	4 871	4 750	465	135 462	330 724	164 952	65	76	0 5	9	14	6
EMR	544 173	325 797	322 306 59	131882 24	115 040	66 543	0	8 84 1	1 352	2 085	37	17	132 113	569 708	255 715	55	52	53 4	+	21	4
EUR	887 455	423 952	359 735 41	109 901 12	170 786	56 363	0	22 685	9 638	2 747	48 741	3 091	141 159	433 261	193 683	78	57 57	39 3	+	16	20
SEAR	1 721 049	2 104 673	1 920 644 112	938 637 55	609 705	261 839	1 188	109 275	25 583	80 175	76 882	1 389	964 908	3 100 355	1 391 204	58	67 6	31 4	6	14	14
WPR	1 764 231	1 416 373	1 331 333 75	671254 38	506 031	86 136	4 332	63 580	3 994	4 845	31 913	44 288	685 707	1 915 285	859 596	66	78 5	57 5	0	6	8
Global	6 590 088	5 817 452	5 392 826 82	2 531 975 38	1 837 928	723 916	9 301	289 706	49 650	113 675	210 572	50 729	2 616 725	9 157 021	4 068 011	56	62	58 4	7	13	12

ss+ indicates soutum smear-positive; ss-, sputum smear result unknown; re-treat, re-treatment; pulm. lab. confirmed; pulm. lab. confirmed; positive smear or culute. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who inutb

## Table A3.3 DOTS coverage, case notifications and case detection rates, 2006

				TB ca	ses reported t.	from DOT	S services						Estimated	incidence and	d case deter	ction rate		Pro	portions	
	DOTS		New pu	Imonary	New extra-	Other		Re-treat	nent cases			New pulm.	Estimated i	ncidence	Case dete	ction rate	+SS	+SS	Extrapulm.	Re-treat.
	coverage	<ul> <li>New and relapse</li> </ul>	SS+	ss-/unk	. pulmonary	new	Relapse .	After failure A	After default	Other re-treat.	Other	lab. confirm.	all forms	+SS	all new	new ss+	(% of	(% of	(% of	(% of
	%	number rate	number rat	te numbe	r number	number	number	number	number	number	number	number	number	number	%	%	oulm.) ne	ew+relapse) r	new+relapse) n	ew+re-treat.)
AFR	91	1 223 008 158	549 420 7	71 379.63	1 220 151	1 860	71946	7 827	18 652	48 249	1 479	551 668	2 807 688	1 202 861	41	46	59	45	18	11
AMR	93	204 547 23	114 412 1	3 48.830	D 29 824	1 913	9 568	1 116	4 291	3 970	463	124 271	330 7 24	164 952	59	69	20	56	15	6
EMR	98	318 973 59	131 820 2	24 11340	1 64 921	0	8831	1 352	2 085	37	17	132 051	569 708	255715	54	52	54	41	20	4
EUR	67	310 156 35	100 102	11 142.30.	3 45 579	0	22 172	9 571	2672	29 305	141	126 522	433 261	193 683	66	52	41	32	15	18
SEAR	100	1 920 371 112	938 572 5	55 609 49:	9 261 837	1 188	109 275	25 583	80 175	76 882	1 382	964 843	3 100 355	1 391 204	58	67	61	49	14	14
WPR	100	1 297 078 74	662 152 3	38 488 95	6 79 672	4 331	61967	3 847	4 583	28 141	40 997	672 353	1 915 285	859 596	64	77	58	51	6	7
Globa	il 93	5 274 133 80	2 496 478 3	38 1 782 62	0 701 984	9 292	283 7 59	49 296	112 458	186 584	44 479	2 571 708	9 157 021	4 068 011	54	61	58	47	13	11

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 on page 187 for further details. Data can be downloaded from www.who.in/tib

								Collaborative T	B/HIV activitie	8							
	-	Laboratory se	ervices, 200	90		2005	2			200	9	_		Manager	nent of MDR-T	-B, 2006	
				smear	TB pts		+NH	+VIH	TB pts		+NH	+VIH					
	number of	flabs working	with NTP	labs included	tested for	TB pts	TB pts	TB pts	tested for	TB pts	TB pts	TB pts	Lab-confirmed	DST	MDR	Re-treatment	Re-treatment
	smear	culture	DST	in EQA	ΝI	HIV-positive	CPT	ART	ΝI	HIV-positive	CPT	ART	MDR	in new cases	in new cases	DST	MDR
AFR	7 726	212	181	4 618	141 006	73 385	52 963	20 033	287 945	150 739	134 270	55 894	7 062	815	74	2 498	202
AMR	14 221	4 175	2 388	9 341	84 032	14 232	4 539	8 492	75775	11 386	7 022	6 840	1636	13 279	958	2 001	689
EMR	3 492	159	33	1 735	2 582	330	58	50	4678	259	46	134	244	1 905	53	366	164
EUR	7 409	1 837	690	2 109	178 033	6 548	101	78	192 965	5 281	281	1 175	12 282	68 324	5 709	19 881	6 711
SEAR	19772	125	41	16 202	31 847	7 025	305	190	87 139	15 920	4 67 7	2 335	763	614	4	1 210	690
WPR	7 390	458	122	6 433	32 605	2 221	20	21	38 672	2 632	290	201	629	6 331	89	1 298	498
Global	60 0 1 0	6 966	3 455	40 438	470 105	103 741	57 986	28 864	687 174	186 217	146 586	66 579	22 61 6	91 268	6 887	27 254	8 954

Table A3.4 Laboratory services, collaborative TB/HIV activities and management of MDR-TB, 2005–2006

ART indicates antiretrowrial threapy, CPT, co-trimovazole preventive threapy, DST, drug susceptibility testing; EOA, external quality assurance; HIV+, HIV-positive; pts, patients. See Explanabry notes on pages 187 for further details. Some countries provided the number of TB patients found to be HIV-positive, but idinot provide the number of TB patients tested. The regional and global totals of TB patients tested are therefore lower than the numbers of patients and cannot be used to calculated regional or global estimates of HIV providence in TB patients. Data cannot be used from www.who.int/tb

### Table A3.5 Treatment outcomes, 2005 cohort

			Nev	v smear-	-positive	cases,	s loa							New S.	mear-po	SILIVE C.	ases, n	ind-no					smea	r-positiv	/e re-tre	eatment	cases, I	sinc		
			%			%	of coho	ht			%			%			0 %	f cohort			%				% O	f cohort			o^	
	Number c	of cases	of notif		Compl-				Trans-	Not		Number	of cases	of notif		Compl-			Tré	ans- Nc	Ŧ	Number		Compl-			LT.	ans- N	ot	
	Notified	Regist'd	regist'd	Cured	eted	Died	Failed	Default	ferred	eval.	Success	Notified	Regist'd	regist'd	Cured	eted	Died F.	ailed De	fault fer	red eva	<ol> <li>Success</li> </ol>	Regist'd	Cured	eted	Died Fa	ailed De	efault fe	rred ev	al. Suo	ess
AFR	538 816	546 832	101	63	13	7	٢	6	4	ю	76	11 185	10 196	91	49	19	7	4	11	4 6	68	112 510	35	27	11	3	13	9	6 6	
AMR	101 808	108 413	106	57	21	2	-	7	ę	9	78	23 002	10 266	45	30	40	5	-	10	5 9	70	16 290	40	15	9	e	14	6 1	5 5	
EMR	113 677	113 555	100	72	1	ę	-	80	4	-	83	187	222	119	41	23	4	2	10	19 0	65	12 860	60	15	5	4	10	4	3	
EUR	72 316	73 768	102	60	10	80	80	80	ę	2	71	25802	10 153	39	37	46	ო	-	4	1 7	83	29 865	39	7	13	17	15	4	6	
SEAR	855 306	854 169	100	83	4	4	2	9	-	0	87	2 065	0	0						10	0	253 864	49	22	7	5	15	2	۲ ۲	
WPR	661 322	662 266	100	89	e	2	-	-	-	2	92	10 290	429	4	6	10	4	2	0	1 2 0	5 18	105 843	81	9	з	3	2	2	4	
Global	2 343 245	2 359 003	101	78	7	4	2	s	2	2	85	72 531	31 266	43	38	34	s	2		4 8	73	531 232	52	19	7	4	12		-	

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of ourced and completed; cases register, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the bedominated for calculating treatment outcomes. The number of cases registered is not reported, then the number of cases registered in 2005 is used. If the latter is greater. Data can be dominated for number of cases registered in 2005 is used. If the latter is greater. Data can be dominated for number of cases registered in 2005 is used. If the latter is greater. Data can be dominated for number not cases registered in 2005 is used.

## Table A3.6 Re-treatment outcomes, 2005 cohort

	%		uccess	53	41	20	43	67	62	64
		Not	eval. S	9	22	0	9	0	5	7
		Trans-	ferred	5	7	4	2	0	6	e
OTS	t		Default	23	22	16	26	19	13	20
efault, D(	of cohoi		Failed	з	0	4	12	4	4	4
After de	%		Died	10	9	9	12	œ	7	8
		Compl-	eted	12	19	21	20	œ	8	6
			Cured	41	23	49	22	59	55	55
		Number	regist'd	10552	4 014	2 411	1 632	73 508	904	93 021
	%		Success	56	38	67	33	61	64	57
		Not	eval.	4	25	-	20	0	4	e
		Trans-	ferred	5	2	2	4	2	4	e
OTS	DT.		Default	15	13	12	13	16	4	15
ailure, D	6 of coho		Failed	10	11	8	18	4	18	13
After f	6		Died	6	7	8	13	œ	9	6
		Compl-	eted	14	21	19	2	ø	8	10
			Cured	42	17	48	29	52	56	47
		Number	regist'd	6 097	861	1 276	3 287	21 761	784	34 066
	%		Success	67	67	78	52	74	88	74
		Not	eval.	5	10	e	8	-	с	e
		Trans-	ferred	5	2	e	4	2	2	e
TS	ort		Default	11	10	6	12	12	1	6
apse, DC	% of coh		Failed	2	ę	e	13	2	з	4
Rel		-	Died	10	2	4	12	7	3	7
		Comp	d eted	13	4	13	9		5	80
			Cure	1 53	53	: 65	95	5 67	83	. 66
		Number	regist'd	47213	7 776	9 0 7 4	16 279	93 865	59750	233 957
				AFR	AMR	EMR	EUR	SEAR	WPR	Global

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of outed and completed, cases regist(d, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes unless it is missing or is less than the sum of outcomes i, in which case the sum of outcomes is used. Data can be downloaded from www.who.in/th

AD./ DOID ILEGUILE		aun	2	nccess	allu ca	alan as	CUUI IS	ILES, 132	2002-46															
DOTS new smear-positive treat	DOTS new smear-positive trea	DOTS new smear-positive trea	w smear-positive trea	-positive trea	trea	tme	ent succe	(%) ss							JOTS nev	v smear-	positive (	case dete	ection ra	ate (%)				
1994 1995 1996 1997 1998 19	1995 1996 1997 1998 19	1996 1997 1998 19	1997 1998 19	1998 19	19	66	2000	2001	2002	2003	2004	2005	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
59 62 57 63 70	62 57 63 70	57 63 70	63 70	70		69	72	71	73	73	74	76	23	25	29	34	35	35	36	42	44	46	45	46
76 77 83 82 81	77 83 82 81	83 82 81	82 81	81		83	81	82	83	83	82	78	25	25	27	31	34	41	40	43	47	56	60	69
82 87 86 79 77	87 86 79 77	86 79 77	77 77	11		83	83	83	8	83	83	83	11	10	11	18	20	24	26	31	33	38	45	52
68 69 72 72 76	69 72 72 76	72 72 76	72 76	76		-17	77	75	76	75	74	71	ę	сņ	5	11	11	12	4	22	23	26	36	52
80 74 77 72 72	74 77 72 72	77 72 72	72 72	72		73	83	84	85	85	87	87	-	4	5	8	14	18	27	34	4	55	62	67
90 91 93 93 95	91 93 93 95	93 93 95	93 95	95		94	92	93	06	91	91	92	16	28	32	33	32	37	39	39	50	65	17	77

Table A3.7 DOTS treatment success and case detection rates, 1994–2006

Treatment success indicates sum of cured and completed; DOTS new smear-positive case detection rate, notified cases divided by estimated incident cases. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.inthb

Global

# Table A3.8 New smear-positive case notification by age and sex, absolute numbers, DOTS and non-DOTS, 2006

~	1							
Male/femalc	ratio	1.3	1.6	1.2	2.4	2.0	2.2	1.8
	65+	18 785	12 893	10 740	10 055	68 372	122 853	243 698
	55-64	31 463	12 144	12 940	9 890	113 108	98 572	278 117
	45-54	66 332	17 74 1	18 066	21558	161 307	111 137	396 141
AII	35-44	118 121	21 400	22 567	23 116	192 203	120 827	498 234
	25-34	172 418	27 138	30 883	25 049	209 438	110 801	575 727
	15-24	111 031	27 392	31680	15 996	179310	98 725	464134
	0-14	17 047	3 346	5 024	607	14 845	3 695	44 564
	65+	6 908	4 830	4 137	4 321	15 163	33 598	68 957
	55-64	11 513	4 035	5 223	2 127	27 764	26 458	77 120
	4554	23 702	5 695	7 490	4 065	42 147	29 600	112 699
Female	35-44	45 149	7 360	10 255	5 381	59 256	35 981	163 382
	25-34	76 914	10 89 1	14 006	7 968	80 704	38 404	228 887
	15-24	57 309	11 484	15 855	6 619	75 939	39 521	206 727
	0-14	9 749	1 787	3 322	375	9 326	2 032	26 591
	65+	11877	8 063	6 603	5 734	53 209	89 255	174741
	55-64	19 950	8 109	7117	7 763	85 344	72 114	200 997
	4554	42 630	12 046	10 576	17 493	119 160	81 537	283 442
Male	35-44	72 97 2	14 040	12 312	17 735	132 947	84 846	334852
	25-34	95 504	16 247	16 877	17 081	128 734	72 397	346 840
	15-24	53 722	15 908	15 826	9 377	103 371	59 204	257 408
	0-14	7 298	1559	1 703	232	5519	1663	17 974
		AFR	AMR	EMR	EUR	SEAR	WPR	Global

For some countries, breakdown of offield cases by age and sex insising, or is provided for a subset of cases. See Explanatory notes on page 187 for further details. Data can be downbaded from www.win.in/th

# Table A3.9 New smear-positive case notification rates by age and sex, DOTS and non-DOTS, 2006

	65+	22	17	51	80	11	83	50	
	55-64	104	17	52	11	112	67	60	
	4554	137	17	42	18	97	51	56	
R	35-44	165	17	37	18	87	41	55	
	25-34	158	20	36	19	76	40	57	
	15-24	20	18	27	12	54	34	39	
	0-14	5	-	e	0	e	1	2	
	65+	51	5	37	9	32	42	25	
	55-64	72	1	41	5	54	36	33	
	4554	95	1	36	9	52	28	32	
emale	35-44	125	12	35	8	55	25	37	
-	25-34	141	16	34	12	61	28	46	
	15-24	72	15	28	10	48	28	36	
	0-14	9	2	4	0	4	1	3	
	65+	110	24	99	12	129	129	82	
	55-64	141	24	62	18	170	96	88	
	4554	182	24	47	30	140	74	81	
Male	35-44	206	23	39	27	118	56	74	
	25-34	175	24	38	26	91	51	67	
	15-24	67	21	26	14	61	39	42	
	0-14	4	-	2	0	2	1	2	
		AFR	AMR	EMR	EUR	SEAR	WPR	Global	

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.inttb

1980-2006
notified,
3 cases
of TE
Number (
5
A3.
Table

	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 2	0.5 200
AFR	219802	224 102	240 263	258 842	264 928	296 627	301 683	333 842	373 550	365 432	418 530	112 414	432 997 4	118 995 5	50 183 5	04 309 £	85 773 5	98 821 6	89 253 74	50 086 78	3 930 86	1 423 1 00	4 557 1 07	9 333 1 175	378 1 186	300 1 2 34 26
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 1	66 458 2	41854 2	58 188 2	56 656 2	54 980 2	62 886 2.	40619 23	18 580 23 <sub>1</sub>	0 403 23	3 678 22	8 4 48 235	511 227	599 224 54
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 2	01 620 1	19374 1	21 745 1	45 373 1	36 2 32 2	33 878 1	71734 14	1 748 16.	5 904 19	1 744 20	7 375 235	943 287	352 322 30
EUR	348 921	346 104	324 580	319220	308 401	298 933	302 602	290 606	277 143	267 232	242 429	231 651	248 519 2	142 425 2	43 691 2	90 031 3	122 080 3	53 361	49 795 3	73765 37	3 081 36.	3 433 37;	3 670 35	8978 354	954 365	346 35973
SEAR	837 901	915 952	1 076 211 1	244 819 1	275 299 1	323 509 1	4134181	520 444 1	667 348 1	735 860 1	719 365 1	747 252 1	322 709 12	387 176 1 2	98 759 14	101 096 1	170 352 1 3	08 981 1 2	79 041 14	64 312 1 41	4 228 1 41	4 141 1 48	8 126 1 55	15161686	681 1 789	186 1 920 64
WPR	356 452	355 337	461 550	462 181	540 985	615 153	651840	655 0 0 6	716 427	741 913	394 073	760 863	754 463 7	18 783 7.	24 2 90 8	24 954 8	73 425 8	70 920 8	34 599 8.	20469 75	6 285 80.	5 105 81	1 482 96	0 890 1 160	130 1 274	24 1 331 33
Global	2 512 883	2 604 408 2	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 0	135 457 3 1	78 151 3 4	00 323 3 6	153 659 3 5	23 295 3 6	49 452 3 8.	20 985 3 73	7 852 3 84	5 409 4 10:	3 257 4 40	6 540 4 852	597 5 130	107 5 392 82
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	99 20:
% 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 91
	ĺ	۱	۱	۱			۱		۱		۱	۱	I			۱		I								

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/b

1980-2006
rates,
notification
v3.11 Case
Table A

	1980	1081	1982	1082	1 98.4	1985	1086	1987	1088	1080	1990	1 991	1992	1003	1001	1005	1006	1007	1 998	1000	0000	2001	2002	2003	2004	2005	2006
	2000		400	2002	5	2002	2000	100	0000	2002	2000		4001	2000	100	2000	0000		000	000	4000	- 0.04	4004	2007	1004	2007	2007
AFR	58	57	60	62	62	67	99	71	78	74	82	78	80	75	96	86	97	97	108	115	117	126	143	150	160	157	160
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
MR	184	176	144	75	53	56	67	82	77	70	61	80	27	49	28	28	33	30	50	36	29	8	38	40	45	54	59
SUR	4	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
SEAR	79	85	97	110	110	112	117	124	133	135	131	131	67	93	92	97	100	88	84	95	06	89	92	94	101	105	112
VPR	27	27	8	34	39	4	46	45	49	50	59	50	49	46	46	51	54	53	50	49	47	47	47	57	67	73	75
lobal	56	58	60	59	58	61	63	66	20	69	71	69	57	55	56	59	63	60	61	63	61	62	65	69	75	62	82

Rates are per 100 000 population. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.invitb

able A3.12 New smear-positive cases notified, numbers and rates, 1993–2006	Number of cases
Tab	

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1993	1994	1995	1996 1.	997 15	998 19.	99 200	70 200	1 2002	2003	2004	2005	2006	
AFR	107 012	121 005	212 910	264 659	277 591	326 831	349 142	362 527	402 431	459983	513 029	551 031	550 00 1	555 123	19	21	36	44	45	51 É	34 55	4 55	3 65	71	75	73	72	
AMR	98 265	137 645	138 932	136987	142 556	139 253	135 153	131 294	129 944	127 575	125 815	126 345	124 810	125 178	13	18	18	17	18	17 7	16 14	6 1£	5 15	14	14	14	14	
EMR	20 260	20 428	46 851	58720	57 947	74 923	69 140	60 959	69 101	76125	81 313	94 775	113 864	131 882	2	2	11	13	13	16 1	15 1.	3 14	1 15	. 16	18	21	24	
EUR	45771	83 568	104 444	110614	106 700	111 772	89 199	94 275	86 239	83 455	101 657	92 233	96 101	109 901	2	10	12	13	12	13	10 1	1 10	6 (	12	10	11	12	
SEAR	317 355	313 430	357 882	372 867	369 583	382 171	481 332	510 053	561 939	606730	673 171	779 530	857 371	938 637	23	22	25	25	25	25 3	31 3.	2 35	5 37	. 41	47	51	55	
WPR	222 813	241 737	314 271	388 142	416 954	379 698	383613	376 109	371 806	372 528	453 812	579 566	671612	671 254	14	15	20	24	25	23 2	23 2.	2 22	22	26	33	38	38	
Global	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	531 975	15	16	24	23	23	24 2	12 21	5 26	27	31	35	37	38	

Rate (per 100 000 population)

Rates are per 100000 population. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/tb

### AFRICA

**THE AMERICAS** 

**EASTERN MEDITERRANEAN** 

EUROPE

**SOUTH-EAST ASIA** 

**WESTERN PACIFIC** 

### Africa

### NTP MANAGER (OR EQUIVALENT); PERSON FILLING OUT DATA COLLECTION FORM (IF DIFFERENT

Algeria Angola Benin Botswana Burkina Faso Burundi Cameroon Cape Verde Central African Republic Chad Comoros Congo Côte d'Ivoire DR Congo Equatorial Guinea Eritrea Ethiopia Gabon Gambia Ghana Guinea Guinea-Bissau Kenva Lesotho Liberia Madagascar Malawi Mali Mauritania Mauritius Mozambigue Namibia Niger Nigeria Rwanda Sao Tome & Principe Senegal Seychelles Sierra Leone South Africa Swaziland Togo Uganda UR Tanzania Saidi Egwaga; Emmanuel Nkiligi Zambia Nathan Kapata Zimbabwe Charles Sandy

Sofiane Alihalassa Maria da Conceição Palma; Arlindo Tomás do Amaral Martin Gninafon; Germain Monteiro Pio Vonai Teveredzi; Grace Kangwagye Nkubito Sarv Mathurin Dembélé; Michel Sawadogo Donatien Nkurunziza Wang Hubert; Adolphe Nkou Bikoe Maria da Luz Lima Aguide Soumouk; Pierre Kanda Mahamat Ali Acyl Aboubacar Mze Mbaba Ongouo Hermann; Antoine Ngoulou Jacquemin Kouakou: Amoin Angennes Akaki André Ndongosieme; Marie-Léopoldine Mbulula Kiflom Bahlebi: Mineab Sebhatu Bekele Chaka; Fekadesilase Mikru; Diriba Agegnehu Toung Mve Médard; Géneviève Angue Nguema Adama Jallow; Kejaw Saidykhan Frank Adae Bonsu Namory Keita; Fodé Cissé Miguel Camará; Laia Jamanca Joseph Kimagut Sitienei; Hillary Kipruto Job Ndile C. Lawuo Gwesa: Henry Dickson Rarivoson Benjamin: Sylvestre Ranaivohajaina Felix Salaniponi; John kwanjana **Diallo Alimata Naco** Sidina Ould Mohamed Ahmed; Mohamed Ould Salem F. Rujeedawa Paula Samogudo; Angélica Salomão Rosalia Indongo; Amos Kutwa Marafa Boulacar; Moumouni Kadi Ben C. Nwobi; Amos F. Omoniyi Michel Gasana; Evariste Gasana Aleixo Rodrigues de Sousa Pires Foday Dafae; Saffa Kamara Lindiwe Mvusi; Carina Idema; Letta Seshoka Themba Dlamini Fantchè Awokou Francis Adatu-Engwau; Joseph Imoko

This list shows the people named on the data collection form sent to WHO in 2006, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

		1000	0001	1000 T			0000			0000		0000	The second
	All formo*	e, 1990 Cmoor pooltivo*	Prevalence, 1990	All former	All formo*	All forms LIVIL	Smoor nonitive* 0	2moor positive HIV/+	All formo*	26, 2000	All forms*	y, ∠000 All forme ⊔1\/+	IIIV prevalence
	number rate	number rate	number rate	number rate	number rate	number rate	number rate	number rate	number rate	number rate	number rate	number rate	TB cases (%)
Algeria	9379 37	4 220 17	11 067 44	541 2	18 699 56	94 55	vi	×	vı	X		X	
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	vi	vi	vi		vi	vi	vi	vı	vi	vi	vi	vi	
VI	vi	vı	vı	vi	VI	vı	vı	vı	vi	vı	vı	vı	
	VI	vi	vı	vı	vı	vi	vı		vı	vı	vı	vı	
`	VI	vı	м,	vı	vı	VI	vı	VI	VI V	vı	VI	VI	
VI VI	VI	vi	/I VI	VI	vi	vi	VI		∕I VI	vi	VI	vi	
	vi	vi	vi	vi	vi	vi	vi	vi	vi	vi	vi	vi	
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I	vi	vi	vı		vi		vı		v		vı		
	VI	VI	vı	vı	VI	vı	VI	vı	VI	VI	vı	VI	
	vı		vı		v		vı		v				
	vi		vı		vi		vi		vī				
	VI	vı	vı	vı	vı	vı	VI	vı	vı	VI	vı	VI	
	VI	VI	VI	VI	vı	VI	vı		VI		vı		
	VI.	,	VI '	,	vi	,	VI '	,	vi '	,	,	,	
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	VI	VI	vı	VI	vı		VI		vı		VI		
						XI		XI		XI		XI	
	vi	vı	vi	vi	VI	vı	vi	vı	vı	vı	VI	vi	
	VI V	VI V	VI V	vi v	VI V	vi	vi v	vi	vi <sup>vi</sup>	vi	vi v		
	vi	vi	vi	vi	vi	v	vi	v	vi	vi	vi	vi	
	VI	vi	vi	vi	VI	vi	vi	vi	vi	vi	vi	vi	
s 25													
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Z	vi	vi	v	v	vı	v	v		v		v		
vi	vi	vi	vi	vi	vi	vi	vi	vi	vi	vi	vi	vi	
	vi V	v	VI V	v	vi vi V	vi <sup>V</sup>	vi v	VI	vi vi V	VI V	vi V	VI V	
	1 V	1 V	, v	1 V	' v	' v	ı v	v	1 V	, v	ı v	ı v	
v	· v	ı v	' v	, v	, v	ı V	ı v	ı v	ı v	, v	ı v	' v	
	I VI	I VI	, VI	v	ı vı	v ا	' vi	' vi	ı VI	I VI	I VI	, vi	
	VI	VI	vi	vi	VI	vi	VI	vi	VI	vī	VI	vi	
AFR	829.377 162	359.97.8 70	1 703 191 333	212 228 42	2 807 688 363	605 989 78	1 202 861 155	212 096 27	4 233 723 547	302 995 39	639 089 83	204 559 26	22
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v1 <sup>V1</sup> vi vi VI VI vi <sub>vi</sub> vi <sub>V</sub>i Vi vi <sup>VI</sup> vi vi vi vi

Table A3.1 Estimated burden of TB, Africa, 1990 and 2006

Table A3.2 Case n	otificatio	ns and c	ase detu	ectior	n rates,	DOTS	and non	DOTS C	ombin	ed, Afric	a, 2006												
	I				:	-	Notified TB	cases, DOTS	and no.	n-DOTS cor.	nbined					Inciden	ce and case	detection r	ates		Prop	ortions	
	Population 4	All notified	New and rel	apse	ss+	buimona	ss- / unk. pu	imonary r	ner Jew R	elapse After	reatment	r default Oth	ier re-treat.	Other la.	b. confirm.	all forms	ncidence ss+	uase dete all new	new ss+	ss+ (% of	ss+ (% of	Extrapulm. (% of	Ke-treat. (% of
	thousands	number	number	rate	number	rate	number	number num	n n	number t	number	number	number r	umber	number	number	number	%	%	pulm.) ne	w+relapse) n	ew+relapse) n	ew+re-treat.)
Algeria	33 351	21 263	21 143	63	8 538	26	1 827	10 219		559	26	94			8 737	18 699	8 405	110	102	82	40	48	з
Angola Benin	16 557 8 760	54 699 3 734	50 419 3 619	305 41	21 499 2 943	130	11 635 206	2 719 322	0 0	14 566 148	322	3 958 56	0 0	0 0	21 499 3 300	47 231 7 878	20 991 3 428	76	102 86	65 93	43 81	ۍ د	34
Botswana	1 858	8 519	8 4 13	453	3 252	175	3 776	1 149	,	236	42	64	<b>b</b>	,	3 594	10 230	4 053	80	88	46	39	4	. 4
Burkina Faso	14 359	4 248	3 941	27	2 659	19	506	551	50	175	224	38	45	0	2 659	35678	15 452	11	17	84	67	14	11
Burundi	8173	6 176	6 114	75	3 119	38	950	1 900	0	145	40	22	0		3 326	29 987	13 266	20	24	77	51	31	3
Cameroon	18 175	24 879	24 316	134	13 811	76	6 569	3 035		901	88	475			13 811	34 829	15 137	67	91	68	57	12	9
Cape Verde Central African Renublic	519 4 265	276 6.375	262 6 045	51 142	131 4 448	25 104	88 707	33 664	C	10 226	367	11 263	C	c	131	873 14 713	393 6 359	20 40	33	60 86	50	13	ი თ
Chad	10 468	000	2			2	6	5	, ,	011	5	004		, ,	000	31 262	13 759	2	2	8		:	
Comoros	818	116	112	4	67	80	22	20	0	e	e	-			67	358	161	30	42	75	60	18	9
Congo	3 6 8 9	8 600	8 478	230	3 340	91	2 504	2 353		281	34	88			3 340	14 869	6 523	55	51	57	39	28	5
Côte d'Ivoire	18 914	21 145	20 746	110	12 867	68	2 675	4 411	0	793	277	122	0	0	12 867	79515	34 699	25	37	83	62	21	9
DR Congo Equatorial Guinea	60 644 496	98 139	95 666	158	63 488	105	10 093	18 213		3 872	667	992		484	63 488	237 473 1 268	104 680 556	39	61	86	99	19	9
Eritrea	4 692	3 136	3 026	64	680	14	1 484	782	0	80	2	28	27	0	680	4 402	1962	67	35	31	22	26	9
Ethiopia	81 021	123 009	122 198	151	36 674	45	40 234	43 255		2 035	298	513			36 674	306 330	135 926	39	27	48	30	35	2
Gabon	1311	3 206	3 051	233	1 145	87	1 478	313		115	6	146			1 145	4 635	1990	63	58	44	38	10	8
Gambia	1 663	1 881	1 795	108	1 209	73	467	102	0	17	2	15	69	0	1 209	4 278	1 893	42	64	72	67	9	5
Ghana	23 008	12 511	12 47 1	54	7 786	8	3 139	1 049	0	497	18	22			7 786	46 693	20 684	26	8	7	62	∞ :	4
Guinea	9 181	9 076	8 787	96	5 903	64	898	1 699		287	126	163			6 500	24 32 1	10 821	35	55	87	67	19	9
Guinea-Bissau	1 646	2 161	2 137	130	1 030	63	955	19	0	133	æ ;	16	0	0	1 030	3 602	1 602	56	55 F	52	48	- ;	- 3
Kenya	36 553	115 234	108 342	296	39 154	107	48 338	17 443		3 407	121	1657	5 114	110	39 154	140 548	55 934	12	2 6	6 t	36	16	ъ,
Lesotho	GRA L	13 308	120/3	609	4 024	202	4 934	2 4//	4	038	80	14/	807	CCZ.	4 024	0/971	880 G	90	19	45	33	1.7	13
Liberia Madagecar	3 5 / 9 19 1 5 0	4 514 22 517	21 Q66	115	2 9Ub 15 613	2 1 2 1 2 1 2	040 1 175	829 4 011	D	00 1 167	356	105			2 905	7 097 11	112 G	3/	66 5	28 28	CQ 72	8	να
Malawi	13 571	27 011	25 054	185	8 166	09	10 608	5 268		1 012	200	2	1 957		8 166	51 172	19 449	47	6 4	43	33	21	1
Mali	11 968	5 224	4 989	42	3 802	32	386	580	0	221	150	85	0	0	3 802	33460	14 896	14	26	91	76	12	6
Mauritania	3 0 4 4	2 766	2 694	68	1 486	4 <sub>1</sub>	480	536	0	192 2	24	48 ,	0	0	1 486	9 626	4 307	26	8 8	76	55	20	9
Mauritius	7071	010 30	75 757	40.0	320 01	- 10	10 640	1 000	¢	4 400	140	- 100	d	c	10 075	204	121	80	10	60	C/	5 5	o u
Mamihia	2047	350 CC	102.00	717	612 01	0/ 262	4 178	4 828 2 450 1	U 674	1 015	202	CU2	U BUI	Þ	5 256	92 033 15 680	59 UUZ 6 458	0C 78	4 83	00 29	20	+ <sup>†</sup>	с <u></u>
Niger	13 7 37	8 755	8 474	62	5 279	38	1 443	1 275	-	477	107	174			5 279	23 845	10 674	35	49	20	62	15	6
Nigeria	144 720	74 225	70734	49	39 903	28	25 782	2 975	0	2 074	787	1336	1 368	0	39 903	449 558	198 002	15	20	61	56	4	7
Rwanda Soc Tomo & Brinding	9464 166	8 283	8 117	86	4 220	55 5	1 603	1 766	136	392	123	43	0 0	c	4 220	37 563	15377	21	27	72	52	52	7
Seneral	12 072	2	201	8	8	2	2		,	,	, ,	0	,	,	8	32,638	14 598	8	8	5	5		
Seychelles	86															28	13						
Sierra Leone	5743	8 208	8 041	140	4 629	81	2 802	480	0	130	51	116			4 629	29 690	13 208	27	35	62	58	6	4
South Africa	48 282	341 165	303 114	628	131 099	272	93 348	47 849	0	30 818	2 639	6974	28 438	0	131 099	453 929	184 199	60	71	58	43	16	20
Swaziland	1134	9 195 0 00 1	8 278	730	2 539	224	3 842	1 584		313	140	37		740 ĵ	2 539	13 097	5 188	61	49	66	31	19	91
l ogo	00,000	2 924	10 200	44	2 131	55	6/2	319	0	90	3/	68	LOL	0	2 131	24 922	10 956 JT	11	6L	80 5	0/	11	~ ·
Uganda UP Tanzania	30 450	6/0 14 62 100	40 / 82 50 28 2	150	400 U2	80	14 84U	4 UZ/ 10 621		1 817	120	767	181		20 304	100 03/	208 04	74	44	20	00	5 5	0 14
Zambia	11 696	51 179	47 790	409	14 025	120	22 059	9 841		1 865	67	403	2 889		14 025	64 632	26 697	4 14	53	8 8	29	21	10
Zimbabwe	13 228	47 774	44 328	335	12 718	96	23 775	6 559		1 276			3 446		12 718	73714	30 028	58	42	35	29	15	10
AFR	773 792	1 310 841	1 234 260	160	555 123	72	381 696	220643 1	860	74 938	7 901	18 952	48 249	1 479	557 376	2 807 688	1 202 861	41	46	59	45	18	11

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ss+ indicates sputum smear-positive; ss.- sputum smear-readitive. Indi, sputum smear result unknown; re-read, re-readment; pulm-lab. confirmed, pulmonay case confirmed by positive smear or cuture. See Explanatory notes on page 187 for further details. Pata can be downloaded from www.who.in/tb

Table A3.3 DOTS c	overage	e, case n	otificat	ions ar	nd cas	e detecti	on rates	, Africi	a, 2006					-		-	-			¢		
	DOT C			MoM	- Contraction	I B Cases I	eported tro		services	Da traatma	nt caeae			Maw num	Estimated I	ncidence an	Case dete	ction rate	Taa	Prop	Cutions	Do troat
	coverage	New and rei	apse	SS+	S International	s-/unk.pu	ulmonary	new I	Relapse Aft	Fr failure Afte	r default Oth	er re-treat.	Other I.	ab. confirm.	all forms	SS+	all new	new ss+	.ss (% of		-vuapum. (% of	(% of
	%	number	rate	number	rate	number	number n	number	number	number	number	number	number	number	number	number	%	%	pulm.) nev	v+relapse) ne	w+relapse) n	ew+re-treat.)
Algeria	100	21 143	63	8 538	26	1 827	10 219		559	26	94			8 737	18 699	8 405	110	102	82	40	48	3
Angola Benin	92 100	39 436 3 619	238 41	15 915 2 943	36 26	9 706 206	2 238 322	0 0	11 57 7 148	249 59	3 659 56	0 0	0 0	15915 3300	47 231 7 878	20 991 3 428	59 44	76 86	62 93	40 81	9 6	36
Botswana	100	8 413	453	3 252	175	3 776	1 149		236	42	64			3 594	10 230	4 053	80	80	46	39	14	4
Burkina Faso	100	3 941	27	2 659	19	506	551	50	175	224	38	45	0	2 659	35 678	15 452	11	17	84	67	14	1
Burundi	100	6 114	75	3 119	88	950	1 900	0	145	40	22	0		3 326	29 987	13 266	20	24	77	51	31	3
Cameroon	100 1	24 316	134	13 811	76	6 569	3 035		901	88	475			13 811	34 829	15 137	67	91	89	57	12	9
Cape Verde Central African Renublic	08 02	262 F 020	51 130	131	52 10 5	88 687	33 654	c	10 223	99 99	11 262	C	C	131	8/3	393 6 350	30	33 90	60 86	50 74	5 5	თ თ
Chad	2	0.050	201	1	401	100	50	>	077	8	202	>	>	-	31 262	13 759	8	2	8			>
Comoros	100	112	4	67	80	22	20	0	ю	б	-			67	358	161	30	42	75	60	18	9
Congo	60	8 478	230	3 340	91	2 504	2 353		281	34	88			3 340	14 869	6 523	55	51	57	39	28	5
Côte d'Ivoire	100	20 746	110	12 867	68	2 675	4 411	0	793	277	122	0	0	12 867	79 515	34 699	25	37	83	62	21	9
DR Congo Equatorial Guinea	100	95 666	158	63 488	105	10 093	18 213		3872	667	992		484	63 488	237 473 1 268	104 680 556	39	61	86	99	19	9
Eritrea	86	3 026	64	680	14	1 484	782	0	80	5	28	77	0	680	4 402	1 962	67	35	31	22	26	9
Ethiopia	100	122 198	151	36 674	45	40 234	43 255		2 035	298	513			36 674	306 330	135 926	39	27	48	30	35	2
Gabon	31	3 051	233	1 145	87	1 478	313		115	6	146			1 145	4 635	1 990	63	58	44	38	10	8
Gambia	100	1 795	108	1 209	73	467	102	0	17	2	15	69	0	1 209	4 278	1 893	42	64	72	67	9	5
Ghana	100	12 471	54	7 786	34	3 139	1 049	0	497	18	22			7 786	46 693	20 684	26	38	71	62	80	4
Guinea	100	8 787	96	5 903	64	898	1 699		287	126	163			6 500	24 321	10821	35	55	87	67	19	9
Guinea-Bissau	87	2 137	130	1 030	63	955	19	0	133	8	16	0	0	1 030	3 602	1 602	56	64	52	48	1	7
Kenya	100	108 342	296	39 154	107	48 338	17 443		3 407	121	1 657	5 114		39 154	140 548	55 934 5 225	75	70	45	36	16	6
Lesotho	100	12 0/3	909	4 024	202	4 934	2 4/7	4	638	86	14/	807	GG2	4 024	12 6/0	880 G	90		49	33	1.7	13
Liberia	000	4 447 24 066	124 116	2 906 15 613	8 6	646 1 176	829	0	66 1 16 7	38 38	29			2 906 15 61 2	11 857	5 277	37	55	82	65 71	19	<b>с</b> о о
Malawi	000	25 054	185	8 166	0	10,608	4 UII		1012	000	CRI	1 067		8 166	4/ 409 51 170	140 12	44	C/	66 43	- 1	01 5	o 5
Mali	100	4 989	42	3 802	32	386	580	0	221	150	85	0	0	3 802	33 460	14 896	14	26	91	26	12	6
Mauritania	82	2 694	89	1486	49	480	536	0	192	24	48	0	0	1 486	9 626	4 307	26	34	76	55	20	10
Mauritius	100	114	6	85	7	11	15		з	0	1			85	284	127	39	67	89	75	13	3
Mozambique	100	35 257	168	18 275	87	10 618	4 929	0	1435	170	205	0	0	18 275	92 835	39 002	36	47	63	52	14	5
Namibia	100 1	14 673	717	5 3 5 6	262	4 178	2 450	1 674	1015	207	6	801		5 356	15 689	6 458	87	83	56	37	17	13
Niger	70	8 4/4	70	R/7 C	8	1 443	G/7 L	c	114	101	1/4	1 260		6/7 G	C40 C7	100/4	to 4	4 G	R/	20	0	ז ת
Rwanda	00	8 117	64 98	4 220	45	1 603	1 766	136	392	123	43	000		4 220	37 563	15.377	5 5	27	72	22	+ 60	. ~
Sao Tome & Principe	0									Ì	2	•			159	72	i	i		ł		
Senegal															32 638	14 598						
Seychelles	001	10.04	140	003 1	6		100	c	100	ŭ	110			000 1	28 20 600	13 200	70	30	5	01	ų	-
Sierra Leone	001	041	140	4 029	0	2 2 0 2	480	-	001	10	011		4	4 029		007 01	17	22	70	00	0	4
South Africa	00	303 114 e 27e	628 730	131 099 2 530	272	93 348 2 842	47 849 1 584	0	30 8 1 8 3 1 3	2 639	6 974 37	28 438	0	7 530	453 929	184 199 5 199	60 61	71	10 28	43 24	16	20 e
	001	2 819	8 4	2 131	33	279	319	0	606	37	689		ę 0	2 131	24 922	10.956	5 5	19	f 88	76	11	~ ~
Uganda	100	40 782	136	20 364	68	14 940	4 027		1451			797		20 364	106 037	45 982	37	44	58	50	10	5
UR Tanzania	100	59 282	150	24 724	63	20 120	12 621		1817	120	257	2441		24724	123 140	53 248	47	46	55	42	21	7
Zambia	100	47 790	409	14 025	120	22 059	9 841		1865	67	403	2889		14 025	64 632	26 697	17	53	39 21	29	21	9
Zimbabwe	100	44 328	335	12 /18	96	53 115	6 559		12/6			3 4 4 6		12 /18	/3 /14	30 028	28	42	35	67	15	10
AFR	91	1 223 008	158	549 420	71	379 631	220 151	1 860	71 946	7 827	18 652	48 249	1 479	551668	2 807 688	1 202 861	41	46	59	45	18	11

ss+ indicates sputum smear-positive; ss.- sputum smear-readitive. In , sputum smear result unknown; re-read., re-treatment; pulm-lab. confirmed, pulm-lab. confirmed by positive smear or cuture. See Explanatory notes on page 187 for further details. Pata can be downloaded from www.who.bit/lb

