

Strategy

Two landmark documents in global TB control – the Stop TB Strategy¹ and the Global Plan to Stop TB² – were launched in 2006. The Stop TB Strategy, developed by WHO, sets out the interventions that need to be implemented to achieve the MDG, Stop TB Partnership and World Health Assembly targets discussed in **CHAPTER 1**. The Global Plan to Stop TB, developed by the Stop TB Partnership, sets out how, and at what scale, the strategy should be implemented over the decade 2006–2015 (see also **CHAPTER 1**). To monitor implementation of the strategy, WHO has asked countries to report on the implementation of TB control activities according to the strategy's major components and subcomponents (**TABLE 2.1**; **TABLE 2.2**) since 2007. In the 2008 round of data collection, countries were asked to report on activities

implemented in 2007 and on activities planned for 2008 (see **ANNEX 2** for further details about the data that were collected). In a few cases, projections for 2009 were also requested.

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

■ **TABLE 2.1**
Components of the Stop TB Strategy

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

■ **TABLE 2.2**
Technical elements of the DOTS strategy

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

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

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

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

■ **TABLE 2.3**

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

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

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

2.1 Data reported to WHO in 2008

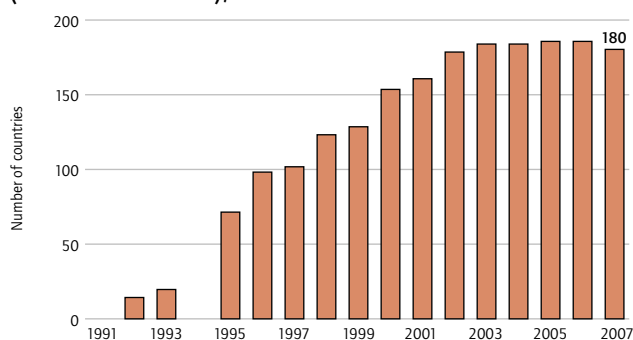
The data that were reported to WHO in 2008 are summarized in **TABLE 2.3**.¹ A total of 196 (out of 212) countries and territories (hereafter "countries") reported data; these countries collectively account for 99.6% of the world's estimated TB cases. Among countries which reported, at least 75% of the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

2.2 DOTS expansion and enhancement

2.2.1 DOTS coverage and numbers of patients treated

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

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



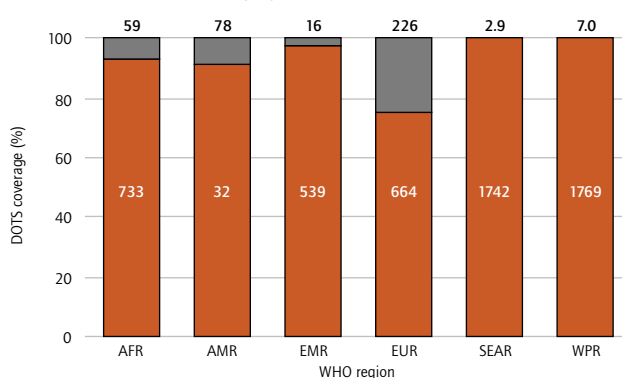
¹ The wording used in **TABLE 2.3** is the wording used on the 2008 data collection form, which was distributed before the update to the wording of the Stop TB Strategy presented in **TABLE 2.1**.

TABLE 2.4
Progress in DOTS implementation, 1995–2007

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

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

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



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

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

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

2.2.2 Political commitment

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

A total of 155 countries (84% of those reporting), including all HBCs, had a national strategic plan for TB control, including all countries in the African, Eastern Mediterranean

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

2.2.3 Early case detection through quality-assured bacteriology

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

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

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

— Indicates information not provided.

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

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

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

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

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

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

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

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

The average number of microscopy laboratories exceeds the target of at least 1 per 100 000 population in four regions (TABLE 2.6). The average number in the Western Pacific Region is 0.5 per 100 000 population, reflecting a

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

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

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

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

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

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

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

BOX 2.1

Recent WHO policy changes in diagnosis of TB

1. WHO policy on smear microscopy and case detection

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

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

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

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

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

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

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

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

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

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

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

2.2.5 Drug supply and management system

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

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

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

At the global level, the Stop TB Partnership's Global Drug Facility (GDF) and Green Light Committee (GLC) are contrib-

BOX 2.3

Providing technical assistance for TB control: the role of TBTEAM

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

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

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

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

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

2.2.6 Monitoring and evaluation

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

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

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

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

— Indicates information not provided or not applicable.

