Results

Detection and treatment of TB cases

Countries reporting to WHO

By the end of 2003, 201(96%) of 210 countries and territories reported case notifications for 2002 and/or treatment outcomes for patients registered in 2001. We received reports from all 22 HBCs.

DOTS population coverage, 1995–2002

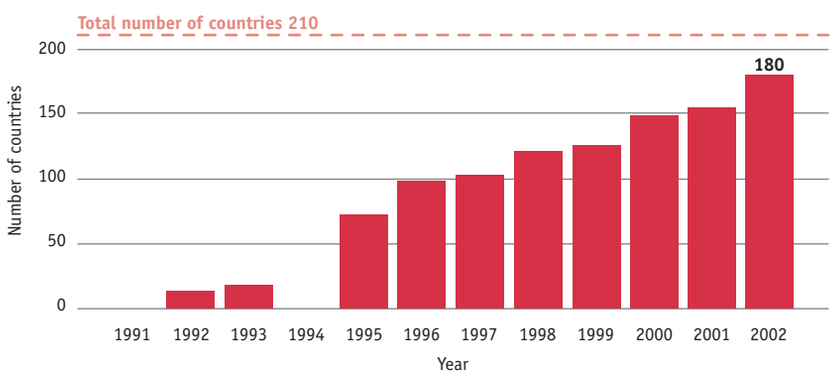
The number of countries implementing DOTS increased by 25 during 2002, bringing the total to 180 out of 210 (Figure 1). One hundred and twenty-one countries determined that DOTS was available to over 90% of their populations (Figure 2, Annex 5). Just one DOTS country had coverage under 10% (Turkey), and 58 were in the expansion phase (coverage 10-90%). All 22 HBCs had a DOTS programme in 2002. Nine countries implemented DOTS for the first time in 2002; five achieved moderate coverage (10-90%), and three reached high coverage (> 90%).

DOTS population coverage has steadily increased since 1995 (Figure 2; Table 4). By the end of 2002, 69% of the world's population lived in counties, districts, oblasts, and provinces of countries that had adopted DOTS. Reported coverage was over 70% in the WHO regions of Africa, the Americas, the Eastern Mediterranean and the Western Pacific, and lowest in the European Region (40%, Figure 3).

All 22 HBCs provided data on detection and treatment from DOTS programmes covering at least part of the country. Ethiopia, South Africa, and Thailand reported that coverage increased to more than 90% of their populations. Afghanistan, Pakistan, Ethiopia, South Africa, all improved coverage by more than 20% between 2001 and 2002, Thailand by 18%, China by 10%, and India by 7% (Table 4).

FIGURE 1

Number of countries implementing DOTS, 1991–2002



Case notifications, 1995–2002

The 201 countries reporting to WHO in 2002 notified 4.0 million cases, of which 1.7 million (42%) were sputum smear-positive (Table 5, Annex 5). The global, crude notification rate (all forms of TB for all reporting countries) has been more or less stable since records began in 1980, and changed little between 2001 (62 per 100 000) and 2002 (66 per 100 000). By contrast, the total number of notified smear-positive cases increased by about 4% per year

FIGURE 2

DOTS coverage, 1995–2002

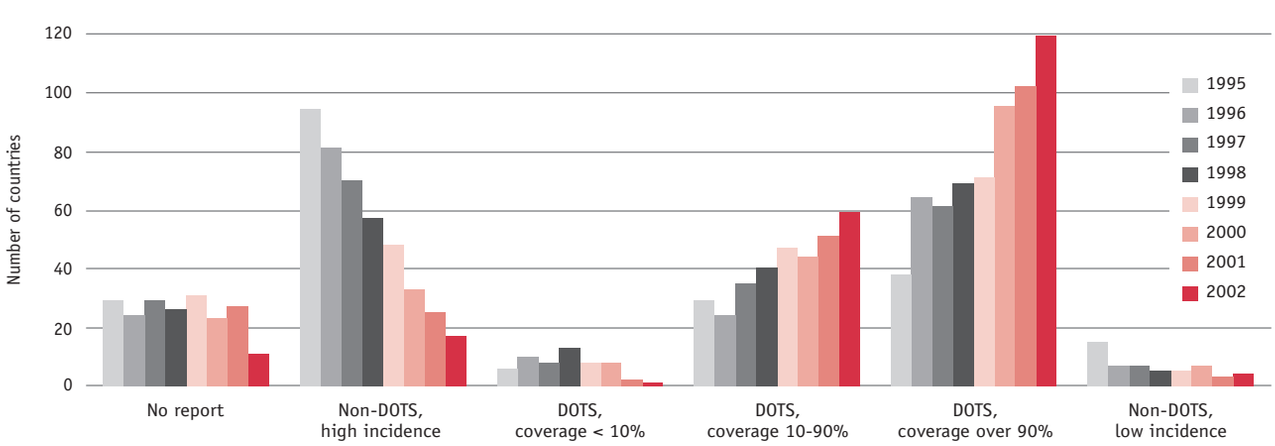
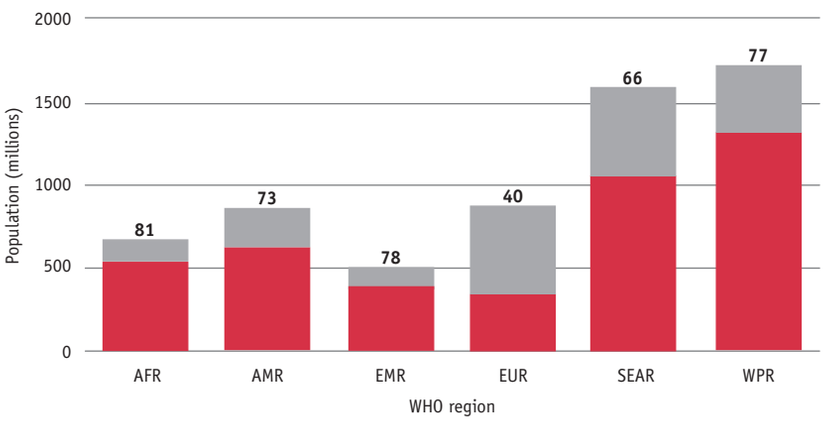