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mea-Bissau         44         1         1         1         200           mea-Bissau         77         2         2         40         1568           otho         770         2         2         40         1568           otho         770         2         2         40         1568           sria         770         2         2         40         1568           sria         100         0         0         14         1568           alwai         227         1         1         6         1759           alwai         3         1         1         6         1759           alwai         73         1         1         6         116           untrania         7         1         1         6         116           untrania         7         1         1         1         1         1           zambique         250         1         1         1         2         2547           mitania         7         1         1         1         1         1         1         1         1           mitania         7         1 <t< td=""><td>110</td><td></td><td>7</td><td>117</td><td>00</td><td>0</td><td>25</td><td>104</td><td>2</td><td>33</td><td>17</td></t<>	110		7	117	00	0	25	104	2	33	17
ya         770         2         400         1568           oftio         17         1         1         1         1568           oftio         17         1         1         1         156           main         100         0         0         114         156           Magascar         227         1         1         6         1759           Mathia         227         1         1         6         1243           Inflanta         7         1         1         6         1243           Inflanta         7         1         1         6         11243           Inflanta         7         1         1         6         10           Inflast         1         1         1         1         11         11           Inflast         260         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <td></td> <td>110 3:</td> <td>151</td> <td>85</td> <td>85</td> <td>43</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td>		110 3:	151	85	85	43	0	0	0	0	0
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initial         100         0         0         0         114           Bagescar         227         1         1         6         1759           ewithin         94         1         1         1         1223           ewithin         94         1         1         1         12549           ewithin         73         1         1         1         12549           ambique         73         1         1         1         12549           ambique         250         1         1         1         11           milus         34         1         1         34         2547           era         76         0         0         0         6         687           anda         173         1         1         1         1         2647           era         694         0         0         0         6         603         5         003           era         694         0         0         1         1         1         1         5         5         5           era         6         0         0         0         5         5	3 127	100	2 508	2 222	1 248	191	0	0	0	0	0
angascar         22/         1         1         6         1/39           awid         24/         1         1         1         1         1         12/32           awid         34         1         1         1         1         1         1         12/32           Intrus         7         1         1         1         1         1         1         1           Intrus         7         1         1         1         1         0         115           Intrus         7         1         1         1         1         0         115           Rembique         250         1         1         1         1         34         2,547           Inbla         34         1         1         1         34         2,547           end         564         0         0         0         6807         6037           end         1         1         1         1         1         6037         6037           ond         1         1         1         1         1         1         6037         6031	14	0	688	101				ł		:	,
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Influes         1         1         1         1         0         115           ambigue         256         1         1         1         1         1         1           nbia         24         1         1         3         2         257           nbia         76         0         0         0         0         2         257           era         76         0         0         0         0         0         897           era         684         0         0         1         1         173         5         033           anda         173         1         1         1         0         5         033           5 forme         8 Principe         1         1         1         0         15         0         15         0         15         0         15         0         15         0         15         15         0         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15         15	0	0					7	61	ю	12	4
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anda / 20 3 2 2 515 10 555 Tanzania 690 3 1 690 1613	841 841	514 180 514 180	7 140	3 604	1 461	935 935	13	369	4	171	6
mbia 156 3 1 156 1082	614	418	11 545	7 177	2 194	2 723	50				
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Table A3.5 Treatr	ment outco	omes, Af	rica, 1	2005 c	ohort	1000	2016	4			F			Mound		on other		eTO C					Ğ		the second			oTO		
			70	IIIS MAN	ear-pos	Cas	V. of coho	, ţ			70			70	n-inalis	SILIVE Ca	0% of oot				70		ō	inear-pos	70	of cohort	rdses, I	202	0	7
	Number (	of cases	of noti	Ĺ	Compl-		% OI COI!		Trans-	Not	0/	Number of o	ases of	notif	Cor	-lqr	100 IO %	101	Trans-	Not	0/	Number		Compl-	0/		F	ans- N	ot	0
	Notified	Regist'd	regist	d Cured	eted	Died	Failed	Default	ferred	eval. Si	access	Notified R	egist'd re	gisťd Cu	red et	d Diec	I Failed	Default	ferred	eval.	Success	Regist'd	Cured	eted	Died	Failed D	efault fe	erred ev	/al. Suc	cess
Algeria	8 654	8 379	97	74	13	2	0	ę	4	4	87											713	48	24	2	-	9	2	17	72
Angola Benin	16 024 2 739	17 678 2 766	110 101	46 74	26 13	3	~ ~	3 20	e ←	0 0	72 87	4 386	2 435	56	88	9	4	7	ო	0	74	1613 341	8 23	24	10 5	3	26 6	4 ←	0 0	81
Botswana	3 170	3 335	105	37	33	2	- I	∞ (	6	9	20											219	8 i	28	5	22	12	11	0	61
Burkina Faso Burundi	2 294 3 262	2 290 3 424	100	66 52	5	4 4	~ 0	9		0 0	1/											272	5	4	9	10	9	4	0	12
Cameroon	13 001	13 169	101	99	7	9	-	14	e.	2	74											1611	49	7	9	ę	16	4	16	55
Cape Verde	135	135	100	56	8	e	2	19	4	7	64											34	41	15	0	0	24	e	18	56
Central African Republic	2 153	3 090	144	37	28	9	2	8	19	0	65	0	127		54 2	9	6	4	0	0	83	291	53	30	6	0	8	-	0	82
Chad	2 516 70	02	08	6	C	¢	~	c	Ŧ	c	6											Ľ	001	c	c	c	c	c	c	8
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Côte d'Ivoire	11 300	11 300	100	64	12	80	2	6	9	0	75	1 196	1 196	100	53 1	0 8	33	17	4	5	63	906	4	15	7	7	12	2	12	59
DR Congo Equatorial Guinea	65 040	65 066	100	80	Ω.	9	-	4	2	-	85											5 448	71	4	10	4	9	e	2	74
Eritrea	687	688	100	83	5	2	÷	2	-	0	88																			
Ethiopia	38 525	39 430	102	64	4	- LO	-	4	2	2	78											3 1 1 6	41	15	6	2	5	4	24	56
Gabon	1 042	1 165	112	35	12	10	-	42	-	0	46											150	18	12	5	ę	60	e	0	30
Gambia	1 127	1 127	100	81	9	7	~	с	٢	٢	87																			
Ghana	7 505	7 584	101	68	5	6	7	1	4	-	73											540	40	80	9	е	11	7	30	48
Guinea	5 479	5 811	106	65	7	9	2	10	10	0	72											458	45	16	10	7	13	11	0	09
Guinea-Bissau	1 132	1 167	103	51	18	12	-	11	7	0	69											147	44	33	8	0	7	7	0	22
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Mali	3 523	3 530	100	69	9	1	4	2	1 00	0	75											379	67	9	10	- 2	10	10	10	23
Mauritania	1 155	1 761	152	3 4	, =	2	· -	19	12	13	55												;	,	2	•	2	,	,	
Mauritius	110	110	100	86		3		9	5	0	86											5	60	20	0	0	20	0	0	80
Mozambique	17 877	17 877	100	78	-	12	-	5	2	-	79											1855	69	-	15	2	10	e	0	20
Namibia	5 222	5 222	001	59 49	16 25	~ 5	2 0	10	ω ư	0 0	74											2 0 0 9	24	58	11	n	13	9	15	22
Nigeria	35 048	35 080	100	50	25	6	4	11	0	0	75											3662	48	18	2	11	20	0	+	99
Rwanda	4 166	4 175	100	73	10	9	2	e	2	-	83											506	56	6	15	ю	4	10	e	65
Sao Tome & Principe												49	49	100	98	0	0	0	0	0	98									
Senegal	6 722																													
Seychelles	80 0			I		,																		'	,		!			1
Sierra Leone	4 3/0	4 3/0	100	1	20 9	9		9	.7		92 i									•		328	89		9		15		0	9
South Africa	119 906	128 393	107	8	13	~ '	~ ~	6 .	9	4	5	5 554	6 389	115	22	4	-		4	6	99	63 588	59	29	: 3	2	16	9 9	9 :	8
Swaziland	2 18/	2 18/	001	22	07	9	N •	n ;	5	4 0	4											1 1 1 3		5	=;		n n	13	5	8
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Not exist 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 2005 is used as the denominator for calculating treatment outcomes, in which case registered is not reported, then the number of cases notified in 2005 is used, or the sum of outcomes in were not outcomes is used. If the number of cases registered is not reported, then the number of cases notified in 2005 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.in/th

2005 cohort
Africa,
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Table

				Relaps	se, DOTS								After failt	Ire, DOT	<i>(</i> 0						Afte	er default	, DOTS				
				% 0	of cohort				%				% 0;	cohort		:	%	:				% of co	hort			~	
	Number regist'd	Cured	Compl- eted [	Died	<sup>r</sup> ailed D€	T sfault fé	rans- h srred ev	lot ⁄al. Su	ccess	Number reaist'd	Cured	Compl- eted	Died	ailed Def	ault ferr	PS PS	ot al. Succe	Nun ss	ist'd Cu	red Con	dr Die Die	d Faile	d Defa	Trans ult ferre	s- Noi d eval	Succ	cess
Algeria	548	51	25	2	+	-	2	18	76	46	39	13	2	4	0	4	1 5	8	119	39 2	4	1	27	2 3	Q		63
Angola	164	22	ų,	٢	÷	4	Ŧ	c	87	1 613 80	23	24	ۍ م	4	26 6	40	0 c		80		ă	с ч	0	Ţ			7
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Burkina Faso Burundi	129	11	4	7	12	e	0	0	81	110	65	5	12	9	5	7	0 7	0	33	2	9	6 6	8	0	0		70
Cameroon	1 000	51	7	4	°	15	e,	15	22	101	52	u	2	10	00	2	2	-	181	13	7	2	1	V	50		50
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Central African Republic	163	55	31	~	0	9		0	85	39	46	31	10	0		0	3 7	7	89	53 2	7	0	_	2			80
Chad																											
Comoros Conao	350	100	0 -	0 -	0 0	04	οıα	0 26	100	3	100	0 6	0 0	0 0	0 0	9	0 10 7 33	0 0	0 0	0 ~		。 。 。			66		0 1
Côte d'Ivoire																											
DR Congo Equatorial Guinea	3 543	75	e	10	e	4	e	7	78	884	64	4	1	2	1	<i>с</i> о	3	80 -	021	ŝ	4	0		4			67
Eritrea																											
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Gambia			!																								
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Guinea	107	70	2 00	=	4	=	2		8		50	-	2	± 0	0	-	0	0 0	071		י	-		2	,		8
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Lesotho	597		71	11	2	7	9	8	71																		
Liberia	33	20	6	с		6	6	0	79	10	06	10					0 10	0	14	62	7		14	-	0	_	86
Malawi	1 093	74	-	19	4	б	0	2	75																		
Mali	195	20	5	10	4	80	2	0	75	94	71	4	6	5	10	-	0 7	g	06	56	8	0 8	10	9			63
Mauritania		2	0	2		0	1	,	2				0	0	2			,	0	ŝ	- >	0	2		,		}
Mauritius	3	67				33		0	67										2	50 5	0				C	1	00
Mozambique Namibia	1 376 1 062	73 45	17	15 13	2 5	8 4	9 7	0 0	74 61	178	57	-	17	ø	5	e	1	00	301	80	-	2	5	°	-		59
Niger									┥																		Τ
Nigeria Rwanda Sao Tome & Principe	341	57	12	14	ę	2	10	-	69	59	5	0		7	ю Г	7	9	4	20	48	9	9 0	4	4			54
Senegal																											
Sierra Leone	136	68	6	7	4	12	0	0	77	57	20	4	7	5	12	2	0 7	4	135	37	9	5	_	2	16		73
South Africa	30 099	49	15	10	2	13	9	5	64	2 213	40	13	12	6	13	7	6 5	3 7	540	36 1	3	0 2	28	9	0		49
Swaziland Togo	311 128	17 73	15	4 <del>4</del>	ი 4	4 ۲	8 0	27 0	32 75	97	10	12	4	14	2	4	2	<i>с</i> о	62	19	5	1	ω	en m	40	_	34
Uganda IID Tanzania	1 86.4	76	¢	÷	-	4	Ľ	-	70	140	61	÷	14	Ľ	6	a	9		97.F	1	c t	C 4		e.			7.0
Zambia	1 805	99	19	9	0 0	C	4	0	85	215	55	29	4	-	0	2	0	14	0	0	. 0	. 0		0	_		0
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AFR	47 213	53	13	9	2	ŧ	5	5	67	6 097	42	14	6	10	15	5	4	6 10	552	41	2	3	23	5	Ű		53

Not eval: indicates not evaluated (percentage of registered cases frequed) exocess, sum of oured and completed; cases registd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes in mixing or is less than the sum of outcomes, in which case the sum of outcomes is used. Data can be downloaded from www.who.in/th

Table A3.7 DOTS trea	tment su	ccess	and ci	ase de	tectior	rates,	Africa,	1994-	2006														
		-	DOTS n	ew sme	ar-posi	tive trea	tment su	Iccess (	(%)						DOTS n	ew sme	ar-posit	ive case	detecti	ion rate	(%)		
	1994 1	995	1996	1997	1998	1999 2	2000 2	001 2(	02 20	03 200	4 200	19	95 199	6 199	7 1998	1999	2000	2001	2002	2003	2004	2005	2006
Algeria			86			87	87	84	89	6 06	1 8	17		13	2		126	116	115	115	107	107	102
Angola	;	i	i	15	89	I	68	99	74	68 6	8	2		9	88	50	:	73	101	101	87	80	76
Benin	76	73	72	13	1	1	ł	6/	8	81		2	20	0	818	86	86	ŗ	83	81	82	83	86
BOISWARIA Burkina Faso	71	0/ 25	0,00	0, 61	4 / 70	19	en B	, 0 65	1	r c RR	 0 -	2.5	<u>.</u>	0 r	5 0 47 0	1.4	0 1	5 4	10	90	0, 4	5 5	17
Burundi	44	45	07	67	74	5	80	88	5 62	- <sup>2</sup>		- 0	- 0	- 4	- 9 19	35	2	9 00	25	26	26	25	24
Cameroon			1	80	75	75	77	62	20	7	1 7	4		4	10	19	31	37	54	74	75	87	91
Cape Verde										7	1 6	2						41				35	33
Central African Republic		37					57	61	~	59 9	11 6	55	4,	8				8	45	5	с	34	69
Chad	63	47			64				72	78 6	6	.,	35	4		34			29	7	14	19	
Comoros	94	06		85		93 6 1	93 80	92 66	96 71	5 9	4 °	10 0	4 g	1-	5 2 2		49 86	53	42 86	28 Fe	38	48 56	42 54
Congo Côte d'Ivoire	17	68	Б. Б.	61	63	63	60	66	67	70 7	2 5	0 u	-	4	45 45	41	8 6	βa	8 %	8 %	5 %	8 %	37
DR Conao	12	80	8 8	5 49	12	69	78	2.12	19	83 - 8	· 0	- 10 0.0	2 1	. 4	5.43	51	1 84	50	49	55	62	63	61
Equatorial Guinea	89	89	11	82						51		~	35	4	83						74		
Eritrea				83	73	44	76	80	82	85 8	5 8	8			9 11	40	42	48	41	53	41	37	35
Ethiopia	74	61	73	72	74	76	80	76	76	2 02	. 6		15	0	2	24	30	30	30	31	31	29	27
Gabon								49	47	34 4	0 4	16						80	68	81	82	58	58
Gambia	74	76	80	70				71	74	75 8	6 8	12	4 6	7 6	9 72				67	64	59	63	64
Ghana		54	51	48	59	55	50	56	909	66 7	2 7	e	15	4	1 32	30	37	40	40	39	36	37	38
Guinea	78	78	75	74	73	74	68	74	72	75 7	2 7	2	4	2	0 53	52	54	53	52	51	53	54	55
Guinea-Bissau						35		51	48	80 7	5 6	65					45		41	52	20	74	64
Kenya	73	75	11	65	11	78	80	80	62	80 8	0	22	22	8	4 59	58	51	59	61	64	99	68	20
Lesotho	56	47	71	63		69		71	52	20 6	6	33	6	8	1 73		72		67	73	84	84	79
Liberia		79		75		74	80	76	76	73 7	2 0.	6	.,	-	40		26	21	42	27	49	42	55
Madagascar	51	55		64			70	69	74	71 7	1	4	22	2	67			99	65	20	20	64	73
Malawi	22	71	68	71	69	71	73	70	72	73 7	1 7	33	12 12	4	7 51	46	44	4	40	39	43	43	42
Mali	68	59	65	62	20	68		50	20	65 7		22	9	8	1 20	19	17		20	22	52	24	26
Mauritania									2	28	2	22									43	28	34
Mauritius	96				91	87	93	93	92	87 8	8	20	60		85	96	06	67	67	78	92	87	67
Mozambique	67	39	5	67		71	75	78	78	76 7	7 7	5	22	2	0 49	48	45	43	43	43	4	46	47
Namibia			99	28	61	51	56	63	99	63	r r 00 r	<u>د</u>	2	0	88	80	F	8	1	88	19	<del>8</del> 5	83
Niceria	6F	40	50	20	73	75	02	5	00	70 7		t 4		ء د	- 0	10	5 5	£ 5	÷ ÷	8 4	£ £	8 6	
Durando	3	b t	10	2 9	2 6	2 4	5 4	0	2 01		 			- •		14	4 6	4 6	- 6	2 8	= 6	2 6	0 4 6
istantia San Tome & Princine			0	8	71	10	0		00			2	2	2 7	5	<u></u>	ŝ	07	87	20	07	7	17
Senegal	88	44	44	55	48	58	52	53	. 99	2 02	4	ľ	32	5	7 54	48	53	53	48	52	48	48	
Sevchelles		89	100	100		06	82	67	45 10	00	2		Ű	5	7 67		83	06	68	38	100	62	
Sierra Leone	75	69	74	79		75	77	80	81	83	8	.1	8	0	98		33	33	32	31	8	36	35
South Africa			69	73	74	09	99	65	68	67 7	2 0.	-			6 22	61	58	56	99	71	20	67	71
Swaziland								36	47	42 5	0	12							33	8	38	43	49
Togo	45	60	65	99	69	76		55	68	63 6	7 7	5	3	3	11	11	11		4	13	16	17	19
Uganda			33	40	62	61	63	56	09	68 7	2 0.	3		G	6 56	56	48	4	4	4	45	4	44
UR Tanzania	80	73	76	11	76	78	78	81	80	81 8	2	32	57	6 5	3 54	52	49	48	45	46	47	47	46
Zambia					0	ĥ	00	75	83	75 8		¥ (			ŭ	ŗ			44	63	59	53	53
ZIIIDaDwe					2	2	RD	-	10	00	1	0			00	4/	6	64	9	4	‡	4	44
AFR	59	62	57	63	70	69	72	71	73	73 7	4 7	. 9	23 23	5 2	9 34	35	35	36	42	44	46	45	46

Treatment success, sum of cured and completed: DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/tb

				Alak						101	olen			_			I V			-	Malo fformatio
•	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34	35-44 4	5-54 55	<u>7</u> -64 6	5+ 0-1	4 15-2	4 25-34	35-44	4554	55-64	65+	ratio
Algeria	41	1 173	1 573	692	409	251	360	80	971	679	339	223	197 4	08 12	1 2 14	4 2.252	1 031	632	448	768	1.6
Angola	540	2 632	3 049	2 182	1 397	729	428	689	2851	2 892	1 990	1 223	583 3	14 1 22	9 5 48	3 5941	4 172	2 620	1 312	742	1.0
Benin	18	298	624	465	247	124	106	32	310	371	158	111	88	41	09 00	8 995	623	358	162	147	1.8
Botswana Burking Econ	8	292	119	490	289	127	104	28	326	267	259	133	22 0	38	0 28 28	8 1084	631	422	1/1	142	4. C
Burundi	30	347	6009	433	320	114	0 <u>4</u> 24	6 F	296	367	242	33 140	33 56	14 1	5 F	3 967	730	460	170	78	1.7
Cameroon	119	1 581	2 685	1 935	1 130	492	264	205	1488	1 908	1 039	555	260 1	50 32	3 06	9 4 593	2 974	1 685	752	414	1.5
Cape Verde	2	15	22	18	8	9	4	2	14	16	2	9	4	6	4	9 38	23	14	10	13	1.3
Central African Republic	48	409	770	923	152	83	30	52	538	613	647	126	42	16 10	0 94	7 1383	1 570	278	125	46	1.2
Chad																					
Comoros	0	12	6	7	4	4	-	0	5	2	6	9	4	-	0	7 14	16	10	8	2	1.2
Congo	32	371	656	392	174	69	51	44	384	500	247	138	79	54 7	6 75	5 1156	639	312	148	105	1.2
Côte d'Ivoire	171	1 467	2 476	1 614	915	564	368	191	1 327	1 776	1 069	445	275 2	09 36	2 2 79	4 4 252	2 683	1 360	839	577	1.4
DR Congo Equatorial Guinea	1122	6 391	9 486	7 321	5 011	2 657	1 504	1 517	7 236	8 522	5 621	3 762 2	019 5	75 2 63	9 13 62	7 18 008	12 942	8 773	4 676	2 479	1.1
Eritrea	9	50	55	44	52	42	36	17	109	123	64	45	19	18	3 15	9 178	108	67	61	54	0.7
Ethiopia	978	6 137	5 950	3 567	2 016	1 066	521	1 178	5238	5 326	2 704 1	1 324	510 1	2 15	6 11 37	5 11276	6 271	3 340	1 576	680	1.2
Gabon	20	157	207	148	89	40	23	19	160	123	79	39	20	21 3	31	7 330	227	128	60	4	1.5
Gambia	13	126	284	170	112	58	56	5	88	126	71	49	25	26 1	8 21	4 410	241	161	83	82	2.1
Ghana	33	557	1 273	1 388	956	529	443	20	494	711	515	381	207 2	29 10	1 05	1 1984	1 903	1 337	736	672	2.0
Guinea	31	834	1 168	916	512	274	162	85	586	581	396	187	118	53 11	6 142	0 1749	1 312	669	392	215	1.9
Guinea-Bissau	8	86	178	143	06	74	24	7	82	116	06	81	36	15 1	5 16	8 294	233	171	110	39	1.4
Kenya	387	4 708	8 229	4 975	2 467	1 037	645	583	4 953	6 052	2 792 1	1 343	604 3	19 97	996 0.	1 14 281	7 767	3 810	1641	1 024	1.3
Lesotho	33	228	628	550	440	218	49	50	370	642	430	171	90 1	25 8	33	8 1270	980	611	308	174	1.1
Liberia	59	324	442	371	250	125	67	55	292	371	242	125	85	68 11	4 61	6 813	613	375	210	165	1.3
Madagascar	117	1 500	2 391	2 220	1 714	766	458	208	1458	1 944	1 444	874	353 1	66 32	5 2 95	8 4 335	3 664	2 588	1119	624	4.1
Malawi	42	584	1647	1 054	491	256	182	80	848	1 545	813	348	183	93 12	2 143	2 3192	1 867	839	439	275	1.1
Mali	87	361	6/9	550	436	7.17	216	09	700	3/1	249	168	116	0r 0r	8	1 1050	667	604	388	787	0.2
Mauritania	12	197	594	203	150	106	99	16	109	114	99	94	67.	57 97.	8. 1	6 408	289	199	135	121	7.5
Mauritius	0	4	ი	77	10	12	9	-	n	/	n	4	-	n	1	/ 16	97	14	13	თ	2.9
Mozambique Namibia	86	347	1 052	299	386	174	146	74	485	875	521	239	92	80 16	0 83	2 1 927	1 320	625	266	226	1.3
Niger	25	537	1 265	606	487	359	217	37	270	427	306	207	149	84	80	7 1692	1 215	694	508	301	2.6
Nigeria	247	4 488	8 145	5 517	3 330	1431	897	385	4 0 2 9	5 430	2 5 1 6 1	1 894 1	049 5	45 63	2 8 51	7 13 575	8 033	5 224	2 480	1 442	1.5
Rwanda	25	598	269 2	591	407	182	100	80	494	467	259 2	139 2	72	37 10	1 09 i	2 1236	850	546	254 2	137 2	1.7
Sao Iome & Principe	-	D	ø	4	7	-	N	-	4	_	-	5		-	-	G. 8	4	7	7	n	1.0
Seychelles																					
Sierra Leone	43	485	851	209	446	216	166	68	375	536	357	207	111	59 11	1 86	0 1387	1 066	653	327	225	1.7
South Africa	2 062	10 498	21273	19 743	11 752	4 392	1 862	2 579	14 073	20 387 1	2 656 £	5 767 2	550 15	05 4 64	1 24 57	1 41660	32 399	17 519	6 942	3 367	1.2
Swaziland	32	18/	452	208	164	91 -	66	8	367	464	C47	701	48	0 72	66 / ·	4 916	513	1/7	139	5	0.1
1 ogo	15	174	358	344	183	94 1	6/	29	214	268	170	96	58	49 44	4 38	8 626	514	279	152	128	1.4
Uganda	997 9	1 624	4 084	3 391	1 591	/18	110	363	1 / 92	2 909	1 /36	812	332	38 01	3 41	6 6993	121 6	2 403	1 050	/49	0, I
UK lanzania	204	2 060	4 926	3 832	2 154	1 348	1 029	293	1 / 45	3 326	1 9/0	995	201	35 49	1 3 80	8 252	708 9	3 149	1 855	1 364	
Zamoia Zimhahwe	215	967 236	3 490 2 391	040 I	984 896	323 348	199	237	1 020	2 834 2 424	1 257	452	230	27 96 45	4 2 44 2 1 75	5 033U	3 294	1 130	578	308 295	
	000 1	001 01		010 01	000 01	01001		0110	000		00 011-		00		-	011 021	101.011	000 00	007 70		
AFK	1 238	53 / 22	90 204	12 312	42 630	19 950	//9/1	8 / 48	5/ 309	10 314 4	0 149 2	3 / 12 11	513 65	1/ 04	111 03	1/2418	171 811	60 33Z	31 4 6 3	C8 / 81	5.1
For some countries, breakdown (	of notified ca:	ses by age a	and sex is n	nissing, or is	s provided fo	or a subset (	of cases. S	ee Explanatc	iry notes on	page 187 ft	or further det	tails. Data c	an be downlc	aded from ww	ww.who.int/t						

DOTS and non-DOTS, Africa, 2006 absolute numbers. and sex. age Table A3.8 New smear-positive case notification by countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who.in/tb Some

			1011 001			- <u>-</u>			- (		0	5	2007	-						
•	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34 C	35-44 4	5-54 5	5-64	65+	0-14 1	5-24 25	-34 35-	44 45-5	4 55-64	65+
Algeria	٢	31	52	31	29	34	52	2	27	23	16	16	24	49	-	29	38	24 2	2 29	50
Angola	14	159	280	307	309	285	245	18	170	260	268	245	196	139	16	164	270 2	287 27	6 237	185
Benin	-	33	103	114	88	82	108	2	35	64	40	39	21	30	-	34	84	78 6	3 49	62
Botswana	£ ,	120	361	523	446	364	432	17	151	338	282	181	133	96 97	4 .	136	350 4	103	6 236	224
Burkina Faso Burundi	0 0	15 30	45 116	151	96 135	109	208	- ~	11 %	67 89	32	26	4 %	8 5	- 0	13 36	61 G	10 10 10	8 0	54 76
Cameroon	4 m	82	204	230	205	138	91	1 10	78	148	125	97	99	43	14	80	176 1	78 15	0 100	64
Cape Verde	2	25	61	99	63	119	53	2	24	42	17	30	46	63	2	25	51	41 4	3 72	59
Central African Republic	5	94	266	509	120	106	44	9	121	208	340	85	41	17	9	108	237 4	123 10	1 69	28
Chad	c	;	Ļ	į		ľ	0	c	c	¢	00	ð	L	c	c	0	;			c
Comoros		÷ 0	GL 986	/L	0L 181	101	0.5	с ч	0 103	α 181 8	77	117	C7 8	x c	с u	0 10	11	2 0 2 1 2	07 001 8	P 08
Coligo	<b>→</b> t	100	104	104	101	101	101	о u	501	101	107	75	30	00	n u	101	160 4	20 10	001 0	000
	4 0	1.04	181	49 C	138	67L	071	۰ <del>،</del>	4 ç	138	13/	<u>م</u>	71	0, 10	00	202	- 70L	0L 20	70L 8	66
UR Congo Equatorial Guinea	20	107	236	294	321	2/4	977	11	121	112	520	177	9/1	107	D	114	7723	200 20	6 5.70	/61
Eritrea	-	10	13	26	54	58	86	2	22	30	35	34	19	27	-	16	22	31 4	3 36	49
Ethiopia	5	75	108	96	84	70	49	7	65	96	71	52	31	12	9	70	102	84 6	8 50	29
Gabon	6	114	206	203	173	129	84	8	117	121	109	76	65	62	8	116	164 1	156 12	5 97	72
Gambia	4	81	242	191	190	152	189	-	58	109	80	81	60	78	3	20	176 1	35 13	5 104	130
Ghana	-	23	72	117	123	101	111	2	21	42	44	49	39	52	-	22	57	81 8	69 69	80
Guinea	2	91	184	208	168	146	132	4	99	95	93	61	57	33	3	79	140 1	51 11	4 99	76
Guinea-Bissau	2	56	170	211	204	258	109	2	53	108	126	168	112	55	2	54	139 1	18 18	5 181	62
Kenya	5	117	300	307	245	194	146	ø	123	224	171	122	66	71	9	120	262 2	238 18	1 143	105
Lesotho	8	98	499	977	943	614	127	13	154	432	507	222	168	224	10	127	463 E	394 49	4 346	184
Liberia	2	6	182	241	256	226	282	2	82	157	159	122	137	155	2	86	170 2	200 18	7 179	211
Madagascar	ю ,	8	182	244	277	218	166	с o	28	146	156	138	63 1	20	4 (	79	164	200 20	7 153	103
Malawi		43	182		148	71.L	00L	ο.	8	7/1	145	76	2	14	7	53	1//1	11 21	8 80	/9
Mali	- (	8.9	8	132	171	205	711	- (	22	96	51	51	19	31	- 0	52	99	88 10	5 116	89
Mauritania Mauritius		4 ∠	67L	121	139	272	191	τo τ	20	LG	ۍ ۵۵	4 u	6 6 6	4 ۳		5	20 a	13	LZL 0	011 1
	5	1	n	77	7	17	=	-	o	-	°	D	7	Þ	5	t	0	2	±	=
Niozambique Namibia	22	150	682	782	637	469	485	19	211	584	495	324	196	193	20	180	634 6	36 46	5 317	316
Niger	1	47	158	142	66	133	92	1	21	49	52	54	61	42	٢	33	101	99 7	96 98	69
Nigeria	<del>.</del> .	8	83	86	76	54	46	<del>.</del> .	27	55	38	41	36	24	<del>.</del> (	29	69	62 5	8 45	34
Kwanda	- 0	70	13/	/9L	09L	8 <u>6</u> 1	/0L	4 0	47	2 2	63	<del>6</del>	<del>5</del> 5	17	n a	4/	201		2 C C C C C C C C C C C C C C C C C C C	AC 1
Sao Iome & Principe	0	67.	69	99	49	48	99	r:	52	61	0	0	37	17	7	56	65	31 2	2 42	45
Sevchelles																				
Sierra Leone	4	68	226	255	235	170	199	9	69	140	123	66	76	55	5	79	182 1	87 16	4 120	118
South Africa	27	217	527	671	566	348	230	34	294	520	417	248	167	116	30	255	523 5	542 39	8 249	160
Swaziland	14	134	591	648	541	447	281	16	261	560	451	265	188	118	15	198	575 5	536 38	3 303	188
Togo	-	27	29	118	95	80	92	2	33	59	57	47	44	44	2	30	69	87 7	0 61	65
Uganda	e	53	210	305	235	172	158	5	59	153	163	111	68	58	4	56	182 2	236 17	0 116	102
UR Tanzania	0	51	177	225	198	195	200	ς Γ	43	121	115	8	62	51	က၊	47	149 1	170 13	9 123	116
Zimbabwe	000	45	416 226	367	260	1/1	128	න ග	121	353 246	288	145 155	89 87	36	- 6	66 23	385 C 236 3 3	20 20 20	6 12/ 3 124	90.63
		5	175	-	100		440		55		1.15	-	F	2		f	110	61 10	101	ţ
AFK	4	10	6/1	007	701	141	011	0	71	. 4.	C7	66	7)	0	0	0	001	21 00	104	-

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 A3.10 Numbe	r of TB ca	ses no	vtified, /	Africa,	1980–2	900																																				
	1980 198	31 19	382 19.	1 1	984 19	165 15	386 15	387 19	88 15	195	1991	1 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	005	2006																
Algeria	2 702	13 9	316 136	381 13	133 138	32 12 5	317 11 2	212 113	25 11 (	139 11 60	11 332	2 11428	13 345	13 345	13 507	15 329	16 522	15 324	16 647 1	8 572 1	8 250 1	8 934 1	19 730 1	9 809 21	336 2	1143																
Angola Benin	10117 751 1835 186	27 10 7 1 7 5	911 66 18	325 10 104 1	153 86 913 20	353 9 ( 41 2 1	363 85	510 81 201 2.0	84 95 27 16	587 10 27 41 2 08	71 11134	4 11272	8 269 2 340	7 157 2 119	5 143 2 332	15 424 2 284	15 066 2 255	14 296 2 316	14 235 1 2 552	16 062 2 2 7 06	1 713 2	29 996 3 2 830	36 079 3	5437 37 3116 3	175 50 270 3	) 419 8.6.10																
Botswana	2 662 2 60	75 27	705 2.8	183 3	101 27	06 26	327 31	173 27	40 2 5	32 2 95	18 3 274	4 179	4 654	4 756	5 665	6 6 3 6	7 287	7 960	8 647	9 2 9 2	9 618 1	0 204	9862 1	0 131 10	058 8	3413																
Burkina Faso	2 577 2 3	91 2 2	265 3 0	161	877 4.5	47 10	14.	407 9	49 16	316 1 45	37 1 486	6	1 443	861	2 572	1814	1 643	2 074	2 310	2310	2 406	2 376	2 620	2 878 3	484 3	3941																
Burundi	-9 -67 - 0 07	13	451 1 U	153 1	904 23	11/ 21	2 60	739 37	45 4(	008 4 5 /	12 4 88	3 4464	4 6//	3 840	3 326	3 / 96	5 335	6 546	6 365		6 4/8	6 3/1	68/1	7 164 6	9 695	114																
Cameroon	2434 2.2. 646 22	36 37	703 34	140 20 20 20	338 30 286 30	593 2	32 32	5/8 49 285 2	76 28	32 1 5 85 10 20	47 681	4 6803	/ 064	1 312	3 292	3 049	3 952 106	5 U22	/ 660	5 251 1	1 307 1	1 05/ 1	15 964 1 3 16	12 999 /	499 24 202	1 316 262																
Central African Republic	651 75	78 14 14	16. 16.		468 5	20 7	-79 4	199 b	5 4	64 2 12	14 2 046	2			3 339	3 623	4 459	4 875	5 003		2 550	4 837	3 9 3 2	3 908 3	210 6	045 045																
Chad	220 28	36 1	127 19	1. 1.	430 14	1 2 1 2	285 1 (	386 2.9	77 25	572 2 55	1 291	2 2684	2 871	3 303	3 186	1 936	2 180	2 784	4 710			5 077	4679	4 946 6	311																	
Comoros								2	12	139 14	115 115	9 108	129	115	123	138	134	132	153	120	138	111	73	89	111	112																
Congo	742 12	14 37	716 41	156 2	776 26	48 31	120 3 4	473 38	78 4 (	363 55	31 615	8 1179	1 976	2 992	3 615	4 4 6 9	3 417	3 863	5 023	9 2 3 9	9 735	9 888	7 782	9 729 9	853 8	8 478																
Côte d'Ivoire	4197 44	18 50	0 9 000	9 000	062 57	29 6 0	72 64	422 65	56 65	382 7 84	11 8 02	1 9 0 9 3	9 563	14 000	11988	13 104	13 802	14 841	15 056 1	2 943 1	6 533 1	16 071 1	17 739 2	0 084 19	681 20	746																
DR Congo Equatorial Guinea	5122 30.	51 95	905 130	21 20	415 26 C 181	)82 27 ( 17	365 27( 1	11 30 2	20 31	321 211( 57 26	31 33 78; 0 331	2 37660 1 262	36 647 309	38 477 356	42 819 306	45 999 319	44 783 366	58 917 : 416	59 531 (	30 627 E	6 748 7	0 625 8	34 687 9	3 336 97 536	075 95	666																
Eritrea										3.65	6(	4 386	11 664	15 505	21453	5 220	8 321	7 789	6 037	6 652	2 743	2 805	4 708	4 239 3	549 3	3 026																
Ethiopia	40 096 42 4	23 52 4	403 568.	324 65	045 717	31 80 8	346 85 8	367 95.5	21 80 7	795 88 65	34 60 00£	5 60 006		99 329	26 034	41889	59 105	69 472 ;	72 095 5	91 101 S	4 957 11	10 289 11	17 600 12	3 127 124	262 122	2 198																
Gabon	865 71	7 36	761 7	752	654 8	155 7	3 69	364 7.	21 5	12 91	17 906	5 926	972	1 034	1 115	951	1 434	1 380	1 598		2 504	2 086	2 208	2 588 2	512 3	3 051																
Gambia	239	128	00		0 0 100		L L	0 J	10	0	1007		001 0	100 11	1 023	1 242	1 357	1 558	1514	0000		1859	1945	2 142 2	031 10	1795																
Guinea	0.4 0.2 C 4 0.	4 - 4	340 25 169 28	100	900 01 13	30 003 17 11	128 15	26 176	40 15	11/ 04/ 195	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7 2941	3 167	3 300	3 523	4.357	4 439	4 768	5 171	5 440	1 923 1 5 874	6 199	6 570	7 423 6	863 8	8 787																
Guinea-Bissau	645 46	35 2	205 3	176	368 5	30 1 3	310 7	752 7	78 1 3	1162 116	3 1246	3 1059	1 558	1 647	1 613	1678	1 445	846	1 164	1 2 7 3	5	1 566	1647	1 835 1	774 2	137																
Kenya	11 049 10 02	27	119	<del>3</del> 66	10 4	10 C	322 10 £	515 109	57 12 5	392 11 7£	38 12 32(	0 14 599	20 451	22 930	28 142	34 980	39 738	48 936 5	57 266 é	34 159 7	3 017 8	0 183 9	91 522 10	0 573 102	680 108	3342																
Lesotho	4082 38;	30 4 9	332 34	143 2	923 2 9	127	21 2	225 23	46 2 4	163 2 52	2 2 994	4 3327	3 384	4 334	5 181	5 598	6 447	7 806	8 552	9 746	-	0 111 1	12 007 1	1 404 10	802 12	2 073																
Liberia	774 1 00	32 8	335 8	385	4	125 2	232	384 8	94			1948	1 766	1 764	1 393	840		1 753		1500	1 751	3 419	2 511	4 337 3	432 4	1 447																
Madagascar	9 082 7 4(	34 35	573 35	588 8	673 32	20 37	717 4(	007 43	93 54	117 6 26	31 6 01	5 8 1 2 6	9 855	10 671	21616	12 718		14 661		-	6 447 1	6 718 1	19 3 09 2	0 001 18	993 21	996																
Malawi	4758 50	33 44	411 47	707 4	404 53	335 62	260 7.5	581 83	·59 9 4	131 12 35	95 14 74:	3 14 237	17 105	19 496	19 155	20 630	20 676	22 674	24 396 2	23 604 2	6 094 2	24 595 2	25 841 2	7 030 25	491 25	5054																
Mali Mauritania	839 9. 7576 0.45	33 1	187 5	532 1 33 3	872 16 977 44	321 15 06 2.23	351 25	534 25 722 3.0	78 16 28 40	326 293	33 263	1 3113	3 204	3 075	3 087 3 849	3655 3837	5 022 3 788	4 142 3 617	4 466 3 640	4 2 16 3 0 6 7		4 457	4496	4 525 4 3 326 2	697 4 162 2	1 989 604																
Mauritius	132 15	1 12	121 1	22	118 1	11 -1	19 1	117 1	14	11 29 11	9 134	4 130	159	149	131	116	121	120	154	160	123	139	137	137	125	114																
Mozambique	7 457 6 9	34 57	787 5.9	337 5.	204 56	45 8 2	263 10 5	396 13.8	63 15 5	158 15 85	309 16 605	9 15 085	16 588	17 158	17 882	18443	18 842	19 672	20 574 2	21158 2	2 098 2	25 544 2	28 602 3	1 150 33	231 35	5 2 5 7																
Namibia	-0 C - 11	7		4	46 84	340 4.4	427 3 ( :70 E	340 28	15 37	703 2 67	71 250(	0 1756	5 500	107 0	1 540	9 625	9 947	11 147 E 046	10 035 1	10 799 1	3 064 1 E 11E	3 282 1 E 10E	14 490 1	5 026 14	920 14	1 673																
Nigeria	9877 108	38 10.9	349 102	12 11.	439 14 9	37 14 0	71 197	723 257	00 13.5	42 20 12	2 19 626	3 14 802	11 601	8 449	13 423	15 020	16 660	20 249 2	24 157 2	5 821 4	5 842 3	8628 4	14 184 5	7 246 62	598 70	734																
Rwanda	1495 138	36	13	364 1.	419 13	27 24	160 3.2	287 41	45 47	741 6 35	3 200				3 054	3 5 3 5	4 710	6 112	6 483	6 093	5 473	6 011	6 812	6 487 7	220 8	3 117																
Sao Tome & Principe	131 ;	37	40	59	49	40	8	55	13	ţ.	17 12(	0	97	41				106	96	97	97	94	457	121	136	153																
Senegal	2014 25	73 16	312 24	117	10	165 5	927 6	145 56	11 55	965 4 97	7 678	1 7408	6 841	6 913	7 561	8 525	8 322	8 475	7 488	8 508	8 554	8 366	9 380	6 860 6	765																	
Seychelles Sierra Leone	16 750 84	17 8	16 889 25	16 93	10 816 8	10 65 3	24 158	14	20	6 63	11 12 1466	3 1665	5 2 691	2 564	8 1 955	15 3241	3 160 3 160	3 270	21	20 3 760	19 4 673	29 4 793	10 5 289	18 5710 6	14 737 8	3 041																
South Africa	55 3 10 59 94	13 64 1	115 62 5	56 62	717 593	49 55 0	113 57 4	106 614	86 68 (	175 80 4C	10 77 652	2 82 539	89 786	90 292	73 917	109 328	25 913 1	42 281 14	48 164 15	51 239 14	8 257 21	15 120 22	27 320 26	7 290 270	178 303	3114																
Swaziland	4	43 30	359 19	355			1	398 13	52 1;	394	1 53	-	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	3 278																
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2003	0	238	37	549	20	9	65	97	49	10	226	66	153	112	157	11	128	55	76	110	271	616	76	206	41		11	146	736	33	76	310	8 :	21	483	703	31	154	168	487	411	
2002	00	204	37	575	19 90	99	8 4	121	56	15	294	91	132	04	15.5	170	126	56	73	108	244	523	105	201	42		12	133	684	29	69	65	12	80	462	619	29	155	169	499	460	
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23		Algen	Benin	Botsw	Burkir	ours.	Cape	Centra	Chad	Como	Congo	Côte c		L duar		Gabor	Gamb	Ghané	Guine	Guine	Kenya	Lesot	Liberi	Malaw	Mali	Maurit	Maurit	Mozar	Namit	Nigeri	Rwan	Sao T.	Senec	Seycr	South	Swazi	Togo	Uganc	UR Ta	Zambi	Zimba	

www.who.int/tb 5 Rates are per 100 000 population.