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

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

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

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

In 2007, 63% (115/184) of NTPs had access to data for individual patients (as opposed to aggregated data for cohorts of patients) at the central office (TABLE 2.7). This included five HBCs (Brazil, Cambodia, China, the Russian Federation and the United Republic of Tanzania), and a particularly high proportion of countries in the European and

Western Pacific regions (93% and 85% of reporting countries, respectively). In the remaining countries, data at the central office were received from lower administrative levels in an aggregated format. Among these countries, around 20% could not confirm whether or not data about case notifications and treatment outcomes had been reported by all management units (for example, all districts). About 30% of the remaining countries with aggregated data reported that some data were missing. This highlights the need for greater efforts to ensure complete reporting of data, and for better monitoring of the completeness of reporting at the central level (see also SECTION 1.3 in CHAPTER 1).

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

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

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

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

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

2.3.1 Collaborative TB/HIV activities

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

BOX 2.4

Introducing District Health Information Software (DHIS) in Myanmar

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

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

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

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

methods used to produce them, are provided in **CHAPTER 1** and **ANNEX 2** respectively. The African Region accounts for 79% of estimated HIV-positive TB cases; most of the remaining cases are in the South-East Asia Region (**TABLE 2.8**).

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

¹ <http://www.who.int/tb/err/catalogue>

² See: <http://openmrs.org>, DHIS (www.hisp.org) or ENRS (www.emro.who.int/stb/enrs.htm).

³ *Interim policy on collaborative TB/HIV activities*. Geneva, World Health Organization, 2004 (WHO/HTM/TB/2004.330; WHO/HTM/HIV/2004.1).

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

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

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

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

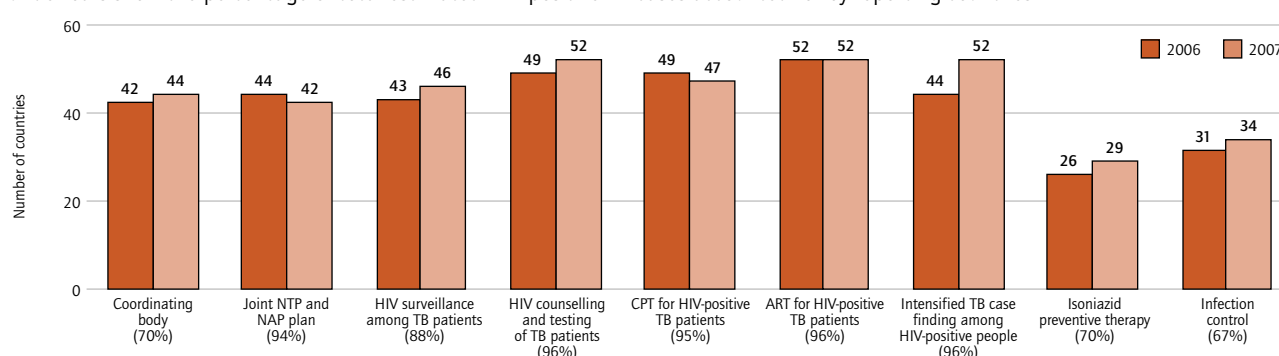
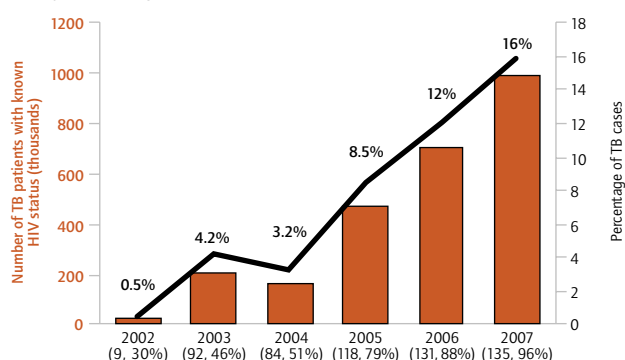


FIGURE 2.5
HIV testing for TB patients, all countries, 2002–2007. Number (bars) and percentage (line) of notified new and re-treatment TB cases for which the HIV status of the patient was recorded in the TB register. The numbers under each bar show the number of countries reporting data, followed by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