FIGURE 3

DOTS population coverage by WHO region, 2002

Each bar shows the population of the region, and the shaded portion of the bar shows the population covered by DOTS. The number above each bar is the percent of the population covered.



between 1995 and 2002, probably because of the emphasis placed by DOTS programmes on diagnosis by sputum smear microscopy. Based on notifications of all TB cases from countries thought to have reliable data, and where there has apparently been no significant change in case finding effort, we estimate that the global incidence rate of TB (all forms) was growing at 1.1% per year in 2002, and the total number of cases was growing at 2.4% per year.

The trends in case notifications between 1980 and 2002, and the presumed trends in incidence, differ among regions. The consistency in trend among countries within each region is revealed by the 95% CI on the standardized series of notification rates in Figure 4. Although the notification rate of TB has been rising quickly in eastern Europe (5% per year, 1997–2002), and in African countries with high HIV prevalence (eastern and southern African countries; 7% per year), the rate of increase has been slowing in both regions since the mid 1990s (Figure 5). In most other regions of the world, the case notification rate has been roughly stable or in decline.

This evaluation of trends in incidence has been used, with other data, to update estimates of TB incidence for every country and region of the

TABLE 4

Progress in DOTS implementation, 2002

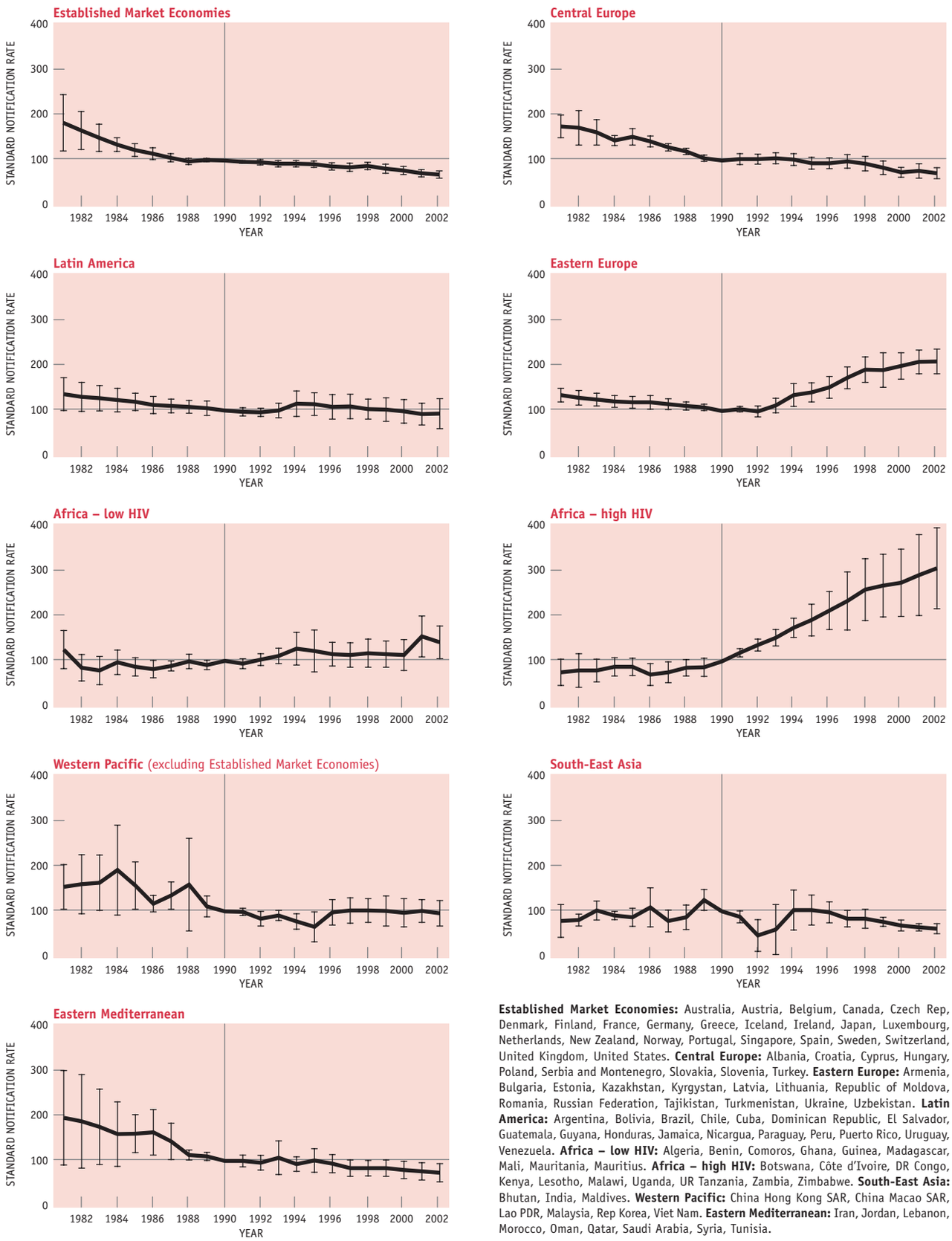
		PERCENT OF POPULATION COVERED BY DOTS							
		1995	1996	1997	1998	1999	2000	2001	2002
1	India	2	2	2	9	14	30	45	52
2	China	49	60	64	64	64	68	68	78
3	Indonesia	6	14	28	80	90	98	98	98
4	Nigeria	47	30	40	45	45	47	55	55
5	Bangladesh	41	65	80	90	90	92	95	95
6	Pakistan	2	8	—	8	8	9	24	45
7	Ethiopia	39	39	48	64	63	85	70	95
8	Philippines	4	2	15	17	43	90	95	98
9	South Africa	—	0	13	22	66	77	77	98
10	DR Congo	47	51	60	60	62	70	70	70
11	Russian Federation	—	2	2	5	5	12	16	25
12	Kenya	15	100	100	100	100	100	100	100
13	Viet Nam	50	95	93	96	99	100	100	100
14	UR Tanzania	98	100	100	100	100	100	100	100
15	Brazil	—	0	0	3	7	7	32	25
16	Uganda	—	0	100	100	100	100	100	100