Table A3.12 New sm	ear-posit	tive câ	ases no	tified, n	umbers	and ra	ites, Afri-	ca, 199:	3-2006																		
							Number c	of cases											Rate	(per 100	ndod 000	ulation)					
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1993 19	94 15	95 19	1997	7 1998	8 1999	2000	2001	2002	2003	2004	2005 20	06
Algeria		6 793	5735	6 556	7740	7 462	7 845	8 328	7 953	8 246	8 549	8 285	8 654	8 538	1	25	20	23 2(	5	5 26	27	26	26	27	26	26	26
Angola Benin	4 8/4 1 653	4 33/ 1 618	3 8 04 1 8 3 9	8 UT6 1 868	8 246 1 939	1 988	2 192	9 053 2 286	11923	18 U8/ 2 415	18 9/1 2 438	20 301 2 582	2 739	21 499 2 943	47 29	30	000	50 50 50	4 0 10 0	9 0 9 0	32	83	31	31	3130	32	8 8
Botswana	1 508	1 668	1 903	2 530	2824	3 112	2746	3 091	3 057	3 334	3 050	3 127	3 170	3 252	101	. 60	122 1;	58 172	2 18	6 161	179	174	188	170	172	173 1	75
Burkina Faso		561	1 028	1 381	1 126	1 331	1411	1 560	1 522	1 544	1 703	1 926	2 294	2 659		9	10	13 1(	.1.	2 12	13	12	12	13	14	16	19
Burundi	1 861	1 527	1121	1 533	2 0 2 2	2 782	2 924		3 040	2 791	3 087	3 277	3 262	3 119	31	25	18	24 3.	4	3 4£		4	40	42	43	42	38
Cameroon	2 316	1 883	2 896	2 312	3 548	4 374	5832	3 960	4 695	7 921	10 692	11 218	13 001	13 811	17	14	21	16 24	4	9 35	25	29	48	63	64	73	76
Cape Verde			111	117	103	104			140	111	165	169	135	131			28	28	2	4		30	23	8	8	27	25
Central African Republic			1794	1 992	2 267	2 637	2725		1 382	2 758	2 818	2 923	2 153	4 448			52	56 6.	3 7	1 7.		35	69	69	71	51 1	4
Chad			2 002	870			2 920			3 519	3 599	2 270	2 516				28	12		36			39	38	23	25	
Comoros		100	103	107	100	66	112	87	92	72	48	63	62	67		6	17	+ i + i	ہ ب 1 - 1	5 16	12	13	9	9	00 I	10	° 2
Congo		1 691	2013	G0G Z	1 984	2 044	2.2.2.2	4 218	4 319	5 019	34//	4 121	3 640	3 340	0	29	2	2/ 0	9	11 1	132	131	149	101	/11	101	91
Côte d'Ivoire	7 012		8 254 20 014	8 927 24 125	9 093 24 600	33 442	10 047 34 023	8 497 36 123	10 920 4 2 054	11 026 44 518	11 430 53 578	12 250 62 102	12 496 65 040 4	12 867 63 488	50 35		55 46	238 238	7 6 6	1 6(	71	63 81	62 83	64	100	67 111 1	68
Equatorial Guinea	130 1		219	209	226	284	010 10	071 000	100 41		00000	406		201	3		24	53 54 54	100			5	3	5	86	-	3
Eritrea					120	135	527	590	702	646	887	720	687	680					4	4 15	16	18	16	21	17	15	14
Ethiopia		5 752	9 040	13 160	15957	18 864	21 597	30 510	33 028	36 541	39 698	41 430	38 525	36 674		10	15	21 24	2	9 32	44	46	50	53	54	49	45
Gabon		395	486	263	577	889	916		1 137	1 033	1 233	1 323	1 042	1 145		38	46	24 52	2 7,	8 75		94	84	66	104	81	87
Gambia			778	743	820	006	861			1 035	1 040	1 011	1 127	1 209			67	32 6(	5 7	0 64			20	68	64	70	73
Ghana		5 778	2 638	6 474	7 254	7 757	6877	7 316	7 712	7 732	7 714	7 259	7 505	7 786		33	15	35 3!	4	0 35	36	37	37	36	33	33	34
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	31	30	31	38 35	4	3 44	48	49	51	52	57	61	64
Guinea-Bissau			956	922	855	541	704	526		899	963	1 186	1 132	1 030			80	75 6	8	2 56	38		62	64	22	71	63
Kenya	10 149	11 324	13 934	16 978	19 040	24 029	27 197	28 773	31307	34 337	38 158	41 167	40 389	39 154	39	43	51	30 6(	8 8	1 85	92	86	104	113	119	113 1	07
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	84	78	79 1	32 13-	4 13.	6 147	161		164	187	217	216 2	02
Liberia	1 547		1 154	668		1 190		1 021	934	1 974	1 319	2 490	2 167	2 906	75		54	29	4	4	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	52	54	58	59	ġ	с С		67	99	73	75	20	81
Malawi	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	58	60	62	55 7.	8	0 72	71	70	63	61	99	64	60
Mali		1 740	1 866	2 173	3 1 7 8	2 558	2 690	2 527		2 757	3 015	3 069	3 523	3 802		20	21	24	2	7 26	25		26	28	27	8	32
Maurtania			2 0/4	8	6192	Z/L L	1001	1 283	Ľ	6	8	799 L	GGL L	1 480			93	0L 2	4,		70	1	٢	c	8 9	99	44
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Niger	463	1 865	1 492		3 4 5 2	3 195	2 63 1	3 045	3 476	3 495	4 505	4 311	5 050	5 279	5	21	16	r N	ο Ω	1 25	27	8	29	36	8	88	8
Nigeria	1 723		9 476	10 662	11 235	13 161	15 903	17 423	23410	21 936	28 173	33 755	35 048	39 903	2		6	10 1(	1 0	1 15	14	18	17	21	24	25	28
Rwanda			1 840	2 034	2820	4 417	4 298	3 681	3 252	3 956	4 627	4 179	4 166	4 220			33	35 4	4 6.	3 56	45	38	45	52	46	45	45
Sao Tome & Principe							30	30	41	42	33	50	49	36						22	21	29	29	22	33	32	23
Senegal		4 599	5 421	5 949	5430	5 454	5011	5 823	6 094	5 796	6 587	6 437	6 722			52	. 09	54 5.	2	6 5(	56	57	23	59	56	57	
Seychelles	2		9	11	13	6	10	t i	12	6	5	13	°° ;		ო			14	 	1	4	15	1	9	15	6	
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South Africa			23 112	42 163	54 073	66 047	72 098	75 967	83 808	662 86	116 364	126 268	125 460 1	31 099 î Tee			20	99 12: 	5 15	0 161	167	182	212	247	266	262 2	72
Swaziland	545		788 887	222 2	935	904	1.8/1	1 823	6/7 L	1 203	1 306	1 608	2 18/ 1 798	2 539	61		50 60	28 20	د 1	8 17 8	1/2	RLL	621	<u>4</u> %	56	7 66 50	5 8
Uranda	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	60	62	64	2 U		8 77	02	68	73	75	75	71	89
UR Tanzania	15 569	17 164	19 955	21 472	22 0 10	23 726	24 125	24 049	24 685	24 136	24 899	25 823	25 264	24 724	55	59	67	10 70	~ ~ _ C	4 73	71	11	89	89	69	66	63
Zambia		9 620	10 038	12 072			11 645	12 927	13 024	16 351	18 934	17 247	14 857	14 025	<b>-</b>	. 20	108 1.	27		114	124	122	150	171	153	129 1	20
Zimbabwe	5 331		8 965	11 965	14 512	14 492	14 4 14	14 392	15 370	15 941	14 488	14 581	13 155	12 718	47		76 1.	30 11§	9 11	7 115	114	120	124	112	112	100	96
AFR	107 012	121 005	212 910	264 659	277 591	326 831	349 142	362 527	402 431	459 983	513 029	551 031 5	50 001 5	55 123	19	51	36 4	14 45	5	1 54	54	59	65	71	75	73	72

Rates are per 100 000 population. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.in/th

### Notes

#### Malawi

Fewer new pulmonary smear positive cases were evaluated than registered due to national policy of registering all patients in whom TB is diagnosed, but reporting outcomes only for those who start treatment.

#### **Mozambique**

While DOTS is available in all administrative areas, it is estimated that only around 50% of the population lives within 10 km of the nearest DOTS unit, reflecting the low coverage of public health services.

Breakdown of notified cases by sex was not available. In 2006, of the 18 275 notified new smear-positive cases, 337 were in patients aged under 15 years, and 17 938 were patients aged 15 years or more.

#### Nigeria

Breakdown of notified cases by age and sex was not available for all states.

### **THE AMERICAS**

**EASTERN MEDITERRANEAN** 

EUROPE

**SOUTH-EAST ASIA** 

WESTERN PACIFIC

## The Americas

NTP MANAGER (OR EQUIVALENT); PERSON FILLING OUT DATA COLLECTION FORM (IF DIFFERENT)

Anguilla	Lynette Rogers
Antigua & Barbuda	Oritta Zachariah; Janet Samuel
Argentina	Elsa Zerbini
Bahamas	
Barbados	R.A. Manohar Singh
Belize	Ines Mendez-Moguel;Marvin Manzanero
Bermuda	John Cann; Lise M. Outerbridge; Dy-Juan M. DeRoza
Bolivia	Miram Nogales Rodriguez
Brazil	Joseney Raimundo Pires dos Santos; Draurio Barreira; Stefano Barbosa Codenotti
British Virgin Islands	
Canada	Edward Ellis: Victor Galant
Cavman Islands	A. K. Kumar: Timothy E. D. McLaughlin-Munroe
Chile	Manuel Zuñiga Gaiardo: Zulema Torres Gaete
Colombia	Gilberto Alvarez Uribe: Ernesto Moreno Naranio: César Castiblanco Montañez
Costa Rica	Zeidy Mata A.
Cuba	María Josefa Llanes Cordero
Dominica	Paul Ricketts
Dominican Republic	Juan José Cordero: Belkys Marcelino
Ecuador	Jorge Iñiguez Luzuriaga: Rocío Morales: Christian Acosta
El Salvador	Julio Garav Ramos: Marta De Abrego: Xochil Aleman
Grenada	Agnes Banfield
Guatemala	Edwin Antonio Quiñonez Villatoro
Guvana	Jeetendra Mohanlall
Haiti	Richard D'Meza
Honduras	Jacobo I. Argüello: Anna Reves
Jamaica	Eva-Lewis-Fuller: Svdnev Erwin
Mexico	Martín Castellanos Jova: Martha A. García Avilés: Héctor A. Téllez Medina
Montserrat	Violet Brown: Dorothea L Hazel
Netherlands Antilles	I. Gerstenbluth: Y. Halabi
Nicaragua	Aleiandro A. Tardencilla Gutiérrez
Panama	Cecilia Lvons de Arando: C. Torres, J. Bravo
Paraquay	Juan Carlos Jara Rodríguez: Irmina Toledo: Ofelia Cuevas: Tomasa Portillo: Mirian Alvarez
Peru	César Antonio Bonilla Asalde; Yvonne Cortez Jara; Eladia Quispe Yataco
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: Anneke Wilson
Suriname	Roel Mahabier
Trinidad & Tobago	Dottin Ramoutar; Leilawat Mohammed
Turks & Caicos Islands	Farina Hussein
Uruguay	Jorge Rodriguez de Marco
US Virgin Islands	
USA	Kenneth G. Castro; Sandy Althomsons
Venezuela	Mercedes España Cedeño; Andrea Maldonado Saavedra

This list shows the people named on the data collection form sent to WHO in 2006, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

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	All forms*	Sm Sm	ear-positive		forms*	All form	y, 1000	All for	ns*	All forms H	V+ S	mear-positive	3* Sme	ar-positive	+11/+	All forms*	Allerice, 2	forms HIV		All forms*	All All	forms HIV+	ori ui	sident
-	number	ate n	umber ra:	te numi	ber rate	number	rate	numbe	r rate	number	rate	number ra	ate r.	number r	ate	number n	ate	number ra	ate	umber ra	ate	umber ra	te TB cas	ses (%)
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Argentina	23 911	73	10 692 3	33 391	506 121	3 209	10	15 23	1 39	672	2	6 787	17	235	≤ 1	18 965	48	336 ±	1	2 043	5	157 ≤	1	4
Bahamas	182	71	75	62	210 82	47	18	12.	5 38	46	14	52	16	16	5	131	40	23	7	25	8	14	4 3.	2
Barbados	54	20	24	6	66 24	11	4	ė	2 11	9	2	14	5	~	× ۲	34	11	e	-	9	2	2	1	6
Belize	06	49	40	22	145 78	18	6	13	7 49	17	9	. 09	21	9	2	159	56	6	e	17	9	5	2	e
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Brazil	125 064	84	79 976 5	53 192 4	447 129	10 881	7	93 93	3 50	11 523	9	59 371	31	6 098	3	04 062	55	5 761	e	7 556	4	1 402 ≤	1	2
British Virgin Islands	4	23	2	10	6 38	vi L	4		3 13	I	1	+	9	ı	1	4	20	ı	ı	≤1	2	1	1	
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Dominica	13	18	9	8	21 30	2	e	-	1 16	I	I	5	7	I	ı	1	16	I	ı	۸ ۲	-	I	1	
Dominican Republic	10 100	138	4511 6	32 16 5	381 233	2 104	29	853	4 89	280	ę	3 812	40	98	-	11 369	118	140	-	1 439	15	89		6
Ecuador	20 580	200	9 250 5	35 2	278 343	4 539	44	16 95	3 128	186	÷	7 612	58	65	s 1	25 732	195	93 ±	< 1	3 412	26	74 ≤	1.	-
El Salvador	5 091	100	2 265 4	14 82	255 162	839	16	338	5 50	365	2	1 487	22	128	2	4 319	64	183	e	580	6	108	1	-
Grenada	9	9	7	3	9 10	-	-	.,	5	I	I	2	2	I	I	80	80	I	I	vi Vi	51	I	1	
Guatemala	8 0 5 5	06	3 601 4	12 5	516 141	1 340	15	10 27	7 79	1 357	10	4 489	34	475	4	13 4 79	103	678	5	1 859	14	430	3 1	с С
Guyana	324	4	142	9 6	522 71	99	6	121	5 164	116	16	535	72	41	5	1 592	215	58	8	213	29	36	5	0
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Nicaragua	5785	140	2 602 (	33 8 1	124 196	899	22	3 20	3 58	24	≤1	1 439	26	80	≤ 1	4 084	74	12 1	<pre>1</pre>	409	7	9	1 0.	8;
Panama	1674	69	735	30 2 (	529 109	231	10	1 46	3 45	201	9	638	19	20	2	1 402	43	100	33	122	4	25 ≤	1	4
Paraguay	3 134	74	1 409	33 4 {	983 117	568	13	426	7 71	80	-	1 912	32	28	× 1	6 041	100	40	- -	711	12	27 ≤	1.	6
Peru	84 406	388	37 910 1	74 109 5	588 504	7 987	37	44 81	5 162	913	33	20 076	73	320	-	51 705 :	87	457	2	4 538	16	179 ≤	1 2.	0
Puerto Rico	385	11	173	5	503 17	68	2	18	5	I	I	84	7	I	I	235	9	I	ı	24	× 1	I	1	
Saint Kitts & Nevis	5	13	2	9	9 21	vi T	7		5 11	I	ı	7	2	I	ı	ø	17	I	ı	vi T	5	I	1	
Saint Lucia	27	20	12	6	45 33	5	4	Ň	9 17	I	I.	13	8	I	T	36	22	I	T	3	2	ı	-	
St Vincent & Grenadines	37	34	17	15	62 57	7	9	ró	2 30	I	ı	16	13	I	ı	56	47	I	ı	9	5	ı	1	
Suriname	400	66	179 4	15 (	364 165	22	19	29.	9 64	24	2	128	28	8	2	435	95	12	e	60	13	6	2 8.	2
Trinidad & Tobago	192	16	83	7 2	282 23	34	33	11.	8	32	2	47	4	11	≤ 1	136	10	16	-	21	2	10	1	6
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AMR	469 150	65 2	33 967	32 697 (	620 96	61 973	6	330 72	4 37	21 265	2	164 952	18	9 508	-	98 0 30	44	10 632	-	40 600	5	3876 ≤	1	4

Table A3.1 Estimated burden of TB, the Americas, 1990 and 2006

- indicates no estimate. - indicates no estimates include patients with HIV. Estimates labelled "HIV+" are estimates of TB in HIV-positive people (all ages). 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 on page 187 for further details. Data can be downloaded from www.who.int/b

Proputerior         Internationary method         New pultinomy method         Internationary method         Intern	-treatment cases ailure After default Ot							-		
Population         Alter failure         Mile         Bits         Mile         Relative         Mile         Mile <thmile< th="">         Mil</thmile<>	ailure After default Ot		New pulm.	Estimated incider	case	detection rate	+SS+	+SS	Extrapulm. Re-	-treat.
		ther re-treat. Other	lab. confirm.	all forms ss	+ all ne	ew new ss-	+ (% of	(% of	(% of (%	% of
	mber number	number number	r number	number num	ber %	%	pulm.	) new+relapse	) new+relapse) new+r	re-treat.)
Marrial         314         1         4         5         4         5         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	0	0		ю	1 0	0				
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	coverage %	New and r number	elapse rate	number	rate	ss-/ unk.	pulmonary number r	new	Kelapse A number	tter tailure At number	ter default Oth number	ner re-treat. number ri	Uther la	b. confirm. number	all forms number r	ss+ strumber	all new %	new ss+ %	(% of pulm.) ne	(% of ew+relapse) ne	(% of w+relanse) ne	(% of w+re-treat.)
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AMR	93	204 547	23	114 412	13	48 830	29 824	1 913	9 568	1 116	4 291	3 970	463	124 271	330 724 1	64 952	59	69	70	56	15	6

Table A3.3 DOTS coverage, case notifications and case detection rates, the Americas, 2006

ss+ indicates sputum smear-positive; ss-, sputum smear-regative; unk., sputum smear result unknown; re-treat., re-treatment; pulm.jab, confirmed; pulmonary case confirmed by positive smear or culture. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who.inVitb

Table A3.4 Labora	ory servi.	ces, collat	orative Ti	B/HIV acti	ivities and	шападешен	I OI MUR-I	D, UIE AIII	Hericas, 20	0007-00							
		Laboratory se	stvices. 2006			2005	Co Co	Ilaborative TB	HIV activities	200	9			Manageme	of MDR-TB	2006	
	a series of the	of labo modified	CTIA diffe	smear labs	TB pts	D ato	+ NH	+/H +/H	TB pts	die OF	+VIH +	+NH +	l on souther	TOL		- transfer of	to the other out
	smear	or raus working culture	DST	in EQA	NIN HIV	HIV-positive	CPT	ART	HIV	HIV-positive	CPT	ART	MDR	in new cases in	nnew cases	DST	MDR
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Barbados	-	-		-	8	0	0		5		0						
Belize	2			-	106	25	17	17	87	11	ø	ø	0	0	0	0	0
Bermuda	1	-	-	1	1	0	0		2	0	0	0	0	3	0	0	0
Bolivia	486	486	486	0	0	0	0	0							34		
Brazil	4 044	193	38	2 100	51 552	8 249	4 442	6 995	54 189	8 059	6 960	6 457	399				
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Canada	10	10	10	9	414	63			388	55			12	1 07 7	œ	104	7
Cayman Islands	4			4	-	0			0	0		Ī		0			
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Colombia	0/L7	841	τ <b>ο</b> τ	9/17	150 C	353		¢	8/69	380			95	507	14	138	97 F
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El Salvador	100			100	1 544	0 188	37 0	71	1631	176	22	63	~	c	c		
Grenada					0	0	5	:	0	0	10	30		0 0	0 0	0	C
Guatemala	136	8	er.	-	600	478		1 160	1429	485				•	•		
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Honduras	144	144	144	0	1 455	200	0	0	1787	202							
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Panama	64	-	-	64	1 560	000	5	00	1 566	215	<b>,</b>	40	10	57	10	2	c u
Paraguav	92	- 4		89	-	004		3	-	24		2	2	27	<u>-</u>	22	o u
Peru	1350	67	7	1 350	668	668			648	648		_	893	876	736	1123	534
Puerto Rico	+	-	-		93	28			101	20			-	67	-	0	0
Saint Kitts & Nevis	-			-								_					
Saint Lucia	2	0	0	2	+	0	'	ľ	-	0		Ī					
St Vincent & Grenadines				_	87	- 00	D	5 0	18	7 70							
Trinidad & Tobado	<del>,</del>	-	-	0	124	42	12	15	250	73	13	36		18	0	2	-
Turks & Caicos Islands	-	-	-	-	5	-	0	0	ø	0	0	0	0	0	0	0	0
Uruguay	-	-	-	_	574	74	0		533	82		18	-	320	0	29	-
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USA Venezuela	165/ 303	1 65/ 22	1 68 /	1 69 1	8 2/3 2 678	1 035 392	0	152	3 224	400	0	188	22	30 8	۹1 ۲	104	21
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ART indicates antiretroviral therapy, CPT, co-timoxazale preventive therapy, DST, drug susceptibility testing; EQA, external quality assurance; HIV+, HIV-positive, pts, patients. See Explanatory notes on pages 137 for further details. Some countries provided the number of TB patients found to be HIV-positive, but did not provide the number of TB patients. TB patients tested is therefore lower than the number of patients set. The regional total of TB patients tested is therefore lower than the number of patients actually tested, and cannot be used to calculated a regional estimate of HIV preview. TB patients tested is therefore lower than the number of patients actually tested, and cannot be used to calculated a regional estimate of HIV preview. TB patients. The regional total of TB patients tested is therefore lower than the number of patients actually tested, and cannot be used to calculated a regional estimate of HIV preview. TB patients. The regional total of TB patients tested is therefore lower than the number of patients actually tested, and cannot be used to calculated a regional estimate of HIV preview. TB patients. The regional total of TB patients tested is therefore lower than the number of patients actually tested, and cannot be used total regional estimate of HIV preview. TB patients. The regional total regional total regional estimate of HIV preview. TB patients.

Table A3.5 Treatn	nent outc	omes, th	ne Am	nericas	, 2005	coho	ť																							
				New smc	ar-positi	ive case	s, DOTS							New	smear-p	ositive c	cases, no	on-DOTS						Smear-	positive	re-treatn	nent case	s, DOTS		
	Number c	of cases	% of notif	l	Compl-	%	of cohor	<u> </u>	Trans-	Not	%	Number of	cases 0	f notif —	ŏ	-Idmo	% of (	cohort	Trar	IS- No	%	Numl	Jer	Com	-id	% of cor	ort	Trans-	Not	%
	Notified	Regist'd	regist'c	d Cured	eted	Died	Failed L	Default	ferred	eval. S	uccess	Notified	Regist'd r	egist'd C	bured e	ted D	ied Fa	iled Def	ault ferre	eve be	. Succe	ss Regis	t'd Cui	ed ete	d Died	I Failed	Default	ferred	eval.	Success
Anguilla Antigua & Barbuda Argentina	6 4 709	4 709	100	19	34	ى م	0	ى ك	ę	33	53	0	9		50		33		+	2	50	16	15	7 21	5	0	6	2	51	33
Bahamas Barbados Belize	0	11	100	45 56	45 19	9	~ ~	12	c	00	91 75												41	2	4	c	c	c	c	86
Bermuda	8	8	2	8	2	!	1	!	,		2	0	-						10	0				1		<b>b</b>	0	, ,		8
Bolivia Brazil	6 278 26 224	6 278 33 527	100 128	76 32	44 2	3		9 5	44	84	78 77	15 869	8 566	54	27	45	5	+	0		7.	2 73	72 6 94 2	6 2	351	2 3	18	3 10	16 16	66 47
British Virgin Islands	0 0	160	106	α	20 20	a	c	÷	÷	2	88												a	u a	2	c	~	c	5	88
Cayman Islands	6	-	8	00	0	0	0	100	- 0	0	<u> </u>											_	g 0	5	-	>	2	4	0	8
Chile	1 186	1 22 1	103	78	0 0	6	0 ·	5	2 ·	9	78											-	40	6	3 14	-	6	ę	0 0	72
Colombia Costa Rica	2 404 330	7 77 8 306	324 93	85 85	04	ഗാ	- 0	9 1	4 -	0 0	71 89	4 466											0 6	5	4	2	24	2	0 0	67
Cuba	467	466	100	06	2	9	-	-		÷	91												48 6	2	9 0	4	2	0	21	67
Dominica Dominican Republic	2 724	2 522	93	80	ŝ	4	2	7	e	0	85	225	175	78	76	4	9	<del>.</del>	σ		8	5	30	g	-	•0	19	9	0	60
Ecuador	2 151	2 150	100	81	e	с	e S	9	5	5	83	897											54	9	2	10	12	e	9	64
El Salvador Granada	1 059	1 059	100	91	0	4	-	2	0	-	91	c	ď		67		55				ŭ	-	14	8	9	4	13	0	ø	68
Guatemala	2 420										T	<b>,</b>	<b>,</b>		5		8				5									
Guyana	196	203	104	-	65	9		22	0	4	67	44	54	123	7	28	2		ŋ	9	ж	0	13	ۍ 8	4 15	0	80	0	15	62
Haiti	6 625	6 625	100	73	ωı	9	- 0	- '	4		81	715	715	100	68	9	80	-	6	2	17	+	97 6	20	7	- 0	10	s I	12	72
Honduras	2 069	1905	92	18	- 23	0 ç		4 ac	τo 4		88											-	Роска Сос	ہ ہے۔ م_ ح			/L 08	~ 0		69
Mexico	11 997	12 172	101	1 1	у ю	<u>0</u> 0	v	9 9	r ന	000	77											1	20 7	5 œ		> 4	3 4	2 01	18	55
Montserrat	-																													
Nicaragua	1 253	1 496	119	73	13	2	2	9	с	0	85											-	81	5	2	0	7	0	0	83
Panama	860	873	102	68	12	80	0	10	-	0	80											2	37 2	3	5 9	4	22	7	0	58
Paraguay Peru	618 18 490	634 14 793	103 80	59 91	32	ы и 1	0 0	44	- 7	0 0	91 91	642	637	66	13	24	4		7	2	6	22	- 66	0	2	Ω.	1	-	0	78
Puerto Rico Saint Kitts & Nevis	09	60	100	75	0	22	0	Э	0	0	75											-	13 2	2 0	3 23	00	4 C	- c	0	73 50
Saint Lucia	,	13	118	15	54	31	0	0	0	0	69												1	5	, ,	<b>)</b>	0	0	8	8
St Vincent & Grenadines Suriname	9											49																		
Trinidad & Tobago	c	c			çç	¢	c	c	00	c	10	95	106	112	68	4	12		9		12	01		č	00	c	c	10	¢	10
Uruguay	355	345	97	8	ç 4	, <del>E</del>	00	04	<u> </u>		84												n 00	9 <del>-</del>	13 20	n o	~	<b>p</b> o	n c	73
US Virgin Islands	7 7 7 1		100		10	c		c	c	2																				
USA Venezuela	3 653	3 581	001 86	83	40	αQ	0	10	5 0	0	64 83											2	47 8	0	0 4	2	12	2	0	80
AMR	101 808	108 413	106	57	21	2	÷	7	ę	9	78	23 002	10 266	45	30	40	5	-	0	5	7(	16 2	90 4	0	5 6	3	14	9	15	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 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes in which case the sum of outcomes is not exercise is used. If the number of cases registered is not reported, then the number of cases registered in 2005 is used, or 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 2005 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.int/th

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Table A3.6 Re-treatr	nent out	comes	s, the ,	Ameri	cas, 2	005 CC	ohort																				
				Relap:	se, DOT	ŝ			H				After fai	lure, DO	TS			-			1	After defa	ault, DO	TS			
	Ali metane			%	of cohort			1714	%				%	of cohort	ŀ		10	%				% 0	f cohort	Ē	4		%
	regist'd	Cured	eted	Died	Failed D	befault fi	irans- erred ∈	sval. St	rccess	regist'd	Cured	compl- eted	Died	Failed D	l Default fi	erred (	NOT eval. Su	ICCE SS	number regist'd	Cured	-ompi- eted	Died F	ailed D	efault fe	ans- N rred ev	rot /al. Sur	ccess
Anguilla Antigua & Barbuda Argentina	226	5	8	4	0	~	4	56	29	381	6	36	œ	-	20	n	22	46	806	4	52	4	0	ę	0	99	26
Bahamas Barbados																											
Belize	7	57	14	29	0	0	0	0	71	7	57	43	0	0	0	0	0	100	0	0	0	0	0	0	0		0
Bermuda Bolivia	772	63	ę	5	ĉ	7	e	16	66																		
Brazil	2 426	22	35	9	-	11	10	15	57	237	5	13	3	22	5	10	43	18	1 955	13	26	9	2	27	11	15	39
British Virgin Islands		ı	0	ı	¢	¢	c	2	0																		
Canada Cavman Islands	0	~ 0	0	~ 0	0 0	0 0	0 0	21	69	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Chile	129	71	з	16	٢	7	з	0	74									-	11	55	0	0		36	0	6	55
Colombia Costa Rica	19	68	21	ŝ	ŝ	0	C	C	68	00	75	13	13				0	88	22	36	ŝ			55	5	0	41
Cuba	39	82	i					10	82	2		2	2	40			60		4					25		75	
Dominica Dominican Republic	312	63	4	ŝ	œ	15	сı	0	68	30	27	с	10	50	10	0	0	30	188	47	ى م	0	2	28	0	0	53
Ecuador	315	64	4	4	10	10	2	5	69	74	47	e	2	23	11	2	5	50	136	50	10	7	e	20	e	7	60
El Salvador Grenada	78	62	0	9	4	4	0	9	79	6	44	0	0		22	0	33	44	27	44	0		4	37	0	15	4
Guatemala									F																		
Guyana	e		100					0	100										10	10	40	20		10		20	50
Haiti	173	99	~	0	0	6	2	13	73	0	0	0	0	0	0	0		0	24	55	œ	4	4	21	8	0	63
Honduras	169	59	o	9	2	17	7	0	69										c		Ċ			C		c	C L
Mexico	646	56	7	2	5	6	-	16	63	82	30	9	12	7	12	-	30	37	385	43	о 9	80	2	33 23	ę	16	49
Montserrat																											
Netherlands Antilles Nicaraqua	118	74	13	00	0	2	0	0	86	18	67	1	1	0		9	9	78	45	67	0	0	2	1	4	0	76
Panama	58	57	19	5	с	14	2	0	76	8	25	13	13	38	13	0	0	38	64	30	20	80	5	33	5	0	50
Paraguay Peru	1 967	80		5	5	6	٢	0	80										332	64		9	4	24	2	0	64
Puerto Rico Saint Kitts & Nevis Saint Lucia									<u> </u>																		
St Vincent & Grenadines									ŀ																		
Suriname Trinidad & Tobago																											
Turks & Caicos Islands	0	0	0	0	0	0	0		0	2	0	0	0	0	0		100	0	3	33	33	33	0	0	0	0	67
Uruguay US Virgin Islands	30	57	17	13	ო	7	0	ო	73																		
USA Venezuela	247	80		4	2	12	2	0	80																		
AMR	7 776	53	14	5	3	10	5	10	67	861	17	21	7	11	13	5	25	38	4014	23	19	9	2	22	7	22	41

Not eval. indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases registd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes in sing or is less than the sum of outcomes, in which case the sum of outcomes is used. Data can be downloaded from www.who.int/th

Table A3.7 DOTS tree	atment	succe	ss and	case (	detectiv	on rate	s, the ,	Americ	as, 199	4-200	ۍ ۵												
			DOTS	new sm	ear-pos	itive tre.	atment	saccess	(%)			H		ŏ	<b>DTS new</b>	smear-I	ositive	case di	etection	rate (%	(		
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003 2	2004 2	005 1	16 16	96 15	97 195	8 199	9 200.	0 200	1 2002	2003	2004	2005	2006
Anguilla Antigua & Barbuda					50	50	100	100	100		100					4	4 13(	۶ 4	5 91	47		284	
Argentina					55	59	54	64	58	66	58	53			4	7 2	3	1 3	9 72	5 67	66	67	71
Bahamas					72	99		64	59	62						9	5 10	-	55	9 55	5 71		
Barbados Bolizo						a	70	99	20	100	U9	91 75		90	SE SE		à	4 č	0 34	+	136	101	29
Bermuda						8	2	8	8	8	3	2		8	8				14		8	2	8
Bolivia Brazil	99	62	r.	11	62 91	89	6/	82	84 75	18 58	80 81	8/	39	78	13	90	. * 	+ "	2/ /S	14	37	75	69
British Virgin Islands					5	8	2	5	2	3	5	-				5			, ,	-	5	2	8
Canada				40	39	36	35	42	36	45	62	68	46	46	52 5	0	4 6	1 5	8 52	2 44	1 58	58	55
Cayman Islands								100				_						13	0		130		
Chile	83	79	80	17	83	83	82	83	86	85	83	78	72	76	82 8	7 8	8	1	0 100	07	7 105	102	141
Colombia					74	82	80	85	84	83	85	71				õ	0	~	رن ا	8	18	26	83
Costa Rica						81	76	72	85	94		89				ŝ	1	80	6 75	5 116	3 147	117	102
Cuba	86	06	92	06	94	91	93	93	92	93	93	91	83	89	87 5	0	6 2	ŝ	5 86	3 89	85	95	94
Dominica			100				i	100	1		;	1			94	2			36		1	i	165
Dominican Republic						81	29	85	78	81	80	85							36	61	65	71	99
Ecuador								82	84	84	85	83						<i>.</i>	5 3C	37	41	28	8
El Salvador Grenada					11	78	79	88	88	88	06	91			46	n n	9	2	8	54	1 29	69	61
Guatemala	62	61	81	73	62	81	86	85	84	91	85	╞	43	57	56	6 5	5	4	0 44	t 42	54	55	56
Guyana						91	91	06	85	57	72	67					1	2	0 11	1 33	\$ 27	40	45
Haiti				73	5	70	73	75	78	78	80	81			t-	1	2	0 2	7 36	3 41	43	52	55
Honduras					93	88	89	86	87	87	85	88				2 1	5 10.	5 12.	4 126	3 85	9 84	87	85
Jamaica		67	72	29	89	74	45	78	49	53	46	57		94	38	4	5 10	ς δ	8 71	1 96	82	63	73
Mexico			75	65	78	80	76	83	84	83	82	77			16 3	4	3 7,	3 10,	8 87	7 105	5 95	112	118
Montserrat																				465	.0	420	
Netherlands Antilles	2	0	C F	2	0	2	00	ç	00	2	ţ	L	ç	0			č	č	ŀ			Ğ	ç
Nicaragua	81	80	6/	10	78	81	20	22 c	7.0	5	8/	£ 6	2	80	80	20	200	× č	2 00	86	007	83	88
Panama	96	1		0	0	80	6 F	00	5.0	14	۵ رو م	8 2	4.4	02	-	r	ກີ ວ	× ×	., o		132	551	45. 45.
r alayuay Peru	<sup>6</sup> <sup>6</sup>	- 68	89	06	92	93	06	6	92 92	88	86	91	101	88	94	6	1	+	2 2 2 86	2 F8	3 2	8	96 96
Puerto Rico		68	69	69	72	20	64	76	60	99	71	75		58	72 6	6 7	3 6	7 7.	2 88	3 70	1 76	71	82
Saint Kitts & Nevis					25	50									16	55	2		41	-			40
Saint Lucia				67	82	89	100	50	25	89	64	69		ţ	13 8	1 7	3 5	7 4	8 64	1 64	1 88	88	104
St Vincent & Grenadines				86		100	100	80			86					8	Ω.	5 1,	8	37	31	38	50
Suriname																							
Turke & Caince lelande					74							67				40							274
l uns à calcos islarios Hrinniav	53	89	08	77	1	83	85	85	82	86		0/ 84	77	05	or P	<u>1</u> 0	م م	18	73	00	01	88	110
US Virgin Islands	3	50	8	-	5	8	8	3	40	8		5	:	73	2	2	, ,	>	2	5	5	3	:
USA	72	74	00 00	62 72	81	82	83 76	83	83	83	82	64	85 73	83 7E	83 83	0 0 0	- 00	4 ×	5 85 7 65	2 86	87	86	88
A GLIGZ MGIN	3	t	3	71	5	70	2	3	70	70	5	3	2	2	t	0			5	5	2	t	-
AMR	76	77	83	82	81	83	81	82	83	83	82	78	25	25	27 3	3	4 4	4	0 43	3 47	56	60	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. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.in/tb

Table A3.8 New smeal	-positive	e case n	otificati	on by aç	ge and s	sex, abs	olute nu	imbers, I	DOTS ar	d non-D	OTS, the	e Amerio	as, 2006				:				
				Male						Fen	nale			-			All	1	1		Male/female
	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34 3	5-44 45	-54 55	-64 65	0 +	-14 15-	24 25-0	4 35-44	45-54	55-64	65+	ratio
Anguilla Antigua & Barbuda	1		i					i													
Argentina	67	519	484	360	351	346	321	74	438	437	235	197	173 2'	ŝ	41 0	57 92	1 595	548	519	534	1.4
Barbados			2						-					-		-	2			-	1.0
Belize	e	4	4	7	5	-	e	2	9	5	3	5	9	9	5	10	9 10	10	7	6	0.8
Bermuda		!	000	÷ į	000	000	000	ļ		101	0.00	t į					1	1		000	1.0
Bolivia Brazil	343	1 14/ 4 783	660 9	4 / 1 6 050	390 5 042	333 2 885	398 2 221	343	, 164 3 132	3 506 2	2569 1	885 1.	148 24 121 11:	- 0	86 7.5	11 111 15 96(	0 /24 4 8 619	6 927	481 4 006	639 3 360	1.6
British Virgin Islands																					
Canada	2	34	34	33	42	26	64	4	39	30	25	16	9	N	9	73 (	4 58	58	32	116	1.4
Cayman Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Chile	12	107	140	176	197	179	199	2	02	91	74	95	64 11	24	19	77 23	1 250	292	243	321	1.9
Colombia	219	709	713	737	785	573 75	766	210	603	653 74	520	377 :	314 46	۷ 00 ۳	29 13	12 136	6 1257	1 162	887	1 235	4.4
	-	17	00	87	ŧ.	0	47	t	17	40	02	0	0	- 9	n	ŧ.	0 1	0 <sup>4</sup>	8 8	00	0.I 2
Cuba	c	2	e -	63	0 <u>0</u>	47	۰ ۵	c	× 7	8 0	3 *	71	4	200	c		GLL -	7.9	61	5	3.5
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Grenada		g		2	2 0	ξ ⊂	3 0		-	3 0	ç c	, c	, c		2 0	i ç c			4 C	5 0	2
Guatemala					,	,	,	,		,	,	,			,						
Guyana	9	37	61	59	40	15	5	~	15	21	20	14	e	+	7	52	2 79	5	18	9	3.0
Haiti	93	1 110	1 132	672	455	201	174	137	1113	1 039	638	387	184 12	9	30 2 2	23 21	1 1 310	842	385	300	1.1
Honduras	21	213	297	213	139	96	147	28	206	234	123	85	87 12	6	49 4	19 53	1 336	224	183	276	1.3
Jamaica	0	6	10	6	9	9	6	0	2	2	e	-	0	-	0	11	5 12	2	9	10	4.1
Mexico	129	986	1 320	1 333	1 275	1012	1 215	153	696	774	662	794	722 8(	0	82 16	82 2 0(	4 1995	2 069	1734	2 018	1.6
Montserrat Netherlande Antilles	C	c	c	0	÷	÷	c	÷	C	c	c	c	c	c	-	0	с с	-	÷	C	4.0
Nicaragua	15	162	151	129	- 86	- 06	72	25	168	, <del>1</del>	, 06	65	° 80		- 4	30	5 219	163	128	110	1.3
Panama	7	100	134	107	88	48	57	14	64	83	52	45	26 3	52	21 1	64 2'	7 159	133	74	06	1.7
Paraguay	20	187	213	139	149	122	112	18	130	81	72	55	61 (	9	38	17 29	4 211	204	183	178	2.0
Peru	400	4 071	2 470	1 494	1 106	884	869	435	2713	1 852 1	082	762	557 55	99	35 67	84 432	2 2 576	1 868	1441	1 425	1.4
Puerto Rico	-	4	7	9	13	o <del>,</del>	2	-	4	m	9	m	7	m	7		0 12	16		10	2.1
Saint Lucia					Ċ	- 2	5						-	-				e	- 9	9	6.5
St Vincent & Grenadines						4	2							2					4	4	3.0
Suriname	5	9	13	6	4	-	7	2	-	4	-	8	0	2	7	. 2	7 10	12	-	6	2.5
Trinidad & Tobago	2	7	27	23	20	16	12	-	e	10	5	4	8	n	e	10	7 28	24	24	35	2.0
Turks & Caicos Islands	0	-	-	0	0	0	0	0	-	-	-	-	-	0	0	2	2	-	-	0	0.4
Uruguay US Virgin Islands	-	Ř	23	34	80	e	29	4	21	19		9	÷	0	ю	60	2 42	36	49	30	2.7
USA	12	388	568	659	759	531	596	11	257	384	263	212	146 3(	3	23 6	45 9(	2 922	971	677	899	2.2
Venezuela	10	323	405	413	422	267	320	42	322	297	188	173	140 22	5	52 E	45 7(	2 601	595	407	545	1.6
AMR	1559	15 908	16 247	14 040	12 046	8 109	8 063	1 787	11484 1	0 891 7	360 5	695 4 (	35 48;	3 3	46 27 3	92 271:	8 21 400	17 741	12 144	12 893	1.6
For some countries. breakdown	of notified ca.	ses by age s	and sex is n	nissing, or i	s provided f	or a subset	of cases. S	ee Explanato	iry notes on	page 187 fo	r further det	ails. Data ca	n be downlo	aded from v	ww.who.int	₽					

some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who.in/tb

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	0-14 15	-24 25-	-34 3	5-44 4	15-54 5	55-64	65+	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+
Anguilla Antigua & Barbuda																					
Argentina	+	15	16	15	18	23	20	4	13	14	10	6	10	6	+	14	15	13	13	16	13
Bahamas			a						u					u		c	~				~
Belize	9	14	18	45	49	17	53	4	21	22	19	51	108	66	2	1 1	50	32	50	62	12
Bermuda																					
Bolivia	7	124	102	95	113	148	209	10	85	67	49	48	59	101	6	105	84	72	79	101	149
Brazil	-	27	39	47	52	50	43	-	18	22	19	18	17	17	-	23	31	33	34	32	28
British Virgin Islands																					
Canada	0	7	7	-	7	-	ю	0	7	-	-	-	0	7	0	7	-	-	-	-	e
Cayman Islands																					
Chile	-	7	12	4	20	28	35	0	2	80	9	6	თ	15	0	9	10	10	4	18	24
Colombia	<i>с</i> о и	17	20	24	35	45	74	с, .	4	8 1	16	15	21	35	ς α	15	19	20	25	32	52
Costa Rica	0	9	10	5	14	19	20	-	9	-	-	9	9	×	0	9	6	÷	10	12	13
Cuba		e	œ	0	4	ი	œ		-	7	7	2	7	n		2	2	Q	Q	2	9
Dominica	,	;	;	1	!	:			:	1		;	i	i	,	;	i	!	:	;	;
Dominican Republic	2	39	65	56	48	41	8	2	33	43	31	25	24	21	2	36	5	43	36	33	28
Ecuador	-	37	49	42	43	49	49	0	26	31	23	53	24	26	0	32	40	32	33	36	37
El Salvador	-	15	21	28	32	32	63	-	1	13	12	18	20	29	-	13	17	20	24	25	43
Grenada	0	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0
Guatemala																					
Guyana	5	61	114	104	06	56	24	-	24	4	41	37	4	4	e	42	12	75	66	37	4
Haiti	5	108	171	145	139	98	97	8	108	147	129	110	79	58	9	108	158	137	124	88	76
Honduras	2	29	60	65	61	71	109	5	28	4	34	36	62	83	7	28	52	49	48	99	95
Jamaica	0	ო	2	2	2	œ	10	0	-	e	2	-	0	-	0	5	4	e	e	4	Q
Mexico	+	11	15	20	26	33	43	-	7	80	6	15	23	23	-	6	12	14	20	28	32
Montserrat																					
Netherlands Antilles	0	0	0	14	80	12	0	2	0	0	0	0	0	0	2	0	0	9	e	2	0
Vicaragua	+	27	36	46	51	79	68	2	28	33	30	32	35	32	2	28	35	38	41	57	49
Panama	-	34	50	47	56	46	59	e	22	32	23	28	25	32	2	28	41	35	42	35	45
Paraguay	2	30	48	42	58	76	82	5	21	19	22	22	39	43	7	25	34	32	40	58	61
Peru	6	150	109	87	60	112	122	10	102	83	62	61	69	65	10	126	96	74	75	60	91
Puerto Rico	0	-	e	2	9	ŝ	m	0	-	-	7	<del></del>	-	-	0	-	2	7	e	n	2
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Venezuela	0 0	12	19	23	32	32	20	~ <del>~</del>	12	14	- =	- 13	16	30	~ <del>~</del>	12	16	17	23 -	24	39 4
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Table A3.10 Numbe	r of TB c	ases no	stified, t	the Am	ericas,	1980-20	900																			
	1980	1981	1982	1983	1984	1985	1986	1987	1 988 1	989 1:	990 19:	91 199	2 1993	1994	1995	1996	1997	1998	1999	2000	2001 2	002 20	03 20	04 20	5 200	9
Anguilla	0	0	4	0	0	-	0	0	0	0	0	0	0		2		0				0	0	0	0	0	0
Antigua & Barbuda	8	e	0	-	e	2	7	0	e	в	-	0	9		0	e	4	4	e	4	-	4	-		9	4
Argentina	16 406 1	6 693 1.	7 292 1	7 305 1	6 359 1	5 987 14	1 681 15	368 13	267 12	636 12	309 12 1	35 12 60	6 13 887	13 683	13 450	13 397	12 621	12 276	11 871 1	1 767 1	1456 11	548 107	728 10 6	19 9.7	0 9406	9
Bahamas	70	67	54	58	53	63	52	43	51	52	46	53 6	3 60	78	57	59	88	75	76	82		4	38	53		
Barbados	64	e	30	17	4	12	4	e	4	2	2	2	ø		e	ę	2 Q	7	2	e	9	2		19		5
Belize	21	33	44	140	35	25	23	41	28	30	57 (	39 6	5 80	59	95	66	107	123	104	106	136	135	66	83 11	2 8!	ŝ
Bermuda	-	2	2	10	e	e	9	2	-	2	0	3	4		4	0	4	0	0	0	0	0		9	.,	e
Bolivia	4 412	5 072	4 777	5 178	4 131	3 679 6	3 837 8	3 960 10	664 12	563 11	166 11 2	23 9 52	0 8 6 1 4	9 431	14 422	10 194	9 853	10 132	9 863 1	0 127 10	531 10	201 98	336 98	01 97	8 901	4
Brazil	72 608 8	6411 8	7 822 8	6 617 8	8 365 8	4 310 80	3 731 81	826 82	395 80	048 74	570 84 9.	90 85 95	2	75 759	91 013	87 254	83 309	95 009	78 870 7	7 899 74	1 466 81	436 80 1	114 868	81 80 2	9 77 632	N
British Virgin Islands		002.0			0000			010				0,0	1	0000	1001		с С								0.	,
Canada Cayman Ielande	70/ 7	070 7	z 4/3	د 305 1	, 100 1	7 T	6 <u>4</u>	7/6	7 146	- cen	908 Z U	01.7 °	C 2 5	00N 7	1261	648 1	FOR L	5// I	18/1	1 00/	1 / 60	21. 700	21	4- 	40 40 7	t c
Chilo	. 663.0	7 227 4	5 041	000 8	6 E61 6	1 10	064 6	a 000	0 V C C	2 002	4E4 E AC	20 5 20	4 500	1 120	A 160	4 170	000 0	2 667	7 100	0.000	- 900	140 2	0 2 C 2 C	- F C 1 - 1-1-	1010	2 0
Colombia	11 589 1	1 483 15	0 34 I 2 126 1:	0 909 3 716 1	2 792 13	0.024 11	630 11	437 11	469 11	329 12.	10 04 10 24	33 11 19	4 4 090 0 11 043	8 901	9 012	9/1 4	3 00U 8 042	0 155	0 429 10 999 1	1630 1-	1480 11	376 116	270 71 272	42 10 30	11128	οœ
Costa Rica	300	521	459	479	393	376	418	434	442	311	230 21	11 11 11 11 11 11 11 11 11 11 11 11 11	8 313	325	586	636	692	730	851	585	630	543 5	527 7	12 25	486	ο
Cuba	1 133	833	815	762	705	680	656	630	628	581	5 46 5	14 41	062 0	1 681	1 553	1 465	1 346	1 234	1 135	1 183	926	898 8	340 7	84 7	92 0.	ŝ
Dominica	20	26	18	16	2	8	35	27	7	13	9	14	3 7	12	80	10	9	2				2			19	6
Dominican Republic	2 174	1 778	2 457	2 959	3 100	2 335 2	634 2	459 3	081 3	145 2	597 18;	37 349	0 4 033	4 337	4 053	6 302	5 381	5 114	5 767	5 291 4	1766 4	040 46	396 4.5	49 5 0	3 456	5
Ecuador	3 950	3 966	3 880	3 985	4 301	1 798 5	5 687 5	1 867 5	: 497 5	480 8.	243 68.	7 31	3 7 050	9 685	7 893	8 397	9 435	7 164	5 756	6 908 6	3 015 5	829 6 4	142 6 1	22 44	6 4 59	4
El Salvador	2 255	2 091	2 171	2 053	1 564	1 461 1	1 659 1	. 647 2	378	617 2	367 2.30	04 2 49	5 3347	3 901	2 422	1 686	1 662	1 700	1 623	1 485 1	458 1	550 1 3	383 14	06 17	4 164	4
Grenada	17	-	-	9	4	2	-	2	0	4	0	+	3	e	4	0	2	2	5	0		-	2	2		-
Guatemala	5 624	6 641	7 277	6 013	6 586 4	3 570 4	1 806 5	1 700 5	: 739 4	900 3	813 2.6	31 2 51	7 2 474	2 508	3 119	3 232	2 948	2 755	2 820	2 913 2	2 419 2	909 2 6	542 3.3	13 3.3	5 3 62	9
Guyana	124	117	135	149	165	215	190	117	150	120	168 1.	34 18	2 91	266	296	314	407	318	407	422	422	590 6	331 6	03 6	9 710	0
Haiti	8 306	6 550	3 337	6 839	5 803	4 959 E	3 583 E	514 8	054 8	100	10.2;	37			6 212	6 632	10 116	9 770	9 124 1	0 420 10	) 224 12	066 14 (	004 14 5	33 14 3	1 13 95	6
Honduras	1 674	1 696	1 714	1 935	2 120	3 377 4	1 213 4	1 227 3	: 962 4	026 3	647 4 5	30 4 15	5 3745	4 291	4 984	4 176	4 030	4 916	4 568	6 406 5	5 048 4	485 38	358 35	94 33	3 319	2
Jamaica	176	178	153	157	160	130	88	133	65	86	123 1.	21 11	1 115	109	109	121	118	121	115	127	121	106	120 1	16	6 0	Ð
Mexico	31 247 3.	2 572 24	4 853 2.	2 795 1	4 531 1	5 017 15	3 180 14	1 631 15	371 15	489 14 -	437 15.2	16 14 44	6 15 145	16 353	11 329	20 7 22	23 575	21514	19 802 1	8 434 18	3 879 17	790 17 (	078 151	01 185	4 17 887	4
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US Virgin Islands			2	5													2	5									
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Table A3.12 New smear-positive cases notified, numbers and rates, the Americas, 1993–2006

Rates are per 100 000 population. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/tb

### Notes

#### Canada

Treatment outcomes not available for all jurisdictions.