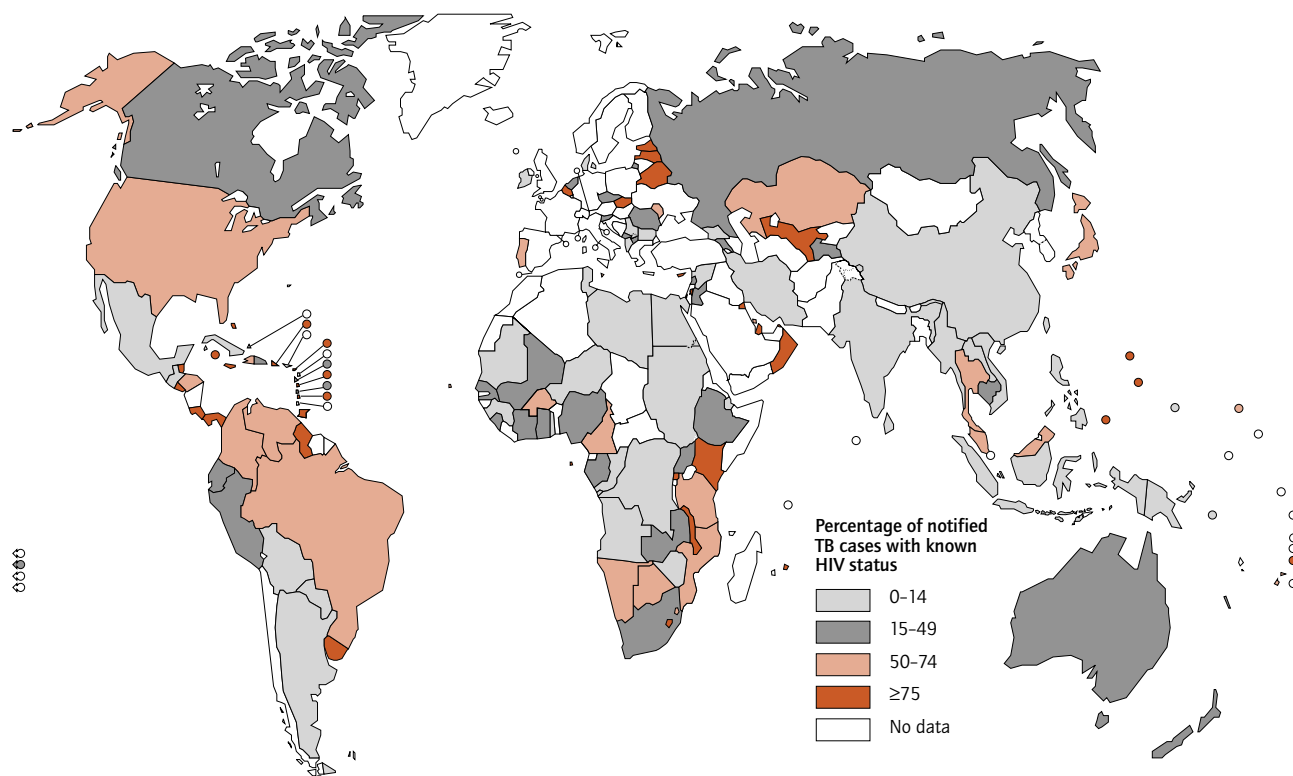
and antiretroviral therapy (ART); and intensified TB case-finding among people living with HIV followed by isoniazid preventive therapy (IPT) for those without active TB.

Mechanisms for collaboration and policy development

Among 63 countries that have been identified as priorities for the implementation of collaborative TB/HIV interventions at global level¹ and which collectively account for 97% of estimated HIV-positive cases worldwide, approximately two-thirds had established coordinating bodies, developed a joint TB/HIV plan and were undertaking HIV surveillance by 2007 (FIGURE 2.4). Around 50 of these 63 countries had policies for HIV counselling and testing among TB patients, as well as for the provision of CPT and ART to those coinfected with HIV. A relatively high number of countries (n=52) also had policies for intensified case-finding among HIV-positive people. In contrast, a smaller number of countries had policies related to IPT (29 countries) and infection control (34 countries). While there was variation in the extent to which mechanisms for collaboration or policies were in place in 2007, there was generally an improvement compared with 2006 (the exceptions were joint TB/HIV planning and provision of CPT). When all countries that reported data are con-

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

FIGURE 2.6
HIV testing for TB patients, 2007



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

HIV testing of TB patients

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

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

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

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

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

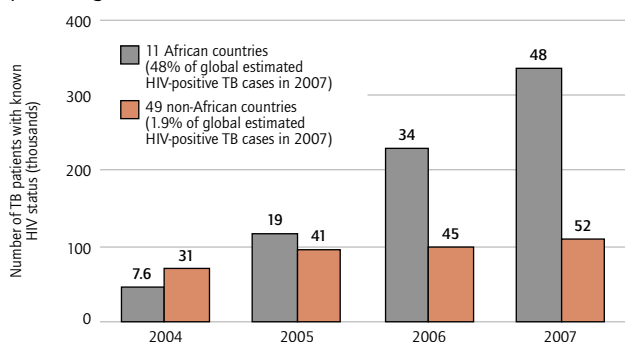


FIGURE 2.8
Co-trimoxazole preventive therapy for HIV-positive TB patients, 2002–2007. The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.