17	Zimbabwe	—	0	0	100	12	100	100	100
18	Mozambique	97	100	84	95	—	100	100	100
19	Thailand	—	1	4	32	59	70	82	100
20	Afghanistan	—	—	12	11	14	15	12	38
21	Cambodia	60	80	88	100	100	99	100	100
22	Myanmar	—	59	60	60	64	77	84	88
High-burden countries		**28**	**32**	**37**	**43**	**46**	**55**	**61**	**68**
	AFR	43	47	56	62	56	70	70	81
	AMR	12	48	50	59	66	69	73	73
	EMR	23	11	18	33	51	65	71	78
	EUR	5.4	8.2	17	22	23	26	32	40
	SEAR	6.7	12	16	30	36	50	61	66
	WPR	43	55	57	58	57	67	67	77
Global		**35**	**33**	**38**	**45**	**48**	**58**	**62**	**69**

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

FIGURE 4

Trends in case notification rates (all cases, sum of DOTS and non-DOTS) for selected countries in different regions, 1981–2002

To highlight trends in notifications within regions, the rates for all countries have been expressed relative to an arbitrary standard of 100 in 1990. Error bars are 95% CI on the standardized (unweighted) rates. Countries selected in each region are those for which case notifications were judged to represent trends in incidence over the period 1981–2002.



Established Market Economies: Australia, Austria, Belgium, Canada, Czech Rep, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Japan, Luxembourg, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, United States. **Central Europe:** Albania, Croatia, Cyprus, Hungary, Poland, Serbia and Montenegro, Slovakia, Slovenia, Turkey. **Eastern Europe:** Armenia, Bulgaria, Estonia, Kazakhstan, Kyrgystan, Latvia, Lithuania, Republic of Moldova, Romania, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan. **Latin America:** Argentina, Bolivia, Brazil, Chile, Cuba, Dominican Republic, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Nicargua, Paraguay, Peru, Puerto Rico, Uruguay, Venezuela. **Africa – low HIV:** Algeria, Benin, Comoros, Ghana, Guinea, Madagascar, Mali, Mauritania, Mauritius. **Africa – high HIV:** Botswana, Côte d'Ivoire, DR Congo, Kenya, Lesotho, Malawi, Uganda, UR Tanzania, Zambia, Zimbabwe. **South-East Asia:** Bhutan, India, Maldives. **Western Pacific:** China Hong Kong SAR, China Macao SAR, Lao PDR, Malaysia, Rep Korea, Viet Nam. **Eastern Mediterranean:** Iran, Jordan, Lebanon, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia.