#### Colombia

The numbers of TB cases tested for HIV and found HIVpositive were reported by 50% of health centres for 2005 and by 26% of health centres for 2006.

Treatment outcomes were not available for all regions.

#### **United States of America**

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 out of 51 did not provide data on HIV testing (the area not providing data represents approximately 20% of TB cases in 2006 and 12% of population of the USA).

### **EASTERN MEDITERRANEAN**

EUROPE

SOUTH-EAST ASIA

WESTERN PACIFIC

# Eastern Mediterranean

NTP MANAGER (OR EQUIVALENT); PERSON FILLING OUT DATA COLLECTION FORM (IF DIFFERENT)

Afghanistan	Hayat Ahmadzai
Bahrain	Saeed Alsaffar
Djibouti	Said Guelleh
Egypt	Essam Hamza El-Moghazy; Amal Galal
Islamic Republic of Iran	Mahshid Nasehi; Shahnaz Ahmadi
Iraq	Dhafer S. Hashim
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	Hassan Sadiq; Yuriko Egami
Qatar	Abdul Latif Al-Khal
Saudi Arabia	Adel Mohammed Turkistani; Mohammad Salama Abouzeid
Somalia	Aiyed Munim
Sudan	Alsadig Yousof Mohammed Ahmed; Joseph Lasu; Samia Ali Alagab; Khadiga Adam; Sindani Ireneaus Sebit
Syrian Arab Republic	Fadia Maamari
Tunisia	Dhikrayet Gamara
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 2006, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

Table A3.1 Estimate	d burden c	of TB,	Eastern	Mediter	ranean,	1990 an	d 200	6																
	Inc	cidence,	1990	Preva	alence, 199	0 TB mo	rtality, 19	06			Incidenc	e, 2006.				Pre	valence, 21	900		TB	nortality,	2006		HIV prevalence
	All forms*		Smear-positiv	e*	Il forms*	AII	forms*		All forms*	All form	HIV+	Smear-posi	tive* Sm	ear-positive	+NH	All forms*	A	forms HI	+>	All forms'		All forms F	+	in incident
	number	rate	number r.	ate nu	mber rat	e nur	nber ra	Ite	number rat	e numb	er rate	number	rate	number	rate	number	ater	umber	rate	number	rate	number	rate	TB cases (%)
Afghanistan	31 375	248	14 119	112 7.	7 705 61	4	864	20	42 074 16	+	9 ≤1	18 932	73	e	v.	60 260	231	2	vi T	8 291	32	Э	vi T	≤ 0.05
Bahrain	376	76	169	34	593 12	0	4	6	304 4	+	1	137	18	I	I	330	45	I	I	30	4	I	I	I
Djibouti	3 227	576	1 438	256 8	3 318 1 48	4	686 1:	52	6 622 8C	99 66	38 82	2 913	356	234	29	10 638 1	300	334	41	1 136	139	195	24	10
Egypt	20 310	37	9 139	17 26	3 790 4	9 2	356	4	17 778 2	4	12 ≤ 1	7 999	11	4	ž.	23 011	31	9	vi t	2 063	e	e	vi Vi	0.1
Iran (Islamic Republic of)	20 308	36	9 13 1	16 28	3 122 5	0	358	4	15 545 2	2 33	36 ≤ 1	6 961	10	118	vi Vi	19 578	28	168	vi T	1839	e	75	vi Vi	2.2
Iraq	10 371	56	4 667	25 16	3 326 8	8	218	12	15 968 5	9	1	7 186	25	ı	ı	22 326	78	I	ı	3 110	11	I	I	I
Jordan	365	11	164	5	365 1	+	26 ≤	-	306	5	1	138	2	ı	ı	330	9	I	ı	30	× 1	1	1	1
Kuwait	954	45	429	20	1 908 8	6	111	2	667 2	4	1	300	11	I	I	689	25	I	I	59	2	I	I	I
Lebanon	1 112	37	500	17	1 285 4	3	111	4	452 1	+	2 ≤ 1	203	5	s t	v T	506	12	-	v T	45	-	vi L	v	0.5
Libyan Arab Jamahiriya	1 176	27	529	12	1 791 4	+	197	5	1 059 1	8	1 1	477	80	ı	ı	1 059	18	I	ı	11	-	1	1	1
Morocco	30 446	123	13 695	55 26	3 449 10	7 2	745	11	28 776 5	3 12	27 ≤ 1	12 937	42	4	۲.	24 265	79	64	۲.	2 599	80	17	Ň	0.4
Oman	482	26	217	12	744 4	0	42	2	336 1	с С	1 1	151	9	I	ı	366	14	I	ı	29	-	I	I	1
Pakistan	204 820	181	92 154	82 48:	3 329 42	8 55	425 4	49	291 743 18	1 92	22 ≤ 1	131 192	82	323	s t	423 011	263	461	s t	54911	34	290	۲.	0.3
Qatar	282	60	127	27	331 7	+	28	9	491 6	0	1 1	221	27	I	ı	601	73	I	ı	56	7	I	I	ı
Saudi Arabia	6 957	43	3 13 1	19 10	0 975 6	8	807	2	10 631 4	4	1 1	4 784	20	I	ı	14 883	62	I	ı	1 233	2	I	I	ı
Somalia	22 236	331	9 995	149 53	3 388 79	5 7	687 1	14	18 444 21	8 25	99 4	8 270	98	105	-	24 757	293	150	2	3 488	41	115	-	1.6
Sudan	44 689	172	19 934	77 10	7 288 41	4 15	362	59	91 331 24	2 415	57 11	40 683	108	1 455	4	158 115	419	2 079	9	25 562	68	2 037	2	4.6
Syrian Arab Republic	9 021	71	4 059	32 10	3 982 11	0	972	8	6 251 3	2	1	2 813	14	I	I	7 723	40	I	I	673	3	I	I	I
Tunisia	2 583	31	1 162	14 4	4 029 4	6	246	e	2 520 2	5	5 ≤1	1 133	11	2	s 1	2 856	28	2	× ۲	278	с	× 1	s 1	0.2
United Arab Emirates	555	30	250	13	876 4	7	64	ო	681 1	9	т т	306	7	I	ı	1 029	24	I	I	79	2	I	I	I
West Bank and Gaza Strip	671	31	302	41	1 059 4	6	120	9	788 2	0	I I	355	6	I	I	1 223	31	I	I	138	4	I	I	I
Yemen	14 753	120	6 639	54 29	9 395 23	9	964	16	16 944 7	8	T T	7 625	35	ı	ī	28 752	132	T	ı	2 168	10	1	I	I
EMR	427 069	111	191 950	50 89	5 047 23	4 102	432	27 5	69 708 10	5 653	38 1	255 715	47	2 288	≤1	826 308	152	3 269	≤1	107 895	20	2 737	۲,	1.1

- indicates no estimate. - incidences no estimates - incidences providence and mortality estimates include patients with HIV. Estimates of TB in HIV-positive people (all ages). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those - published providences are represented by the call and by the providence from www.who.inthb

					·	l			ļ		.												
_							Notified TE	3 cases, DOT	S and r.	100-DOTS C	combined					Inciden	ce and cast	e detection	rates		Prc	portions	
					New F	nomluc	ary Nev	w extra- Oth	er	_	Re-treatment	t cases		-	Vew pulm.	Estimated	incidence	Case detec	ction rate	+SS+	+SS+	Extrapulm.	Re-treat.
	Population →	All notified N	lew and rel	apse	+SS	5	ss- / unk. pul	monary ne	× 8	telapse Afte	vr failure Afte	er default Oth	er re-treat. 0	ther lat	<ol> <li>confirm.</li> </ol>	all forms	+SS+	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	number num.	ber n	number	number	number	number nu.	mber	number	number	number	%	%	pulm.) nt	lew+relapse)	new+relapse) I	new+re-treat.
Afghanistan	26 088	25475	25 475	86	12 468	48	6 809	5 066		1 132					12 468	42 074	18 932	58	99	65	49	20	4
3ahrain	739	278	278	38	98	13	77	103	0	0	0	0	0	0	98	304	137	92	72	56	35	37	
Djibouti	819	3 095	3 011	368	1 153	141	400	1 266	0	192	62	22	0	0	1 153	6 622	2 913	43	40	74	38	42	6
Egypt	74 166	10400	10 046	14	4 745	9	2 130	2 726	0	445	160	194			4 745	17 778	7 999	54	59	69	47	27	80
ran (Islamic Republic of)	70 270	9 535	9 361	13	4 802	7	1 866	2 386	0	307	131	43	0	0	4 810	15 545	6 961	58	69	72	51	25	2
raq	28 506	8 043	8 043	28	2 886	10	2 179	2 375		603					2 886	15 968	7 186	47	40	57	36	30	7
lordan	5 729	381	359	9	104	2	70	181		4	5	0		17	113	306	138	116	76	60	29	50	2
Suwait	2 779	644	644	23	284	10	76	284	0	0	0	0	0	0	323	667	300	97	95	79	44	44	
-ebanon	4 055	375	375	6	112	ę	06	165	0	80	0	0	0	0	112	452	203	81	55	55	30	44	2
-ibyan Arab Jamahiriya	6 0 3 9	2 274	2 022	33	745	12	473	804			0	252			745	1 059	477	191	156	61	37	40	11
Morocco	30 853	26 099	26 099	85	12 280	40	2 055	11 764							12 453	28 776	12 937	91	95	86	47	45	
Oman	2 546	339	339	13	184	7	42	108		5	0	0			184	336	151	66	122	81	54	32	-
akistan	160 943	179 067	176 678	110	65 2 5 3	41	82 519	25 745	0	3 161	908	1 481			65 253	291 743	131 192	59	50	44	37	15	ę
Jatar	821	339	339	41	115	4	76	148							115	491	221	69	52	09	34	44	
Saudi Arabia	24 175	3 774	3 774	16	1914	æ	663	1 096	0	101					1 914	10 631	4 784	35	40	74	51	29	ę
Somalia	8 445	11 904	11 864	140	6861	81	2 479	2 034	0	490	15	25	0	0	6 861	18 444	8 270	62	83	73	58	17	4
Sudan	37 707	29 019	28 937	17	12 194	32	9 801	4 966	0	1 976	35	47	0	0	12 194	91 331	40 683	30	30	55	42	17	7
Syrian Arab Republic	19 408	4 025	3 931	20	1 352	7	563	1 950	0	66	36	21	37	0	1 352	6 251	2 813	62	48	71	34	50	4
Tunisia	10 215	2 131	2 131	21	922	6	261	912		36					922	2 520	1 133	83	81	78	43	43	2
Jnited Arab Emirates	4 248	06	06	0	52	-	18	16	0	4	0	0	0	0	54	681	306	13	17	74	58	18	4
West Bank and Gaza Strip	3 889	42	42	-	16	0	7	19	0	0	0	0	0	0	16	788	355	5	2	20	38	45	
Yemen	21 732	8 468	8 468	39	3 342	15	2 386	2 429	0	311					3 342	16 944	7 625	48	44	58	39	29	4
EMR	544 173	325797	322 306	59	131 882	24	115 040	66543	0	8 841	1352	2 085	37	17	132 113	569 708	255 715	55	52	53	41	21	4

Table A3.2 Case notifications and case detection rates, DOTS and non-DOTS combined, Eastern Mediterranean, 2006

- set incloses sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treatment; pulm.lab. confirmed; pulmorary case confirmed by positive smear or culture. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who.infb

Table A3.3 DOTS co	overage	, case n	otific	ations	and c	ase dete	sction rate	es, Ea:	stern M	lediterrar	1ean, 200	6										
						TB case:	s reported fro	om DOTS	services						Estimate	d incidenc	e and cas	e detection rate		Pr	oportions	
	DOTS			Nev	v pulma	nary	New extra-	Other		Re-treatr	nent cases			New pulm.	Estimated	incidence	Case	detection rate	+SS+	+SS+	Extrapulm.	Re-treat.
	coverage	New and re	slapse	+SS+		ss- / unk.	pulmonary	new	Relapse	After failure	After default C	other re-treat.	Other	lab. confirm.	all forms	+SS+	allnew	new ss+	(% of	(% of	(% of	(% of
	%	number	rate	number	rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.) r	new+relapse)	new+relapse)	new+re-treat.)
Afghanistan	67	25475	86	12 468	48	6809	5 066		1 132					12 468	42 074	18 932	58	99	65	49	20	4
Bahrain	100	278	38	98	13	77	103	0	0	0	0	0	0	98	304	137	92	72	56	35	37	
Djibouti	100	3 011	368	1 153	141	400	1 266	0	192	62	22	0	0	1 153	6 622	2913	43	40	74	38	42	6
Egypt	100	10 046	14	4 745	9	2 1 3 0	2 726	0	445	160	194			4 745	17 778	2 999	54	59	69	47	27	80
Iran (Islamic Republic of)	100	9 361	13	4 802	7	1 866	2 386	0	307	131	43	0	0	4 810	15 545	6 96 1	58	69	72	51	25	5
Iraq	87	8 043	28	2 886	10	2 179	2 375		603					2 886	15 968	7 186	47	40	57	36	30	7
Jordan	100	359	9	104	2	20	181		4	5	0		17	113	306	138	116	76	60	29	50	2
Kuwait	100	644	23	284	10	76	284	0	0	0	0	0	0	323	667	300	97	95	79	44	44	
Lebanon	100	375	6	112	ę	06	165	0	80	0	0	0	0	112	452	203	81	55	55	30	44	2
Libyan Arab Jamahiriya	100	2 022	33	745	12	473	804			0	252			745	1 059	477	191	156	61	37	40	11
Morocco	100	26 099	85	12 280	40	2 055	11 764							12 453	28 776	12 937	91	95	86	47	45	
Oman	100	339	13	184	7	42	108		2	0	0			184	336	151	66	122	81	54	32	-
Pakistan	100	176678	110	65 253	41	82 5 1 9	25 745	0	3 161	908	1481			65 253	291 743	131 192	59	50	44	37	15	ę
Qatar	100	339	4	115	4	76	148							115	491	221	69	52	09	34	44	
Saudi Arabia	100	3 774	16	1 914	80	663	1 096	0	101					1 914	10 631	4 784	35	40	74	51	29	ę
Somalia	80	11 864	140	6 861	81	2479	2 034	0	490	15	25	0	0	6 861	18 444	8 270	62	83	73	58	17	4
Sudan	91	28 937	22	12 194	32	9801	4 966	0	1 976	35	47	0	0	12 194	91 331	40 683	30	30	55	42	17	7
Syrian Arab Republic	100	3 931	20	1 352	7	563	1 950	0	99	36	21	37	0	1 352	6 251	2813	62	48	71	34	50	4
Tunisia	100	2 131	21	922	6	261	912		36					922	2 520	1133	83	81	78	43	43	2
United Arab Emirates	20	06	2	52	-	18	16	0	4	0	0	0	0	54	681	306	13	17	74	58	18	4
West Bank and Gaza Strip	100	42	-	16	0	7	19	0	0	0	0	0	0	16	788	355	2	5	70	38	45	
Yemen	98	5 135	24	3 280	15	747	807	0	301					3 280	16 944	7 625	29	43	81	64	16	6
EMR	98	318973	59	131 820	24	113 401	64 921	0	8 831	1 352	2 085	37	17	132 051	569 708	255715	54	52	54	41	20	4

ss+ indicates sputum smear-positive; ss-, sputum smear-negative; unk., sputum smear result unknown; re-treatment; pulm.lab. confirmed; pulmonary case confirmed by positive smear or culture. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who.in/tib

						,	Ċ	11-h									
_							č	DI ADOFATIVE I E	WIN ACTIVITIES								
_		Laboratory sei	vices, 2006			200	95			200	90			Manageme	int of MDR-TE	3, 2006	
				smear labs	TB pts		+NH	+VIH	TB pts		+VIH	+NH					
	number o	f labs working w	/ith NTP	included	tested for	TB pts	TB pts	TB pts	tested for	TB pts	TB pts	TB pts	Lab-confirmed	DST	MDR	Re-treatment Re	e-treatmen
	smear	culture	DST	in EQA	ΝN	HIV-positive	CPT	ART	ΗIV	HIV-positive	CPT	ART	MDR	in new cases ir	n new cases	DST	MDR
vfghanistan	500	1	1														
lahrain	6	2	-	6	128	9	0	0	167	7	0	0	2	2	2	0	
Jjibouti	6	0	0	0	224	135	20	20				95					
gypt	157	18	+	157									119	44	7	168	112
an (Islamic Republic of)	313	30	-	313					1 002	206	6	22	28	432	4	06	24
aq	101	e	-	100									20				
ordan	150	50	+	11	86	0	0	0	104	0	0	0	14	72	ę	16	11
Cuwait	12	-	-	12	517	ę	ę	ę	644	2	2	2	10	644	10	0	0
ebanon	68	4	-	9	e	ę	0		£	5	0		ę	9	-	19	ę
ibyan Arab Jamahiriya	27	3	с	0													
Aorocco	167	12	2	167													
Dman	203	10	-	203	257	10	10	10	334	10	10	10	2	2	2	0	0
akistan	982	3	+	318	0	0	0	0									
Zatar					325	0	0	0	339	0	0	0	-	193	-	0	0
audi Arabia	06	10	10	8													
Somalia	47	0	0	0	375	21	8	0	0								
Sudan	285	-	-	117	180	150	15	15	103	20	20	0					
syrian Arab Republic	68	1	1	68	345	0	0	0	14	0	0	0	14	0	0	20	8
unisia	99	7	5	66	129	2	2	2	1 066	3	5	5	10		8		
Inited Arab Emirates													0				
Vest Bank and Gaza Strip	7	-	0	0	13	0	0	0	0	0	0	0	0	0	0	0	0
'emen	231	2	-	180	0	0	0	0	006	9			21	510	15	53	9
MR	3 492	159	33	1 7 35	2 582	330	58	50	4 678	259	46	134	244	1 905	53	366	164

Table A3.4 Laboratory services, collaborative TB/HIV activities and management of MDR-TB, Eastern Mediterranean, 2005–2006

ART indicates antiretrovical therapy, CPT, co-trinoxazole preventive therapy, DST, drug susceptibility testing; EOA, external quality assurance; HIV+, HIV-positive; pls, patients. See Explanatory notes on pages 187 for further details. Some countries provided the number of TB patients to the HIV-positive; pls, patients. See Explanatory notes on pages 187 for further details. Some countries provided the number of TB patients to the HIV-positive; pls, patients and to be HIV-positive; pls, patients of the therapy. CPT, co-timoxazole preventive therapy, Details and the therapy of the HIV-positive; pls, patients of the therapy. The regional total of TB patients tested is therefore lower than the number of patients addrally tested, and cannot be used to calculated a regional estimate of HIV prevalence in TB patients. Data can be downloaded from www.ho.in.th

				New sm	near-pos	itive cas	ses, DOT	S		1	ſ			New	smear-po	ositive ca	ases, non	1-DOTS			╞		Sme	ear-posit	ive re-tre	eatment	cases, D	OTS		Γ
			%			0	% of coho	ort			%		0	%			% of coh	ort			%				% of	f cohort			%	
	Number c	of cases	of not	ļ,	Compl				Trans-	Not		Number of case	es of i	notif	Com	-ldt			Trans-	Not		Number		Compl-			Tra	ns- No	Ħ	
	Notified	Regist'd	regist	'd Cured	eted	Died	Failed	Default	ferred	eval.	Success	Notified Regi.	st'd reg	iist'd Cui	red ete	d Died	H Failed	Default	ferred	eval. Si	nccess	Regist'd	Cured	eted L	Died Fi	ailed De	fault fen	red eva	al. Succ	ess
Afghanistan	9 949	10 0 13	101	83	7	2	-	2	5	0	06											856	87	2	с	1	2	5	0	89
Bahrain	101	15	15	93	0	7	0	0	0	0	93																			
Djibouti	1 120	1 120	100	71	6	-	-	16	2	0	80											253	58	10	e	2	24	2	0	69
Egypt	5 217	5 154	66	99	13	с	2	ę	2	11	5											738	41	17	10	12	8	œ	с.	59
Iran (Islamic Republic of)	4 581	4 58 1	100	78	5	7	ę	ę	4	-	83											448	68	æ	6	e	4	5	с С	76
Iraq	3 096	3 096	100	76	10	e	2	7	ę	0	86											953	60	12	4	80	12	4	0	72
Jordan	86	86	100	71	12	5	7	9	0	0	83																			
Kuwait	187	187	100	53	10	-	0	7	29	0	63											-	0	100	0	0	0	0	0	8
Lebanon	131	131	100	81	1	2	-	9	0	0	92											4	75	25	0	0	0	0	0	8
Libyan Arab Jamahiriya	860	860	100	40	29	2	0	27	2	0	69																			
Morocco	12 757	12 683	66	76	5	2	-	6	7	0	81											1 650	55	17	4	2	14	5	0	72
Oman	131	104	79	6		10				0	06	0	35						100	0										
Pakistan	48 319	48 205	100	71	13	с	-	6	4	0	83											5 009	61	15	5	ę	11	e	2	76
Qatar	96	96	100	74	6	-	0	0	15	-	83																			
Saudi Arabia	1 722	1722	100	09	5	7	-	10	-	16	65											96	40	6	6	2	18	33	9	49
Somalia	7 068	7 059	100	85	4	4	-	4	2	0	89											524	76	5	9	2	5	e	 	80
Sudan	12 730	12 7 30	100	64	18	e	-	6	2	2	82											1 828	53	29	e	-	6	2	4	81
Syrian Arab Republic	1 350	1 350	100	76	13	e	2	9	-	0	89											144	53	14	2	6	19	0	0	67
Tunisia	915	910	66	83	7	2	-	2	4	0	06																			
United Arab Emirates	62	62	100	42	31	9	0	15	9	0	73											5	80	0	0	0	20	0	0	8
West Bank and Gaza Strip	7	12	171	58	42	0	0	0	0	0	100											0							0	
Yemen	3 192	3 379	106	20	10	3	1	9	4	9	80	187 1.	87 1.	00 4	19 2.	8 4	2	12	4	0	77	351	48	6	2	3	7	1 3	0	58
EMP	113 677	113 555	100	72	+		÷	~	Ψ	÷	83	187 2.	22 1	19 4	14 25	3 4	6	10	49	•	65	12 860	60	15	Ľ	v	10	4		75

Table A3.5 Treatment outcomes, Eastern Mediterranean, 2005 cohort

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 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered is not reported, then the number of cases registered is not reported, then the number of cases registered in 2005 is used, or 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 rottled in 2005 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.in/th

				Relap	se, DOT	s			ľ				After fail	lure, DO'	LS			_			Aft	er defau	It, DOTS				
				%	of cohor.	+			%				%	of cohort			6					% of c	sohort			%	, o
	Number		Compl-				Trans-	Not		Number		Compl-			T	ans- N	ot	ź	mber	õ	-Idmo			Trar	-sr	<b> </b> ₊	
	regist'd	Cured	eted	Died	Failed	Default	ferred 1	eval. S	Success	regist'd	Cured	eted	Died F	ailed D	efault fe	red ev	al. Suco	sess re	gist'd C	ured (	ted Di	ed Fai	led Defa	ault ferr	ed eva	I. Succ	cess
Afghanistan	856	87	2	ю	-	2	5	0	89																		
Bahrain																											
Djibouti	192	63	80	-	-	25	ю	0	71	42	50	12	12	5	19	2	0	62	19	37	26	5	1	-	0	- -	63
Egypt	449	48	12	7	10	6	11	4	59	198	25	31	17	16	7	4	-	56	91	43	16	2	3	7	5	~	59
Iran (Islamic Republic of)	274	73	9	10	-	e	5	-	79	131	69	5	7	5	8	з	4	74	43	35	30	7	2	7	5	- -	65
Iraq	768	99	6	4	5	12	4	0	75	81	47	20	7	16	5	5	0	67	104	31	24	5	1	4	4	~	55
Jordan																											
Kuwait	-	0	100	0	0	0	0	0	100	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Lebanon	4	75	25	0	0	0	0	0	100																		
Libyan Arab Jamahiriya																											
Morocco	1282	71	9	4	4	12	4	0	76	11		48	80	16	17	12	0	48	226		53	4	5	-	9	~	53
Oman																											
Pakistan	2638	68	12	4	2	80	с	ę	80	578	50	18	5	e	16	9	0	69	1793	55	18	5	3 1	5	3		74
Qatar																											
Saudi Arabia	96	40	6	6	5	18	3	16	49																		
Somalia	360	78	4	9	2	4	2	5	82	66	69	9	8	5	8	4	0	75	65	75	з	8	2	8	5		78
Sudan	1737	51	30	e	-	6	7	4	81	42	83	7	5	2	2	0	0	06	49	84	2	0	0		0		86
Syrian Arab Republic	61	99	15	5	5	10	0	0	80	28	61	0	0		21	0	18	61	21	29	24	4	0		0 3	8	52
Tunisia																											
United Arab Emirates	5	80	0	0	0	20	0	0	80	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
West Bank and Gaza Strip	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Yemen	351	48	6	2	e	7	-	30	58																		
EMR	9 074	65	13	4	e	6	ę	e	78	1 276	48	19	8	80	12	2	÷	67	2411	49	21	9	4	9	4		70

Table A3.6 Re-treatment outcomes, Eastern Mediterranean, 2005 cohort

Not eval: indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of cured and completed; cases registd, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes unless it is missing or is less than the sum of outcomes in which case the sum of outcomes is used. Data can be downloaded from www.hoi.in/tb

			DOTS	new sm	ear-pos	itive tre	atment :	success	(%)			-		ŏ	<b>JTS nev</b>	v smear	-positiv	e case c	detectio	n rate (%	(		
	1994	1995	1996	1997	1998	1999	2000	2001	2002 20	203 2h	004 2(	J05 15	95 16	96 15	97 16	98 19	99 20 <sup>i</sup>	00 20(	01 200	12 2003	2007	2005	2006
Afghanistan				45	33	87	86	84	87	86	89	06			3	6	6	15 2	24 3	13 34	4	1 52	99
Bahrain					13	95	73	87	88	97	82	93					15	17 1	17 1	2 12	5	74	72
Djibouti		75	77	76	79	72	62	78	82	73	80	80		93	97	82	72	61 £	55 5	0 46	40	40	40
Egypt	52		81	82	87	87	87	82	88	80	70	79	43	-	11	17	32 .	45 4	16 1	58	9	64	59
Iran (Islamic Republic of)			87	84	83	82	85	85	85	84	84	83	42		12	35	54	58 (	31	11 62		62	69
Iraq					83	85	92	89	91	85	85	86				5	13	51 5	55 5	19 10 10 10 10 10 10 10 10 10 10 10 10 10	4	4	40
Jordan	6				92	88	06	86	89	87	85	83	90,			76	11	20	78 7	5 91	22	99	9/
Kuwait						99	69	73	55	62	63	63					62	65 (	32 7	1 70	8	63	96
Lebanon	89				73	96	92	91	91	92	06	92	40				75	65 (	34 6	13 63	7	64	55
Libyan Arab Jamahiriya					68	67			61	62	64	69					47 1	11	10	147	175	176	156
Morocco	86	06	88	89	88	88	89	87	89	86	87	81	92	93	93	06	92	3 68	38	11 93	6	36	96
Oman		84	87	91	86	95	93	06	92	06	06	90	,	21 1	21 1	21	91 1.	23 1	12 11	7 85	128	96	122
Pakistan	74	70		67	99	70	74	17	78	79	82	83	-	2		4	2	e	5	3 17	26	37	20
Qatar	83	81	72	79	8	74	99	60	75	73	78	83	33	27	24	43	33	29 4	#	4	ŝ	46	52
Saudi Arabia					57	99	73	11	76	79	82	65					21	36	88	19 19 19 19 19 19 19 19 19 19 19 19 19	33	38	40
Somalia		86	84	06	88	88	83	86	89	06	91	89		29	39	39	43	47 5	57 5	63 63	52	86	83
Sudan				20	65	81	79	80	78	82	77	82		2	-	27	27	31	59	0 31	32	33	30
Syrian Arab Republic			92	88	88	84	79	81	87	88	86	89			8	20	27 .	40 4	13	2 46	4	4	48
Tunisia					91	91	91	06	92	91	06	90					93 14	01 1(	33 6	0 84		83	81
United Arab Emirates							74	62	79	64	20	73						27 2	25	0 27	10	21	17
West Bank and Gaza Strip									100	80	20	100						10	8	4	-		2
Yemen		99	78	81	80	79	75	80	80	82	82	80	+	8	29	37	50	54	51 2	17 45	41	41	43
EMR	82	87	86	79	77	83	83	83	84	83	83	83	1	10	1	18	20	24 2	26	1 33	3	45	52

Table A3.7 DOTS treatment success and case detection rates, Eastern Mediterranean, 1994–2006

Treatment success, sum of cured and completed: DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.in/tib

					-			•														
				Male						Ĕ	emale						-				Σ	ale/female
	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34	35-44	15-54 E	55-64	65+	0-14 1	5-24 2	5-34 3	35-44 4	15-54 {	55-64	65+	ratio
Afghanistan	193	837	791	574	572	572	410	442	2 139	2 340	1 654	1 0 0 6	630	309	635	2 976	3 13 1	2 228	1 578	1 2 0 2	719	0.5
Bahrain	0	10	25	11	18	-	-	0	7	14	4	2	7	0	0	17	39	15	23	б	-	2.1
Djibouti	41	225	246	165	63	33	20	24	117	129	59	35	18	5	38	342	375	224	98	51	25	2.0
Egypt	54	542	728	563	587	340	135	64	470	367	338	279	155	87 117	.1884 101	1.329 109	5.372 901	.1138 865	6116 494	.8911 222.	1945	1.7
Iran (Islamic Republic of)	12	357	495	365	318	249	686	48	430	236	185	292	336	793	60	787	731	550	610	585	1479	1.1
Iraq	14	409	593	278	230	147	107	38	338	264	133	154	111	70	52	747	857	411	384	258	177	1.6
Jordan	0	6	23	16	7	4	10	0	8	11	ę	5	2	9	0	17	34	19	12	9	16	2.0
Kuwait	-	19	72	40	37	14	e	0	17	41	23	5	9	9	-	36	113	63	42	20	6	1.9
Lebanon	0	11	12	18	14	10	ø	-	16	12	2	2	2	-	-	27	24	23	16	12	6	1.9
Libyan Arab Jamahiriya	+	98	247	150	49	23	23	8	55	34	24	10	12	11	6	153	281	174	59	35	34	3.8
Morocco	73	2 104	2 373	1 498	1 036	527	551	155	1273	1 025	597	426	335	307	228	3377	3398	2095	1462	862	858	2.0
Oman	9	18	19	18	18	12	2	2	21	22	7	13	12	14	8	39	41	25	31	24	16	1.0
Pakistan	820	7 290	6 896	5 594	5 427	4 392	3 439	1 941	8410	7 030	5 404	3 913	2 802 1	950	2761 1	5700 1	3926	10998	9340	7194	5389	1.1
Qatar	0	22	21	17	22	9	-	0	9	11	7	-	0	-	0	28	32	24	23	9	2	3.4
Saudi Arabia	10	256	323	229	169	94	101	39	226	211	107	56	37	56	49	482	534	336	225	131	157	1.6
Somalia	166	1 377	1 121	647	436	309	336	170	668	628	432	269	171	131	336	2045	1749	1079	705	480	467	1.8
Sudan	297	1 351	1 890	1 504	1 102	710	532	312	965	1 108	948	763	442	270	609	2316	2998	2452	1865	1152	802	1.5
Syrian Arab Republic	8	225	267	137	110	71	44	18	195	109	42	53	39	34	26	420	376	179	163	110	78	1.8
Tunisia	5	125	174	119	111	58	85	3	53	52	33	33	33	38	8	178	226	152	144	91	123	2.8
United Arab Emirates	0	5	ю	7	ო	-	4	2	9	4	5	ę	4	5	2	11	7	12	9	5	6	0.8
West Bank and Gaza Strip	0	-	ю	4	-	-	2	0	0	0	-	-	+	-	0	-	e	2	2	2	e	3.0
Yemen	29	535	555	358	246	143	103	55	435	358	244	166	73	42	84	970	913	602	412	216	145	1.4
EMR	1 7 0 3	15 826	16877	12 312	10 576	7117	6 603	3 322	15855	14 006	10 255	7 490	5 223 4	137	5 024 3	1 680 3	0883 2	2 567 1	8 066 1	2 9 4 0 1 0	740	1.2

Table A3.8 New smear-positive case notification by age and sex, absolute numbers, DOTS and non-DOTS, Eastern Mediterranean, 2006

For some countries, breakdown of notifield cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes on page 187 for further details. Data can be downloaded from www.mo.in/tb

	200			,		5	300								_						
			~	AALE							EMALE							ALL			
	0-14	15-24	25-34	35-44	4554	55-64	65+	014	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+
Afghanistan	3	31	44	48	74	120	146	7	87	143	151	142	138	105	5	58	91	67	107	129	125
Bahrain	0	16	27	14	31	2	6	0	13	24	8	15	16	0	0	14	26	1	25	6	4
Djibouti	6	256	389	371	224	185	181	16	135	208	133	119	92	36	12	196	299	252	171	136	101
Egypt	0	7	13	14	17	16	80	-	9	9	80	80	7	4	0	7	10	11	12	12	9
Iran (Islamic Republic of)	0	4	80	6	10	16	4	-	2 2	4	5	10	18	50	0	4	9	7	10	17	47
Iraq	0	14	28	18	24	28	29	1	12	13	6	17	20	16	0	13	20	14	21	24	22
Jordan	0	2	5	4	4	4	11	0	-	2	-	ę	2	9	0	-	З	с	e	e	<b>б</b>
Kuwait	0	80	16	11	21	22	10	0	6	16	13	Ω	16	27	0	80	16	1	16	20	17
Lebanon	0	3	4	7	7	8	9	0	4	4	2	1	-	-	0	4	4	4	4	4	3
Libyan Arab Jamahiriya	0	15	42	38	17	14	20	-	6	9	7	Ω	6	6	0	12	24	23	12	12	14
Morocco	2	99	100	82	67	64	74	e	39	39	30	28	39	35	2	52	68	55	48	51	53
Oman	-	9	7	6	14	23	9	0	80	1	9	18	30	41	-	7	6	80	16	26	23
Pakistan	e	39	58	64	83	116	111	2	48	63	99	65	76	60	5	44	60	65	74	67	85
Qatar	0	32	15	13	25	22	14	0	13	19	15	4	0	26	0	25	16	14	20	17	18
Saudi Arabia	0	11	12	10	14	21	29	1	10	11	8	6	10	17	1	11	12	6	12	16	23
Somalia	6	174	182	162	167	211	335	6	84	100	105	96	106	108	6	129	140	133	130	156	211
Sudan	4	35	67	80	88	85	86	4	26	40	51	59	20	37	4	31	54	65	73	67	60
Syrian Arab Republic	0	10	16	13	17	20	16	1	6	7	4	8	11	10	0	6	11	6	13	15	13
Tunisia	0	12	19	17	21	21	29	0	5	9	5	9	11	11	0	80	13	11	14	16	19
United Arab Emirates	0	-	0	-	-	-	14	0	7	-	2	e	15	25	0	2	-	-	7	2	19
West Bank and Gaza Strip	0	0	-	2	-	2	4	0	0	0	-	-	2	-	0	0	-	-	-	2	ო
Yemen	-	22	38	40	40	42	4	-	19	25	27	26	20	15	-	21	32	33	33	30	29
EMR	2	26	38	39	47	62	99	4	28	34	35	36	41	37	e	27	36	37	42	52	51

Table A3.9 New smear-positive case notification rates by age and sex. DOTS and non-DOTS. Eastern Mediterranean. 2006

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 A3.10 Numbe	· of TB cas	ses not	tified, E	astern	Medite	rranean,	1980–2	2006																		
	1980 15	981 1	1982	1983	1984	1985 15	386 15	387 15	388 15	15 15	190 19	91 195	32 1995	3 1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Afghanistan	71 685 71 5	554 41	752 52	502 16	3 784 1C	742 14 3	351 18 0	)91 16 (	)51 14 S	186 4.5	32 23 00	37					1 290	3 084	3 314	7 107	10 139	13 794	13 808	18 404	1844	25475
Bahrain	219	262	156	232	208	194 1	156 1	120 1	142 1	22	17 14	42 14	11-	4	43	49	45	83	145	207	188	191	261	244	280	278
Djibouti	2 2	265	671		1 489 2	262 1 5	364 15	378 2 (	330 2 L	140 2 1	100 2 90	J0 2 86	34 3 485	9 3311		3 332	3 830	3 785	4 133	3 971	4 198	3 191	3 231	2 940	3 109	3 011
Egypt	1 637 1	306 1	805 1	932 1	1 572 1	308 12	209 22 (	J63 1 (	378 1 4	92 2	142 3.6.	34 8.87	76 3 426	5 3 911	11 145	: 12 338	13 971	12 662	11 763	10 762	10 549	11 177	11 490	11 620	1 446 1	0 046
Iran (Islamic Republic of)	42 717 11 ;	728 9	509 8	589 10	3 493 8	1728 8 (	J32 10 (	34 9 5	367 12 (	105 9.2	255 14.24	46 14 12	21 20 565	9 13 021	15 936	: 14189	12 659	11 794	12 062	11 850	11 783	11 464	10 900	10 171	9 192	9 361
Iraq	11 809 10 6	314 7	741 6	9 026	3 807 6	1485 6 5	346 6 5	517 11 5	384 14 3	312 14 ;	735 13.52	27 14 9(	J5 18 550	3 19 733	9 697	29 196	26 607	29 410	29 897	9697	10 478	11 898	11 656	10 498	9 454	8 043
Jordan	298 t	346	860	856	672	769 5	592 £	537 5	553 4	84 4	139 31	30 5(	14 42	7 443	496	468	397	380	373	306	342	312	310	324	367	359
Kuwait	847 8	319	880	855	812	717 6	311 £	540 4	180 4	168	277 3.	30 28	32 217	7 237	336	400	528	564	515	513	496	585	566	557	517	644
Lebanon		67	75	284	410 1	943 21	257 24	178			ŏ	34 86	7	940	983	836	701	640	679	571	516	437	380	393	391	375
Libyan Arab Jamahiriya	718 4	481	512	610	357	325 2	: 16	331 4	116 2	9 29	142 2;	39 116	7		1 440	1 282		1 575	1 615	1 341		1 824	1 917	1 653	2 098	2 022
Morocco	24 878 28 t	337 28	095 26	944 22	2 279 26	1790 27 5	553 27 1	159 25 7	717 267	756 27 t	358 27 6.	38 25 4(	33 27 62(	5 30316	29 829	31771	30 227	29 0 87	29 854	28 852	28285	29 804	26 789	25 909	6 269 2	660 93
Oman	1872 \$	928	897	802	843	861 12	265 £	316 4	177 4	178 4	182 44	42 3(	37 28	1 304	276	300	298	287	249	321	292	290	255	292	261	339
Pakistan	316 340 324 5	576 326	492 117	739 91	1 572 11	1419 149 (	704 179 4	194 3	323 170 5	62 156	759 194 3;	23	73 175	5	13 142	4 307		89 599	20 936	11 050	34 066	52 762	70 485	94 327 1	12 2 11 17	6 678
Qatar	257	213	172	206	203	250 2	20 2	248 2	23	101	184 1	95	20(	c	304	257	212	253	259	279	284	278	276	272	325	339
Saudi Arabia	10 956 8 2	263 8	529 7	551 7	7 163 3	1966 36	396 3.0	729 24	133 2 5	83 24	115 2.2	21 2 01	16 2 386	5 2518			3 138	3 235	3 507	3 452	3 327	3 374	3 317	3 312	3 539	3774
Somalia			2	838 2	2 719 2	2722 3 L	3.7 970	322 2.7	728 13	123				2 023	2 504	3 920	4 450	4 320	4 802	5 686	6 852	7 391	9 278	11 747	2 904 1	1 864
Sudan	32 971 47 4	431				1509 24	3 091	300 6	393 7	701	212 164	23 19 50	33 37 516	5 23 178	14 320	20 230	20 894	22 318	26 875	24 807	23 997	24 554	25 105	26 567	7 562	28 937
Syrian Arab Republic	1 689 1 5	308 1	838 1	867 2	2 111 2	163 35	342 4 2	290 4 5	352 5 £	504 61	J18 5.6t	51 545	37	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 93 1
Tunisia	2 504 2	316 2	554 3	062 2	2 501 2	510 24	187 2.2	272 23	309 2 4	103 2 (	754 2 Ot	34 216	34 2 565	5 2 376	2 383	2 387		2 211	2 158	2 038	1 945	1 885	1 965	1 994	2 079	2 131
United Arab Emirates	522 t	538	597	507	534	568 4	164 8	318 3	339 3	308 2	2.85 2.	34 22	72	426		507		773	99	115	74	06	117	92	103	6
West Bank and Gaza Strip	191	139	136	136	123	113	63	82	85	45	64	30 66	76		17	40		18		82	67		36	23	28	42
Yemen								34	146 45	313 4 6	350 6.8-	44 10 1	13 11 07(	6 11 510	14 426	14 364	12 013	12 383	13 085	13 651	13 029	11 677	10 413	10 016	9 063	8 468
EMR	22 110 514	791 433	271 234	482 171	1 652 186	344 230 4	127 288 5	305 280 1	126 261 4	141 234 6	320 315 4	33 109 08	37 201 620	0 119 374	121 745	145 373	136 232	233 878	171734 1	141 748	165 904	191 744 2	07375 2	35 943 2	1 352 32	2 306
Number reporting	18	20	19	19	20	21	21	21	21	21	20	21	18 15	5 16	16	20	17	22	21	22	21	21	22	22	22	22
% reporting	82	91	86	86	91	95	95	95	95	95	91	95 8	32 68	9 73	82	91	11	100	95	100	95	95	100	100	100	100