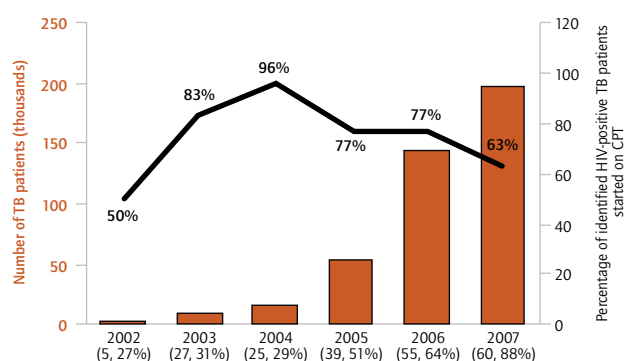
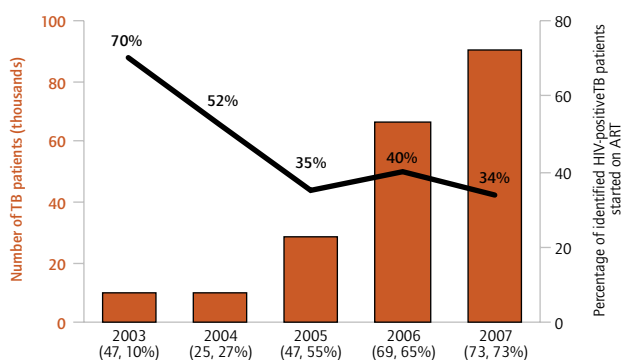


FIGURE 2.9
Antiretroviral therapy for HIV-positive TB patients, 2003–2007. The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated HIV-positive TB cases accounted for by reporting countries.



Provision of CPT and ART to HIV-positive TB patients

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

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

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

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

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

Progress against Global Plan targets

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

BOX 2.5

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

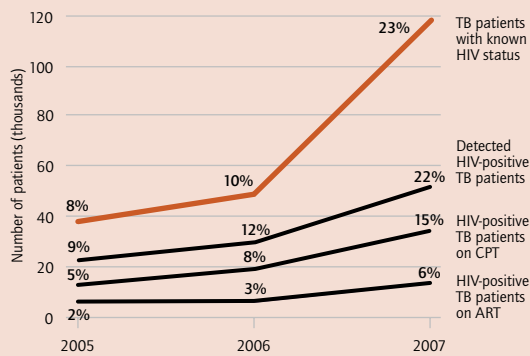
Data from eight countries (that account for 18% of the estimated global burden of HIV-positive TB cases) show that TB patients have poorer access to ART than to HIV testing. This may be a limiting factor in scaling up the provision of ART to HIV-positive TB patients and may result in unnecessary deaths.

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

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

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

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



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

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

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

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

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

FIGURE 2.10

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

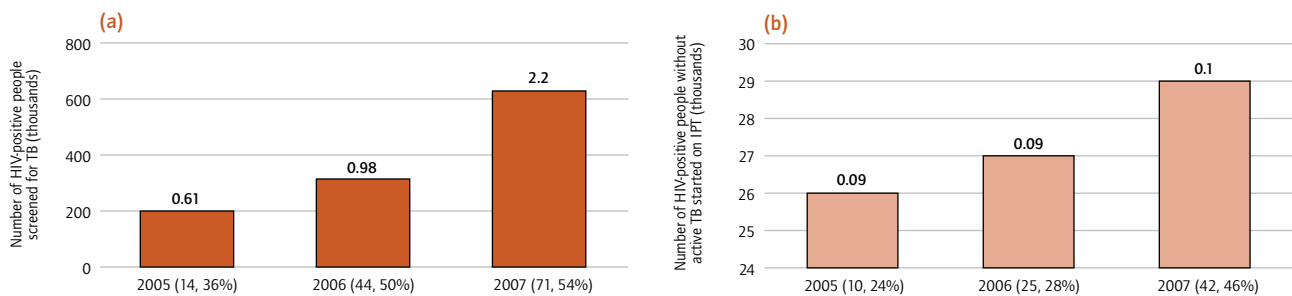


TABLE 2.9
Collaborative TB/HIV activities, 2007: country reports compared with expectations given in the Global Plan

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

^a Includes only those countries in the Global Plan, i.e. countries in sub-regions Central Europe and Established Market Economies are excluded here. Includes patients reported from DOTS and non-DOTS areas.

^b Maximum number included for each country is the number of notified cases multiplied by the population coverage of collaborative TB/HIV activities anticipated by the Global Plan.

^c Numbers of notified TB cases are weighted according to the population coverage of collaborative TB/HIV activities anticipated by the Global Plan.

^d Only the 116 countries (33 in Africa) that provided both numerator and denominator are included in this percentage.

^e Only the 58 countries (27 in Africa) that provided both numerator and denominator are included in this percentage.