TABLE 5

Case notifications, 2002

	NUMBER NOTIFIED				SMEAR-POSITIVE CASE DETECTION RATE		% OF NEW PULMONARY CASES SMEAR-POSITIVE[a]	
	ALL CASES		SMEAR-POSITIVE					
	DOTS	NON-DOTS	DOTS	NON-DOTS	DOTS	WHOLE COUNTRY	DOTS	NON-DOTS
1 India	549 700	511 251	245 135	150 698	31	50	55	33
2 China	388 195	74 414	180 239	14 733	27	30	51	22
3 Indonesia	155 188	—	76 230	—	30	30	51	—
4 Nigeria	29 645	8 983	19 596	2 340	12	14	71	26
5 Bangladesh	71 637	10 185	45 701	1 070	32	33	70	13
6 Pakistan	47 754	4 418	15 331	934	13	13	40	24
7 Ethiopia	110 289	—	36 541	—	33	33	52	—
8 Philippines	118 408	—	65 148	—	58	58	58	—
9 South Africa	212 616	2 504	97 656	1 143	96	97	62	57
10 DR Congo	70 625	—	44 518	—	52	52	84	—
11 Russian Federation	17 530	111 343	5 179	22 686	6.4	34	33	22
12 Kenya	80 183	—	34 337	—	49	49	52	—
13 Viet Nam	95 577	—	56 811	—	82	82	75	—
14 UR Tanzania	60 306	—	24 136	—	43	43	52	—
15 Brazil	8 770	72 666	4 835	36 536	10	84	64	62
16 Uganda	40 695	—	19 088	—	47	47	53	—
17 Zimbabwe	59 170	—	15 941	—	46	46	33	—
18 Mozambique	25 544	—	15 236	—	45	45	71	—
19 Thailand	49 581	—	25 593	—	73	73	61	—
20 Afghanistan	13 794	—	6 509	—	19	19	66	—
21 Cambodia	24 610	—	17 258	—	52	52	86	—
22 Myanmar	57 012	—	24 162	—	73	73	57	—
High-burden countries	**2 286 829**	**795 764**	**1 075 180**	**230 140**	**35**	**42**	**57**	**32**
AFR	958 365	33 689	438 259	13 394	44	45	59	44
AMR	134 267	99 381	76 212	51 142	46	77	72	63
EMR	179 594	8 864	73 639	1 323	26	27	59	19
EUR	134 917	238 580	43 005	40 450	20	39	40	27
SEAR	954 727	533 258	449 575	157 115	35	47	56	33
WPR	680 750	125 362	340 777	31 442	36	40	57	29
Global	**3 042 620**	**1 039 134**	**1 421 467**	**294 866**	**37**	**44**	**57**	**35**

—Indicates not applicable (for countries with 100% DOTS coverage) or not available (no non-DOTS report received).
[a] Expected percentage of new pulmonary cases that are smear positive is 65–80%.

FIGURE 5

Annual changes in TB notification rates 1992–2002

Average percent change (on previous year) in notification rates (all forms, DOTS and non-DOTS) between consecutive years for 2 groups of countries; Africa – high HIV (red) and eastern European countries (grey).
See Figure 4 for countries included.