From 1995 on, number shown is all notified new and relapse cases (DOTS and non-DOTS). The table includes updated information; data shown here may differ from those published in previous reports. Data can be downbaded from www.who.inttb

Table A3.11 Case n	otificat	ion rat	tes, Ea:	stern I	Medite	errane	an, 198	0-2006	~																	
	1980	1981	1982	1983	1984	1985	1986	1987 1:	988 1	989 15	90 19	91 19	92 195	33 199	4 1995	1996	1997	1998	1999	2000	2001	2002	2003 2	004 20	05 2	900
Afghanistan	514	521	312	403	149	87	119	152	135	119	34 1	71					7	16	16	34	47	62	60	76	87	98
Bahrain	63	73	42	60	52	47	36	27	31	26	24	28	27 2	5	2	80	7	13	23	32	28	28	38	34	39	æ
Djibouti		640	184		388	562	434	427	406	382 3	375 5	500 4	87 56	30 54	2	519	577	551	583	544	562	418	416	372 3	387	368
Egypt	4	ę	4	4	с	ę	2	43	ę	с	4	9	15	9	7 18	20	22	20	18	16	16	16	16	16	16	44
Iran (Islamic Republic of)	109	29	22	19	23	18	16	19	19	22	16	25	24	34	1 26	22	20	18	18	18	18	17	16	15	13	13
Iraq	84	73	52	45	43	40	41	38	65	79	80	71	76 §	91 9	45	131	116	124	123	39	41	45	43	38	34	28
Jordan	13	28	36	34	26	28	21	19	19	16	13	11	14	1	1 12	11	6	8	∞	9	7	9	9	9	7	9
Kuwait	62	57	58	55	50	42	34	28	23	22	13	16	14	1	3 19	23	29	29	24	23	21	24	22	21	19	23
Lebanon		2	ę	10	14	67	78	85				29	28	2	8 28	23	19	17	18	15	4	11	10	10	10	6
Libyan Arab Jamahiriya	23	15	15	17	10	∞	7	8	10	9	10	2	26		30	26		31	31	25		33	34	29	35	33
Morocco	127	143	136	127	102	120	121	116	108	110 1	111 1	60	99 1(	11 11	4 111	116	109	103	105	100	97	101	06	86	86	85
Oman	158	74	68	58	58	56	79	37	28	27	26	23	19	1	4 13	13	13	12	1	13	12	12	10	12	10	13
Pakistan	399	396	384	133	100	117	151	175	183	156 1	139 1	67		00	10	ę		65	15	8	23	35	46	61	06	110
Qatar	112	85	62	68	61	69	57	61	52	42	39	40	4	9	58	48	38	4	4	45	4	40	38	36	41	4
Saudi Arabia	114	81	79	99	59	31	27	21	16	16	15	13	12	4 1	4		16	16	17	17	16	15	15	14	15	16
Somalia				43	42	42	47	111	41	20				3	2 40	62	69	65	20	81	94	66	120	148 .	157	140
Sudan	168	234				7	10	e	e	з	-	62	72 1(	34 8	1 49	67	67	70	82	74	20	71	71	74	75	12
Syrian Arab Republic	19	20	19	19	20	20	35	37	41	45	47	43	40	3	6 30	35	32	34	34	31	29	27	27	25	23	20
Tunisia	39	35	38	44	35	34	33	30	29	30	25	25	25	30 2	7 27	26		24	23	21	20	19	20	20	21	21
United Arab Emirates	51	58	51	40	40	40	31	52	20	17	15	12	11	-	6	20		27	2	4	2	2	e	2	e	2
West Bank and Gaza Strip	13	6	6	œ	7	9	e	4	4	7	e	4	4		e	-		-		ო	2		-	-	-	~
Yemen									30	42	38	53	75 7	78 7	7 93	89	72	72	74	75	70	61	52	49	43	39
EMR	184	176	144	75	53	56	67	82	77	20	61	80	27 4	19 2	8 28	33	30	50	36	29	34	38	40	45	54	59

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and releape cases. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.ho.hufub

Table A3.12 New sm	ear-posit	ive cas	es notif	fied, nu	mbers	and rate	es, East	ern Med	iterrane	an, 199	3-2006																
							Number c	of cases						-					Rate	a (per 10	dod 000 C	ulation)					
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1993	1994 1	1 995 15	996 19	97 199	8 199	9 2000	2001	2002	2003	2004	2005 2	900
Afghanistan					618	1 833	1 669	2892	4 639	6 509	6 510	8 273	9 949	12 468					3	6	8 14	1 22	29	28	34	40	48
Bahrain	82		17	31	22	25	21	23	23	17	16	69	101	98	15		ę	5	4	4	3	с 1	ę	2	10	14	13
Djibouti	1668	1 743		1 744	1 904	1 690	1 564	1 39 1	1 312	1 253	1 202	1 086	1120	1153	277	285		272 2	91 24	16 22	0 191	176	164	155	137	139	141
Egypt		1811	4 229	5 084	5 469	4 915	5 094	4 606	4 514	4 889	5 118	5 383	5217	4745		ę	7	80	6	80	8	- 7	7	7	œ	7	9
Iran (Islamic Republic of)		4 615	5 347	5 373	5 253	5 105	5 426	5361	5 529	5 366	5 188	4 900	4 581	4 802		80	6	6	8	8	8	8	8	80	7	7	7
Iraq	5240	5 781	3 194	10 320	8 164	8 933	9 908	3 194	3 559	3 895	3 577	3 381	3 0 9 6	2 886	26	28	15	46	35 3	38 4	1 16	3 14	15	13	12	11	10
Jordan	173	161	187	170	136	110	102	68	94	91	108	91	86	104	4	4	4	4	ę	2	2	2	2	2	2	2	2
Kuwait	148	155	175	153	201	185	169	180	174	206	201	247	187	284	80	6	10	6	11	6	8	2 2	8	80	6	7	10
Lebanon		148	197	198	206	224	249	202	171	148	134	146	131	112		4	9	9	9	9	7 5	4	4	ę	4	ę	3
Libyan Arab Jamahiriya				515			803	607		722	764	872	860	745				10			5 11		13	13	15	15	12
Morocco			14 171	14 278	14 134	13 426	13 420	12 872	12 804	12 914	12 842	12 280	12 7 57	12 280			53	52	51 4	18 4	7 45	4	44	43	41	42	40
Oman	123	135	135	164	165	156	120	164	156	151	110	160	131	184	9	9	9	7	7	7	5	. 6	9	4	9	2	7
Pakistan	11 020		2 578	1 849		14 974	6 248	3 2 8 5	10 935	16 380	21 301	31 557	48 319	65 2 5 3	6		2	£		11	4	2	11	14	20	31	41
Qatar			60	46	39	69	58	53	77	6	95	73	96	115			1	6	7 1	12 1	3 0	9 12	6	13	10	12	4
Saudi Arabia	800				1 568	1 644	1 680	1 595	1 686	1 674	1 646	1 683	1 722	1914	2				8	8	8	8	80	7	7	7	8
Somalia		1 168	1572	2 894	3 093	3 121	3 461	3776	4 640	4 818	5 190	6 479	7 068	6861		19	25	46	48 4	17 5	1 54	1 64	64	67	81	86	81
Sudan		3 728	8 761	8 978	10 835	10 820	11 047	12 3 1 1	11 136	10 338	11 003	12 095	12730	12 194		13	30	30	35 3	34 3	4 37	33	30	31	33	34	32
Syrian Arab Republic			1 295	1 523	1 423	1 593	1 577	1584	1 507	1 447	1 545	1 561	1 350	1352			6	10	9	10 1	0 10	6	8	6	80	7	7
Tunisia	1 006	983	1 243	1 005		1 196	1 066	1 099	1 077	927	878	944	915	922	12	11	14	11		13 1	1	11	6	6	6	6	6
United Arab Emirates							31	73	69	57	22	57	62	52							1	2	2	2	-	2	-
West Bank and Gaza Strip			6	24		80		37	31		15	4	7	16			0	-		0	·	-		0	0	0	0
Yemen	0	0	3 68 1	4 371	4 717	4 896	5 427	5 565	4 968	4 259	3 793	3 434	3 379	3 342	0	0	24	27	28 2	29 3	1 31	27	22	19	17	16	15
EMR	20 260	20 428	46 851	58 720	57 947	74 923	69 140	60 9 59	69 101	76125	81 313	94 775	113 864 1	31 882	5	5	1	13	13 1	6 1	5 13	14	15	16	18	21	24

Rates are per 100 000 population. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/tb

### Notes

#### **Bahrain**

Of the 278 notified TB cases, 202 were in non-nationals; of the 98 new smear-positive cases notified, 84 were in non-nationals.

#### Oman

Of the 334 notified TB cases, 83 were in non-nationals; of the 184 new smear-positive cases notified, 66 were in non-nationals.

#### Sudan

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.

The numbers of laboratories performing culture and DST do not include those in the southern part of the country.

Separate data for patients treated after failure and after default, and data on the number of TB patients tested for HIV, found HIV-positive and started on CPT were provided for the southern part of the country only.

### EUROPE

**SOUTH-EAST ASIA** 

WESTERN PACIFIC
## Europe

NTP MANAGER (OR EQUIVA	LENT); PERSON FILLING OUT DATA COLLECTION FORM (IF DIFFERENT)
Albania	Hasan Hafizi; Donika Bardhi
Andorra	Margarita Coll Armangué; Jennifer Fernandez
Armenia	Vagan Rasailovich Pogosvan: Narine Meilimvan
Austria	Jean-Paul Klein
Azerbaijan	Faig Frudinovich Agavey: Natavan Alikhanova
Relarus	Gennady I vovich Gurevich: Andrei Petrovich Astrovko
Belgium	Marvse Wanlin: Patrick De Smet
Bosnia & Herzegovina	Zehra Dizdarevic: Mladen Duroniic
Bulgaria	Vladimir Milanov
Croatia	Aleksandar Simunovic
Cyprus	Andreas Georophicu: Chrystalla Hadiianastassicu
Czech Republic	liří Wallenfels: Alena Andračková
Donmark	Pater Henrik Andersen: Charlotte Kielsø
Estonia	Kai Kliiman: Vahur Hollo
Einland	Nai Niiiitai, valiul Tiuliu Dotri Duutu
Finianu Franco	Felli nuulu Maria Claira Datu: Dalahina Antoina
Coordia	Marie Glaire Faty, Delphine Antonie Archit Calakaia
Georgia	Alchii Salakala Walter Llage Panite Prodhun
Germany	Waller Haas; Borilla Brourium
Greece	Georgia Spala; Dimitra Panagiotopoulou
Hungary	Janos Strausz and Gador Kovacs
Iceland	I norsteinn Biondai
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	Pierrette Huberty-Krau; Norbert Charlé
Malta	Analita Pace Asciak; Anthony Gatt
Monaco	
Montenegro	Olivera Bojović
Netherlands	Vincent Kuyvenhoven; Connie Erkens
Norway	Brita Askeland Winje
Poland	Kazimierz Roszkowski; Ireneusz Szczuka
Portugal	António Fonseca Antunes
Republic of Moldova	Silviu Sofronie; Dmitrii Sain
Romania	Constantin Marica; Domnica Chiotan
Russian Federation	Ekaterina Petrovna Kakorina; Elena Igorevna Skachkova
San Marino	
Serbia	Gordana Radosavljević-Ašić and Radmila Curčić
Slovakia	Ivan Solovic; Jana Svecova
Slovenia	Damijan Eržen
Spain	Odorina Tello Anchuela: Elena Rodríquez Valín
Sweden	Victoria Romanus
Switzerland	Peter Helbling
Taiikistan	Sadulo Makhmadalievich Saidaliev: Firuza Teshaevna Sharipova
TEYR Macedonia	Stefan Talevski: Maia Zakoska
Turkey	Fevzullah Gümüslü: Ülgen Gullu
Turkmenistan	Babakuli Dzhumaev
Ukraine	Mikhailo Vasilievich Golubchikov: Oksana Rostislavovna Smetanina
United Kingdom	John Watson: Brian Smyth: Jim McMenamin <sup>®</sup> Roland Salmon <sup>®</sup> Michelle Kruiishaar <sup>®</sup> Fisin Shakir
Uzbekistan	Dilrabo Ulmasova: Nilufar Abdieva

This list shows the people named on the data collection form sent to WHO in 2006, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

	-	ncidence	e, 1990	1	Prevaleno	e, 1990	TB mortality, 1	066			Ē	cidence, 2	006.				đ	evalence	, 2006		TB n	nortality, 2006		HIV preva	lence
	All forms	***	Smear-pt	ositive*	All for	ns*	All forms*	╡	All forms		All forms HIV	/+ Sr	near-positive	e* Sm	ear-positive	+NIV+	All forms	*.	All forms HI	+>	All forms*	All fo	rms HIV+	in incid	ent
	number	rate	numbe	r rate	numbei	rate	number	ate	number	rate	number	rate	number	Ite	number	rate	number	rate	number	rate	number	ate nun	nber rat	IB cases	(%) \$
Albania	819	25	36	9 11	1 380	42	141	4	598	19	I	ı	269	8	I	I	831	26	I	I	108	с	I	1	
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Armenia	11/3	55	17.9	12	1 895	22	206	<u>ہ</u>	1112	7.7	07 7	1	116	32	, 1 C	vi V	2 422	80	13		308	10	Ω. 1	1.2	T
Austria	1801	25	800	01 4	1 1095	2 2	180	7 4	1 040 F	2 ₽	4/		400 2 0 1 E	o y	5 5		108	2	7 4		104	- 0	n v	0, H	
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Bosnia & Herzegovina	4 029	94	1810	3 42	6 917	161	651	15	2 005	51	I	I	902	23	I	I	2 243	57	I	I	293	7	I	1	
Bulgaria	2 353	27	1 056	9 12	3 836	44	327	4	3 101	40	I	I	1 396	18	I	I	3 190	41	I	I	386	5	T	1	
Croatia	3 326	74	1 497	7 33	5 700	126	527	12	1 832	40	I	I	824	18	I	I	2 910	64	I	ı	292	9	I	1	
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Hungary	4 254	41	1914	1 18	7 018	68	576	9	1904	19	4	k L	857	6	2	۸ ۲	2 162	21	2	۸ ۲	254	33	5 1 2	0.2	
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srael	641	4	28	9	497	7	64	-	521	ø	13	k L	233	e	2	<u>1</u>	402	9	7	v T	52	<u>۲</u>	۰ ۱۷	2.6	
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Kyrgyzstan	2412	55	1 08	25	3 961	6	365	00	6454	123	28	vi Vi	2 901	55	9	vi	7 189	137	4	vi Vi	943	18	vi S	0.4	
Latvia	916	8	41.	2 15	1 504	56	138	2	1312	57	53	2	585	26	19	vi Vi	1 369	60	27	-	193	00	10 ≤	4.1	
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Netherlands	2115	4	945	7 6	1 637	1	212	~	1249	, œ	41	د ۲	558	i n	4	vi t	961	9	20	۸ ۲	125	- <del>1</del>	4 V	3.3	
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Portugal	9 / 35	19	2.98	30	107.9	52	6/3	- 0	3 382	32	468	4	14/5	14	164		2 202	24	234	. 7	337	С	49 VI V	14	T
Republic of Moldova	17 068	C 0	7.681	62 C	78 14F	121	393 7 383	n (	5 404 27 533	141	98		2 43U 12 381	2 6	33	, v	20.053	4CI 1041	01		3 765	17	υq νιν	4.0	
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San Marino	3	12		1 5		6	s 1	-	2	9	I	ı	×	e	I	ı	2	5	I	ī	× 1	× 1	I	1	
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Switzerland	1 253	18	56(	8 (	970	14	125	2	500	7	33	s 1	222	e	12	× 1	380	2	16	s ۲	50	s 1	v ∾	1 6.6	
Tajikistan	5927	112	2 66	7 50	10 357	195	1 165	22	13 532	204	104	7	6 0 7 9	92	37	v t	19 764	298	52	v t	2 605	39	37 ≤	0.8	
TFYR Macedonia	1 023	54	10 746	24	1 752	92	214 4 886	11	596 24 752	29		1	268	13	1	1	574 23 975		1		103 2 4 4 B	5		1	
runcy Turkmenistan	2 356	64	1 060	52 (	3.870	105	356	° (	3175	52			1 429	2 00	1 1		3 833	78			463	οσ			
Ukraine	21 320	41	9 582	2 19	35 235	68	3 089	6	49 308	106	2 862	9	21 902	47	1 002	2	52 917	114	1431	3	6 762	15	521	1 5.8	
United Kingdom	6722	12	3 0 1 5	3.5	5 224	6	672 2 002	- ;	9358	15	335	11	4 177	7	117	11	7 188	12 145	167	V V	935 4 EE 4	2 1	32 ≤	3.6	
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EUR	318 540	37	142 95;	3 17	446 679	53	46 898	9	433 261	49	12842	-	193 683	22	4 495	۱ <u>۲</u>	478 332	54	6421	<u>۲</u>	62 197	7 2	335 ≤	3.0	

Table A3.1 Estimated burden of TB, Europe, 1990 and 2006

- indicates no estimate. \* Incidence, prevalence and mortafty estimates include patients with HIV. Estimates labelled "HIV\*" are estimates of TB in HIV-positive people (all ages). 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 on page 187 for further details. Data can be downloaded from www.who.int/tb

							1000							ſ				-		•		ſ
	-				New	, pulmor	Jarv N	ew extra- Other	OU-non put	s compined Re-treatmen	t cases			New pulm.	Estimated i	ncidence	Case detec	tion rate	-ss+	SS+	Extrapulm.	Re-treat.
	Population /	All notified <u>N</u>	lew and rel.	apse	SS+	rate	ss-/ unk. p.	ulmonary new number number	Relapse	After failure Aft number	er default C	ther re-treat.	Other Is	db. confirm.	all forms	ss+ numher	all new %	new ss+	(% of num) n	(% of ew+relanse) r	(% of	(% of ew+re-treat )
Albania	3 172	502	469	15	186	9	106	175	2		+	32		197	598	269	78	69	64	40	37	7
Andorra Armenia	3010	13 2 155	12 1 767	16 59	8 580	19	2 694	2 324	169	72	63	1 253		580	14 2 1 7 7	977	84 73	125 59	80 46	67 33	17	8 26
Austria	8 327	873	855	10	213	3	507	135				18		485	1 046	466	82	46	30	25	16	2
Azerbaijan Belarus	8 406 9 742	7 498 6 065	5 705 5 142	68 53	1 454 1 072	1 1	2 278 3 709	697 361	1 276			1 793 923	0	1 454 2 086	6 484 5 989	2 915 2 690	88 86	40 50	53 39	25 21	12	41 15
Belgium	10 430	1 127	1 043	10	343	e	370	330				84		603	1 389	620	75	55	48	33	32	7
Bosnia & Herzegovina Bulgaria	3 926 7 693	1 800 3 232	1 778 3 136	45 41	562 1 307	4 5	910 1 377	215 377	91 125			22 96		993	2 005 3 101	902 1 396	84 97	62 94	38 49	32	12	6
Croatia	4 556	1 135	1 029	23	396	6	520	113				106		583	1 832	824	56	48	43	38	1	6
Cyprus	846	37	36	4	8	-	22	9			-	:		21	42	19	85	42	27	22	17	<i>с</i> і
Czech Republic	10 189	973	941	o (	257		480	204				32	,	520	1 007	452	93	57	35	27	22	<i>т</i> (
Denmark	1 340	311	195 725	۶ <sup>6</sup>	123	N <del>[</del>	123	95 31	40	c	ę	88	-	790	510 510	794	1 22	29	00	35 35	28	ь <del>с</del>
Finland	5 261	299	422 280	- 2 2	84	- ~	110	3- 86	24	Þ	2	19		187	287	129	86	65 65	5 <del>6</del>	6 8 8	31	<u> </u>
France	61 330	5 336	4817	80	1 911	e	1 626	1 280				349	170	2 780	8 630	3 830	56	50	54	40	27	7
Georgia	4 433	6 311	4 554	103	1 831	41	1 231	1 261	231	217	231	1 308	-	1 831	3 736	1 680	116	109	60	4	28	31
Germany	82 64 1	5 402	5 021	99 L	1 303		2 537	1 027	154	7	-	250	122	2 957	5370	2 407	91	45 S	5 G	26	20	20 Ç
Greece Hundany	11 123	1 804	180 783 1	0 t	012	~ ~	1 067	84 86	110	c	e	20	85	314 202	2 008	898	87 6	5 6	47 80	30	<u>4</u> u	01
Iceland	298	1 034	100/	5 4	424	t -	001	90	711	Þ	o	407		907	1304	99	103	71	22	31	0 46	2
Ireland	4 22 1	458	416	10	133	e	180	66	4			17	25	219	555	247	74	54	42	32	24	5
Israel	6810	386	384	9	72	-	237	74	-			2		220	521	233	74	31	23	19	19	-
Italy	58779	4 387	4 145	2	1 377	2	1 473	1 295				242		1881	4 393	1 945	94	71	48	33	31	9
Kazakhstan	15314	43 204 6 666	23 7 28 6 1 7 4	155	6 205	4 4	11 029 2 122	3640 1761	2 854	1119	1 151	14 600	2 606	7 227	19961 6 464	8 971 2 001	105	69	36 16	26 30	15 20	49
Latvia	2 289	1 328	1 290	56	498	88	522	124	146	-	29	8		787	1312	585	87	85	9 4 9	39	10	± 4
Lithuania	3 408	2 559	2 365	69	1 029	30	754	316	266	43	106	45		1 304	2 102	944	100	109	58	44	13	18
Luxembourg	461	33	33	~ '	. 22	• Ω	9 0	- 0						32	57	26	58	86	69	67	ი ე	
Malta	405	30	30	-	4	-	50	9						11	Q7	E	771	36	/L	13	50	
Montenegro	601	171	167	28	58	10	74	21	14	0	-	ę		101	194	87	79	99	44	35	13	11
Netherlands	16379	1 021	1 002	9	203	1	441	341	17			19		493	1 249	558	79	36	32	20	34	4
Norway	4 669	294	276	9	46	-	131	66				17	-	140	263	118	105	39	26	17	36	9
Poland	38 140	8 593 3 423	8017 3218	30	2 835	- 6	4 102 050	690 813	390	÷	26	576	с С	4 342	9 462 3 382	4 254 1 475	81 91	67 88	41 82	35	9 25	<del>1</del> 5
Republic of Moldova	3 833	6 118	4 990	130	1 679	4	2 112	597	602	250	206	672	0	1 679	5 404	2 430	81	69	8 4	34	12	28
Romania	21 532	27 319	24 295	113	9 814	46	7 254	3 665	3 562	1 106	492	1 426		11 124	27 533	12 381	75	79	57	40	15	24
Russian Federation San Marino	143 221 31	152 265	124 689	87	32 335	53	73 252	12 059	7 043	6 287		21289		46 491	152 797 2	68 178 1	11	47	31	26	10	23
Serbia	9 85 1	3 272	3 146	32	1 136	12	1 260	543	207	14	17	96		1 470	3 183	1 430	92	79	47	36	17	10
- Serbia (without Kosovo) - Kosovo		2 150 1 122	2 024		843		749 511	276 267	156 51	14	17	95		1 177					53	42 26	14	ء 13
Slovakia	5 388	730	673	12	160	e	344	122	47	2	-	54		310	829	373	76	43	32	24	18	14
Slovenia	2 001	215 P 020	207 7 81 F	¢ 4	33 2 006	4 u	81	38 1 276	100			8 244		146 2.410	261 13 1 70	117 5 910	77	71 25	51	40 26	18	9 ư
Sweden	9028	497	489	2	106	~ -	203	176	4			2	ţ.	256	549	246	88	43	34	22	36	2
Switzerland	7 455	520	461	9	112	~	231	118		;	1	46	13	308	500	222	92	51	33	24	26	6
Tajikistan	6640	6 671	5 362	81	2 051	31	1 613	1562	136	64	52	1 190	e	2 051	13 532	6 079	39	34	56	38	29	22
Turkov	2 036	129 20 626	10501	82 6	7 066	÷ در	218	133 F 600	32	و ري	11 acc	25		212	24 7E2	202	89 0E	00	64 8	32	24 20	91
Turkmenistan	4 899	3 369	3 223	99	1 155	54	1 339	630	66	5	044	146		1 155	3 175	1 429	86	81	46	99 98	20	2
Ukraine	46 557	41 265	41 265	88	14 206	31	20 226	4 452	2 381					14 206	49 308	21 902	52	65	41	34	11	9
Uzbekistan	26 98 1	8 498 25 310	23 900	89	7 211	3 27	2 832 10 301	3 558 5 600	788	376	113	23/ 921	104	3 430 7 211	9 358 32 778	4 177 14 729	8/ 71	42	38 41	30	44 23	ით
EUR	887 455	423 952	359735	41	109 901	12	170 786	56363 0	22 685	9 638	2 747	48 741	3 091	141 159	433 261	193 683	78	57	39	31	16	20
ss+ indicates sputum sme:	ar-positive; ss-	., sputum sm	ear-negativ	ve; unk	., sputum	smear n	esult unknov	vn; re-treat., re-tres	atment; pulm.	lab. confirmed,	pulmonary c	ase confirme	d by positive	smear or cr	ulture. See E	xplanatory i	notes on pa	ige 187 fo	r further de	tails. Data can	t be downloaded	l from
www.who.int/tb																						

Table A3.2 Case notifications and case detection rates. DOTS and non-DOTS combined, Europe. 2006

	22.040					TR cacoc	renorted from	m DOTS	services						Fetimator	incidenc	o and rase	detection rate		Prop	ortions	ſ
	DOTS			Nev	w pulmo	nary h	lew extra- (	Other		Re-treatmen	t cases		ĺ	New pulm.	Estimated in	cidence	Case (	letection rate	+SS	+SS	Extrapulm.	Re-treat.
	coverage %	New and re number	lapse rate	ss+ number	+ rate	ss- / unk.   number	oulmonary number nu	umber	Relapse Aften number	er failure Afte. number	r default Oth number	er re-treat. number nu	Other Ial	b. confirm. number	all forms number	ss+ number	all new %	new ss+ %	(% of pulm.) n∈	(% of sw+relapse) ne	(% of ew+relapse) ne	(% of ew+re-treat.)
Albania	50	246	œ	66	e	48	26		2		-	7		108	598	269	41	37	67	40	39	4
Andorra	100	12	16	80	5	2	5		ı					80	14	9	84	125	80	67	17	- @
Armenia	100	1 767	59	580	19	694	324		169	72	63	253		580	2 177	977	73	59	46	33	18	26
Austria	100	855	10	213	с	507	135					18		485	1 046	466	82	46	30	25	16	2
Azerbaijan	100	5 705 E 142	89 52	1454	11	2 278	697 361		1276			1 793	0	1 454 2 0 06	6 484 5 080	2 915	68 86	20	39	25	12	41 15
Beldium	100	1 043	80	343	ď	370	330					84		603	1 380	620	75	0 t t	48	- 23	30	2 1
Bosnia & Herzenovina	001	1 778	45	695	0.4	910	215		91			5 8		600	2 005	070	2.48	62	f 8	20	10	- 6
Bulgaria	100	3 136	6 4	1 307	17	1 377	327		125			96		1 307	3 101	1 396	97	94	49	42	: 0	2
Croatia	25														1 832	824						
Cyprus	100	36	4	80	-	22	9				-			21	42	19	85	42	27	22	17	e
Czech Republic	100	941	6	257	ę	480	204					32		520	1 007	452	93	57	35	27	22	б
Denmark	100	341	9	123	2	123	95					35	-	201	444	198	22	62	50	36	28	6
Estonia	100	422	31	147	11	195	31		49	0	10	23		267	519	224	72	66	43	35	7	18
Finland	0														287	129						
France	0														8 630	3 830						
Georgia	100	4 554	103	1831	41	1 231	1 261		231	217	231	1 308	<del>,</del>	1831	3 736	1 680	116	109	60	40	28	31
Germany	100	5 021	9	1 303	2	2 537	1 027		154	2	2	250	122	2 957	5 370	2 407	91	54	5 K	26	20	; ∞
Greece	c														2 008	898				*		
Hindany	100	1 687	17	422	4	1 067	86		112	c	c	204		708	1 904	857	83	40	28	25	Ľ	17
Iceland	100	13	4	4	-	- °°	9		4	þ	>	-		9	13	9	103	71	22	31	46	:
Ireland	0	2												)	555	247			5		2	
stae 	001	384	g	77	~	237	74		÷			0		000	521	233	74	31	23	19	10	-
Italy	92	4 145	~ ~	1377	- ~	1 473	1 295		-			242		1881	4 393	1945	5 8	71	48	0.00	31	- യ
k azak hetan	100	23 254	152	6 1 5 1	40	10.663	3 502		2 848	1 052	1 102	11 372	2	7 166	19 961	8 071	102	69	37	26	15	45
	000	50 501 8 174	117	10.0	e e	0000	1 764		040	100	701	210 11	-	1 0 2 2	6 464	100 0	100	60	46	04	2	2 5
ryigyzsian Latvia	001	1 290	292	498	00	527 522	124		146	÷	20	40 <del>1</del>		787	1 312	585	60 87	55	64	96	10	± 7
Lithuania	96	2 365	69	1 0 29	30	754	316		266	43	106	45		1304	2 102	044	100	109	85	44	13	18
Livemboling	001	- C	3 0		2	5	2		224	2	2	2			57	90		4	02	20	2	2
Malta	001	3 08	~ ~	- 4	~ <del>~</del>	- 02	9							1 1	25	3 5	122	36	17	13	20	
Monaco						1								:	-	c			:			
Montenearo	C														194	87						
Netherlands	100	1 002	9	203	-	441	341		17			19		493	1 249	558	79	36	32	20	34	4
Norway	100	276	9	46	-	131	66					17	÷	140	263	118	105	39	26	17	36	g
Poland	100	8 017	21	2 835	. ~	4 102	690		390			576	-	4342	9 462	4 254	81	67	41	35	ς σ	1 0
Portugal	100	3 218	8	1 300	12	959	813		146	-	26	172	9	1865	3 382	1475	91	88	28	40	25	: 0
Republic of Moldova	100	4 990	130	1679	44	2 112	262		602	250	206	672	0	1679	5 404	2 430	81	69	44	34	12	28
Romania	100	24 295	113	9814	46	7 254	3 665		3 562	1 106	492	1 426		11 124	27 533	12 381	75	79	57	40	15	24
Russian Federation	84	102 997	72	29 9 8 9	21	56713	9 502		6793	6 287		6 185		44 145	152 797	68 178	63	44	35	29	6	17
San Marino															2	-						
Serbia	100	3 146	32	1136	12	1 260	543		207	14	17	95		1470	3 183	1 430	92	79	47	36	17	10
Serbia (without Kosovo)		2 024		843		749	276		156	14	17	95		1177					53	42	14	13
Kosovo		1 122		293		511	267		51					293	1				36	26	24	£
Slovakia	001	673	29	160	N	344	122		47	N	-	54		310	829	373	9/	43	32	24	18	14
Slovenia	001	707	0L	20	4	81	38		G			Ø		140	197	/11	-	17	-0	40	18	٥
Spairi														T	10 1/ 3	0100						
Switzerland															248	047						
Taikistan	5	4 619	70	1986	30	1 237	1 292		104	64	27	1 190	¢.	1 986	13 532	6 079	33	33	62	43	28	23
TEVP Macedonia	100	561	28	178	٥	218	133		32	e e	÷	52	,	212	506	268	b0	66	45	32	54	9
Turkev	20	19 629	27	7 866	; =	5 069	5 609		1 085	81	226	590		9 142	21 752	9 788	85	80	61	40	29	2 0
Turkmenistan	80	2 073	42	830	17	888	256		66			146		830	3 175	1 429	62	58	48	40	12	11
Ukraine	100	41 265	89	14 2 0 6	31	20 226	4 452		2 381					14 206	49 308	21 902	56	65	41	34	11	9
United Kingdom	0														9 358	4 177						
Uzbekistan	100	22 845	85	7 093	26	9 913	5 055		784	376	113	903		7 093	32 778	14 729	67	48	42	31	22	6
EUR	67	310 156	35	100 102	5	142 303	45 579	0	22 172	9 571	2 672	29 305	141	126 522	433 261	193 683	99	52	41	32	15	18
ss+ indicates sputum smeal	r-positive; s	s-, sputum s	mear-n	egative; uı	nk., sput	um smear re	sult unknown;	re-treat.,	re-treatmen	t; pulm.lab. co	nfirmed, puln	nonary case oc	onfirmed by	positive sme	ar or culture.	See Expla	natory note	s on page 187 for	further detai	ils. Data can be	e downloaded fi	.om
WWW.WNO.INVID																						

Table A3.3 DOTS coverage, case notifications and case detection rates, Europe, 2006

Table A3.4 Labora	tory service	s, collab	orative Th	3/HIV acti	vities and i	пападепе	ונ סו אורא-יו	b, curopi	3, 2003-201	9							
	L	aboratory se	rvices, 2006			2005	5	llaborative I t	S/HIV activities	2006				Managei	ment of MDR-T	B, 2006	
	number of I	abs working w	vith NTP	smear labs included	TB pts tested for	TB pts	HIV+ TB pts	HIV+ TB pts	TB pts tested for	TB pts	HIV+ TB ats	HIV+ TB pts	Lab-confirmed	DST	MDR	Re-treatment	Re-treatment
	smear	culture	DST	in EQA	NН	HIV-positive	CPT	ART	HIV	HIV-positive	CPT	ART	MDR	in new cases	in new cases	DST	MDR
Albania	15	с	-	0	81	٢			51	3			-	140	-	5	0
Andorra	8 46	80 0	∞ ←	46	270	ç	5	~	332	25	25	1	215	8 524	0 65	346 346	0
Austria	6	6	6	2	i		0			1	ł	17	10	500	8	11	2
Azerbaijan Belarus	69	8	8	-		130							398 651	404 1 920	97 224	369 1 194	301 427
Belgium		160	17	0	937	52			927	55					ł	-	į
Bosnia & Herzegovina	:		5		1								7	666	m ;	93	4
Bulgaria	33			31	23					9		Ī	23	1 108	24	221	29
Croatia	-	-			0	0	0	0	0	0	0	0	ņ	410	-	78	Z
Czech Republic	45	45	14	45	189	2			163	4			6	552	9	15	3
Denmark	σ	¢	0	0 0	490	ې ۵۵	-		414	11			33	286 270	36 36	22 68	0 4
Finland	D	5	4	0	e f	<u>ვ</u> ო	þ		t 9	- 9 t			2 0	250	с С	15	<u> </u>
France	310	0											30	1 368	19	110	11
Georgia	30 240	1 185	1	30	674	13	7	13	649	17	10	6	266 78	1 297 3 258	111 65	587 243	155 13
Greece	01-4	201	2	04-3								Ī	13	507	13	0	0
Hungary	18	18	11	10									14	478	11	11	ę
Iceland	-	٢			10	-	-	-	10	2	0	1	0	12	0	0	0
Ireland	13	13	e	13	28	53			27	7		_	e i	145	0	9	<del>~</del> .
Israel				-		22							19	264 847	18 28	7	-
Kazakhstan	471	20	16		31 187	183	75	14	43 204	234	06	37	4 117	7 835	1 028	7 898	3 089
Kyrgyzstan	ð	c		3		c L	0	4 8	007		0	00	336	962	248	155	88 [
Lithuania	24	0	-	24	077	50 7		R7	1 120	40		8	332	1346	00 128	440	204 204
Luxembourg													0	33	0		
Malta	0	0	0	0	٢	0	0	0	٢	2	۲	-	2	14	2	0	0
Monaco Montenegro	-	-	-	_	80	0	0	0	17	-	0	-	2	06	0	15	2
Netherlands	78	43	15		252	61			185	41			5	645	3	76	2
Norway	19 106	13 76	30	19 10	0				0				e	216	-	6	2
Portugal	60	09	16	0	2 485	571			1 823	474			17	1 120	14	97	ę
Republic of Moldova	57	4 007	4 0	4 ;	6 469	6 0			5 523	20			1 040	1 05 1	242	1655	798
Russian Federation	57 4 953	978	302	998	85 537	3 533			0 4 U Z 87 0 4 1	00 1 979		1 037	3 949	25 804	33 2 942	4 396	1 007
San Marino	;	,			,		:	2	'		,	:	:		'	:	:
Serbia Slovakia	8c 16	o f	ט מ	¥ E	3 720	÷, α	0	12	с с	00	- 0	<u>وا</u> 0	0L 2	990 340	<b>0</b> m	140 61	0 4
Slovenia					107	0	0	0	20	£	-	-	- F	176	-	œ	0
Spain Sweden	ŝ	ى ا	сı	c)	0				3 566 0				° 20	1 265 377	36	54 23	4 -
Switzerland	25	15	15	11									4	382	4	41	0
Tajikistan	66	0	0	53	670	٢	0	0	1 148	e	0	0	0	0	0	0	0
TFYR Macedonia	13	13	- I	10	2	2	0	2 0	0	0	0	0	9	133	0	29	9
Turkey Turkmenistan	175 29	57		4 C	0	0	0	0	0	0	0	0	249	4 112 0	133	700 103	116 16
Ukraine	1			,		1 526	0			1 987	0						
United Kingdom Uzbekistan	317	2	2	317	35 801	147	0	0	37 565	238	154	6	52 83	4 677 206	39 29	255 89	13 54
EUR	7 409	1 837	690	2 109	178 033	6 548	101	78	192 965	5 281	281	1 175	12 282	68 324	5 709	19881	6 711
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ART indicates antirerioxiral therapy; CPT. co-trimoxazate preventive therapy; DST, drug succeptibility testing; EQA external quality assurance; HIV+ HIV-positive; ps, patients. See Explanatory notes on pages 137 for further details. Some countries provided the number of TB patients found to be HIV-positive; ps, patients setting, EQA external quality assurance; HIV+ HIV-positive; ps, patients. See Explanatory notes on pages 137 for further details. Some countries provided the number of TB patients found to be HIV-positive; ps, patients setting, tested, and cannot be used to accurated a regional estimate of HIV prevalence in TB patients. Data can be downloaded from www.hon.influe who influe therapy.

cohort
2005
Europe,
outcomes,
Treatment
A3.5
Table

			Ne	w smear	r-positive	e cases.	DOTS							New sm	iear-posit	ve cases, n	on-DOTS				_		Smear-p	ositive r	e-treatme	ent cases	, DOTS		
			%			% of	cohort			%			%			%	of cohort			%				-	% of cohc	ц			%
	Number of Notified F	cases of teaist'd rea	notif tist'd C	ured e	ompt- ted Di	ied Fa	ailed Defi	Trar fault ferre	Nc Nc	ot 1. Succes	S Notified	er of cases Redist's	of noti	f Cured	Compl- eted	Died	Failed	Tr Default fe	ans- red e	lot /al. Succ	Numb ess Regis	er dd Cur	Comp ed eted	ol- Died	Failed	Default	Trans- ferred	Not eval. Su	ccess
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Austria	234	230	86	17	58	~	0	-	1	1 75												0	09	. 0	0	9	• 0	10	8
Azerbaijan <sup>1</sup> Relarus	1 561	1 561	001	48	1	4	4 6	12 1(		6 59 7											131	4	6	9	9	13	20	18	37
<sup>2</sup> Belgium	380	304	80	21	45	10	0	0	1	3 66												1	4 24	33	0	0	0	29	88
Bosnia & Herzegovina	1 036	1 035 1	100	, i	93	VV	e		-	3 93											5 (	90	ю -	4 4	- ç	C 4	- c	0 0	92
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<sup>1</sup> Indicates that the outcomes are for laboratory-confirmed cases, i.e. strear and/or culture-positive. <sup>2</sup> Indicates that "notified cases" in this table included cases with "history unknown," whereas "registered cases" does not. <sup>2</sup> Indicates that "notified cases" in this table included cases with "history unknown," whereas "registered cases" does not. Not even includes not evaluated (procentage of registered cases for international completed; cases registed, the denominator for calculating treatment outcomes. The number of cases registered cases for a cases for international concenters, in the number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes as the set on time concomes is used in the number of cases registered in the number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes it is easy in the number of cases registered for treatment in 2005 is used form www.who.intUB outcomes is used form www.who.intUB outcomes in the number of cases registered for treatment in 2005 is used form www.who.intUB outcomes is used form www.who.intUB outcomes interval the number of cases registered for treatment in 2005 is used form www.who.intUB outcomes is used form www.who.intUB outcomes interval to cucomes is used form www.who.intUB outcomes is used form www.who.intUB outcomes is used form www.who.intUB outcomes interval to cucomes in the cucomes is used form www.who.intUB outcomes is used form www.who.intUB outcomes interval to cucomes interval to cucomes interval to cucomes is used form www.who.intUB outcomes is used form www.who.intUB outcomes is used for the sum of outcomes is used form www.who.intUB outcomes is used form www.who.intUB outcomes is used for the sum of outcomes is used form www.who.intUB outcomes is used for the sum of outcomes is used form www.who.intUB outcomes is used form www.wh

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Table A3.6

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			Albar	Ando Arme	Austi Azert Belar	Belgi <sup>1</sup> Bosn <sup>1</sup> Bulga	Croa Cypri Czec	Denr Estor Finlau	France	Geor	Gree Hung Icelar	lsrae	Italy	Kaza Kyrg) Latviá	Lithu Luxe	Mone	Mont	Norw Polar Portu	Repu	Russ	San I Serbi	Slov	Slovi Spair Swec	Switz	Tajik TFYF	Turk	Turki Ukrai	Unite Uzbe	EUR

<sup>1</sup> Indicates that the outcomes are for laboratebry-confirmed cases, i.e. stmear and/or cubine-positive. Not evail. Indicates not evaluated (percentage of registered cases for which cases registered for treatment in 2005 is used a denominator for calculating treatment cubromes are interesting of cubines, in which cases the sum of outcomes is used. Data can be downlaaded from www.mb.it