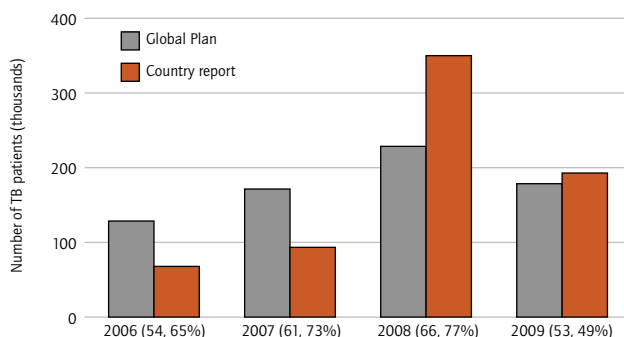
^f Only the 66 countries (22 in Africa) that provided both numerator and denominator are included in this percentage.

^g Only the 62 countries (11 in Africa) that provided both numerator and denominator are included in this percentage.

^h While the Global Plan includes only people newly diagnosed with HIV in this indicator, country reports include all HIV-positive people eligible for IPT, regardless of year of diagnosis.

ⁱ Only the 32 countries (8 in Africa) that provided the numerator are included in the denominator of this percentage.

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



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

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

■ **TABLE 2.10**

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

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

– Indicates information not provided.

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

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

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

2.3.2 Diagnosis and treatment of MDR-TB

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

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

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

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

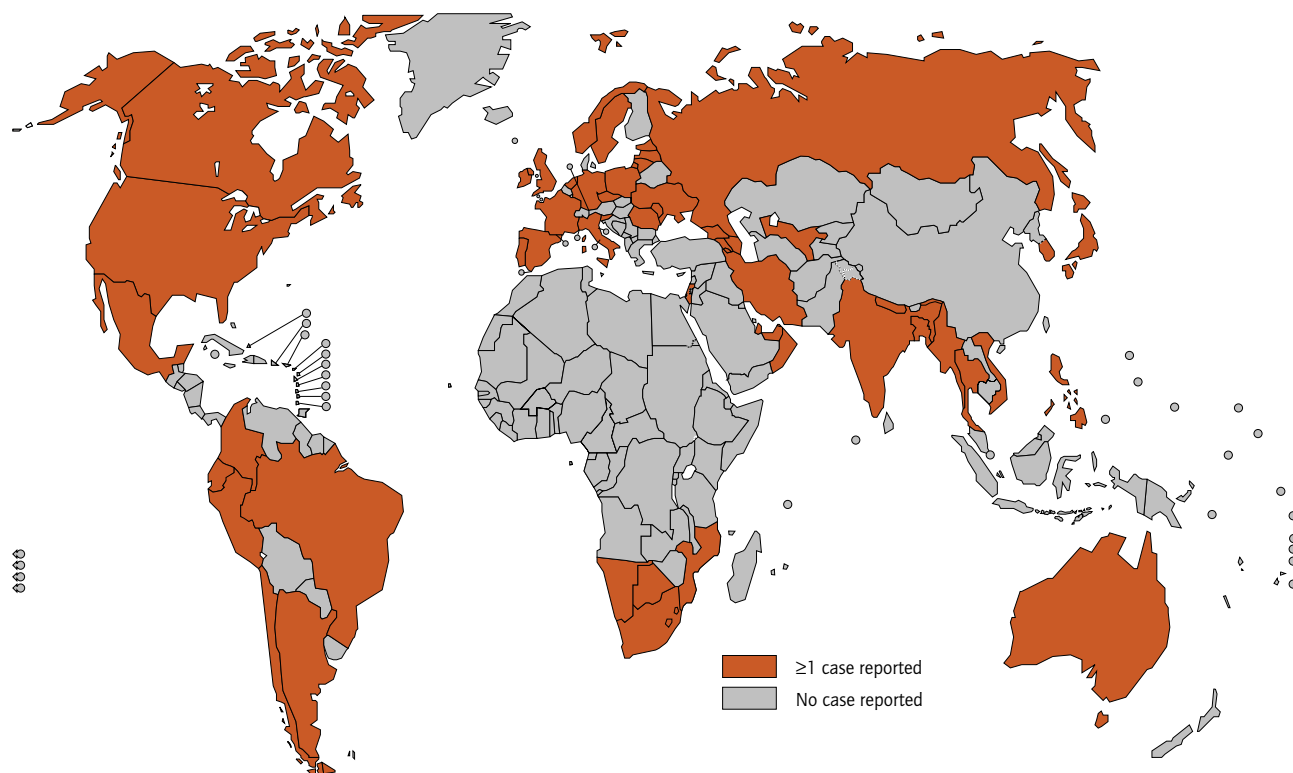
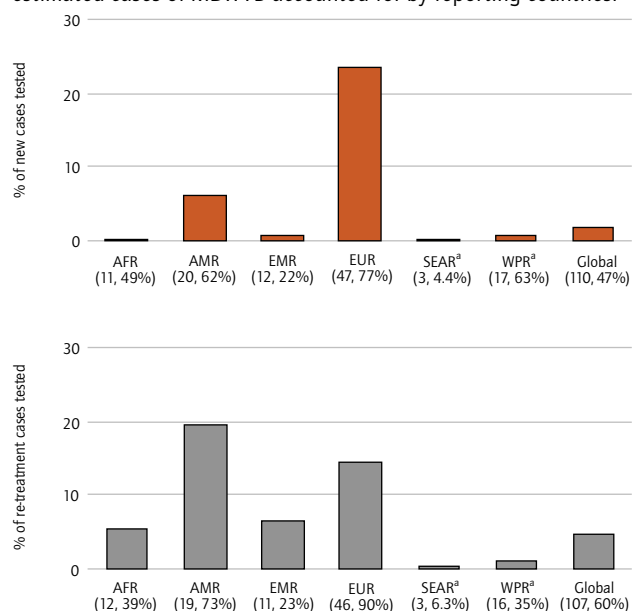