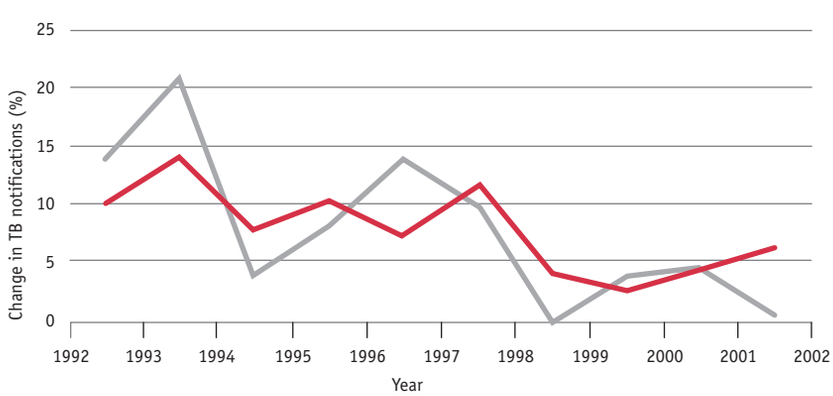


TABLE 6

Estimated incidence of TB, 2002

		NUMBER ESTIMATED				
		ALL CASES		SMEAR-POSITIVE CASES		
	POPULATION (1000s)	NUMBER (1000s)	RATE PER 100 000 POP	NUMBER (1000s)	RATE PER 100 000 POP	CUMULATIVE INCIDENCE (%) (REGIONAL PROPORTION OF GLOBAL TOTAL)
1 India	1 049 549	1 761	168	787	75	20
2 China	1 294 867	1 459	113	656	51	37
3 Indonesia	217 131	557	256	250	115	43
4 Nigeria	120 911	368	304	159	132	47
5 Bangladesh	143 809	318	221	143	99	51
6 Pakistan	149 911	272	181	122	81	54
7 Ethiopia	68 961	255	370	110	159	57
8 Philippines	78 580	251	320	113	144	60
9 South Africa	44 759	250	558	102	227	62
10 DR Congo	51 201	196	383	85	167	65
11 Russian Federation	144 082	182	126	81	56	67
12 Kenya	31 540	170	540	70	223	69
13 Viet Nam	80 278	155	192	69	86	70
14 UR Tanzania	36 276	132	363	56	155	72
15 Brazil	176 257	110	62	49	28	73
16 Uganda	25 004	94	377	41	164	74
17 Zimbabwe	12 835	88	683	35	271	75
18 Mozambique	18 537	81	436	34	182	76
19 Thailand	62 193	80	128	35	57	77
20 Afghanistan	22 930	76	333	34	150	78
21 Cambodia	13 810	76	549	33	242	79
22 Myanmar	48 852	75	154	33	68	80
Total, high-burden countries	**3 892 274**	**7 005**	**180**	**3100**	**80**	**80**
AFR	672 238	2 354	350	1 000	149	26
AMR	856 916	370	43	165	19	4.2
EMR	502 824	622	124	279	55	7.2
EUR	877 887	472	54	211	24	5.4
SEAR	1 590 833	2 890	182	1 294	81	33
WPR	1 718 314	2 090	122	939	55	24
Global total	**6 219 011**	**8 797**	**141**	**3 887**	**63**	**100**

world (Table 6, Annex 5). There were an estimated 8.8 million (141 per 100 000) new TB cases in 2002, of which 3.9 million (63 per 100 000) were smear-positive. These revised incidence estimates are the denominators used to calculate case detection rates for 2002. The ranking of countries by number of TB cases has drawn attention to the 22 countries that account for roughly 80% of the world's burden of TB, but the importance of the TB problem for individual countries is better expressed as the incidence rate. Among the 15 countries with the highest estimated TB incidence rates per capita, 13 are in Africa and, in most, the prevalence of HIV infection among TB patients is high (Figure 6).

Case notifications from African countries show two other patterns that appear to be associated with HIV infection. First, women aged 15–24 years make up a higher proportion of TB cases in countries with higher rates of HIV infection (Figure 7), consistent with the observation that HIV prevalence tends to be higher in women than men in this age range, and the difference between the sexes is bigger where HIV infection rates are higher. Second, some East African countries with high rates of HIV infection show a declining proportion of smear-positive cases among all TB cases notified (Figure 8). This is expected because smear-negative TB is more frequent among HIV-positive than HIV-negative TB cases, but might also reflect a decline in diagnostic performance, despite the

emphasis placed on sputum smear microscopy in DOTS programmes.

Among all TB cases reported in 2002, 3.0 million (over two-thirds) originated in DOTS areas (Table 5). Of the smear-positive cases, 1.4 million were notified by DOTS programmes (83%). The African (25%), South-East Asia (37%), and Western Pacific Regions (20%) together accounted for 82% of all notified cases and similar proportions of smear-positive cases. Because DOTS emphasizes diagnosis by sputum smear microscopy, 47% of all new cases were smear-positive (45–60% expected) in DOTS areas, compared with 30% elsewhere. Similarly, 57% of new pulmonary cases were smear-positive under DOTS (55–70% expected), compared with 34% elsewhere.

The increment in smear-positive cases detected by DOTS programmes was roughly constant between 1995 and 2000 (linear increase in total cases detected), but there are signs that case finding under DOTS has accelerated globally over the past 2 years. An extra 610 228 TB cases (all forms) were reported under DOTS between 2001 and 2002, as compared with the average of 269 268 over the period 1995–2000. Similarly, an extra 214 656 smear-positive cases were reported between 2001 and 2002, as compared with the 1995–2000 average of 134 157.

The number of cases enrolled under DOTS has continued to increase much more quickly than the total number of cases notified: DOTS programmes appear to have improved their performance primarily by recruiting cases that would otherwise have been notified outside DOTS programmes. Thus 25% more TB cases, and 18% more smear-positive cases, were recruited under DOTS in 2002 as compared with 2001. Conversely, the numbers of TB cases (both smear-positive and all forms) reported outside DOTS programmes fell by 28% between 2001 and 2002.