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	1994 1	995	1996	1997	1998	1999	2000	001 2	002 20	303 2C	104 20	05 15	95 196	6 199	7 1998	1999	2000	2001	2002	2003	2004	2005	2006
Albania								98	06	91	78	77						25	30	31	35	24	37
Andorra					100	67	50	100	100	100	100	80		22	4 14	58	15	46	31	109	47	78	125
Armenia		83	77	82	81	88	87	06	79	77	70	72	12 2	5 4	4 44	41	47	29	30	43	48	60	59
Austria						17	73	64	78	68	69	75					62	52	44	56	45	50	46
Azerbaijan			86	87	86	88	91	66	84	73	60	59 73	£	6	7	7	9	0	46	29 3 8	47	54 78	20
Doloium								64	60	64	11	2 22						22	63	200	19	e c	2
Bosnia & Herzedovina				63	88	06	64	5 8	95	5 46	27	20			38	67	71	80	23	51	5 5	70	62
Bulgaria				8	8	8	5	87	86	91	8 8	86			8	5	24	5 5	64	06	96	2 88	3 45
Croatia																							
Cyprus			:	:	42			92	75	79	20	63			91	43	1		40	72	52	47	42
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Georgia		58		65	78	61	63	67	65	66	89	73	18	LC LC	34	45	34	58	57	58	78	06	109
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Greece																							
Hungary					80		64	46	55	48	54	45				36	25	36	39	40	49	42	49
loeland								67	100	100	50 1	00						68	60	31	58	44	71
Ireland																							
Israel							78	79	81	80	80	78					7	73	69	64	39	42	31
Italy		80	82	69	72	71	74	40	79	95		74	1	4	9 13	56	31	10	60	73	53	65	71
Kazakhstan					79	79	79	78	78	75	72	71			4	62	94	93	95	87	81	74	69
Kyrgyzstan			88	76	82	83	82	81	82	84	85	85		3	4 31	58	42		48	56	61	99	63
Latvia		61	64	65	71	74	72	73	76	74	73	74	7	1 7	0 72	64	72	76	77	84	83	83	85
Lithuania					79	84	92	75	72	74	72	20				ę	2	30	56	86	85	66	109
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Poland					75	69	72	17	86	78	79	77			2	ę	4	ę	56	57	57	62	67
Portugal	48	69	74	78	74	85	79	78	82	84	84	89	78 7	7 6	6 86	82	91	101	101	94	06	82	88
Republic of Moldova				i	;	i	83	99	61	65	62	62			!			4	52	41	63	02	69
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Serbia								88	91	89	91	85						26	23	37	31	76	79
Slovakia	96	64	73	67	85	79	82	87	85	87	88	92	80 8	5 3	4 40	35	37	37	34	38	34	39	43
Slovenia		06	87	82	78	88	84	82	85	85	06	84	2	6.	8 65	74	71	73	75	75	63	84	71
Spain							40	52	7.2	00	64							85	202	0	22	01	
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TFYR Macedonia							86	88	79	84	8	8						54	49	49	72	65	99
Turkey										93	91	89								5	с	с	80
Turkmenistan							69	75	77	82	86	81					17	36	42	43	33	4	58
Ukraine																							65
United Kingdom Uzbekistan					78	56	80	76	80	81	78	5			C	~	4	7	22	21	29	37	48
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Table A3.7 DOTS treatment success and case detection rates, Europe, 1994-2006

				Malo				60.000									IV.				5W	loffomalo
	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34 3	5-44 45	5-54 55	-64	65+ 0-	-14 15	-24 25-	-34 35-	44 45	-54 55	-64	35+	ratio
Albania	5	24	19	22	21	19	20	2	12	8	7	7	7	13	7	36	27	29	28	26	33	2.3
Andorra	0 0	t 4	116	0 y	0 8	1 38	- 5	0 %	0 80	1 00	0 4	+ ۲	0 1	04	0 %	141	145	12 2	1 4	45	- 5	3.0
Austria	~	6	25	36	96 68	19	19	5 6	12	12	16	2 22	m	15		21	37	52	4	22	34	2.3
Azerbaijan	9	241	362	365	120	78	30	0 7	51	99	66	44	15	ω <u>6</u>	00 1	292	428	131	164	93	38	4.8
Belaium	4	26	52	38	45	27	42	- 9	25	30 25	<del>1</del> 8	9	2	22	10	51	17	26	51	34	64	2.1
Bosnia & Herzegovina	0	40	58	47	53	42	99	0	41	50	24	29	20	88	0	81	108	71	82	62	154	1.2
Bulgaria	9	86	146	170	184	133	123	12	76	96	86	8	24	59	18	162	242	256	218	157	182	2.2
Croatia	0 0	50	53	28	69	30	84 0	N	16	26	16	22	~ 0	59	N C	36	49	74	91	37	107	1.7
Cyprus Czech Republic	0 0	0 0	- 1	- 39	56 0	38 -	0 25	. 0	И 4	ء 12	n 21	o 6	0 0	30		7 D	4 5	51	0 99	- 4	55 C	0.0
Denmark	0	8	13	15	27	10	∞	-	9	12	6	2	5	4	-	14	25	24	32	15	12	1.9
Estonia	0	4	19	24	40	12	7	0	ю	6	10	6	4	9	0	7	28	34	49	16	13	2.6
Finland	0	5	9	2	6	9	20	0	2	4	e	4	-	19	0	7	10	8	13	7	39	1.5
France	17 %	137 315	214 302	238	209	153 86	278 72	ъ Ъ	112 115	158	91	67 60	44 ac	34	, 8 32	249	372	329	276 301	197 112	448 106	1.9
Germany	r 0	215	138		189	103	199	0 -	99	109	12	8 68	24	102	റെ	144	247	246	228	127	301	2.1
Greece	0	11	32	22	24	22	27	0	13	12	80	2 2	9	24	0	24	44	30	29	28	51	2.0
Hungary	0 0	9 0	31	7	86	54	33	ς α	17	16	19	28	5	29	പ	27	47	06	126	65 0	62	2.4
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Table A3.8 New smear-positive case notification by age and sex, absolute numbers, DOTS and non-DOTS, Europe, 2006

For some countries, breakdown of of lighted cases by age and sex in missing, or is provided for a subset of cases. See Explanatory notes on page 187 for further details. Data can be downloaded from www.moi.in/tb

Table A3.9 New sme	ar-posi	tive ca	se not	ITICATIC	n rates	by ay		267, UC	0 0110		1010	ni ope	2000	-			•	-			
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Rates are per 10000 population of each ageises 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.inttb

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Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. For notification rates including re-treatment cases in years prior to 2006 please see www.eurotb.org. The table includes updated information, data shown here may differ from those published in previous reports. Data can be downloaded from www.who.in/tb

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Poland	7 606	4 000	6 955	6819	3 497	3 502	3 177	3 180	3 155	3 060	2 983	2 777	2 823	2 835	20	1 0	- 18	1 8	10	- 6	- w		- @	- 00			
Portugal		2 072	2 019	1 938	1 628	2 016	1 801	1863	2 042	1 976	1742	1 514	1 302	1 300		21	20	19	16	20 1	8 15	3 20	19	17	14	12	12
Republic of Moldova	615	704	665	219	397	477	609	651	1 060	1 146	1214	1 536	1 696	1 679	4	16	15	2	6	1	4	36	28	31	30	4	4
Romania Russian Federation	9339	30,389	37 512	10 359 42 534	11 666 42 094	10 841 42 219	21744	10 202 27 467	71 184 26 605	77 865	10 418 28 868	30,890	32 605	9 814 32 335	41	94 20	46 25	94 29	28.23	49 28 14	5 4 10 4 10 4	10 0 11 0	19 49	8 2	09 5	09 88	946
San Marino				0	-	0	0	-	0	0	0	0						0	4	0	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			14	16	16	17 2	33	4	4	9	12	1	12
Slovakia	882	409	788	760	283	303	246	236	226	202	200	157	162	160	17	80	15	14	5	9	5	4	4	4	e	e	e
Slovenia	361	294	303	221	156	157	165	145	139	130	116	89	109	83	19	15	15	1	œ	ωı	8		~ ~	1 0	4 i	ഗ	4 ı
Sweden	312	106	cuo 2 102	06	94	26 006 L	117	3 423 118	2 450 105	3 317 109	109	z U82 120	134	2 UU6 106	4	<del>.</del>		<del>.</del>	<del>.</del>	o <del>-</del>	- "		- 0 - 0		o <del>-</del>	o –	o <del>-</del>
Switzerland	528	507	185	172	144	165	98	118	116	123	107	119	108	112	8	7	3	2	2	2	1	~	2	-	2	-	2
Tajikistan			1 042	232	373	435	0	434	719	687	0	1 058	1 745	2 051			18	4	9	7	0	12	11	0	16	27	31
TFYR Macedonia			319	209	192	179	122	167	164	200	200	200	178	178			16	11	10	6	6 8	~	3 10	10	10	6	6
Turkey	624		4 383	2 816 667	3 439 764	3 692	4 124 064	4315	4 444	1 264	5816	5 870	7 450	7 866	ę		- <sup>2</sup>	4 ç	ۍ ت ا	9 e	9 ° 9 °	910	0 10	80 y	°, 0	9 5	11
Ukraine	8314	8 471	8 263	7 827	9 533	10 586	10 412	10 738	0	0	12 785	0	000	14 206	16	17	16	15	6	21 2	1 5	10	0	27	30	7	3 5
United Kingdom	283	270		4 147	844	1 342	797	1 204	946	1 365	1455	1 693	1 821	1 767	0	0	1	7	-	2	1		2	2	ς,	e j	e
Uzbekistan		7 487	2 735	3 350	3 386	3 504	3977	3825	4 608	4 783	4 690	5 119	5 695	7 211		33	12	14	14	15 1	6 15	15	3 19	18	20	21	27
FIIR	45 771	83 568	104 444	110614	106 700	111 772	89199	94 275	86 239	83 455 1	101 657	92 233	96 101 10	109 901	Ľ	10	12	13	10	13	1	9	6	12	10	÷	12

Table A3.12 New smear-positive cases notified, numbers and rates, Europe, 1993-2006

Rates are per 100 000 population. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/tb

## Notes

#### Azerbaijan

The numbers shown under "DST new cases" and "Retreatment DST" in table A3.4 include only those cases for whom samples were sent to the supranational laboratory in Germany.

#### Denmark

Data for Denmark exclude Greenland. A total of 73 TB cases were notified in Greenland for 2006 (128 per 100 000 population). No MDR-TB cases were identified in Greenland.

#### Italy

Notification data not available for re-treatment cases.

Treatment outcomes were reported by only 5 regions (Emilia-Romagna, Friuli-Venezia Giulia, Marche, Piemonte and Veneto), which together account for 34% of the TB notifications in Italy.

#### **Montenegro**

Outcome monitoring is incomplete as reporting system was in pilot phase.

#### **Russian Federation**

Number of new smear-positive cases registered under DOTS (shown in table A3.5) is more than number notified for 2005; included are cases registered for treatment in parts of the country which were classified as DOTS for the first time in 2006.

## **SOUTH-EAST ASIA**

WESTERN PACIFIC

## South-East Asia

NTP MANAGER (OR EQUIVALENT); PERSON FILLING OUT DATA COLLECTION FORM (IF DIFFERENT)

Bangladesh	Mohammed Abdul Awal Miah; Roksana Hafiz
Bhutan	Pandup Tshering; Kinzang Namgyal
DPR Korea	Han Man Gap
India	L.S. Chauhan
Indonesia	Carmelia Basri; M. Epid; Sudarman
Maldives	Shameema Hussain
Myanmar	Win Maung; Thandar Lwin
Nepal	Pushpa Malla; Badri Nath Jnawali
Sri Lanka	Chandra Sarukkali
Thailand	Sriprapa Nateniyom; Suksont Jittimanee
Timor-Leste	Constantino Lopes

This list shows the people named on the data collection form sent to WHO in 2006, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

# Table A3.1 Estimated burden of TB, South-East Asia, 1990 and 2006

	-	Incidenc	e, 1990		Prevalence,	1990 1	B mortality, 1	1990			Ĺ	cidence, .	20.06.				J L	evalence,	2006		IBn	nortality, 2	006	I	IV prevalence
	All form:	s*	Smear-posi	tive*	All forms	*-	All forms*		All forms*	A	VII forms HIV	3 +/	Smear-positi	ve* Sn	near-positive	HIV+	All forms'		All forms HIV	+/	All forms*	A	I forms HIV	+	in incident
	number	rate	number	rate	number	rate	number	rate	number r.	ate	number	rate	number	rate	number	rate	number	rate	number	rate	number r	ate r	number r	ate T	B cases (%)
Bangladesh	298 205	264	134 192	119	701 637	621	83 581	74	350 641 2	225	156	۸ ۲	157 773	101	55	۸ ۲	896 609	391	78	≤ 1	70 254	45	99	≤1	≤ 0.05
Bhutan	1134	207	510	93	1 338	244	95	17	621	96	2	×	279	43	v L	vi T	620	96	۸ ۲	× 1	45	7	۸ ۲	v.	0.3
DPR Korea	35 810	178	16115	80	86 802	431	11 790	59	42 147	178	142	s t	18 952	80	50	vi T	42 591	180	71	×	3 370	14	15	s T	0.3
India	1 443 567	168	649 237	75	4 883 882	568	362 424	42	1 932 852	168	23 283	2	867 455	75	8 149	vi Vi	3 444 685	299	11 642	-	325 172	28	6 833	× 1	1.2
Indonesia	626 867	343	282 090	154	800 073	438	163 842	06	534 439	234	3 143	-	240 183	105	1 100	vi T	578 410	253	1571	× 1	88 113	38	1 078	v.	0.6
Maldives	299	139	134	62	317	147	16	ø	136	45	e	×	61	20	v L	vi T	163	54	-	× 1	12	4	vi L	×	2.0
Myanmar	68 616	171	30 695	76	164 959	411	19 940	50	82 687	171	2 145	4	36 994	76	751	2	81 614	169	1 073	2	6 054	13	215	× 1	2.6
Nepal	46 445	243	20895	109	119 535	625	9 707	51	48 772	176	702	з	21 877	79	246	vi T	67 425	244	351	-	6 365	23	158	v.	1.4
Sri Lanka	10 353	60	4 659	27	18 426	108	1 725	10	11 620	60	18	×	5 227	27	9	vi T	15 422	80	6	× 1	1512	8	5	×	0.2
Thailand	77 232	142	33 599	62	184 486	340	15 118	28	90 252	142	9 961	16	39 617	62	3 486	5	125 291	197	4 981	8	12 710	20	2 435	4	11
Timor-Leste	4112	556	1 850	250	8 940	1 208	928	125	6187	556	≤1	s 1	2 784	250	≤ 1	N 1	8 789	789	≤1	s 1	1 093	98	≤ 1	s 1	≤ 0.05
SEAR	2 612 643	200	1 173 978	06	6 970 394	533	669 167	51	3 100 355	180	39 556	2	391 204	81	13 844	۶I	vi vi		vi		vi		vi	٧	

- indicates no estimate. \* Indicates no estimates indude patients with HIV. Estimates labelled "HIV+" are estimates of TB in HIV-positive people (all ages). 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 on page 187 for further details. Data can be downloaded from www.who.int/tb

							Notified T	B cases, DC	TS and	non-DOTS	combined					Incident	ce and case c	letection ra	ates		Pro	portions	
					New	pulmor	ary h	Vew extra-	Other		Re-treatme	ont cases			New pulm.	Estimated i	ncidence	Case detec	tion rate	+SS	+SS+	Extrapulm.	Re-treat.
_	Population →	All notified	New and rela	bse	+SS		ss- / unk. p	Julmonary	new	Relapse A	offer failure A:	fter default O	ther re-treat.	Other la	b. confirm.	all forms	+SS	all new	new ss+	(% of	(% of	(% of	(% of
	thousands	number	number	rate	number	rate	number	number n	umber	number	number	number	number	number	number	number	number	%	%	pulm.) ne	ew+relapse)	new+relapse) r	new+re-treat.)
Bangladesh	155 991	145 186	145 186	93	101 967	65	24 565	14 436	0	4218					101 967	350 641	157 773	40	65	81	70	10	ę
Bhutan	649	934	917	141	312	48	238	326	0	41	9	11	0	0	370	621	279	141	112	57	34	36	9
DPR Korea	23 7 08	51 877	44 558	188	18 435	78	19610	5 012		1501	2 210	1 186	3 923		18435	42 147	18 952	102	97	48	41	11	17
India	1 151 751	1 397 965	1 228 827	107	553 851	48	400 680	183 203	1 188	89 905	19 491	76 688	72 959	0	553 851	1 932 852	867 455	59	64	58	45	15	19
Indonesia	228 864	277 589	277 589	121	175 320	17	91 029	7 013	0	4 227					175 320	534 439	240 183	51	73	99	63	б	2
Maldives	300	100	66	33	53	18	16	26	0	4	0	-	0	0	53	136	61	70	87	17	54	26	5
Myanmar	48 379	126 445	122 472	253	40 241	83	42 7 4 1	34 495		4 995	2 852	1 121			46 598	82 687	36 994	142	109	48	33	28	7
Nepal	27 641	33 207	32 670	118	14 028	51	9 170	7 089	0	2 383	285	252	0	0	33 207	48 772	21 877	62	64	60	43	22	6
Sri Lanka	19 207	8 946	8 510	44	4 442	23	1 905	1 936		227	72	136		228	5 119	11 620	5 227	71	85	70	52	23	5
Thailand	63 4 4 4	58 828	56 230	89	29 081	46	17 607	7 800		1742	665	772		1 161	29 08 1	90 252	39 617	60	73	62	52	14	9
Timor-Leste	1114	3 596	3 586	322	907	81	2 144	503		32	2	8			907	6 187	2 784	57	33	30	25	14	1
SEAR	1 721 049	2 104 673	1 920 644	112	938 637	55	609 7 05	261839	1188	109 275	25 583	80 175	76 882	1 389	964 908	3 100 355	1 391 204	58	67	61	49	14	14

Table A3.2 Case notifications and case detection rates, DOTS and non-DOTS combined, South-East Asia, 2006

ss+ indicates sputum smear-positive; ss-, sputum smear readil unknown; efeatar, retreatment; pulm.lab. confirmed, pulmonary case confirmed, pulmorary case confirmed, pulmorary case confirmed, pulmorary case softence and be downloaded from www.wh.in/tb

					TBC	ases reported	from DOT	S servic.	es						Estimated	incidence ai	nd case dete	ction rate		Pro	portions	
	DOTS			New pr	Ilmonary	New extr.	a- Other		Re-	-treatment c	ases			New pulm.	Estimated ir	ncidence	Case det	sction rate	+SS+	+SS+	Extrapulm.	Re-treat.
	coverage	New and relat	pse	+SS+	in / -ss	ik. pulmonai	ry new	Relap	se After fai.	lure After d	lefault Other	re-treat.	Other k	ab. confirm.	all forms	+SS	all new	new ss+	(% of	(% of	(% of	(% of
	%	number	rate nu	umber ra	te numt	er numb	er numbe	numt	ber nun.	Ther nu	umber	number n	umber	number	number	number	%	%	pulm.) n	ew+relapse)	new+relapse)	new+re-treat.)
Bangladesh	100	145 186	93 10	01 967 t	55 245	65 14 45	36 C	1 42	18					101 967	350 641	157 773	40	65	81	70	10	e
Bhutan	06	917	141	312	48 2	38 32	26		41	9	11	0	0	370	621	279	141	112	57	34	36	9
DPR Korea	100	44 558	188	18 435	78 196	10 5 01	12	15	01 2.	210	1 186	3 923		18435	42 147	18 952	102	97	48	41	11	17
India	100	1 228 589	107 5£	23 797	48 4004	96 183 20	J3 1 18E	89.9	19	491 7	6 688	72 959	0	553 797	1 932 852	867 455	59	64	58	45	15	19
Indonesia	98	277 589	121 17	75 320 .	77 910	29 7 0	13 C	1 42	27					175 320	534 439	240 183	51	73	99	63	ю	2
Maldives	100	66	33	53	18	16 2	26 C		4	0	1	0	0	53	136	61	70	87	77	54	26	5
Myanmar	95	122 472	253 4	40 241 8	33 42.7.	41 34 45	35	49	95 2.	852	1 121			46 598	82 687	36 994	142	109	48	33	28	7
Nepal	100	32 670	118 1	14 028	51 91	70 7 05	39 (	1 23	83	285	252	0	0	33 207	48 772	21877	62	64	09	43	22	6
Sri Lanka	98	8 475	4	4 431	23 18	83 190	34	2	27	72	136		221	5 108	11 620	5 227	71	85	20	52	23	5
Thailand	100	56 230	89 2	29 081	46 176	07 7.80	00	17	42	665	772		1 161	29 08 1	90 252	39 617	60	73	62	52	14	9
Timor-Leste	100	3 586	322	307 8	31 2.1	44 50	33		32	2	8			907	6 187	2 784	57	33	30	25	14	1
SEAR	100	1 920 371	112 95	38 572 🕴	55 6094	99 261 8:	37 1 188	1092	75 25	583 8	0 175	76 882	1 382	964 843	3 100 355	1 391 204	58	67	61	49	14	14

Table A3.3 DOTS coverage, case notifications and case detection rates, South-East Asia, 2006

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 on page 187 for further details. Data can be downloaded from www.who.int/b

	ĺ					,	¢					ſ					ſ
							ت	ollaborative	B/HIV activitie	Sé		-					
		Laboratory se	rvices, 2006			200	5			200	16	-		Manageme	ant of MDR-TE	, 2006	
				smear labs	TB pts		+NH	+VIH	TB pts		+NH	+NH					
	number o	of labs working w	vith NTP	included	tested for	TB pts	TB pts	TB pts	tested for	TB pts	TB pts	TB pts	Lab-confirmed	DST	MDR	Re-treatment R	te-treatment
	smear	culture	DST	in EQA	NN	HIV-positive	CPT	ART	HIV	HIV-positive	CPT	ART	MDR	in new cases ir	n new cases	DST	MDR
Bangladesh	687	е	0	679	0												
Bhutan	29	-	0	-	250	-	0	0	0				0	0	0	0	0
DPR Korea	285			285													
India	11 968	ø	8	9422	29 488	6 411			59 654	8 785			21	0	0	26	21
Indonesia	4 855	41	11	4 855									59				
Maldives	24	-	0	-									-	+	-	4	4
Myanmar	391	2	-	50	2 109	611	305	190	2 626	642	489	282	999			844	652
Nepal	401	ę	2	0	0				0				0	0	0	0	0
Sri Lanka	176	-	-	26		2	0	0					16	613	ę	336	13
Thailand	937	65	18	864					24 859	6 493	4 188	2 053					
Timor-Leste	19	0	0	19	0		0	0			0	0					
SEAR	19 772	125	41	16 202	31 847	7 025	305	190	87 139	15 920	4 677	2 335	763	614	4	1 210	069

Table A3.4 Laboratory services, collaborative TB/HIV activities and management of MDR-TB, South-East Asia, 2005–2006

ART indicates antiretroviral therapy; CPT, co-timoxazole preventive therapy. DST, drug susceptibility testing; EOA external quality assurance; H/V+, H/V-positive; ps, patients. See Explanatory notes on pages 187 for further details. Some countries provided the number of TB patients and to the Dot be H/V prevalence in TB patients tested is therefore lower than the number of patients actually tested, and cannot be used to calculated a regional total of TB patients. Data can be used to movim or the number of TB patients. Data can be used to movim or the prevalence in TB patients. Data can be used to movim or the number of TB patients tested is therefore lower than the number of patients actually tested, and cannot be used to calculated a regional estimate of HIV prevalence in TB patients. Data can be used to movim or the number of TB patients.

Table A3.5 <b>Treat</b>	ment out	comes,	South	. East	Asia,	2005 c	sohort																					
				New sm	ear-pos	itive cast	es, DOTS				_			New smea	ar-positiv	'e cases,	non-DOTS					Smear-p	ositive r	e-treatme	ent cases	, DOTS		
			%			%	of cohort			%	9,		%			% of	f cohort		%					% of cohe	DT.			%
	Number	· of cases	of notii	 _	Compl-			Tra	Ins- No	Ŧ	z	umber of case	ss of no	tif	Compl-		Ť,	ans- No	ŧ	Numbe	<u>ہ</u>	Com				Trans-	Not	
	Notified	Regist'd	regist'c	d Cured	eted	Died	Failed De	sfault feri	red eva	al. Succ	cess Nc	ntified Regis	t'd regis,	t'd Cured	eted	Died Fa	ailed Default fei	red eva	al. Succe	iss Regist	d Cure	ed etec	d Died	Failed	Default	ferred	eval. Sı	uccess
Bangladesh	84 848	84 848	100	91	٢	4	+	2	2	0	91									3.87	7: 73	3 6	4	2	2	4	5	80
Bhutan	308	340	110	84	7	2	ę	-	0	0	91									4,	52 65	5 10	9 (	80	2	80	2	75
DPR Korea	17 796	17 796	100	84	2	2	4	2	2	0	89									9 11	16 70	9	33	12	2	4	0	76
India	506 852	507 204	100	83	2	5	2	7	-	0	86	038								224 14	13 47	7 24	2 1	4	16	÷	0	71
Indonesia	158 640	158 640	100	83	œ	2	-	4	2	0	91									4 81	12 63	3 15	33	4	80	7	0	78
Maldives	99	20	106	86	0	9	0	e	9	0	86										8 50	0 13	0	0	0	0	38	63
Myanmar	36 541	34 859	95	78	7	5	2	5	2	0	85									6 03	39 26	9 13	6	9	7	2	0	73
Nepal	14 617	14 617	100	87	-	5	-	ю	2	0	88									2 97	73 81	1	4	9	4	ю	0	83
Sri Lanka	4 841	4 841	100	83	e	5	-	9	1	0	86	27								20	14 67	7 5	5	2	18	2	-	72
Thailand	29 762	29 919	101	20	5	80	2	7	3	9	75									2 28	35 52	2	12	5	7	4	13	58
Timor-Leste	1 035	1 035	100	61	21	5	-	11	2	~	82									4,	6 96	0	2	0	2	0	0	96
SEAR	855 306	854 169	100	83	4	4	2	9	-	~	87 2	065	0					10	0	253 86	54 45	9 22	7	2	15	7	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 2005 is used as the denominator for calculating treatment outcomes, in which case the sum of outcomes is used. If the number of cases registered is not reported, then the number of cases registered in 2005 is used, or 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 registered in 2005 is used, or 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 registered in 2005 is used, or 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 registered in 2005 is used, or 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 registered in 2005 is used, or 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 registered in 2005 is used, or the sum of outcomes is used.

## Table A3.6 Re-treatment outcomes, South-East Asia, 2005 cohort

				Relaps	ie, DOTS							<	fter failun	e, DOTS						-	After defa	ult, DOT	ŝ			
				0 %	of cohort			%					% of (	cohort			%				% of	cohort			%	
	Number		Compl-			F	ans- N	л т	٦	mber	Ŭ	-Idmo			Trans	- Not		Number		Compl-			Tra	ns- No	Ŧ	
	regisťd	Cured	eted	Died F	-ailed D	efault fe	rred ev	al. Sucot	ess ré	gist'd C	Sured (	sted C	ied Fa	led Defa	ult ferre	d eval.	Success	regist'd	Cured	eted	Died Fa	ailed De	fault fen	ed eva	al. Succ	ess
Bangladesh	3 876	73	9	4	2	5	4	5 6	30																	
Bhutan	41	99	10	7	7	2	7	0	26	7	71	14	0	-	0	14	86	4	50	0	0	0	0	Ω.	0	20
DPR Korea	1 364	73	9	e	11	4	e	0	62	1524	99	7	4	4	5	0	73	1 018	68	7	e	13	5	4	0	75
India	75 278	67	9	7	5	14	ŕ-	0	73 1	7 783	52	7	~	14	8	0	59	72 298	59	8	8	4	19	2	0	37
Indonesia	4 446	65	14	e	e	80	7	0	62																	
Maldives	5	80	20	0	0	0	0	0 10	00	0	0	0	0	0	0		0	2	0	0	0	0	0	0 10	0	0
Myanmar	4 458	65	11	6	5	9	4	0	26	1 581	44	21	10	10 1	9 0	0	65									
Nepal	2 344	84	2	e	9	2	e	300	36	316	99	-	6	16	5	-	67									
Sri Lanka	263	76	5	5	1	11	1	1 8	31	55	65	4	4	7	95	5	69	186	55	5	5	2	31	1	1	30
Thailand	1 790	52	9	12	4	9	4	7 5	57	495	55	9	13	9	1 6	0	61									
Timor-Leste																										
SEAR	93 865	67	7	7	5	12	2	1 7	74 2	1 761	52	8	8	14	6 2	0	61	73 508	59	8	8	4	19	2	0	67
					I																					1

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 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes.

									•															
			DOTS r	new sm	ear-pos	itive tre	atment	succes	s (%)						DOTS n	ew sme	ar-pos	itive ca:	se detec	ction rat	(%) ə;			
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Bangladesh	73	71	72	78	80	81	83	84	84	85	06	91	9	14	18	23	23	24	26	30	35	40	54	65
Bhutan	71	97	96	85	06	85	06	93	86	06	83	91	66	87	83	81	96	108	114	118	119	120	107	112
DPR Korea					91	94	91	91	88	88	89	89					2	25	52	77	88	98	94	97
India	83	79	79	82	84	82	84	85	87	86	86	86	0	-	-	2	7	12	23	30	43	55	59	64
Indonesia	94	91	81	54	58	50	87	86	86	87	06	91	-	4	7	12	19	20	21	30	37	52	65	73
Maldives	95	97	93	94	94	94	97	97	95	91	95	86	105	102	96	94	66	11	74	79	95	97	103	87
Myanmar		99	79	82	82	81	82	81	81	81	84	85		26	27	29	33	49	58	68	76	86	100	109
Nepal			85	87	89	87	86	88	86	87	87	88		5	11	16	4	57	58	61	99	67	67	64
Sri Lanka	11	79	80	76	76	84	11	80	81	81	85	86	62	60	70	75	11	67	72	71	71	76	93	85
Thailand			78	62	68	22	69	75	74	73	74	75		0	5	22	40	47	74	67	73	73	76	73
Timor-Leste								73	81	81	80	82								49	43	40	39	33
SEAR	80	74	77	72	72	73	83	84	85	85	87	87	۲	4	5	8	14	18	27	34	44	55	62	67

Table A3.7 DOTS treatment success and case detection rates, South-East Asia, 1994–2006

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/b

5:24 25-34 35-64 65-64 65+ ratio   101 20214 19284 18308 13265 11248 2.1   128 82 32 29 18 22 15 1.5   233 3765 2770 3674 2270 980 1.7	All Male/Temale	5-24 25-34 35-44 45-54 55-64 65+ ratio   101 202.14 19.284 13.265 11.248 2.1   126 23 23.936 13.265 13.48 2.1   125 37.66 5.70 3674 2.270 988 1.7	5:24 25-34 35-44 45-64 65-64 65+ ratio   101 20:14 19.284 13.265 11.248 2.1   126 82 32 29 18 2.1   128 82 32 29 18 2.1   223 3766 570 3674 2.70 988 1.7   203 3765 9491 1072 36133 2.3 3.6 1.7   162 4030 3475 2.4555 24655 1.651 1.4 1.4	5-24 25-34 35-44 45-54 55-64 65+ rato   101 20214 19284 13308 13265 11248 2.1   111 20214 19284 13308 13265 11248 2.1   121 305 2.0 305 2.0 306 1.7   223 3766 5.20 3674 2.70 968 1.7   048 1267 3614 2.70 363 2.3 1.7   048 127 3533 2.3 2.3 1.7 1.7   14 12 7 7 5 8 1.7	-24 25-34 35-44 45-54 55-64 65+ ratio   101 20214 19284 18388 13265 11248 21   128 82 32 23 22 36 23 23   223 3765 57.0 3674 270 988 17   223 3765 547 114.067 90.491 61072 35 133 2.3   048 126.457 114.067 90.491 61072 35 133 2.3   1662 40380 34753 22.455 1655 1.4   14 7 7 7 5 8 1.7   0705 966 9367 7425 4436 3049 2.0	5:24 25:34 35:44 45:564 65:4 65:4 ratio   101 20:21 19:284 13:265 11:248 2:1   126 9:23 29:395 13:265 11:248 2:1   126 9:27 3:74 2:70 968 1:7   223 3:76 5:70 3:67 2:70 988 1:7   223 3:76 9:71 10:72 3:133 2:3 1:7   104 126:47 13:73 2:3 2:3 1:4 1:4   14 12 475 2:455 1:651 1:4 1:7   075 9562 2:30 2:415 1:051 1:4 1:7   078 2:652 2:30 2:21 2:21 1:4 1:7 1:4	5-24 25-34 35-44 45-54 55-64 65+ rato   101 20214 19284 13398 13265 11248 21   111 20214 19284 13398 13265 11248 21   123 88 23 354 273 289 17   223 3766 510 988 1.7 98 1.7   048 12647 3644 2.70 988 1.7   048 12647 3453 2456 1651 1.4   14 12 7 7 5 8 1.7   078 2656 3367 7435 2436 206 20   078 2652 2330 2214 1051 2.1 2.7   077 252 2331 2214 1051 2.7 3.1 2.7   078 252 2331 2214 1051 2.7 1.6 2.7 1.7	5:24 25:34 35:44 45:64 65:64 65:4 ratio   101 20:14 19:284 13:08 13:265 11:248 2:1   126 8:2 22 29:44 19:396 12:64 26:1   223 3:66 5:70 3:64 27:0 988 17   223 3:66 5:77 3:64 2:70 988 17   408 12:47 2:270 9891 16172 35:33 2:3   682 4366 9547 7 5 8 17   14 12 7 5 44:36 34:99 2:1   14 12 7 5 8 17 14 14   15 662 2428 2:301 2:14 1051 2:1   16 2652 2428 2:01 2:14 1051 2:1   16 7:05 5:11 2:16 1055 2:1 2:1	$\begin{array}{ c c c c c c c c c c c c c c c c c c c$
18101 20214 19284 18398 13265 126 82 32 29 18 2223 3766 5270 3674 2270		18 101 20 214 19 284 18 398 13 265 126 82 32 29 18 2 223 3 766 5 270 3 674 2 270	18 101 20 214 19 284 18 388 13 265   126 82 32 22 18   2223 3766 5.70 3674 2.20   116 82 5.70 3674 2.70   116 1246 114.067 90.491 61.072   130 682 40380 37.652 24.655	18 101 20 214 19 284 18 398 13 265   126 82 32 29 18   2223 376 570 3674 270   116 048 126 457 114 067 90 491 61 072   30 62 4030 347 32 465 510   30 662 4030 347 32 465 7   31 41 12 7 7 5	18 101 20214 19284 18398 13265   126 82 32 32 18   2223 3766 5770 3674 2700   116 6477 114.067 9491 61.072   30.662 403 3474 54.65 67.02   30.662 403.60 37.33 24.55 24.655   6025 96.66 95.66 7.27 4.436	18 101 20 214 19 284 18 33 16   126 82 32 32 29 18   115 86 5.270 3674 19 270   116 048 124.457 144.067 90.491 61.072   30 662 40 380 34.753 32.455 24.655   14 12 7 7 7 5 6   14 12 7 7 7 5 6 456   14 12 7 7 7 5 6 456   6 0.366 9.366 9.366 7.425 4.436   6 0.366 9.366 7.435 2.436   6 0.365 2.438 2.301 2.743	18 101 20214 19284 18386 13265   126 82 32 23 18 23 18   2223 3166 570 3674 270 18 13265   3166 570 3674 270 3674 270 18   116 0481 126457 114.067 90.491 61.072 30.455 4655   30.66 0.366 0.356 7.75 2.455 4.456 6.025 9.06 2.745 4.436   6.025 9.666 9.366 7.26 4.36 6.32 7.248 7.06 7.24   6.33 7.44 7.78 1.005 7.204 7.24 7.24	18 101 20214 19284 18398 13265   126 82 22 32 39 13   2223 3166 5770 3674 2700 18   116 6477 114 067 9491 61072 3624   3062 4030 3455 2465 57 3455 2465   3062 9136 714 067 90491 61072   3062 401 12 7 2455 2465   6025 9666 356 742 4436   3078 2652 2438 201 2214   3078 2652 2438 201 2214   3078 2652 2438 201 2214   2160 5274 603 5404 4377	18 10 202.14 19.284 18.388 13.265   12.6 8.2 32 23 27.6 22.7   116 0.48 12.645 114.067 90.491 61072   30.66 2.03 34.75 32.45 46.5   30.66 4.0380 34.753 32.455 46.55   30.66 2.60 34.753 22.4655 46.65   14 12 7 7 7 5   6.025 96.66 3567 2.7455 44.95   3078 2.652 2.408 2.70 2.74   230 13.1 1366 138 8.2   230 19.1 166 3.74 371
5 126 82 32 44 2.223 3.766 5.270	14 15-24 25-34 35-44	5 126 82 32 44 2 223 3 766 5 270	5 126 82 32   14 2 223 3766 5 270   29 116 048 126 457 114 067   34 30 662 40 30 34 753	5 126 82 32   14 2.223 3766 5.270   29 116.048 126.457 114.067   94 3062 4.303 34.753   0 14 12 7	5 126 82 32   14 2 223 3 766 5 270   29 116 048 126 457 14 067   34 0 662 493 3 753   34 0 662 493 3 755   34 662 966 9 356	5 126 82 32   14 2.223 3.766 5.270   30 116.048 128.457 114.067   34 30.662 40.380 34.753   34 30.662 40.380 34.753   34 50.662 9.666 9.366   34 6.025 9.666 9.366   34 6.025 9.662 2.436	5 126 32   146 2223 3766 5270   150 116 048 126 571   140 128 141 067 143 067   141 12 403 128 174 067 174 067   141 12 403 128 144 067 144 067 143 067 143 067 143 067 143 067 143 067 153 175 175 175 175 175 175 175 175 175 175 176 175 176 176 175 176 175 176 175 176 175 176 176 175 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 176 <t< td=""><td>5 126 32 32   10 16 223 376 570   10 16 18457 144 67   14 30 347 144 67   14 3065 40380 347 57   14 3065 40380 347 57   14 675 566 9366 9366   14 675 2652 2428 7   10 3078 2652 2428 2428   21 643 5466 9366 3566   21 643 2652 2428 2428   21 643 5466 374 673   21 643 546 774 778   21 643 544 643 574 643</td><td>5 126 32 32   14 223 3766 5270   16 116 048 12457   14 057 04 124   14 067 40380 34 753   0 14 077 7 7   0 14 077 7 7   0 14 073 04 73   0 14 077 7 7   13 078 2665 9366 9366   04 3078 2652 2438 778   21 643 744 778 378   9 2160 193 169 1603</td></t<>	5 126 32 32   10 16 223 376 570   10 16 18457 144 67   14 30 347 144 67   14 3065 40380 347 57   14 3065 40380 347 57   14 675 566 9366 9366   14 675 2652 2428 7   10 3078 2652 2428 2428   21 643 5466 9366 3566   21 643 2652 2428 2428   21 643 5466 374 673   21 643 546 774 778   21 643 544 643 574 643	5 126 32 32   14 223 3766 5270   16 116 048 12457   14 057 04 124   14 067 40380 34 753   0 14 077 7 7   0 14 077 7 7   0 14 073 04 73   0 14 077 7 7   13 078 2665 9366 9366   04 3078 2652 2438 778   21 643 744 778 378   9 2160 193 169 1603
244 2 223	- 0–14 15–24 5 1 457 18 101	244 2 223	244 223   10529 116048 1   1 1884 30662	244 2 223   10 529 116 048 1   1 1884 30 662 14   0 14 30 14 14	244 2 223   10529 116048   1884 30662   1884 14   284 6025	244 2223   10529 116048 1   1 1884 30.662 14   2 284 6.025 3078   3 304 3.078 3078	244 2223   10529 116048 1   1884 30662 14   2323 062 14   233 078 14   234 6055 14   234 6075 14   234 5078 14   21 304 3078   21 643 643	244 2223   10 529 116 048 1   11 1884 3062 14 3062   1 1 1884 3062 14   2 2 2 34 3078   3 2 284 6 025   1 3 3 3 3   3 1 3 3 3   1 1 1 1 643	10 524 2.223   11 529 116 048 1   11 184 20 652 14   11 18 0 14 14   12 13 0 14 14   13 284 6.02 14 0.73   14 304 3.078 6.03 14   10 21 643 3.78 6.03   10 21 643 3.78 6.03   10 21 643 2.30 9.3   10 21 643 2.30 2.30
	55-64 65+ 2 982 1735 6 a		11 752 6 417 10 8 786 3 203	11 752 6 417 10 8 786 3 203 2 2 2	11 752 6 417 11 8 786 3 203 2 2 2 2 1 448 1 016	11 752 6 417 11 8 786 3 203 1 2 2 2 1 448 1 016 519 243	11 752 6 417 11 8 786 3 203 12 2 2 2 1 448 1 016 519 243 157 129	11752 6417 11 8786 3203 8786 3203 14 1448 1016 157 129 157 1989	11752 6417 11 8786 3203 14 1448 1016 519 243 157 129 1287 1989 1287 1989
020 01 000 10	35-44 45-54	01007 0070	31 128 10 07 0 14 421 12 376	31 128 10 0/0 14 421 12 376 4 3	31 128 10 0/U 14 421 12 376 4 3 2 820 2 282	31 128 10 0/U 14 421 12 376 4 3 2 820 2 282 788 613	31 128 10 0/U 14 421 12 376 4 3 2 820 2 282 788 613 178 189	31 128 10 6/0 14 421 12 376 4 3 2 820 2 282 788 613 178 189 1 379 1 349	51 128 10 0/0 14 421 12 376 2 820 2 282 788 613 178 189 1 379 1 349 82 63
C UCV 2V	25-34 3	007 27	4/ 420 J	4/ 420 0 17 628 1 3	4/ 420 3 17 628 1- 3 338 3 338	4, 440 0 17 628 1 3 338 3 338 1 001	4/ 420 5 17 628 1- 3 338 1 001 248	4/ 420 3 17 628 1- 3 338 1 001 248 1 542	4/420 3 17 628 1-1 3 338 1 001 248 1 542 76
	0-14 15-24		6 963 47 702 985 14 377	6 963 47 702 985 14 377 0 6	6 963 47 702 985 14 377 0 6 171 2 453	6 963 47702 985 14377 0 6 171 2453 179 1164	6 963 47 702 985 14 377 0 6 171 2 453 179 1164 13 301	6 963 47702 985 14377 0 6 171 2453 179 1164 13 301	6 963 47 702 985 14 377 0 6 171 2 453 179 1164 13 301 65 884 8 102
			28 716 7 348	28 716 7 348 6	28 716 7 348 6 2 033	28 716 7 348 6 2 033 808	28 716 7 348 6 2 033 808 402	28 716 7 348 6 6 2 033 808 402 3 732	28 716 7 348 6 6 2 033 808 402 3 732 49
			621 49 320 059 15 869	621 49 320 059 15 869 4 3	621 49320 621 49320 1059 15869 4 3 143 2988	621 49320 059 15869 4 3 143 2988 688 1695	621 49320 621 49320 4 3 6143 2988 688 1695 816 563	621 49320 059 15869 4 3 6143 2988 688 1695 816 563 1055 3084	621 49320 1059 15869 4 3 5143 2988 688 1695 816 563 816 563 75 48
	V VV 20		82 939 71 20 332 20	82 939 71 20 332 20 3	82 939 71 20 332 20 33 536 5	82 939 71 20 332 20 332 20 6 536 5 1 640 1	82 939 71 20 332 20 332 20 6 536 5 1 640 1 600	82 939 71 20 332 20 33 20 6 536 5 1 640 1 600 4 4 664 4	82 939 71 20 332 20 6 536 5 6 636 5 1 640 1 6 600 4 664 4 103
		I	79 037 22 752	79 037 22 752 9	79037 22752 9 6328	79037 22752 9 6328 1651	79037 22752 9 6328 1651 496	79 037 22 752 9 6 328 1 651 496 3 732	79 037 22 752 9 6 328 1 651 496 3 732 115
			566 68 346 899 16 285	566 68 346   899 16 285   0 8 8	566 68 346   899 16 285   0 8 1   113 3 572	566 68 346   566 68 346   899 16 285   0 8 0 8   113 3 572   125 1 914	566 68 346   899 16 285   0 8 8   1113 3 572   1125 1 914   8 342	566 68 346   899 16 285   0 8 0 8   113 3 572   125 1 914 8   8 342 8 342   8 342 1 276	566 68 346   899 16 285   0 8 9   113 3 572   125 1 914   8 342 3   43 1 276   1 128 3
			3 5 6 6 8 9 5	3566 895 C	3566 899 0 115	3566 899 899 113 125	3566 899 899 113 125 8	3566 899 899 112 125 8 44	3566 8999 8999 113 125 8 25 42 42 42 42
			India	India Indonesia Maldives	India India Maldives Myanmar	India Indonesia Maldives Myanmar Nepal	India Indonesia Myanmar Nepal Sri Lanka	India Indonesia Maldives Nepal Sri Lanka Thailand	India Indonesia Maddives Myammar Nepal Sri Lanka Thailand Timor Laste

Table A3.8 New smear-positive case notification by age and sex, absolute numbers, DOTS and non-DOTS, South-East Asia, 2006

For some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who.int/tb

Table A3.9 New sm	ear-posi	itive cá	ase not	ificatic	on rate	s by aç	je and	sex, D(	DTS ai	-uou pr	-DOTS	, South	h-East	Asia, 2	900						
				MALE						۳.	EMALE							ALL			
	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14	15-24	25-34	35-44	45-54	55-64	65+
Bangladesh	2	61	96	131	197	265	354	3	53	68	69	79	27	59	3	57	82	101	140	171	200
Bhutan	0	82	93	56	72	69	72	5	87	57	31	38	40	59	2	84	11	45	56	55	65
DPR Korea	5	78	135	159	180	138	79	ę	39	80	105	108	68	30	4	59	108	132	144	102	47
India	2	59	84	113	127	149	104	4	45	55	46	36	36	21	ę	52	20	81	83	93	60
Indonesia	б	75	115	125	173	237	128	e	68	89	89	109	119	45	ę	72	102	107	141	175	82
Maldives	0	21	36	17	35	49	100	0	17	13	26	26	33	36	0	19	25	21	31	41	69
Myanmar	2	75	147	195	208	225	167	ę	53	17	81	86	66	68	2	64	112	137	145	159	112
Nepal	2	67	83	121	173	279	185	e	43	49	50	55	72	42	ę	55	65	83	110	166	103
Sri Lanka	0	19	37	43	65	69	70	-	17	17	12	15	18	19	0	18	27	28	40	43	42
Thailand	1	25	76	98	93	117	173	-	18	30	26	28	46	68	-	22	52	60	60	80	113
Timor-Leste	0	113	159	207	196	219	334	e	95	115	153	166	140	147	2	104	138	179	181	177	238
SEAR	2	61	91	118	140	170	129	4	48	61	55	52	54	32	3	54	76	87	97	112	11