FIGURE 2.13
Diagnostic DST for new and re-treatment cases, by WHO region, 2007. The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated cases of MDR-TB accounted for by reporting countries.



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

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

Diagnosis and notification

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

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

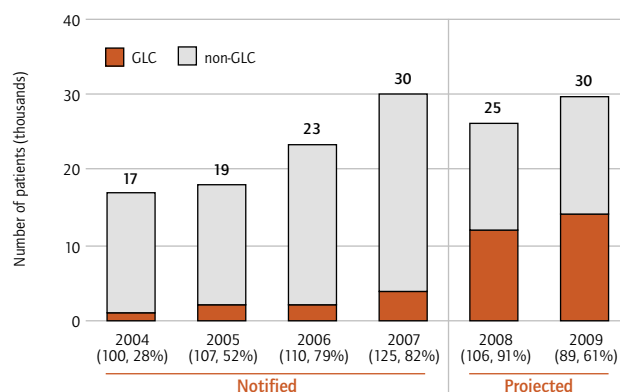
notified in 2007 represented only 6% of the 0.5 million cases estimated to exist worldwide (and 9% of estimated cases of smear-positive MDR-TB). This average conceals higher figures for several high MDR-TB burden countries: the number of notified cases was above 70% of the estimated number of cases in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

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

Scaling-up diagnosis and treatment

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

FIGURE 2.14 Notified cases of MDR-TB (2004–2007) and projected numbers of patients to be enrolled on treatment (2008–2009). The numbers under each bar show the number of countries reporting data, followed by the percentage of total estimated cases of MDR-TB accounted for by reporting countries.



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

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

Treatment outcomes

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

¹ <http://www.who.int/tb/challenges/mdr/greenlightcommittee/en/>

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

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

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

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

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

— Indicates information not provided.

^a The lower part of table shows the number of countries answering "yes" to each question.

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

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

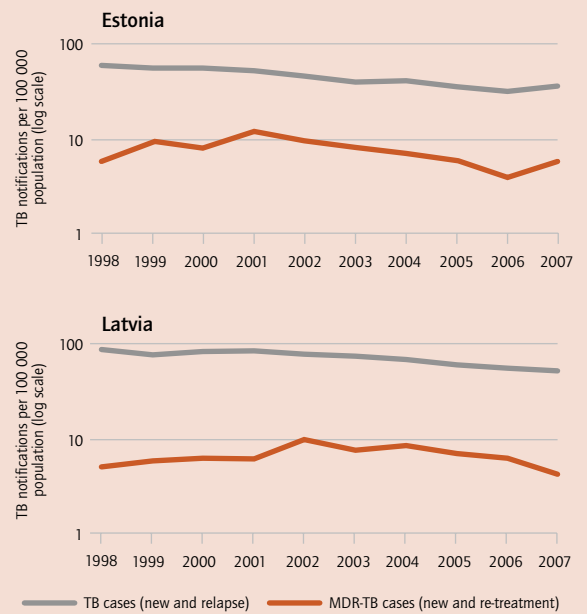
BOX 2.6

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

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

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

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

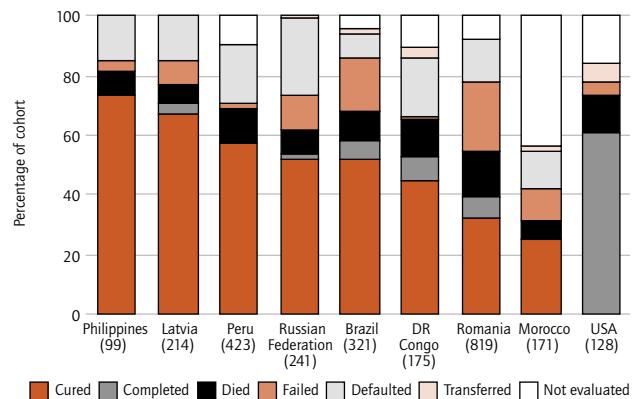


for patients with MDR-TB, more data from more countries, including data from GLC-approved projects and treatment provided outside the framework of the GLC, are needed.