Approximately 28% of the addi-

FIGURE 6

Fifteen countries with the highest estimated TB incidence rates per capita (all ages, all forms; grey bars) and corresponding incidence rates of HIV-infected TB (among adults 15–49 years; red bars), 2002

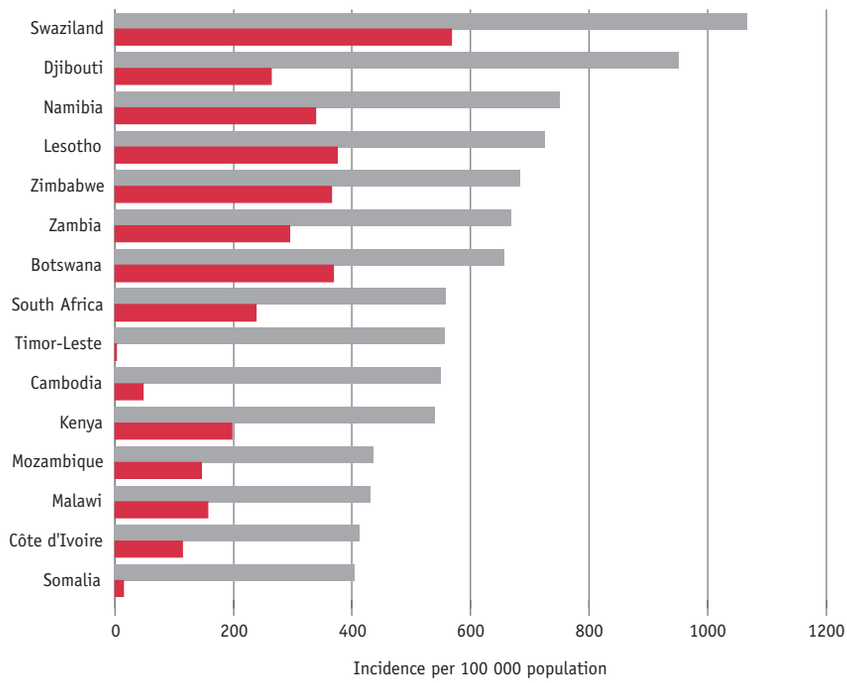


FIGURE 7

The proportion of notified TB patients aged 15–24 years that were women, plotted against the estimated HIV prevalence in adults 15–49 years. TB data are for 15 African countries in sub-Saharan Africa (2002); HIV estimates are from UNAIDS (2001); $r^2 = 66\%$.

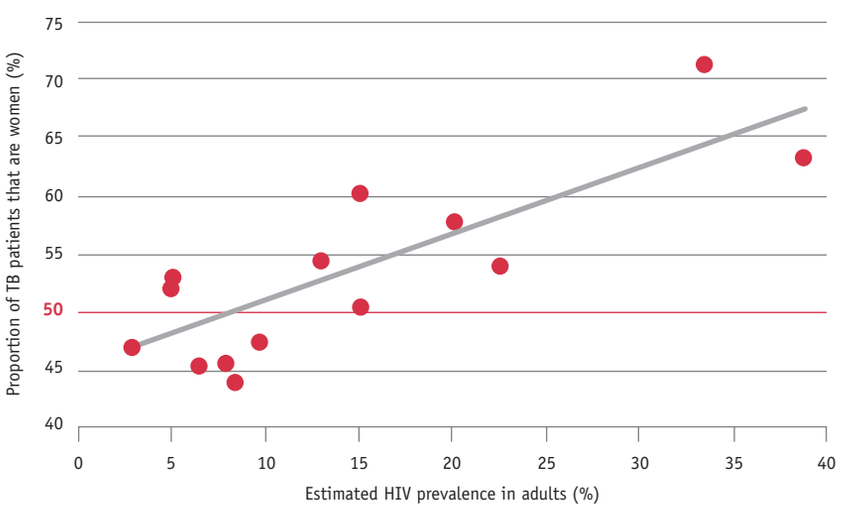


FIGURE 8

Smear-positive cases as a proportion of all notified cases over time for 6 African countries with high HIV prevalence