Rates are per 10000 population of each ageises group. Rates are calculated excluding those countries for which breakdown of notified cases or population by age and sex is insisting. Data can be downloaded from www.who.intt/b

1980–2006
Asia,
South-East
notified,
cases
Щ
Number of
3.10
Table A:

	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
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 (	33 471 (	33 420 7	2 256 7	2 688 6.	75 557 7	76 302 8	31 963 8	38 1 56 5	8 336 12	3 1 1 8 1 4	5 186
Bhutan	1 539	2 657	720	1 017	904	1 073	1 582	608	1 126	1 525	1 154	966	140	108	1 159	1 299	1271	1 211	1 292	1 174	1 140	1 037	1 089	1 026	988	1 007	917
DPR Korea									0									11 050	1152 1	2 287 3	34 131 2	29 284 4	40 159 4	1 810 4	4 602 4	2 7 22 4	4 558
India	705 600	769 540	923 095 1	075 098 1	109 310 1	168 804 12	?79 536 1 4	103 122 14	57 288 1 5	10 500 1 5	19 182 15	555 353 1 1.	21 120 1 0	8127911	14 374 12	18 183 1 2	90 343 11,	32 859 1 1	12 002 1 21	8 743 111	15 718 1 06	35 075 1 06	30 951 1 07	3 282 1 13	6 182 1 15	6 248 1 22	8 827
Indonesia	25 235	32 461	33 000	31 809	32 4 32	17 681	16750		97 505 1	05 516	74 470	60 808	38 458 N	52 966	49 647	35 529	24 647	22 184 4	0 497 6	19 064 8	34 591 5	32 792 15	55 188 17	4 174 21	0 229 25	4 60 1 27	7 589
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	66
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	4 756 1	9626 3	30 840 4	12 838 5	57 012 7	5744 9	6 662 10	7 009 12	2 472
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 2	4 135 2	7 356 2	29 519 2	29 5 19	30 359 3	0 925 3	1 979 3	3 448	32 67 0
Sri Lanka	6 212	6 288	7 334	6 666	6376	5 889	6 596	6 411	6 092	6429	6 666	6174	6 802	6 809	6 132	5 956	5 366	6 542	6 925	7 157	8 413	7 499	8 939	8 9 9 8	8 562	9 249	8510
Thailand	45 704	49 452	48 553	65 413	69 2 4 0	77 611	52 152	51 835	50 021	44 553	46 510	43 858	47 697	49 668	47 767	45 428 3	39.871	30 262 1	5 850 2	9413 3	34 187 4	19 656 4	19 581 5	54 504 8	5 306 E	7 895 5	6 230
Timor-Leste	0																						2 760	2 760	3 716	3 767	3 586
SEAR	837 901	915 952 1	076 211 1	244 819 1 2	275 299 1 3	323 509 14	113 4 18 1 5	520 444 16	67 348 1 7	35 860 1 7	19 365 17	747 252 1 3.	22 709 1 24	87 176 1 2	98 759 14	01 096 1 4	70 352 1 30	38 981 1 2.	9 041 1 46	4 312 141	14 228 1 4	14 141 148	38 126 1 55	51 516 1 68	6 681 175	9 186 1 92	0 644
Number reporting	10	6	6	6	6	6	6	œ	10	6	6	6	80	6	6	6	6	10	10	10	10	10	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

From 1995 on, number shown is all notified new and relapes cases (DOTS and non-DOTS). The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.inttb

Table A3.11 Case	notifica	ation ra	ates, S	outh-E	East A	sia, 19	380-20	90(																		
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991 1	992 1:	993 15	94 19:	95 195	96 199	7 1996	3 1995	3 200	0 2001	2002	2003	2004	2005	2006
Bangladesh	45	47	53	55	47	42	44	43	41	41	43	48	27	45	, 98	45 4	19 4	8 54	1 56	3 2	4 54	4 57	60	65	80	93
Bhutan	364	612	162	223	193	223	319	118	212	281	211	183	26	21	26 2:	56 2!	50 23-	4 244	4 216	3 20-	4 181	184	169	159	158	141
DPR Korea																	ũ	- - -	5	4	9 127	7 173	179	190	181	188
India	102	109	128	146	147	152	162	174	177	179	177	177	125	118	19 1.	28 1;	33 11.	4 105	3 115	9 10	7 102	98	96	102	102	107
Indonesia	17	21	21	20	20	11	10		55	59	41	33	52	33	26	18	12 1	1 20	33	64	0	3 71	29	94	113	121
Maldives	46	69	99	83	69	50	59	59	42	97	20	55	40	74	103	33	34 6	7 67	7 57	4	8 5(	4	48	41	41	33
Myanmar	38	37	35	31	31	29	29	31	24	28	31	37	41	45	37 .	42	51 3	9 36	3 4	3 6	26 27	2 122	161	203	223	253
Nepal	7	2	6	4	-	0	-	9	6	59	53	46		64	74	91 1(	73 10	6 100	3 115	5 12	1 118	3 119	119	120	123	118
Sri Lanka	42	41	48	43	40	37	41	39	37	38	39	36	39	38	34	33	29 3.	6 37	7 35	3 4	5 4(	97	47	45	48	44
Thailand	98	104	100	133	138	153	101	66	94	83	86	80	86	88	84	) 62	39 5	1 27	7 45	3	.8 0	1 80	88	88	92	89
Timor-Leste																						308	289	367	353	322
SEAR	79	85	97	110	110	112	117	124	133	135	131	131	97	93	92	97 1(	)0 B(	8 84	36 t	2 90	0 8	92	94	101	105	112

Rates are per 100 000 population. From 1995 on, number shown is notification rate of new and relapse cases. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.ho.in/tb

							Number o	f cases											Rate (	per 100 0	00 popula	ttion)					
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 2	2006	1993 1:	994 19	95 195	6 1997	1998	1999	2000	2001	2002	2003	2004 2	005 20	90
Bangladesh	18 993	1 710	20 524	29 674	33 117	37 737	37 821	38 4 84	40 777	46811	53 618	62 694	84 848 1	101 967	16	+	16 2	3 25	28	28	28	29	32	36	42	55 (	65
Bhutan		352	367	308	284	270	315	347	359	364	360	356	308 3	312		69	72 (	1 55	51	58	62	63	62	59	57	48	48
DPR Korea					3 980	403	5 073	16 440	14 429	18 576	17 392	18 479	17 796 1	18 435				18	5	22	72	62	80	74	79	75	78
India	225 256	226 543	264 515	290 953	274877	278 275	345 150	349 374	384 827	395 833	433 564	489 195	508 890 5	553 851	25	24	28	0 28	28	34	33	36	37	39	44	45	48
Indonesia	62 966	49 647	31768	11 790	19492	32 280	49 172	52 338	53 965	76230	92 566	128 981	158 640 1	175 320	33	26	16	6 10	16	24	25	25	35	42	58	02	1
Maldives	126	125	114	106	95	88	88	65	59	60	68	99	66 £	53	53	52	46 4	2 37	. 33	33	24	21	21	24	23	22	18
Myanmar		946	8 68 1	9 7 1 6	9 695	10 089	11 458	17 254	21 161	24 162	27 448	31 408	36 541 4	t0 241		2	20	22 22	22	25	88	46	52	58	99	76 8	83
Nepal	6 679	10 442	8 59 1	10 365	11 323	11 306	13 410	13 683	13 683	13714	14 348	14 614	14 617 1	14 028	32	49	40	7 50	48	56	56	55	54	55	55	25	51
Sri Lanka	3 335	3 405	3 049	2 958	3 506	3 761	3 911	4314	4 316	4 297	4 321	4 302	4 868 4	1 442	19	19	17	6 19	20	21	23	23	23	23	23	25	23
Thailand		20 260	20 273	16 997	13214	7 962	14 934	17 754	28 363	25 593	28 459	28 421	29762 2	29 081		36	35 2	9 22	13	25	29	46	41	46	45	47	46
Timor-Leste										1 090	1 027	1 014	1 035 5	307									122	108	100	97	81
SEAR	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 9	138 637	23	22	25 2	5 25	25	31	32	35	37	41	47	51	55
																											1

Table A3.12 New smear-positive cases notified, numbers and rates, South-East Asia, 1993-2006

Rates are per 100 000 population. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.in/tb

## Notes

#### India

The population estimate used by the NTP (1114 million) is lower than that of the United Nations Population Division (1151 million). Using the smaller population estimate gives a notification rate for new smear-positive cases of 50 per 100 000 population, and a smear-positive case detection rate of 66%.

## **WESTERN PACIFIC**

## Western Pacific

#### NTP MANAGER (OR EQUIVALENT); PERSON FILLING OUT DATA COLLECTION FORM (IF DIFFERENT)

American Samoa	Faatuai Faoa
Australia	Krissa O'Neil; Paul Roche
Brunei Darussalam	Hjh Kalsom Binti Abdul Latif; Bheemayya 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	Ngapoko Short; Tae Nootutai
Fiji	Joe Koroivueta
French Polynesia	Axel Wiegandt
Guam	Cecilia Teresa T. Arciaga
Japan	Satoru Miyake; Seiya Kato; Nobukatsu Ishikawa
Kiribati	Taketiau Beiriki; Monica Timan; Sno Bereka Reider
Lao PDR	Phannasinh Sylavanh; Phonenaly Chittamany
Malaysia	Abdul Rasid bin Kasri; Fuad bin Hashim
Marshall Islands	Kenner Briand; Risa J. Bukbuk
Micronesia	Mayleen Jack Ekiek
Mongolia	D. Khandaasuren; Naranbat Nymadawa; Tseveen Tserenbaljid
Nauru	Isabella Amwano
New Caledonia	Bernard Rouchon; Oksana Segur
New Zealand	Alison Roberts; Ingrid Hamilton
Niue	Kara Okesene Gafa; Minemaligi Pulu
Northern Mariana Is	Richard Brostrom; Susan Schorr
Palau	Henrietta Merei
Papua New Guinea	Paul K. Aia; Rajendra Yadav
Philippines	Rosalind Vianzon; Anna Marie Celina Garfin; Arlene Rivera
Rep. Korea	Jeoum Ja Kim; Hee Jin Kim
Samoa	Siniva Sinclair; Serafi Moa
Singapore	Wang Yee Tang; Khin Mar Kyi Win
Solomon Islands	Noel Itogo
Tokelau	Tekie losefa; Faimanifo M. Peseta
Tonga	Louise Fonua; Saia Penitani
Tuvalu	Nese Ituaso Conway
Vanuatu	Markleen Tagaro
Viet Nam	Dinh Ngoc Sy
Wallis & Futuna	

This list shows the people named on the data collection form sent to WHO in 2006, not necessarily the current NTP manager. It is intended as an acknowledgement rather than a directory.

	h	cidence,	1990	Prev	alence, 1	1990 TE	3 mortality,	1990		1		Incidence	s, 2006.	1		1	ľ	revalence	, 2006		TB	mortality,	2006		HIV prevalence
	All forms*	3	Smear-positive	e*	All forms*		All forms	*.	All form	lS*	All forms I	+/ -	Smear-positi	ve* Sr	near-positive	+NH+	All form	s*	All forms H	+/1	All forms	*	All forms H	+>	in incident
	number	rate	number ri	ate nu	umber	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	number	rate	TB cases (%)
American Samoa	9	12	ო	5	13	28	-	С	9	6	I	I	ო	4	I	I	8	12	I	I	× ۲	vi T	I	I	I
Australia	1 120	7	502	e	1 140	7	112	v T	1 3 2 9	9	33	v F	595	e	12	v L	1 341	7	17	v L	133	v t	e	vi T	2.5
Brunei Darussalam	193	75	86	33	301	117	35	14	317	83	28	7	140	37	10	3	377	66	14	4	43	11	7	2	8.9
Cambodia	56 806	586	24 707 2	3255 8	38 702	915	11 549	119	70 949	500	6 841	48	31 243	220	2 394	17	94 4 33	665	3 420	24	13 054	92	2 279	16	9.6
China	1 338 563	116	602 288	52 365	15 881	322	275 833	24	1 311 184	66	4 135	v F	589 619	45	1 447	v T	2 658 377	201	2 068	v L	200 820	15	1 170	vi T	0.3
China, Hong Kong SAR	5355	94	2 410	42	5 475	96	461	8	4 4 3 3	62	1	I	1 995	28	I	I	4 5 3 3	64	I	I	381	5	I	I	I
China, Macao SAR	258	69	116	31	272	73	27	7	283	59	I	ı	127	27	I	ı	283	59	I	ı	21	4	I	I	I
Cook Islands	4	22	2	10	7	39	v L	e	2	16	I	I	v T	7	I	I	3	24	I	I	v L	ю	T	T	I
Fiji	303	42	136	19	453	63	49	7	184	22	۸ ۲	vi L	83	10	۸ ۲	vi L	254	30	v.	v L	25	с	×	vi Vi	0.3
French Polynesia	145	74	65	33	290	148	30	15	68	26	1	I	31	12	I	ı	75	29	T	ı	6	с	I	I	I
Guam	69	51	31	23	137	103	14	11	64	37	I	I	29	17	I	ı	83	49	I	I	10	9	I	I	ı
Japan	58 085	47	26 123	21 7	6 348	62	7 033	9	28 330	22	118	۸ ۲	12 736	10	41	v L	37 490	29	59	۲ ۲	3 486	ę	13	v.	0.4
Kiribati	369	513	166 2	31	834 1	1 162	83	115	348	372	I	1	157	168	ı	ı	376	402	I	1	42	45	I	I	1
Lao PDR	7 283	179	3 277	80 1	9386	476	1 533	38	8779	152	161	ę	3 934	68	57	v L	16 846	292	81	-	1 368	24	5	Ň	1.8
Malaysia	21625	119	9 691	54 5	14 805	192	3 897	22	26 877	103	2 964	11	11 798	45	1 037	4	32 554	125	1 482	9	4 515	17	857	ო	11.0
Marshall Islands	143	302	64 1	36	324	685	32	68	127	220	1	ı	57	66	I	ı	140	241	T	ı	16	28	I	I	I
Micronesia	182	188	82	85	301	313	32	33	112	101	I	ı	50	45	I	ı	121	109	I	ı	14	12	I	I	ı
Mongolia	4 880	220	2 196	1 66	2 615	569	1 147	52	4 893	188	7	s 1	2 201	85	2	s 1	4 962	191	4	s 1	398	15	< 1 	s 1	0.1
Nauru	13	146	9	66	30	330	ς	33	11	106	1	ı	5	48	I	ı	14	134	T	ı	2	15	I	I	I
New Caledonia	156	91	70	41	196	114	22	13	63	27	I	ı	28	12	I	ı	83	35	I	ı	6	4	I	I	ı
New Zealand	346	10	155	5	352	10	35	1	352	6	4	≤	158	4	2	s 1	358	6	2	≤	35	≤1	≤ 1	≤	1.3
Niue	t	59	≤1	26	e	133	×1	13	≤	43	I	I	<u>۱</u>	19	I	I	-	85	I	I	≤1	6	I	I	I
Northern Mariana Islands	45	103	20	46	102	233	6	21	61	75	I	I	28	34	I	I	74	06	I	I	80	10	I	I	I
Palau	11	70	5	32	13	89	≤ 1	9	10	51	I	I	5	23	I	I	10	51	I	I	≤ 1	4	I	I	I
Papua New Guinea	10 307	250	4 636 1	12 5	32 639	790	2 803	68	15 473	250	618	10	6 901	111	216	e	31830	513	309	5	3 006	48	164	e	4.0
Philippines	206 099	337	92 741 1	51 50	11 677	819	48 946	80	247 740	287	151	vi t	111468	129	53	vi Vi	372 841	432	75	vi L	38 995	45	49	v T	0.1
Rep. of Korea	70 946	165	31918	74 5	14 666	221	8 024	19	42 359	88	314	N ۲	19 030	40	110	v t	59 219	123	157	vi t	4 790	10	34	ı<	0.7
Samoa	51	32	23	14	71	4	œ	ŝ	36	19	I	I	16	6	I	I	47	25	I	I	2 2	ო	I	I	I
Singapore	1 493	50	671	22	1 560	52	169	9	1 128	26	31	v t	505	12	11	v L	1 113	25	15	vi t	98	7	e	v T	2.7
Solomon Islands	915	292	412 1	31	2 072	661	205	65	655	135	I	I	295	61	I	I	939	194	I	I	111	23	I	I	I
Tokelau	× 1	56	۸ ۲	25	2	127	v L	6	N 1	56	I	ı	v L	25	1	ı	2	112	I	ı	N 1	12	I	I	I
Tonga	32	34	14	15	51	54	9	9	24	25	I	I	11	11	I	I	34	34	I	I	с	ю	T	T	I
Tuvalu	48	508	22	29	108 1	1150	10	106	31	295	I	I	14	133	I	I	53	504	I	I	9	55	I	I	I
Vanuatu	140	94	63	42	318	213	32	21	128	58	I	1	58	26	I	ı	144	65	I	1	17	8	I	I	I
Viet Nam	133 986	202	60 239	91 25	13 649	444	25 750	39	148 918	173	7 416	6	66 271	-17	2 596	ю	193 946	225	3 708	4	19 819	23	1 910	0	5.0
Wallis & Futuna	6	63	4	28	20	143	2	14	7	46	1	I	3	21	I	I	6	60	I	I	1	7	I	I	I
WPR	1 919 985	127	862 944	57 486	4 814	322	387 894	26	1 915 285	109	22 823	-	859 596	49	7 988	v	3 512 972	199	11 412	v,	291240	17	6 545	v	1.2
								2						2										i	

Table A3.1 Estimated burden of TB, Western Pacific, 1990 and 2006

- indicates no estimate - indicates no estimate - indicates of all year and mortality estimates induce patients with H/V. Estimates of TB in H/V-positive people (all ages). Estimates for all years are re-calculated as new information becomes available and techniques are refined, so they may differ from those - published provinsity. See Explanatory notes on page 167 of further details. Data can be downloaded from www.hnb.infb

		5					DT Protection			DOTO	a subline d				ſ	a stale sta					ć		
	1				N and			CdSes, DO	o alla			1 00000			Marrie and an	Letonic	Ce alla cas	Core dete	I dies				
	Population A	All notified	New and rel	apse	SS+		ss-/unk. pu		Lew L	Relapse Aft	ter failure Afte	r default Ot	ther re-treat.	- Other Is	b. confirm.	all forms	SS+	all new	new ss+	.ss (% of		(% of	(% of
	thousands	number -	number	rate	number	rate	number	number n	umber	number	number	number	number	number	number	number	number	%	%	pulm.) nev	v+relapse) I	new+relapse)	new+re-treat.)
American Samoa	65	4	4	9	3	5		-							3	9	e	69	115	100	75	25	
Australia	20 530	1 203	1 159	9	269	-	405	451	0	32	0	4	36	4	602	1 329	595	85	45	40	23	39	9
Brunei Darussalam	382	202	202	53	128	34	15	35	12	12					144	317	140	60	91	06	63	17	9
Cambodia	14 197	35 466	34 660	244	19 294	136	6 875	7 800		691	71	26	209		19 294	70 949	31243	48	62	74	56	23	4
China	1 320 864	1 011 388	940 889	71	468 291	35	382 492	38 294	4 286	47 526	3 003	3 800	23 689	40 007	468 291	1 311 184	589 619	68	79	55	50	4	80
China, Hong Kong SAR	7 132	5 773	5 356	75	1 547	22	2 900	669	0	210	0	13	404	0	3 236	4 433	1 995	116	78	35	29	13	11
China, Macao SAR	478	437	374	78	144	30	174	45	0	11	0	4	20	39	281	283	127	128	113	45	39	12	6
Cook Islands	14	-	-	7	0	0	0	-	0	0	0	0	0	0	0	7	-	47	0			100	
Fiji	833	114	114	14	73	6	22	18	0	1	0	0	0	0	73	184	83	61	88	77	64	16	1
French Polynesia	259	69	69	27	24	6	28	15	0	2	0	0	0	0	51	68	31	<del>8</del> 6	78	46	35	22	ю
Guam	171	4	4	26	21	12	15	8	0	0	0	0	0	0	21	64	29	69	73	58	48	18	
Japan	127 953	26 384	25 304	20	10 159	8	9 0 9 8	5 203		844			1 080		10 159	28 330	12 736	86	80	53	40	21	7
Kiribati	94	379	378	404	129	138	121	124		4	0	0	-	0	129	348	157	107	82	52	34	33	1
Lao PDR	5 759	3 994	3 958	69	3 041	53	457	325	0	135	18	18	0		3 183	8 779	3 934	4	77	87	77	80	4
Malaysia	26114	16 665	16 051	61	9 414	36	4 336	1 920	0	381	23	164	427		15 311	26 877	11 7 98	58	80	68	59	12	9
Marshall Islands	58	148	138	238	45	78	43	41		6			6	1	45	127	57	101	79	51	33	30	12
Micronesia	111	113	104	94	41	37	37	23	0	e	9	0	9	0	54	112	50	6	82	53	39	22	11
Mongolia	2 605	5 216	5 049	194	2 129	82	724	1 922	0	274	91	35	41	0	2 129	4 893	2 20 1	98	97	75	42	38	8
Nauru	10	12	12	118	2	20	4	4	2	0	0	0	0	0	2	11	5	112	42	33	17	33	
New Caledonia	238	50	48	20	6	4	22	10	0	7	0	0	0	2	27	63	28	65	32	29	19	21	15
New Zealand	4 140	355	344	8	97	2	103	105	30	6	0	0	11	0	156	352	158	95	61	49	28	31	6
Niue	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0				
Northern Mariana Islands	82	51	51	62	15	18	32	4	0	0	0	0	0	0	18	61	28	83	5	32	29	80	
Palau	20	12	12	59	9	30	2	4	0	0	0	0	0	0	9	10	5	116	129	75	50	33	
Papua New Guinea	6 202	13 532	12 620	203	1 948	31	5 969	4 575		128			912		2 076	15 473	6 90 1	81	28	25	15	36	80
Philippines	86 264	148 217	147 305	171	85 740	66	55 964	1 445	0	4 156	74	52	786	0	86 308	247 740	111468	58	77	61	58	-	ო
Rep. of Korea	48 050	46 284	37 861	79	11 513	24	18 804	5 044		2 500	147	356	3 699	4 221	16 584	42 359	19 030	83	60	38	30	13	16
Samoa	185	26	25	13	13	7	œ	7	0	7	-	0	0	0	13	36	16	64	80	62	52	œ	12
Singapore	4 382	1 420	1 314	90	538	12	525	183	0	68	4	6	83	10	889	1 128	505	110	107	51	41	41	12
Solomon Islands	484	371	371	77	124	26	168	74	0	5	0	0	0	0	124	655	295	56	42	42	33	20	1
Tokelau	+	0	0	0	0	0	0	0	0	0	0	0	0	0	0	+	0	0	0				
Tonga	100	18	18	18	14	4	e	-	0	0	0	0	0	0	15	24	1	74	127	82	78	9	
Tuvalu	10	6	6	86	4	38	3	2	0	0	0	0	0	0	4	31	14	29	29	57	44	22	
Vanuatu	221	132	126	57	42	19	37	47	0	0	-	-	0	4	42	128	58	86	73	53	33	37	2
Viet Nam Wallis & Futuna	86 206 15	98 284	97 363	113	56 437	65	16 645	17 711		6570	558	363			56 437	148 918 7	66 271 3	61	85	11	58	18	ø
WPR	1 764 231	1 416 373	1 331 333	75	671 254	38	506 031	86136	4332	63 580	3 994	4 845	31 913	44 288	685 707	1 915 285	859596	99	78	57	50	9	8

Table A3.2 Case notifications and case detection rates, DOTS and non-DOTS combined, Western Pacific, 2006

ss+ indicates sputum smear-positive; ss-, sputum smear-realit, in,", sputum smear result unknown; re-treatment, pulm.lab. confirmed, pulmonary case confirmed by positive smear or outure. See Explanatory notes on page 137 for further details. Data can be downloaded from www.who.in/tb
						TE caeo	e ronortad fro	m DOTS	eonicoe					ſ	Ectimator	d incidence	and race date	action rate			ontione	
	DOTS			Ž	omind we	onarv	New extra-	Other	SAUVIES	Re-treatm	ent cases			New pulm.	Estimated	ncidence	Case dete	ection rate	+SS+	SS+	Extrapulm.	Re-treat.
0	coverage	New and re	lapse	SS	t.	ss-/ unk.	pulmonary	new	Relapse A	After failure Ai	fter default Or	ther re-treat.	Other	lab. confirm.	all forms	SS+	all new	new ss+	(% of	(% of	(% of	(% of
	%	number	rate	numbe	sr rate	number	number	number	number	number	number	number	number	number	number	number	%	%	pulm.) ne	ew+relapse)	new+relapse) r	new+re-treat.)
American Samoa	100	4	9		3 5		+							3	9	3	69	115	100	75	25	
Australia	97	1 053	2	23	8	361	423	-	30	0	4	36	4	527	1 329	595	77	40	40	23	40	9
Brunei Darussalam	100	202	53	12	8 34	15	35	12	12					144	317	140	60	91	90	63	17	9
Cambodia	100	34 660	244	19 29	4 136	6 875	7 800		691	71	26	209		19 2 94	70 949	31243	48	62	74	56	23	4
China	100	940 889	71	468 29	1 35	382 492	38 294	4 286	47 526	3 003	3 800	23 689	40 007	468 291	1 311 184	589 619	68	79	55	50	4	ø
China, Hong Kong SAR	100	3 785	53	111	6 16	2 045	482	0	142	0	12	303	0	2 2 0 7	4 433	1 995	82	56	35	29	13	11
China, Macao SAR	100	374	78	14	4 30	174	45	0	11	0	4	20		281	283	127	128	113	45	39	12	6
Cook Islands	80	-	7	-	000	0	-	0	0	0	0	0	0	0	2	-	47	0			100	
Fiji	100	114	4	7.	3	22	18	0	-	0	0	0	0	73	184	83	61	88	77	64	16	-
French Polynesia	100	69	27	5	4 9	28	15	0	2	0	0	0	0	51	68	31	98	78	46	35	22	e
Guam	100	44	26	2	1 12	15	80	0	0	0	0	0	0	21	64	29	69	73	58	48	18	
Japan	66	25 060	20	10 06	89 89	9 012	5 143		837			1 070		10 068	28 330	12 736	86	79	53	40	21	7
Kiribati	100	378	404	12	9 138	121	124		4	0	0	-	0	129	348	157	107	82	52	34	33	t
Lao PDR	100	3 958	69	3 04	1 53	457	325		135	18	18			3 183	8 779	3 934	44	77	87	77	80	4
Malaysia	100	16 051	61	941	4 36	4 336	1 920	0	381	23	164	427		15311	26 877	11 798	58	80	68	59	12	9
Marshall Islands	100	138	238	4	5 78	43	41		6			6	-	45	127	57	101	79	51	33	30	12
Micronesia	98	104	94	4	1 37	37	23	0	ę	с	0	9	0	54	112	50	06	82	53	39	22	11
Mongolia	100	5 049	194	212	9 82	724	1 922	0	274	91	35	41	0	2 1 2 9	4 893	2 201	98	97	75	42	38	8
Nauru	100	12	118		2 20	4	4	2	0	0	0	0	0	2	11	2	112	42	33	17	33	
New Caledonia	100	48	20		9	22	10	0	7	0	0	0	2	27	63	28	65	32	29	19	21	15
New Zealand	100	344	8	6	7 2	103	105	30	6	0	0	11	0	156	352	158	95	61	49	28	31	9
Niue	100	0	0		0 0	0	0	0	0	0	0	0	0	0	-	0	0	0				
Northern Mariana Islands	100	51	62	<del>, `</del>	5 18	32	4	0	0	0	0	0	0	18	61	28	83	54	32	29	ø	
Palau	100	12	59		6 30	2	4	0	0	0	0	0	0	9	10	2	116	129	75	50	33	
Papua New Guinea	40	8 165	132	148	1 24	3 241	3 315		128					1 609	15 473	6 901	52	21	31	18	41	7
Philippines	100	147 305	171	85 74	66 0	55 964	1 445	0	4 156	74	52	786	0	86 308	247 740	111 468	58	77	61	58	-	ო
Rep. of Korea	100	9 982	21	343	7 7	5 442	145		964	0	95	950	696	4 892	42 359	19 030	21	18	39	34	1	18
Samoa	100	25	13	-	3 7	80	2	0	2	-	0	0	0	13	36	16	64	80	62	52	8	12
Singapore	100	1 314	30	53	8 12	525	183	0	68	4	6	83	10	889	1 128	505	110	107	51	41	14	12
Solomon Islands	100	371	11	12	4 26	168	74	0	5	0	0	0	0	124	655	295	56	42	42	33	20	1
Tokelau	0													_	-	0						
Tonga	100	18	18	÷	4 14	e	-	0	0	0	0	0	0	15	24	11	74	127	82	78	9	
Tuvalu	100	6	86		4 38	33	2	0	0	0	0	0	0	4	31	14	29	29	57	44	22	
Vanuatu	100	126	57	4	2 19	37	47	0	0	-	-	0	4	42	128	58	98	73	53	33	37	2
Viet Nam	100	97 363	113	5643	7 65	16 645	17 711		6570	558	363			56 4 37	148 918	66 271	61	85	27	58	18	80
Wallis & Futuna															7	3						
WPR	100	1 297 078	74	662 15	2 38	488 956	79 672	4 331	61967	3 847	4 583	28 141	40 997	672 353	1 915 285	859 596	64	77	58	51	9	7
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Table A3.3 DOTS coverage, case notifications and case detection rates, Western Pacific, 2006

ss+ indicates sputum smear-positive; ss-, sputum smear-realit, i.m., sputum smear result unknown; re-treat. re-treatment; pulm.lab. confirmed, pulmonary case confirmed by positive smear or cuture. See Explanatory notes on page 187 for further details. Data can be downloaded from www.wh.in/tb

Table A3.4 Laborat	tory servic	es, collab.	orative TI	B/HIV acti	vities and	managem	ent of MDR	:-TB, Wes	tern Paci	fic, 2005–2	006						
		Laboratory ser	vices, 2006			20(	05 05	Ilaborative T	B/HIV activiti	es 20(	06			Managem	nent of MDR-TE	3, 2006	
				smear labs	TB pts		+VIH	+NH	TB pts		+VIH	+VIH					
	number of	Flabs working w	ith NTP	included	tested for	TB pts	TB pts	TB pts	tested for	TB pts	TB pts	TB pts	Lab-confirmed	DST	MDR	Re-treatment	Re-treatment
	smear	culture	DST	in EQA	≥H	HIV-positive	CPT	ART	>IHI	HIV-positive	CPT	ART	MDR	in new cases	in new cases	DST	MDR
American Samoa	107	ç	c	107	0	Ş	c			ŝ	c	,	5	100	ţ	ç	9
Australia Brunei Darussalam	121	5. 1	ø	121	163	20	NC		202	7	ņ	-	77	LGR	7L	60	01
Cambodia	186	. 6.	÷	186	1 044	96	,	,	3547	342	239	120	C	C	C	C	C
China	3 010	360	- 06	2770	-	8		_	1350	18	26	09	~		0 0	10	0 0
China. Hong Kong SAR	- 1	- 1	g -		4 209	35	17	19	4511	33 5	19	15	35 -	3 338	27	388	1 00
China, Macao SAR	80	-	-	-	378	-	0	-	398	5	0	7	4	251	2	27	0
Cook Islands	-	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Fiji	4	-	0	4	132	-	0	0	114	ę	2	2	0	43	0	-	0
French Polynesia	4	2	2	0	30	0	0	0	26	0	0	0	0	40	0	2	0
Guam	ю	2	2	ю	46	0	0	0	40	0	0	0	-	34	-	0	0
Japan																	
Kiribati	1	0	0	0	44	2	0	0									
Lao PDR	155	0	0	135				_	404	51							
Malaysia	241	1	1		11 66 1	1 468			13 0 39	1438			42				
Marshall Islands					86	0			103	0			2	38		3	
Micronesia	5	0	0	4	7	0	0	0	55	0	0	0	2	21	2	2	2
Mongolia	36	1	1	36	1	1	1	1	1	1	1	1	98	48	6	250	89
Nauru	2	2			0	0	0	0	0		0	0	0	0	0	0	0
New Caledonia	ю	ю	-	-	21	0	0	0	25	0	0	0	-	41	-	0	0
New Zealand	10	10	3	10	140	8			129	10			1	250	1	16	0
Niue					0	0	0	0	0	0	0	0	0	0	0	0	0
Northern Mariana Islands	-	0	0	-	56	0	0	0	50	0	0	0	2	18	2	0	0
Palau	-	0	0	-	6	0	0	0	6	0	0	0	0	0	0	0	0
Papua New Guinea	60	-	-	15				_						0		0	
Philippines	2 374	n j	ю ·	2 374				_					403	33	19	424	384
Kep. of Korea	260	12	-														
Samoa	-	0	0	-	2	0	0	0	0	0	0	0	0	0	0	0	0
Singapore	4	2	2	4									9	861	e	101	с
Solomon Islands	6	1	1	6	0	0	0	0	0	0	0	0	0	364	0	5	0
Tokelau	0	0	0	0	0	0	0	0	0								
Tonga	-	0	0	-				_									
Tuvalu	-		0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	9	0	Э	9	0	0	0	0	0	0	0	0					
Viet Nam	874	18	2	740	14 128	595		_	14 230	708							
Wallis & Futuna						0											
WPR	7 390	458	122	6 433	32 605	2 221	20	21	38 672	2 632	290	201	629	6 331	89	1 298	498

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ART indicates antiretroviral frerapy; CPT, co-trimoxazole preventive therapy; DST, drug susceptibility testing; EQA external quality assurance; HIV+, HIV-positive; pis, patients. See Explanatory notes on pages 187 for further details. Some countries provided the number of TB patients found to be HIV-positive; pis, patients setually tested, and cannot be used to calculated a regional estimate of HIV prevalence in TB patients. Data can be downloaded from www.who.in/tb

Table A3.5 Treatme	ant outco	mes, W	estern	Pacif	ic, 20(	05 coh	lort				ŀ			:		:					Ī				:					
				New sn	lear-pos	Itive cas	ses, DOT	s						New	smear-p	OSITIVE C	ases, noi	2100-6					מ	near-po	sitive re-	treatmer	nt cases,	DOLS		
			%			%	s of cohor	t		ļ	%			%	ļ		% of co	nort			%				%	of cohort				%
	Number	of cases	of notif		Compl-			~	rans- N	lot		Number of	cases	of notif	റ്റ	-Idm			Trans-	Not		Number		Compl-			-	rans- 1	Vot	
	Notified	Regist'd	regist'c	1 Cured	eted	Died	Failed .	Default f	erred e	val. Su	Iccess	Notified	Regist'd	egist'd C	ured e	ted Die	ed Faile	d Defaul	ferred	eval. S	uccess	Regist'd	Cured	eted	Died	Failed D	befault fe	erred e	val. Su	seese
American Samoa	ę	4	133	75					25	0	75											-	0	100	0	0	0	0	0	100
Australia	219	219	100	12	68	6		2	6	0	80	22	22	100	44	68 1	8			0	82	39	18	56	ę	0	2	18	0	74
Brunei Darussalam	101	101	100	99	5	7	0	2	20	0	71											2	40	40	20	0	0	0	0	80
Cambodia	21 001	21001	100	89	4	e	0	2	2	0	93											1 306	49	27	6	2	e	4	7	76
China	472 719	472719	100	92	2	7	-	-	-	2	94											89 239	85	2	e	б	-	-	e	6
China, Hong Kong SAR	1 266	1 266	100	74	3	5	11	3	2	1	77	295	295	100	3	1	3 1	0	0	93	3	568	50	23	5	11	8	2	2	73
China, Macao SAR	136	136	100	93	0	4	0	+	-	-	93											37	51	24	11	0	0	з	11	76
Cook Islands	-	-	100	100	0	0	0	0	0	0	100											0							0	
Fiji	63	68	108	71	0	10	0	10	-	7	71											0							0	
French Polynesia	21	18	86		89	11	0	0	0	0	89											4	0	75	25	0	0	0	0	75
Guam	27	27	100	85	0	1	0	0	4	0	85											7	50	0	0	0	50	0	0	20
Japan	9 297	10819	116	38	22	11	3	1		26	60	1 634	112	7	24	21	4 5	2		44	46	1 980	29	16	8	2	2	0	43	45
Kiribati	124	123	66	62	31	7	0	-	0	0	93											с С	100	0	0	0	0	0	0	100
Lao PDR	2 806	2 802	100	85	5	2	-	e	-	0	06											181	75	12	9	2	2	0	-	87
Malaysia	8 446	8 446	100	69	-	6	0	2	9	10	70											1 056	46	6	ø	-	6	80	19	55
Marshall Islands	48	47	98	85	2	2		2	6	0	87											20	60	10	0	0	0	30	0	20
Micronesia	32	20	63	75	5	10	£	0	2	0	80											6	1	89	0	0	0	0	0	100
Mongolia	1 868	1 868	100	82	9	e	2	e	2	0	88											443	39	34	6	11	4	2	0	73
Nauru	0	3		0	67	33	0	0	0	0	67											1	0	0	0	0	0	0	100	0
New Caledonia	16	16	100	88	9	9	0	0	0	0	94											7	86	0	14	0	0	0	0	86
New Zealand	83	84	101	0	60	9	0	1	9	27	60											18	0	67	0	0	0	22	11	67
Niue	0	0																				0							0	
Northern Mariana Islands	15	15	100	73	0	0	0	0	27	0	73											0							0	
Palau	e	e C	100	100	0	0	0	0	0	0	100											0							0	
Papua New Guinea	1 346	1 292	96	57	14	4	-	19	5	0	71	459										65	42	14	15	9	20	e	0	55
Philippines	81 647	81 125	66	83	~ 0	~ ~	- ,	4 •	~ ;	0 0	88	000										100 0	¢,	¢	c	¢	c	0	c	ł
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Solomon Islands	160	040	99 100	97	86	tα		v 4	- c	- c	2 a											р и †	0 0	6 V	2 0	0 0				80
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Tonga	1	11	100	73	C	18	C	C	σ	c	73	5										C							c	
Tuvalu	22	9	120	100	0	0	0	0	0	0	100											0							0 0	
Vanuatu	35	42	120	64	17	10	7	2	0	0	81											0							0	
Viet Nam	55 492	55 492	100	06	0	ę	-	-	2	0	92											7 374	79	4	5	9	ę	ę	0	83
Wallis & Futuna	-																													
WPR	661 322	662 254	100	89	ę	2	-	-	÷	2	92	10 290	429	4	6	10	4	0	0	75	18	105 843	81	9	ę	ę	2	2	4	87
	1		:								1		1			2				:	2		;							8

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 is not recorded); success, sum of cured and completed; then the number of cases registered in 2005 is used, or 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 registered in 2005 is used, or 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 2005 is used, or the sum of outcomes if the latter is greater. Data can be downloaded from www.who.in/th

				Dolog	TOT on	ų			ľ				After fail		ų			╞			٩f	tor dofa	H DOT				Γ
				%	of cohor	, ,			%				0 %	of cohort			%				Ċ	% of 0	phort			%	
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American Samoa		1								,																	
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Fiji Forset Behmedie	•	5	0	0	0	0	0	c	0 4	-	0	0	-	o	0	0		5	0	5	D	D	0	0			5
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Japan	862	41	22	o 6	<b>ი</b> თ	0 01	>	23	62	>	Þ	Þ	Þ	0	5	5		0	5	5	þ	0	5	5	5		>
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Lao PDR	140	78	10	9	-	4	0	-	88	15	47	33	7	7	7	0	0	80	26	77	12	0	0		0		88
Malaysia	332	50	11	7	0	9	8	18	60	29	41	3	0		0	. 0	55	45	239	44	7	10	1	2 1	0 15		51
Marshall Islands	13	85	15					0	100																		
Micronesia	-		100					0	100										-	100					0	1	8
Mongolia	216	53	21	11	6	5	2	0	74	94	30	35	10	20	1	2	2	65	31	39	23	. 9	13 1	0 1	0	6	31
Nauru	-	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
New Caledonia	-	100	0	0	0	0	0	0	100	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
New Zealand	10	0	60	0	0	0	30	10	60	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Niue	0	0	0	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	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Palau	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0		0	0		0
Papua New Guinea	65	42	14	15	9	20	ę	0	55																		
Pen of Korea	1 074	92	¢	0	÷	ų	74	C	68	Ľ	00	00	c		c		, 05	10	125	40	0	0	0	0	2		Į,
Samoa	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0			0
Singapore	60		80	18	0	0	0	2	80										80		63	13	0		0 25		33
Solomon Islands	5	20	40	20	20	0	0	0	60	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Tokelau																											
Tonga	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Tuvalu	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Vanuatu	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0		0
Viet Nam	6 325	81	4	2	Ω	7	e	0	85	577	64	e	Q	19	Ð	4	0	68	399	67	5	7	5	<del>.</del>	2		72
Wallis & Futuna									Ť									+									Τ
WPR	59 750	83	5	3	e	÷	2	e	88	784	56	80	9	18	4	4	4	64	904	55	8	7	4	3	4 6		52

Table A3.6 Re-treatment outcomes, Western Pacific, 2005 cohort

Not eval: indicates not evaluated (percentage of registered cases for which outcomes were not recorded); success, sum of outed and completed, cases regist(d, the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes. The number of cases registered for treatment in 2005 is used as the denominator for calculating treatment outcomes.