Progress against Global Plan targets

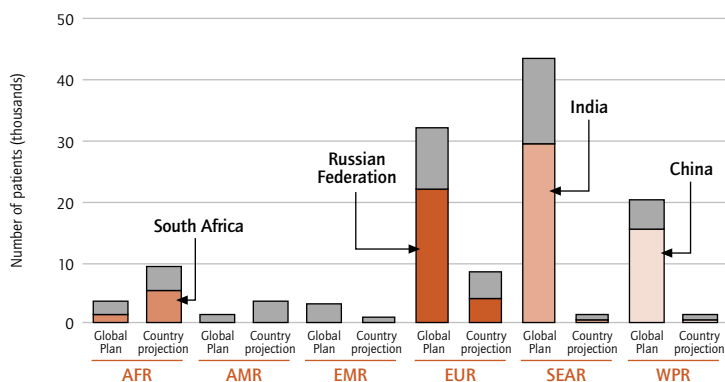
As with collaborative TB/HIV activities, the Global Plan sets out the progress required in provision of treatment for MDR-TB cases for each year 2006–2015. During 2007, the targets for the number of patients to be diagnosed and treated for MDR-TB were reviewed and revised to make the targets for 2010 comparable to the goal of universal access to ART by 2010.¹ The principal 2010 targets for MDR-TB are: (i) to offer diagnostic DST to all previously treated and chronic TB cases as well as to 90% of new TB cases with a high risk of having MDR-TB (for example, contacts of MDR-TB cases and those for whom treatment is failing after three months); and (ii) to enrol all those in whom MDR-TB is diagnosed in GLC-approved or equivalent treatment programmes. Despite the progress that has been made in some countries documented above, the number of MDR-TB patients notified in 2007 and country projections of the number of MDR-TB patients to be enrolled on treatment in 2008 and 2009 fall far behind the expectations of the Global Plan (TABLE 2.10; FIGURE 2.14; FIGURE 2.16). In 2008, the Global Plan recommended that

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



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

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



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

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

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

2.3.3 Poor and vulnerable populations

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

Among the 176 countries and territories addressing TB in high-risk groups, 57 (32%) including seven HBCs were providing TB care to refugees and displaced people in 2007. Adaptation of TB control services to meet the needs of

migrant workers and cross-border populations was reported by 47 (27%) and 35 (20.0%) countries, respectively (including seven HBCs). About one fifth of countries stated that special attention was given to providing TB care among the homeless, slum dwellers, minorities, drug dependent individuals and people living with diabetes.

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

may be immediately on diagnosis of TB (two countries) or after the initial phase of treatment (10 countries).

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

2.4 Contribute to health system strengthening based on primary health care

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

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

2.4.1 Integration in primary health care

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

¹ The “+” in the title recognizes that there are number of other partnerships addressing system strengthening elements.

² <http://www.internationalhealthpartnership.net>

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

2.4.2 Alignment with broader planning and financing frameworks

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

2.4.3 Human resource development

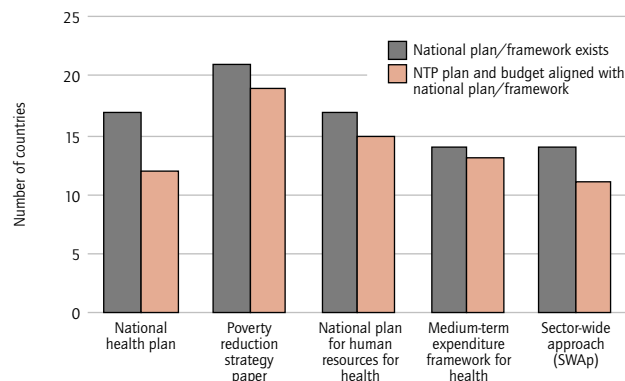
A comprehensive strategic plan for human resource development (HRD) should ensure both financing and guidance for an adequate, competent and performing workforce for TB control, integrated within overall health workforce plans and strategies. Plans should be based on a recent needs assessment and include: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