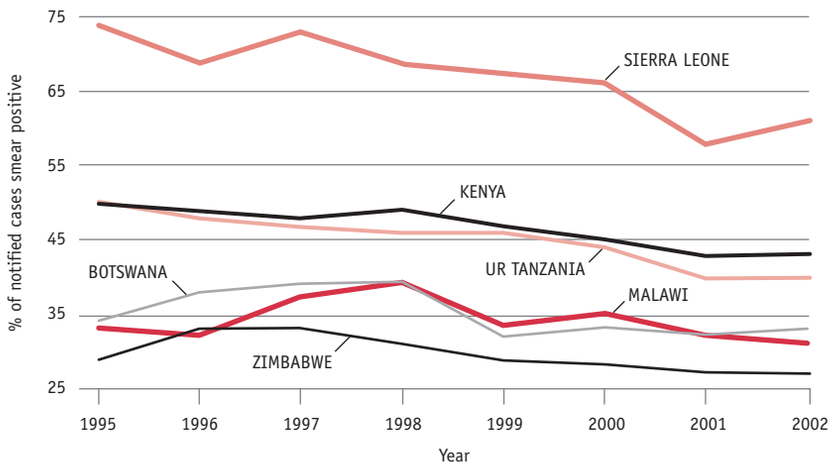
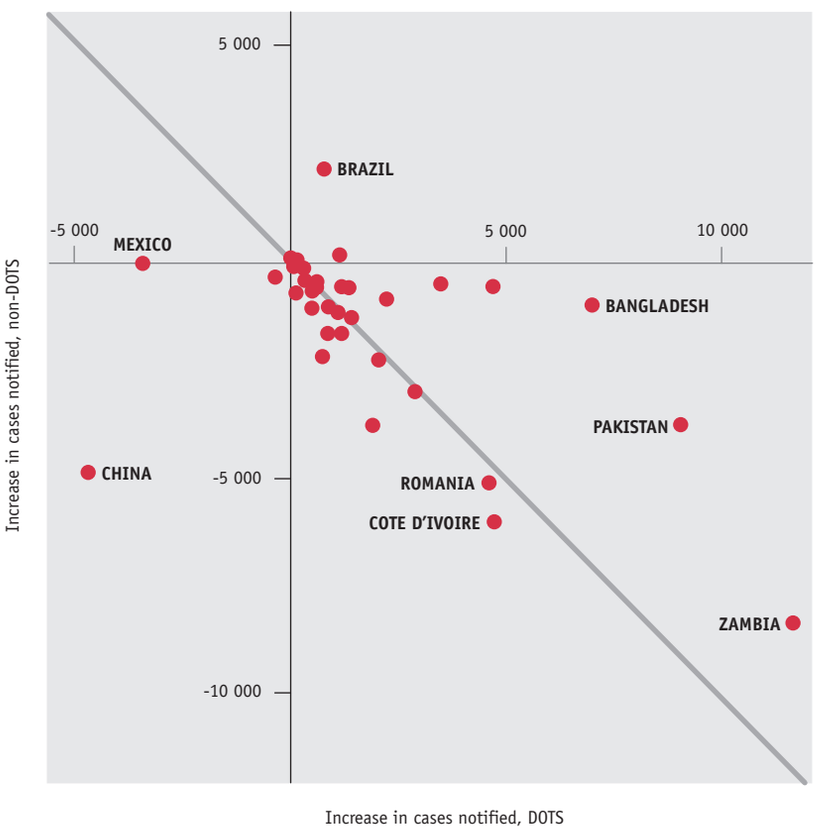


FIGURE 9

Increases in DOTS notifications at the expense of non-DOTS notifications

The graph shows the increase or decrease in numbers of smear-positive cases (2001 to 2002) notified from DOTS and non-DOTS areas in 49 countries. The gains to DOTS programmes match losses to non-DOTS programmes on the line (slope = -1). India (not shown) gained 59 858 cases under DOTS, but lost 48 852 cases from non-DOTS areas, while South Africa (not shown) gained 26 085 cases under DOTS, but lost 11 094 cases from non-DOTS areas.



tional smear-positive cases reported from all DOTS programmes in 2002 (compared with 2001) were in India. There were smaller but marked improvements in case detection in South Africa (contributing 12% of the total increase), Indonesia (10%), Pakistan (4%), Bangladesh (3%), and the Philippines (3%). These 6 countries together accounted for 61% of the additional cases notified under DOTS in 2002.

The global trade-off between cases recruited to DOTS programmes and at the same time lost from other programmes can also be seen in data from individual countries. Notifications from 51 countries show that the gain in DOTS areas is, by and large, offset by the loss from non-DOTS areas, and many of these countries cluster around the line of exact compensation (slope –1; Figure 9). India (not marked on the graph) gained 59 858 smear-positive cases under DOTS between 2001 and 2002, but notifications from outside DOTS programmes fell by 48 852, a net gain of 11 006 cases. Bangladesh, Brazil, Pakistan, and Zambia also made noticeable net gains (points lie above the line in Figure 9). China reported fewer cases from both inside and outside DOTS areas.

Case detection rate, 1995–2002

The 4.0 million cases of tuberculosis (all forms) notified in 2002 represent 46% of the 8.8 million estimated new cases; 1.7 million new smear-positive cases account for 44% of the 3.9 million estimated (Table 7). In parallel with trends in case notifications, the detection rate of all TB cases has remained stable since 1995 (Figure 10b, red points), while the detection rate of smear-positive cases has slowly increased (Figure 10a, red points).