			DOTS	new sm	Par-nos	tive tres	atments	SSECON	(%)		:	╞		ć	OTS new	smear-r	ositive	case de	tection r	rate (%)			
	1994	1995	1996	1997	1998	1999	2000	2001	2002 2	003 2	2004 2	005 1	995 1	996 15	397 1990	3 1996	2000	2001	2002	2003	2004	2005	2006
American Samoa		100			50	100	100	100	100	100	67	75			232	117	. 78	78	39	78	77	116	115
Australia				99	75	84	74	66	78	82	85	80			2	50	23	19	25	6	32	39	40
Brunei Darussalam					85	76	63	56	84	60	71	71				91	91	91	91	91	91	91	91
Cambodia	84	91	94	91	95	93	91	92	92	93	91	93	40	34	45 44	25	1 20	48	57	62	62	68	62
China	9	96	96	96	97	96	95	96	93	94	94	94	15	29	32 3.	30	31	31	30	43	64	80	62
China, Hong Kong SAR					85	78	76	78	79	78	80	77				9	. 67	61	65	66	64	61	56
China, Macao SAR	75			81		78	89	86	89	88	89	93	88	136	164 15	0	96	98	06	66	101	107	113
Cook Islands	100	100	100	100		67			100			100	126	65	136			165	87		95	66	
Fiji	6	86	86	91	60	92	85	85	78	86		71	57	60	59 6.	3 62	61	74	78	85	70	74	88
French Polynesia		67	95	100	74	85	97	80	82	83	80	89		74	86 7;	5 76	202		75	59	89	65	78
Guam						94	93	71	68	96	100	85					147	161	106		76	94	73
Japan						76	70	75	76	76	57	60					23	32	37	46	51	67	79
Kiribati					83	88	91	86	94	88	94	93			7 3.	37	. 34	40	52	63	06	62	82
Lao PDR		70	55	65	80	79	22	76	75	79	86	06		24	33 4	45	40	41	47	48	57	72	77
Malaysia		69				06	78	79	76	72	56	70	64	68			73	73	70	69	67	72	80
Marshall Islands					83	82	91	86	100	90	06	87			1	30	19	26	31	35	68	84	62
Micronesia	64	80				95	93	100	91	92	80	50	12	19			24	13	38	47	65	62	82
Mongolia			78	86	84	86	87	87	87	87	88	88	7	9	31 6	1 66	63	74	76	70	82	85	97
Nauru						50	25	100	50			67					74	38	39	20			42
New Caledonia	62	75			20	77	89	84	85	75	94	94	43	55		4	50	50	75	43	60	60	32
New Zealand							30	6	60	36	68	60					40	41	51	62	65	50	61
Niue									100										273				
Northern Mariana Islands						80	81	74	71	75	88	73					103	72	78	59	51	55	54
Palau	64	67	75					100	38	80	100	100	184	81	141				183	103	104	64	129
Papua New Guinea				93	72	99	63	67	53	58	65	71			÷-	2	2	8	15	16	17	20	21
Philippines	80		82	83	8	87	88	88	88	88	87	89	0	0	3 1	20	48	56	61	67	72	74	77
Rep. of Korea	71	76	71	82					83	82	80	83	30	60	56 6.	2				26	23	20	18
Samoa	50	80	100		86	94	92	22	84		100	91	73	44	71	86	0/ 10	60	107	69	65	99	80
Singapore	88	86				95	85	88	87	11	81	83	62	27			16	28	51	57	87	102	107
Solomon Islands		65	73	92	92		81	89	60	87	87	85		25	31 4	0 27	. 32	36	33	44	49	56	42
Tokelau																							
Tonga	89	75	82	75	94	80	93	92	83			73	67	106	85 12	8	123	67	196	95	20	86 86	127
Tuvalu											100	100										35	29
Vanuatu						88	88	88	79	75	06	81				4	44	81	53	68	101	09	73
Viet Nam Wallis & Futuna	91	91	06	85	93	92	92	8 00 00	92 100	92	93 100	92	80	59	78 8.	8	82	59 83	30	85 213	88	8 28	85
WPR	06	91	93	93	95	94	92	93	06	91	91	92	16	28	32 3:	33	37	39	39	50	65	11	77
	:	;	3	;	2	5	5	8	8	5	5	5	2	2	5	;	;	;	;	;	;	:	:

Table A3.7 DOTS treatment success and case detection rates, Western Pacific, 1994-2006

Treatment success, sum of cured and completed; DOTS new smear-positive case detection rate, notified new smear-positive cases divided by estimated incident cases. The table includes updated information, data shown here may differ from those published in previous reports. Data can be downloaded from www.who.in/tb

				•																		
				Male						-	emale							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	4554	55-64	65+	ratio
American Samoa										-		2					-		2			
Australia	-	33	35	23	21	16	43	2	18	27	14	7	6	21	e	51	62	37	28	25	64	1.8
Brunei Darussalam	2	10	11	12	13	10	1	-	5	11	80	11	4	6	ę	15	22	20	24	14	20	1.4
Cambodia	50	791	1 486	2 205	1 902	1 689	1 665	44	749	1 330	1 839	2 072	1 915	1 557	94	1 540	2816	4 044	3 974	3 604	3 222	1.0
China	1 023	44 528	48 232	56 733	54 301	53 746	68 557	1 408	30 904	26 526	24 564	18 7 75	17 782	21212	2431	75 432	74 758	81 297	73 076	71528 8	9 769	2.3
China, Hong Kong SAR	e	73	86	136	175	161	443	6	59	98	74	55	41	134	12	132	184	210	230	202	577	2.3
China, Macao SAR	0	15	9	17	32	19	19	-	7	œ	6	4	с	4	+	22	14	26	36	22	23	3.0
Cook Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fiji	0	8	11	4	7	2	4	-	12	2	9	4	9	0	-	20	16	10	11	11	4	1.1
French Polynesia	-	-	-	e	e	+	-	-	9	-	0	0	2	e	2	7	2	e	e	e	4	0.8
Guam	0	-	-	2	с	2	9	0	0	0	-	-	2	2	0	-	-	ę	4	4	ø	2.5
Japan	e	175	436	529	743	1 388	3 728	5	179	361	280	213	256	1863	80	354	797	809	956	1 644	5 591	2.2
Kiribati	e	18	18	16	18	ę	7	5	15	2	5	-	8	e	80	33	23	21	19	11	10	2.0
Lao PDR	12	145	245	340	406	345	354	13	109	196	221	228	222	205	25	254	441	561	634	567	559	1.5
Malaysia	15	507	855	734	678	443	496	e	30	300	403	321	257	161	18	537	1 155	1 137	666	700	657	2.5
Marshall Islands		4	e	4	9	ę	2	2	2	e	e	7	4	2	2	9	9	7	13	7	4	1.0
Micronesia	14	21	e	9	8	9	-	5	23	2	7	4	9	4	19	4	80	13	12	12	ŝ	1.1
Mongolia	7	317	335	241	157	64	41	16	372	265	180	81	24	29	23	689	600	421	238	88	70	1.2
Nauru	0	-	0	0	0	0	0	0	0	0	-	0	0	0	0	-	0	-	0	0	0	1.0
New Caledonia	0	0	e	-	-		-	0	-	0	0	0	0	2	0	-	ო	-	-	0	С	2.0
New Zealand	5	14	5	8	4	3	7	1	12	12	12	3	9	4	9	26	17	20	7	6	11	0.9
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	2	e	-	0	0	0	2	2	ю	-	0	-	0	7	4	9	2	0	-	0.7
Palau	1	0	+	2	1	0	0	0	0	1	0	0	0	0	+	0	2	2	1	0	0	5.0
Papua New Guinea	32	221	220	122	84	48	e	41	226	215	142	75	24	3	73	447	435	264	159	72	9	1.0
Philippines	419	7 878	11697	13 478	12 733	8 074	4 640	379	4 337	5 746	5 630	5 007	3 485	2 237	798	12 215	17 443	19 108	17 740	11 559	6 877	2.2
Rep. of Korea	19	652	1 109	1 223	1 406	955	1 698	27	579	859	507	403	371	1 705	46	1 231	1 968	1 730	1 809	1 3 2 6	3 403	1.6
Samoa		e	2	-	-	٢	2		с			-				9	2	-	2	٢	2	2.5
Singapore	2	7	31	67	107	75	106	0	19	22	22	22	27	31	7	26	53	89	129	102	137	2.8
Solomon Islands	-	13	11	4	4	14	80	4	16	14	6	14	80	4	5	29	25	13	18	22	12	0.8
Tokelau																						
Tonga	0	-	0	0	-	2	4	0	-	-	7	0	0	0	0	7	-	2	-	2	9	1.3
Tuvalu	0	1	0	0	0	0	0	0	1	0	1	1	0	0	0	2	0	1	1	0	0	0.3
Vanuatu	-	5	e	-	4	4	0	2	7	6	2	4	0	0	e	12	12	ę	ø	4	0	0.8
Viet Nam	49	3 761	7 549	8 931	8 717	5 037	7 408	62	1827	2 381	2 036	2 283	1 996	4 400	111	5 588	9 930	10 967	11 000	7 033 1	1 808	2.8
Wallis & Futuna																						
WPR	1663	59 204	72 397	84 846	81 537	72 114	89 255	2 032	39 521	38 404	35 981	29 600	26 458	33 598	3 695	98 725	110 801 1	120 827 1	111 137	98 572 12	2 853	2.2

Table A3.8 New smear-positive case notification by age and sex, absolute numbers, DOTS and non-DOTS, Western Pacific, 2006

some countries, breakdown of notified cases by age and sex is missing, or is provided for a subset of cases. See Explanatory notes on page 187 for further details. Data can be downloaded from www.who.hvfb

For

0.000	200			AALE		5	200	1 (200	50		EMALE		5	5	8		∢	F			
	0-14	15-24	25–34	35-44	4554	55-64	65+	0-14	15-24	25-34	35-44	4554	55-64	65+	0-14 1	5-24 2	5-34 3	5-44 4	5-54 5	5-64	65+
American Samoa	c	c	c	c	-	*	c	c	*	c	*	c	-	-	c	c	c	-	•	•	c
Brunei Darussalam	<b>)</b> က	29	3 0	4 4	57	92	177	0 0	15	28 4	- 28	0.09	- 09	151	<b>o</b> m	22 4	29	35	- 09	- 08	164
Cambodia	2	46	163	303	397	604	1071	2	45	143	221	343	483	527	2	46	153	259	367	533	714
China	-	39	45	47	63	96	139	-	30	26	22	23	8	40	-	34	36	35	4	99	87
China, Hong Kong SAR	-	16	17	24	29	46	111	2	13	17	10	6	12	29	-	15	17	16	19	29	67
China, Macao SAR	0	37	20	46	71	81	120	e	17	22	17	6	16	20	-	27	21	29	40	52	64
Cook Islands																					
Fiji	0	6	17	8	16	19	25	1	15	8	12	6	21	0	0	12	13	10	13	20	11
French Polynesia	ю	4	5	14	20	11	15	e	24	5	0	0	25	42	ю	14	2	7	10	18	29
Guam	0	7	œ	15	29	31	113	0	0	0	80	10	32	33	0	4	4	12	20	31	70
Japan	0	2	2	9	6	15	8	0	e	4	e	e	e	12	0	ę	4	ŝ	9	6	22
Kiribati																					
Lao PDR	-	23	59	119	201	363	396	-	17	46	73	109	203	182	-	20	52	95	154	277	277
Malaysia	0	20	41	41	49	56	92	0	1	15	23	24	34	26	0	11	28	32	37	45	57
Marshall Islands																					
Micronesia	64	157	42	117	176	249	53	24	189	73	129	88	243	173	45	172	57	123	132	246	119
Mongolia	7	105	141	132	142	122	93	4	126	113	96	70	43	49	e	116	127	114	105	81	68
Nauru																					
New Caledonia	0	0	16	9	7		4	0	2	0	0	0	0	22	0	2	ø	ę	4	0	18
New Zealand	1	5	2	3	1	٢	3	0	4	4	4	1	3	1	1	4	3	3	1	2	2
Niue																					
Northern Mariana Islands							_														
Palau																					
Papua New Guinea	2	36	47	34	37	40	4	e	38	46	39	8	20	4	ო	37	46	37	35	30	4
Philippines	ĉ	6	172	270	362	383	310	e	51	86	113	139	160	120	ო	71	130	191	249	269	205
Rep. of Korea	0	18	27	29	39	43	87	-	18	22	13	11	16	61	+	18	25	21	25	29	72
Samoa		16	17	ø	13	25	52		19			15				17	6	4	14	13	23
Singapore	0	2	11	17	27	32	09	0	7	œ	2	9	12	15	0	2	6	11	16	22	36
Solomon Islands	1	25	27	16	26	145	110	4	8	38	37	91	85	56	e	29	32	26	58	115	83
Tokelau							_														
Tonga Tuvalu	0	6	0	0	33	83	136	0	10	16	45	0	0	56	0	6	œ	22	15	37	92
Vanuatu	2	21	19	80	50	79	0	5	32	57	16	51	0	0	e	26	38	12	50	41	0
Viet Nam	0	42	104	152	215	256	332	-	21	33	34	55	96	171	0	31	68	92	134	174	246
Wallis & Futuna							Ī														
WPR	-	39	51	56	74	96	129	-	28	28	25	28	36	42	-	34	40	41	51	67	83
Rates are per 100 000 popul	lation of each	variane	Croin B.	ates are o	alculated	avoluding	those of	untries for	which hrea	sk down of	notified cs	or no sest	outation h	ane and w	t cev ic mice	ing Data	can he d	abadawa	d from ww	w who int	4ŧ
רמובא מו ב לבו יהה ההה להלור	וומותוו הי במהי	I ayerser	Aluup. 1	מובא מות ר	alculation	SAUDUUN	1 niose c	MILLING IN		IN UNIVERSITY OF		1 IN 6260	Duld uori L	ny ayo ann	Y 30Y IS III ST	anny. vara				MINDER WITCHING	

			>	555 65		6																				
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989 1	990 1	991 1	992 19	993 15	94 199	5 199	6 1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
American Samoa	2	9	9	80	12	5	80	6	13	5	6	ę	-	4	4		0 6	ę	4	ę	ę	2	ę	5	9	4
vustralia	1457	1 386	1 270	1 219	1 299	1088	906	907	954	952 1	016	950 1	011 \$	91 10	107 107	ç,	1 145	899	1073	1 043	980	1 013	949	1 059	1 046	1 159
3runei Darussalam	196	285	245	276	256	238	212	189	126	128	143		180	160			160		272	307	216	230	206	176	163	202
Cambodia	2 576	1 980	8 158	7 572	10 24 1	10 145	10 325	9 106 1	10 691	7 906 6	501 10	903 16	148 132	270 151	72 14 60	3 14 85	7 15 629	16 946	19 2 6 6	18 891	19 170	24 610	28 216	30 838 3	35 535 3	4 660
China	0		98 654	117 557	151564 2	226 899 2	265 095 2	51 600 3(	04 639 31	0 607 375	481 345	000 320	426 344 2	218 363 8	04 515 76	4 504 75	8 466 394	445 704	449 518	454 372	470 221	462 609 6	315 868 7	790 603 85	34 428 94	0 889
China, Hong Kong SAR	8 065	7 729	7 527	7 301	7 843	7 545	7 432	7 269	7 021	6704 6	510 6	283 6	534 6 (	537 6.3	19 621	2 6 50	1 7 072	7 673	5605	6 015	6 788	6 277	5 914	5 684	5 660	5 356
China, Macao SAR	1 101	585	233	455	671	571	420	389	320	274	343	329	294 2	285	40	2 57	0 575	465		449	465	388	371	309	355	374
Cook Islands	80	2	12	15	e	80	ę	2	0	2	0	-	9	5	4	2	1 2	0	e	-	2	-	0	-	-	-
ili.	210	180	163	185	165	230	199	173	162	218	226	247	240	183 2	25 20	3 20	0 171	166	192	144	183	148	185	134	132	114
French Polynesia	76	99	65	78	80	78	85	80	63	73	59	49	83	78	89	8	6 91	105	93	62	62	64	50	60	63	69
Buam	55	41	49	48	5	37	49	34	41	75			60	20	94					54	63	51	22	50	63	4
lapan	70 9 16	65 867	63 940	62 021	61521	58 567	56 690	56 496 5	54 357 5	3 112 51	821 50	612 48	956 48 4	161 44 4	25 43 07	8 42 12	2 42 190	44 016	40 800	39 384	35 489	32 828	31638	29 736 2	27 194 2	5 304
(iribati	146	187	193	127	111	103	129	110	208	121	68	91	100	66	53	32	7 464	276	255	252	189	196	284	310	332	378
.ao 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 (	1 1 1	35 83	0 144	0 1 923	2 149	2420	2 227	2 418	2 621	2748	3 162	3 777	3 958
Aalaysia	11218	10 970	11 944	11 634	10 577	10 569	10 735	11 068 1	10 944 1	0 686 11	702 11	059 11	420 12 2	285 117	08 1177	8 12 65	1 13 539	14 115	14 908	15 057	14 830	14 389	15671	14 986 1	5 342	3 051
Aarshall Islands	9	7	12	15	12	15	37	32	11	7		26	52	61		ω,	6	49	41	34	56	51	60	117	111	138
Aicronesia	0		67	73	75	66	09	98	77	68	367	350	111	151	73 17	2 12	6 107	123		91	104	127	66	118	98	104
Aongolia	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 4	118 17	30 278	0 4 06	2 3 592	2915	3 348	3 109	3 526	3 829	3 918	4 542	4 601	5 049
Jauru	0	2	8	0	0	0	80	9	80	0	7				4				2	4	e	5	ę		11	12
Jew Caledonia	108	128	120	171	144	104	98	74	111	128	143	140		104	97 8	7 10	4 88	06	78	94	61	65	38	61	47	48
Jew Zealand	474	448	437	415	404	359	320	296	295	303	348	335	317 2	274 3	52 39	1 35	2 321	365	447	344	377	329	386	371	332	344
Viue	-	0	2	с	-	0	5	0	ę		0		2	Ļ	2	0	2 0	0	1	0	0	4	0	0	0	0
Vorthern Mariana Islands	0	26	75	74	58	64	16	56	27	28	28		67		46 4	ф ф	1 93	67	66	75	58	53	45	53	57	51
alau	17	10	17	14	20	26	13	38	17	с		9	4	25	41 1	6	5 15		32			1	6	5	10	12
<sup>2</sup> apua New Guinea	2 525	2 508	2 742	2 955	3 505	3 4 5 3	2 877	2 251	4 261	3 396 2.	497 3	401 2	540 7 4	451 5.3	35 8 04	1 315	5 7 977	11 291	13 0 0 3	10 520	12 658	11 197	12 798	12 743 1	2 564	2 620
hilippines	112 307	116 821	104 715	106 300	151863	151 028	153 129 1	63 740 16	33 113 21	7 272 317	008 207	371 236	172 178	134 1800	44 11918	6 165 45	3 195767	162 360	145 807	119 914	107 133	118 408	132 7 59	130 530 13	37 100 14	7 305
Rep. of Korea	89 803	98 532	100 878	91 572	85 669	87 169	88 789	87 419 7	74 460 7	0 012 63	904 57	864 48	070 46 9	999 381	55 4211	7 3931	5 33 215	34 66 1	32 075	21 782	37 268	34 967	33 843	34 389 3	38 290 3	7 861
Samoa	59	49	43	41	37	43	65	29	29	37	44	44	26	49	45 4	5	1 32	23	31	43	53	31	27	34	24	25
Singapore	2710	2 425	2 179	2 065	2 143	1952	1 760	1 616	1 666	1617 1.	591 1	841 1	778 18	330 16	577 188	9 195	1 1977	2 120	1805	1 728	1 536	1 516	1581	1 414	1 356	1 314
Solomon Islands	266	313	324	302	337	377	292	334	372	488	382	309	364	367 3	32 35	2 25	9 318	295	289	302	292	256	293	340	397	371
okelau	0	-	0	0	0	2	0	6	٢	0	-	-	-		0	2	0		0	0	0		0		0	0
onga	64	49	45	50	54	49	35	24	14	36	23	20	29	33	23	0	2 21	30	22	24	12	29	16	12	18	18
uvalu	33	18	12	23	6	32	27	22	24	26	23	30	30	28	19 3	6		18	14	16	16	13	30		12	6
/anuatu	178	92	173	196	188	124	131	06	118	144	140	230	193	114 1	52 7	9 12	6 184	178	120	152	175	101	104	115	76	126
/iet Nam	43 062	43 506	51 206	43 185	43875	46 941	47 557	55 505 (	52 463 5	2 270 50.	203 59	784 56	594 52 9	994 517	63 5573	9 74 71	1 77 838	87 468	88 879	89 792	90 728	95 044	92 741	98 173 9	34 916 9	7 363
Vallis & Futuna	23	24	5	17	14	14		34	1	30		22	4	11	11	6	8 14				1	19	15		7	
VPR	356 452	355 337	461 550	462 181	540 985 6	315153 6	351 840 6.	55 006 71	16 427 74	1913 894	073 760	863 754	463 718	7242	90 82495	4 873 42	5 870 920	834 599	820 469	786 285	805 105	811482 9	980 890 1	160 130 1 27	4 124 1 3:	1 333
Jumber reporting	36	33	36	36	36	36	35	36	36	35	32	31	35	33	33	6	1 31	30	32	34	35	35	36	32	36	35
6 reporting	100	92	100	100	100	100	97	100	100	20	89	86	97	92	92 8	1	6 86	83	89	94	97	97	100	89	100	97

Table A3.10 Number of TB cases notified, Western Pacific, 1980–2006

From 1995 on, number shown is all notified new and relapes cases (DOTS and non-DOTS). The table includes updated information: data shown here may differ from those published in previous reports. Data can be downloaded from www.wio.int/tb

Table A3.11 Case n	otificati	on rat	es, We	stern	Pacifi	c, 198(	0-2006																			
	1980	1981	1982	1983	1984	1985	1986	1987 1	988 1	989 1	990 1	991 19	92 195	3 1994	4 199	5 1996	1997	1998	1999	2000	2001	2002	2003	2004	2005 2	006
American Samoa	9	18	17	22	32	13	19	21	29	11	19	9	2			0	11	2	7	2	2	e	2	80	6	9
Australia	10	6	80	œ	80	7	9	9	9	9	9	9	9	9	9	6	9	2	9	2	2	2	2	2	2	9
Brunei Darussalam	102	143	120	131	118	107	92	80	52	51	56		66 5	7			52		84	92	63	66	58	48	44	53
Cambodia	38	29	114	102	132	125	123	104	118	84	67	109 1	55 12	13.	7 12	3 127	7 130	138	154	148	147	186	209	225	255	244
China			10	1	14	21	24	23	27	27	33	30	27 2	50 31	6	4	38	36	36	36	37	36	47	61	68	71
China, Hong Kong SAR	160	150	144	137	145	138	135	131	126	119	114	109 1	11 10	9 10	4 10	103	111	118	85	90	101	92	86	81	80	75
China, Macao SAR	437	226	87	163	229	186	131	117	92	76	92	86	75 7	2	6	3 136	136	108		102	104	85	80	99	75	78
Cook Islands	45	11	68	85	17	45	17	11	0	11	0	9	33	28	5	-	11	0	18	9	13	7	0	7	7	7
Fiji	33	28	24	27	24	32	28	24	23	30	31	34	32 2	24 31	0 2(	3 26	22	21	24	18	23	18	23	16	16	14
French Polynesia	50	42	41	47	47	45	48	44	34	38	30	25	41 3	8	2	36	41	46	40	26	26	26	20	24	25	27
Guam	52	38	4	42	46	31	40	27	32	57			43 5	90	ø					35	40	32	13	30	37	26
Japan	61	56	54	52	51	48	47	46	44	43	42	41	39 3	19 3I	6 3-	4 35	33	35	32	31	28	26	25	23	21	20
Kiribati	267	333	335	214	182	164	200	166	304	172	95	124 1	35 13	12 33	2	417	582	340	309	300	221	225	320	343	361	404
Lao PDR	246		145	141	191	121	42	93	190	75	45	46	23 4	1 2	5	30	39	43	47	43	45	49	50	57	67	69
Malaysia	82	78	83	78	69	67	67	67	64	61	65	59	60 6	3	ي 8	200	) 62	64	99	65	62	59	63	59	60	61
Marshall Islands	20	22	36	43	33	39	92	76	25	15		54 1	05 12	5		115		95	62	65	106	95	110	211	196	238
Micronesia			86	91	06	77	68	109	84	72	381	354 1	10 14	16: 16:	3 16	117	99	114		85	97	118	91	108	89	94
Mongolia	70	64	76	84	89	157	143	120	121	103	75	71	66 6	1 7:	3 11(	3 165	148	119	136	126	142	153	155	178	178	194
Nauru	0	26	104	0	0	0	96	20	91	0	27			4	+				20	40	30	50	30		109	118
New Caledonia	76	88	81	114	94	67	62	46	68	76	84	80	78 5	2 2	4	22	3 44	44	37	4	28	29	17	26	20	20
New Zealand	15	14	14	13	13	11	10	6	6	6	10	10	6	8 11	0	1	6	10	12	6	10	8	10	6	8	8
Niue	29	0	64	100	35	0	190	0	125		0		89 4	4 8	8	91	0	0	51	0	0	228	0	0	0	0
Northern Mariana Islands		139	355	308	214	213	49	157	20	68	64	-	35	čó	00 00	8	5 149	150	66	109	81	72	59	68	71	62
Palau	139	80	134	108	150	191	94	269	118	21		39	25 15	55 24	7 11	1 26	93		169			56	45	25	50	59
Papua New Guinea	62	77	82	86	66	95	77	59	109	84	60	80	58 16	37 110	6 17	1 66	161	221	248	195	229	198	221	215	207	203
Philippines	234	237	207	205	286	278	275	287	314	363	518	331 3	68 27	26	8 17	1 236	3 273	222	195	157	138	149	164	158	162	171
Rep. of Korea	236	255	257	230	212	214	215	210	177	165	149	134 1	10 10	16 81	6 9	4 87	73	75	69	47	79	74	71	72	80	79
Samoa	38	32	28	26	24	27	41	18	18	23	27	27	16 3	10 2	7 2	7 18	3 19	13	18	24	12	17	15	19	13	13
Singapore	112	98	86	80	81	72	64	57	58	55	53	59	56 5	99	ů 0	4	53	56	46	43	37	36	37	33	31	30
Solomon Islands	116	132	132	119	128	139	104	116	125	160	122	96 1	10 10	17 9-	4 9.	7 80	83	75	71	73	68	58	65	74	84	77
Tokelau	0	64	0	0	0	126	0	559	62	0	62	63	64		0 13	20			0	0	0		0		0	0
Tonga	99	51	47	53	58	53	38	26	15	38	24	21	30	34	4	1 23	21	31	22	24	12	29	16	12	18	18
Tuvalu	410	221	145	274	106	370	307	245	263	280	244	315 3	12 26	19:	5 36	2		179	138	157	156	126	290		115	86
Vanuatu	152	77	141	156	146	94	67	65	83	66	94	150 1	22 7	IG 0.	94	5 72	: 103	98	65	80	06	51	51	55	35	57
Viet Nam	81	80	93	76	76	79	79	06	83	81	76	88	82 7	5	7	301	103	114	114	114	113	117	112	117	112	113
Wallis & Futuna	200	200	40	130	104	101		243	7	216		158	29 7	8 7	7 4:	56	96				7	127	100		46	
WPR	27	27	34	34	39	44	46	45	49	50	59	50	49 4	6 4	2	27	1 53	50	49	47	47	47	57	67	73	75
	:								i				:						:							

www.who.int/tb from be downloaded Data can those published in previous reports. rom differ may Jere own data updated table includes Pe ases. elapse and new ate of I atior shown is r ber 1995 on, Rates are per 100 000 population. From

Table A3.12 New sm	lear-posit	ive case	es notifi	ed, nun	nbers a	ind rate:	s, West	srn Paci	fic, 1993	-2006																	
							Number o	of cases						-					Rate	(per 100	1000 popr	ulation)					
	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	1993 1	994 1	95 19	96 199	7 1998	1999	2000	2001	2002	2003	2004	2005 20	90
American Samoa	-	4		0	9	2	ю	2	2	-	2	2	ю	e	2	8		0	1 4	2	4	e	2	e	ю	5	2
Australia	557				226	203	285	251	228	210	113	285	241	269	e				+	2	-	-	-	-	-	-	-
Brunei Darussalam	68				0		102	84	95	112	121	115	101	128	24				0	31	25	28	32	34	31	27	34
Cambodia		11 058	11 101	12 065	12 686	13 865	15 744	14 822	14 361	17 258	18 923	18 978 2	21 001 1	9 294		100	97 1	J3 1C	113	126	116	110	130	140	138	150 1	36
China	84 898	104 729	134 488 2	203 670	236 021	202 817	201 775	204 765	204 591	194 972 2	67 414 3	184 886 47	72 719 46	8 291	7	6	11	17 1	9 16	16	16	16	15	21	29	36	35
China, Hong Kong SAR	2429		0	1 774	1 943	2 091	1 536	1 940	1 857	1 892	1 794	1 693	1 561	1 547	41		0	28 3	0 32	23	29	28	28	26	24	22	22
China, Macao SAR	108		141	258	325	276		160	157	147	138	128	136	144	27		34	32 7	7 64		36	35	32	30	27	29	30
Cook Islands	5	4	2	-	2	0	0	0	2	-	0	-	-	0	28	22	11	6 1	1	0	0	13	7	0	7	7	0
Eji.	61	62	68	69	99	74	65	62	73	74	78	62	63	73	80	80	6	6	8	0	80	6	6	10	ø	8	6
French Polynesia		88		37	41	8	33	29	0	28	21	30	21	24		18		17 1	8 15	14	12	0	11	œ	12	80	б
Guam		40						43	47	31	0	22	27	21		28					28	30	19	0	13	16	12
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 1.	0 159	14	13	11	10 1	1 9	10	6	6	80	80	ø	6	œ
Kiribati	66	184		144	50	52	59	54	64	82	66	142	124	129	132	241	-	34 E	3 64	71	64	75	94	112	157	135 1	88
Lao PDR			478	886	1 234	1 494	1 706	1 526	1563	1 829	1 866	2 226	2 806	3 041			10	18 2	5 30	33	29	29	33	34	40	50	53
Malaysia	6954	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	36	34	32	34 5	15 35	36	35	35	33	32	31	33	36
Marshall Islands	12			12		11	17	11	15	18	20	39	48	45	24			23	21	33	21	28	34	37	20	85	78
Micronesia			6	14	6	14		15	80	22	26	35	32	41			8	13	8 13		14	7	20	24	32	29	37
Mongolia	0	145	455	769	1 171	1 356	1 513	1 389	1631	1 670	1 541	1 808	1 868	2 129	0	9	19	32 4	18 56	. 62	56	99	67	61	71	72	82
Nauru		2					2	4	2	2	-		0	2		20				20	40	20	20	10		0	20
New Caledonia	16	28	21	26	24	26	22	20	19	21	12	15	16	б	6	15	11	13 1	2 13	10	6	6	6	5	7	7	4
New Zealand	91	61	78	90	83	106	94	74	68	88	106	111	83	97	3	2	2	2	2 3	2	2	2	2	3	3	2	2
Niue	0	0	0	-	0	0	1	0	0	-	0	0	0	0	0	0	0	45	0 0	51	0	0	57	0	0	0	0
Northern Mariana Islands			14	26	21	26	15	27	19	21	16	14	15	15			24	43 6	34 40	22	39	27	29	21	18	19	18
Palau	8	11	6	4	7		20			6	5	5	3	6	50	66	53	23 5	6	106			46	25	25	15	30
Papua New Guinea			1 652	447	1 195	2 107	2 140	1 933	1351	1 345	2 310	1 896	1 805	1 948			35	6	4 41	41	36	24	24	40	32	30	31
Philippines	92 279	87 401	94 768	86 695	80 163	69476	73 373	67 056	59 341	65 148	72 670	78 163 8	31 647 8	15 740	141	130	138 1	24 11	2 95	98	88	76	82	06	94	97	66
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 1	1 513	38	30	26	25 2	22 22	21	18	25	24	23	24	24	24
Samoa	21	18	15	6	14	7	17	13	11	19	12	11	11	13	13	1	6	5	8	10	7	9	1	7	9	9	7
Singapore	513	861	455	519	436	482	465	248	357	549	583	501	552	538	16	26	13	14 1	2 13	12	9	6	13	14	12	13	12
Solomon Islands	155	114	109	90	113	140	93	109	118	108	138	152	169	124	45	32	30	24 5	10 36	23	26	28	25	31	33	36	26
Tokelau		0	+	0			0	0	0		0		0	0		0	68	0		0	0	0		0		0	0
Tonga	16	17	6	14	1	16	10	15	80	23	1	80	11	14	17	18	6	14 1	1 16	10	15	80	23	1	80	11	4
Tuvalu	2	-	9				0	0	0	0	0		5	4	21	10	61			0	0	0	0	0		48	38
Vanuatu		62	30	50	99	38	43	63	57	38	40	59	35	42		37	17	28 3	37 21	23	33	29	19	20	28	16	19
Viet Nam			37 550	48 911	50 016	54 889	53 805	53 169	54 238	56 698	55 937	58 394 8	55 492 5	6 437			51	56 E	36 71	69	67	68	20	68	20	65	65
Wallis & Futuna			e	e	~				-	-	7		~				21	21	7			7	7	47		7	
WPR	222 813	241 737	314 27 1 3	388 142	416 954	379 698	383 613	376 109	371 806 3	72 528 4	53812 5	79 566 67	1 612 67	1 254	14	15	20	24 2	5 23	23	22	22	22	26	33	38	38
																											1

Rates are per 100 000 oppulation. The table includes updated information; data shown here may differ from those published in previous reports. Data can be downloaded from www.who.int/tb

# Notes

#### **Brunei Darussalam**

Breakdown by age and sex provided for cases in nationals only.

## China, Macao SAR

39 cases treated outside public sector, with site and history of treatment unspecified were reported as "other", non-DOTS.

## Japan

The number of cases registered for treatment is different from the number of cases reported for 2005 due to changes in the jurisdiction of some public health centres. Treatment outcomes are only available for pulmonary TB patients treated under standardized regimens (with isoniazid and rifampicin).

# **Republic of Korea**

There is no mechanism for follow-up of treatment outcomes for patients who transfer from the public sector (DOTS) to the private sector (non-DOTS).

# ANNEX 4

Surveys of tuberculosis infection and disease, and death registrations, by country and year

Table A4.1 National and	subnational surve	evs of prevalence	e of tuberculosis disease

Table A4.1.1 National surveys <sup>1</sup>		Table A4.1.2 Subnational surveys <sup>1</sup>			
Bangladesh	1964, 1987	Afghanistan	1982		
Cambodia	2002	Bangladesh	1995, 2001, 2002, 2006		
China	1979, 1984, 1990, 2000	Botswana	1981, 1995		
Eritrea	2005	Brunei Darussalam	1985		
Gambia	1960	China	1957, 1959		
Ghana	1957	Cambodia	1981, 1982, 1983, 1984, 1985, 1989, 1995, 1998		
Indonesia	2004	Colombia	1988		
Irag	1970	Cyprus	1963		
Japan	1953, 1958, 1963, 1968	Ethiopia	2001		
Kenya	1948, 1958	Eygpt	2007		
Liberia	1959	India	1948–1993 (numerous surveys), 2007		
Libyan Arab Jamahiriya	1976	Indonesia	1979, 1983–1993, 1994		
Malaysia	2003	Iraq	1961		
Mauritius	1958	Japan	1954, 1964		
Myanmar	2006	Kenya	1958, 2006		
Netherlands	1970	Liberia	1959		
Nigeria	1957	Malawi	1960		
Pakistan	1959, 1987	Malaysia	1970		
Philippines	1981, 1997, 2007	Mozambique	1961		
Rep. of Korea	1965, 1970, 1975, 1980, 1985, 1990, 1995	Myanmar	1972, 1989, 1990, 1991, 1994		
Samoa	1975	Nepal	1965, 1976, 1994		
Sierra Leone	1958	Nigeria	1958, 1973		
Somalia	1956	Pakistan	1962		
Sri Lanka	1970	South Africa	1972–1985		
Thailand	2007	Spain	1991		
Uganda	1958	Syrian Arab Republic	1960		
Viet Nam	2007	Thailand	1962, 1970, 1977, 1983, 1987, 1991		
		Tunisia	1957, 1961		
Table A4.1.3 Planned of	or recommended surveys (national or	Turkey	1971		
subnational) <sup>2</sup>		Uganda	2000		
Afghanistan	2010	UR Tanzania	1958		
Bangladesh <sup>3</sup>	2008	Viet Nam	1961		
Cambodia <sup>3</sup>	2010	Zambia	1980, 2006		
China <sup>3</sup>	2010				
Djibouti⁴	2010				
Gambia					
Ghana <sup>3</sup>	2009	1			
Indonesia <sup>3</sup>	2011				
Kenya <sup>3</sup>	2009				
Laos	2009				
Malawi <sup>3</sup>	2009				
Mali <sup>3</sup>	2008				
Myanmar <sup>3</sup>	2010				
Mozambigue <sup>3</sup>					

<sup>1</sup> 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/publications/global\_report. References to surveys done in 2006 and 2007 have generally not yet been published in peer reviewed journals, but will be added to the website when they are published.

<sup>2</sup> Not included here are countries which indicated 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. These tables will be updated as the information is confirmed. See www.who.int/tb/global\_report

<sup>3</sup> 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 a fuller explanation of how the 21 countries were selected). For those countries which 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.

<sup>4</sup> Funding for surveys in these countries has been approved by the Global Fund.

2007

2009

2009

2009

2012

2008

2009

2009

Nigeria<sup>3</sup>

Pakistan<sup>3</sup> Philippines<sup>3</sup>

Rwanda<sup>3,4</sup> Sierra Leone<sup>3</sup>

Thailand<sup>3</sup>

Viet Nam<sup>3</sup> Zambia<sup>3</sup>

South Africa<sup>3</sup> Syrian Arab Republic<sup>4</sup>

UR Tanzania<sup>3</sup> Uganda<sup>3,4</sup>

Table A4.2.1 National s	urveys <sup>1</sup>	Table A4.2.2 Subnation	nal surveys <sup>1</sup>
Afghanistan	1978, 1982	Afghanistan	1985, 1989, 2005
Algeria	1949, 1966, 1980, 1985	Algeria	1938, 1948, 1958, 1968, 1976, 1981
Argentina	1979	Angola	1991
Bahrain	1969, 1981, 1985, yearly 1988–1994	Bhutan	1991
Bangladesh	1964	Botswana	1989
Benin	1987, 1994	Brazil	1970, 1973, 1979, 1983, 1986, 1988, 1990
Botswana	1956, 1981	Burundi	1982
Cambodia	2002	Cambodia	1955, 1968, 1981, 1995
China, Hong Kong SAR	1999	Cameroon	1984
China	1970, 1979, 1984, 1990, 2000	Central African Republic	1988
Cyprus	1955	Colombia	1970–1998
Djibouti	1994, 2001	Cyprus	1963, 1995
Egypt	1951, 1996	Czech Republic	1961, 2001
Ethiopia	1954, 1989	France	1990
Gambia	1960	Gabon	1987
Ghana	1957	Gambia	1958, 1976
Greece	yearly 1981–1991	Guinea	1989
India	2000,2007	India, Bangalore	1962, 1963, 1965, 1967, 1977
Indonesia	2004	India, Chingleput	1969, 1979, 1984
Iraq	1995	India, other	1948–1993
Japan	1953, 1958, 1963, 1968	Indonesia	1952–1965, 2005, 2006
Jordan	1986, 1990	Iran (Islamic Republic of	) 1946, 1952, 1963, 1972, 1983, 1990
Kenva	1958, 1986, 1995	Irag	1989
Lao PDR	1995	Italy	1997
Lesotho	1956 1981	Japan	1954 1964 1992
Libvan Arab Jamahiriya	1976	Jordan	1949 1970 1976 1982
Madagascar	1991	Kenva	1974 2006
Malawi	1994	Kuwait	1962 1972_1981 1991 1993_1997
Mauritius	1956 1958	Lebanon	1994
Mexico	1961	Lesotho	1962 1992
Myanmar	1972	Libvan Arab Jamabiriya	1954 1959 1971
Nenal	2006	Morocco	1994
Netherlands	vearly 1956_1979_1989	Mozambique	1961 1987 1988
Pakistan	1987	Myanmar	1991
Philippines	1081 1007	Nenal	1047 1062 1063 1065 1066 1073 1074
Pen of Korea	every 5 years 1965, 1995, 2007	1076 1070 1080	1088 1080 1000 1001 1002 1003 1004
Samoa	1075	Oman	1005
Somalia	1975	Bakistan	1002 1004
Sudan	1950, 2000	Doru	1992, 1994
Theiland	1970, 1960	Bhilippingg	1002
Tunicio	1960	Coudi Arabia	1992
Lagrado	1959, 1960		1900
	1958, 1970, 1989	Sierra Leone	1958
UR Tanzania	1985, 1990, 1995, 2002	Somalia	1986
remen	1991, 2007		1972–1985, 1988
		Sudan	2006
Table A3.2.3 Planned s	urveys (national or subnational) <sup>2</sup>	Syrian Arab Republic	1960, 1978, 1983, 1992
Afghanistan	2010		1978, 1986, 1988
Armenia	0010		1980
Cambodia	2010		1994
China	2010	Uganda	1971, 1987
Ghana		UR Tanzania	1958, 1988–1992, 1993–1998, 2000
India	2007	USA	1997
Nigeria	2007	Viet Nam	1955, 1961, 1986, 1990, 1991, 1996
Philippines	2007	Zambia	1980
South Africa			
UR Tanzania	2007		
Viet Nam		1	

# Table A4.2 National and subnational surveys of prevalence of tuberculosis infection

<sup>1</sup>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/publications/global\_report. References to surveys done in 2006 and 2007 have generally not yet been published in peer reviewed journals, but will be added to the website when they are published.

2 Not included here are countries which indicated 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. These tables will be updated as the information is confirmed. See www.who.int/tb/global\_report

C	Cov/qual <sup>1</sup>			Cov/qu	al <sup>1</sup>
Albania	73 L	1987–1989, 1992–2003	China, Macao SAR		1994
Anguilla		1985–1995, 2000–2001, 2004	Malaysia	Μ	1997
Antigua & Barbuda	74	1985–1995, 2000–2002	Malta	94 H	1985–2004
Argentina	100 L	1985–2003	Mauritius	93 M	1985–2004
Armenia	63 L	1985–2003	Mexico	96 H	1985–2003
Australia	100 H	1985–2003	Monaco		1986, 1987
Austria	99 M	1985–2005	Mongolia		1994
Azerbaijan	68 M	1985–2002	Montserrat		1990–1994
Bahamas	83 H	1985, 1987, 1993–2000	Myanmar		1998–2000
Bahrain	87 L	1985, 1987–1988, 1993–2000	Netherlands	100 M	1985–2004
Barbados	76 M	1985–1995, 2000–2001	New Zealand	100 H	1985–2003
Belarus	98 M	1985–2003	Nicaragua	58 L	1988–1994, 1996–2003
Belgium	M	1985–1997	Norway	98 M	1985–2004
Belize	81 M	1986–1987, 1989–1991, 1993–2001	Pakistan		1993, 1994
Bermuda		1985–1994, 1996–2000, 2002	Panama	91 M	1985–2003
Bosnia & Herzegovina		1985–1991	Paraguay	74 L	1985–2001, 2003
Brazil	79 L	1985–2000, 2002	Peru	54 L	1986–2000
British Virgin Islands		1985–1998	Philippines	M	1992–1998
Brunei Darussalam	100 M	1996–2000	Poland	100 L	1985–1996, 1999–2004
Bulgaria	100 M	1985–2004	Portugal	100 L	1985–2003
Canada	100 H	1985–2003	Puerto Rico		1985–2002
Cayman Islands		1985–2000	Qatar	L	1995
Chile	94 M	1985–2003	Rep. of Korea	87	1985–2004
Colombia	M	1985–1999	Republic of Moldova	80 H	1985–2004
Costa Rica	88 M	1985–2004	Romania	100 H	1985–2004
Croatia	95 M	1985–2004	Russian Federation	100 M	1985–2004
Cuba	100 H	1985–2004	Saint Kitts & Nevis		1985–1997
Czech Republic	100 M	1986–2004	Saint Lucia	99 M	1986–2002
Denmark	100 M	1985–2001	St Vincent & Grenadines	93	1985–1987, 1995–2003
Dominica	100 M	1985–2003	San Marino	73 L	1995–2000
Dominican Republic	45	1985–1992, 1994–2001	Sao Tome & Principe		1985, 1987
Ecuador	74 L	1985–2004	Serbia & Montenegro	89 M	1997–2002
Egypt	81 L	1987,1991, 1992, 2000	Seychelles		1985–1987
El Salvador	76 M	1990–1993, 1995–2003	Singapore	82 H	1985–2003
Estonia	100 H	1985–2005	Slovakia	98 H	1992–2002
Fiji	L	1999	Slovenia	99 H	1985–2004
Finland	100 H	1985–2004	South Africa	78 L	1993–1996, 2004
France	100 M	1985–2003	Spain	100 M	1985–2004
Georgia	97 M	1985–2001	Sri Lanka		1985–1989, 1991, 1992, 1995
Germany	99 M	1990–2004	Suriname	73	1985–2000
Greece	99 L	1985–2004	Sweden	100 M	1985–2002
Grenada	M	1985, 1988–1996	Switzerland	99 M	1985–2004
Guatemala	89 M	1986–2003	Syrian Arab Republic		1985
Guyana	72 M	1988–1990, 1993–1996, 2001–2003	lajikistan	54 L	1985–2001
Haiti	8	2001-2003	TFYR Macedonia	93 M	1991-2003
China, Hong Kong SAR	400.11	1985-2004		87 L	1985–1987, 1994–2000, 2002
Hungary	100 H	1985-2003	Trinidad & Tobago	83	1985-2000
Iceland	95 H	1985-2004	Turkey		1987
Iran (Islamic Republic of)	05.11	1985, 1987		IVI	1985-1998
	95 H	1985-2005		100 M	1985-2001
Israel	100 M	1985–2001, 2003		100 M	1985-2004
Italy	100 M	1985-2002	United Kingdom	99 H	1985–1999, 2001–2004
Jamaica	400.11	1985-1991	USA	100	1985-2002
Japan	100 H	1985-2004		100 M	1985-1990, 1993-2001
Kazaknstan	100 M	1907-2004	Veneruele	73 M	1965-2000, 2002, 2003
Kurguratan		1900-1907, 1993-2002		99 H	1965-1990, 1992-1994, 1996-2002
Kyrgyzstan	70 M	1985-2004	US VIrgin Islands		1997-2002
Latvia	95 H	1900-2004	≥imbabwe		1990
	98 H	1900-2004			
Luxembourg	90 IVI	1985-2004			

#### Table A3.3 Availability of death registrations by cause-of-death, WHO Mortality Database, 2006

Shown are years for which cause-of-data (1985–2005) were available in the WHO Mortality Database at the end of 2006 (see also http://www.who.int/healthinfo/morttables/en/index.html). In some cases more recent data are available in the country in question, but have not yet been sent to WHO.

<sup>1</sup>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 and evaluates surveillance, planning and financial data in support of national TB control programmes.

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