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

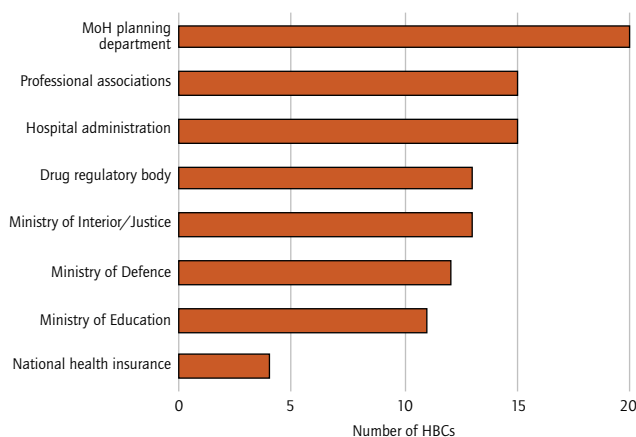
Job descriptions of staff involved in the implementation of the Stop TB strategy were up-to-date in 120 countries, including 19 HBCs. Among the 22 HBCs, 18 had a designated person for HRD at the central level of the NTP. However, a full-time member of staff was available in only six countries: Afghanistan,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

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

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



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



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

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

2.4.4 Infection control

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

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

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

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

^a Lower part of table shows the number of countries with affirmative answer (for last column, the number of countries where all or almost all job descriptions were up to date).

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

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

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

Data reported in 2008 suggest that infection control is at an early stage of development in most countries and that better indicators are needed to monitor implementation. No country provided data about actual implementation of interventions, although 75% (131/175) of countries had a policy

on TB infection control in hospitals in 2007. The number of countries that reported the existence of a policy on TB infection control in clinics, prisons and military barracks was 114, 94 and 69 respectively.

2.4.5 Practical Approach to Lung Health

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

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

2.5 Engage all care providers

2.5.1 Public-private mix approaches

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

In 2008, all countries were asked to provide information about the number of different types of providers¹ that had been engaged formally in TB control and the number of new TB cases referred and treated by major categories of public and private providers involved in PPM initiatives. Unfortunately, while most countries have begun implementing PPM-related activities, data were usually too incomplete to make an accurate assessment of the contribution of PPM to case detection and treatment. This suggests that very few countries are using the revised recording and reporting forms recommended by WHO, which are designed to allow disaggregated analysis of referrals and treatment by category of provider (at a minimum on an annual basis from selected facilities). By 2007, only nine HBCs had started systematically to record the source of referral of patients and where they were receiving treatment, and a smaller number were extracting data from these records in a systematic way. The best example of a country that was able to report data was the Philippines, where PPM initiatives that have been implemented in 40% of the country account for 9% of national notifications (**ANNEX 1**). It is also evident that PPM initiatives are capable of making a major contribution to notifications in Pakistan (**BOX 2.7**), although here results are from a special study rather than routinely reported data.

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

BOX 2.7

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

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

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

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

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

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

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

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

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

2.5.2 International Standards for Tuberculosis Care

Launched on World TB Day in 2006, the International Standards for Tuberculosis Care¹ provide an excellent basis for standardizing management practices across providers of TB care and are also an effective tool for advocating scale up of PPM implementation. A suggested initial step towards their application is to have the standards endorsed by relevant associations of health professionals. This step has been carried out by at least one professional association in about a quarter of reporting countries including 13 HBCs. One third of all reporting countries were using the standards to promote the engagement of non-NTP care providers. A higher proportion of reporting countries (about 50%, including 14 HBCs) have incorporated the standards into the curricula of medical schools; about 40% of countries (including 13 HBCs) have integrated them into NTP training material.

2.6 Empower people with TB, and communities through partnership

2.6.1 Advocacy, communication and social mobilization

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

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

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

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

2.6.2 Community participation in TB care

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

2.6.3 Patients' Charter for Tuberculosis Care

Launched alongside the International Standards for Tuberculosis Care, the Patients' Charter for Tuberculosis Care² outlines the rights and responsibilities of TB patients. An essential first step for many countries is translation of the charter into local languages. Many countries are also likely to require some guidance on the most effective way to use the charter; to date, information about its actual use is limited (see also ANNEX 1).

2.7 Enable and promote research

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

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

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

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

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

2.8 Summary

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

Besides DOTS implementation, diagnosis and treatment of MDR-TB and collaborative TB/HIV activities (both under component 2) are the other major parts of the Stop TB Strategy for which implementation can best be quantified. There is clear evidence of progress in implementing interventions such as HIV testing of TB patients and provision of CPT and ART to HIV-positive TB patients, particularly in the African Region. In 2007, 37% of TB patients in the African Region knew their HIV status, 0.2 million HIV-positive TB patients were enrolled on CPT and 0.1 million HIV-positive TB patients were started on ART; in each case, figures were higher than those reported in previous years. Nonetheless, the numbers of HIV-positive TB patients accessing services for provision of CPT and ART remain small compared with the estimated 1.4 million HIV-positive TB cases. Collaborative TB/HIV activities need to be scaled up to ensure that many more people know their HIV status and many more HIV-positive

people, with and without TB, have access to appropriate treatment and care.

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

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

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