Thirty-five percent of all new cases, and 37% of new smear-positive cases, were detected by DOTS programmes in 2002. The detection rate achieved by DOTS programmes has been rising much faster than the overall case detection rate, and appears to have accelerated since 2000. The acceleration is more pronounced for the total number of cases notified (Figure 10b, white points) than for smear-positives (Figure 10a, white points). However, to reach 70% case detection by 2005, an extra 1.04 million

TABLE 7

Case detection rate of new smear-positive cases (%), 1995–2002

	DOTS PROGRAMMES								WHOLE COUNTRY							
	1995	1996	1997	1998	1999	2000	2001	2002	1995	1996	1997	1998	1999	2000	2001	2002
1 India	0.2	0.8	1.0	1.5	6.6	12	23	31	33	36	34	35	43	44	49	50
2 China	15	28	31	30	28	29	28	27	22	33	37	32	31	32	31	30
3 Indonesia	1.3	4.5	7.5	12	19	20	21	30	12	*	*	*	*	21	*	*
4 Nigeria	12	18	12	12	13	13	13	12	*	12	*	*	*	*	16	14
5 Bangladesh	6.4	14	18	23	24	25	27	32	14	21	23	26	26	27	28	33
6 Pakistan	1.0	1.8	—	3.8	2.0	2.8	5.2	13	2.5	*	—	14	5.5	*	9.2	13
7 Ethiopia	16	21	24	25	26	34	33	33	*	*	*	*	26	*	*	*
8 Philippines	0.4	0.5	3.2	10	19	46	54	58	99	88	80	67	69	62	*	*
9 South Africa	—	—	6.1	22	68	72	76	96	41	68	80	90	90	88	89	97
10 DR Congo	42	49	47	57	54	51	54	52	46	*	46	57	*	*	*	*
11 Russian Federation	—	0.4	0.9	1.0	1.7	4.8	5.2	6.4	58	63	61	59	29	36	34	34
12 Kenya	53	55	54	59	58	49	51	49	*	*	*	*	*	54	*	*
13 Viet Nam	31	60	79	82	81	79	80	82	61	78	84	85	82	*	*	*
14 UR Tanzania	53	53	52	53	51	48	46	43	*	*	*	*	*	*	*	*
15 Brazil	—	—	—	4.1	4.0	7.6	8.1	10	79	78	78	80	79	80	76	84
16 Uganda	—	—	58	57	54	48	45	47	52	55	58	*	55	*	*	*
17 Zimbabwe	—	—	—	52	49	46	47	46	39	49	56	*	*	*	*	*
18 Mozambique	60	54	52	52	—	47	45	45	*	*	*	*	50	*	*	*
19 Thailand	—	0.3	5.0	22	41	49	80	73	53	45	35	*	*	*	*	*
20 Afghanistan	—	—	2.0	5.9	5.3	9.0	14	19	—	—	*	*	*	*	*	*
21 Cambodia	41	34	44	47	51	47	44	52	*	43	*	*	*	*	*	*
22 Myanmar	—	25	26	29	34	51	62	73	25	28	28	*	*	*	63	*
High-burden countries	**8.0**	**13**	**16**	**19**	**22**	**26**	**31**	**35**	**31**	**35**	**36**	**36**	**38**	**39**	**40**	**42**
AFR	23	26	29	35	36	37	39	44	38	43	42	45	45	42	43	45
AMR	23	27	30	34	37	45	44	46	71	72	77	77	76	75	77	77
EMR	11	9.1	10	17	17	22	23	26	20	25	24	30	27	23	25	27
EUR	2.2	3.2	4.3	11	11	12	14	20	55	58	55	57	45	46	42	39
SEAR	1.4	3.8	5.3	7.8	13	18	27	35	27	28	28	29	37	39	43	47
WPR	15	27	31	32	30	35	36	36	36	44	47	42	42	41	40	40
Global	**11**	**16**	**18**	**21**	**24**	**28**	**32**	**37**	**35**	**39**	**39**	**40**	**41**	**41**	**43**	**44**

—Indicates not available.
* No additional data beyond DOTS report, either because country is 100% DOTS, or because no non-DOTS report was received.

FIGURE 10

Progress towards the 70% case detection target

(a) Open circles mark the number of smear-positive cases notified under DOTS 1995–2002, expressed as a percentage of estimated new cases in each year. The solid line through these points indicates the average annual increment from 1995–2000 of about 134 000 new cases; the steeper line represents a higher annual increment of approximately 433 000 cases needed to reach the 70% target by 2005 (horizontal line). Closed circles show the total number of smear-positive cases notified (DOTS and non-DOTS) as a percentage of estimated cases.
(b) As (a), but for all forms of TB.

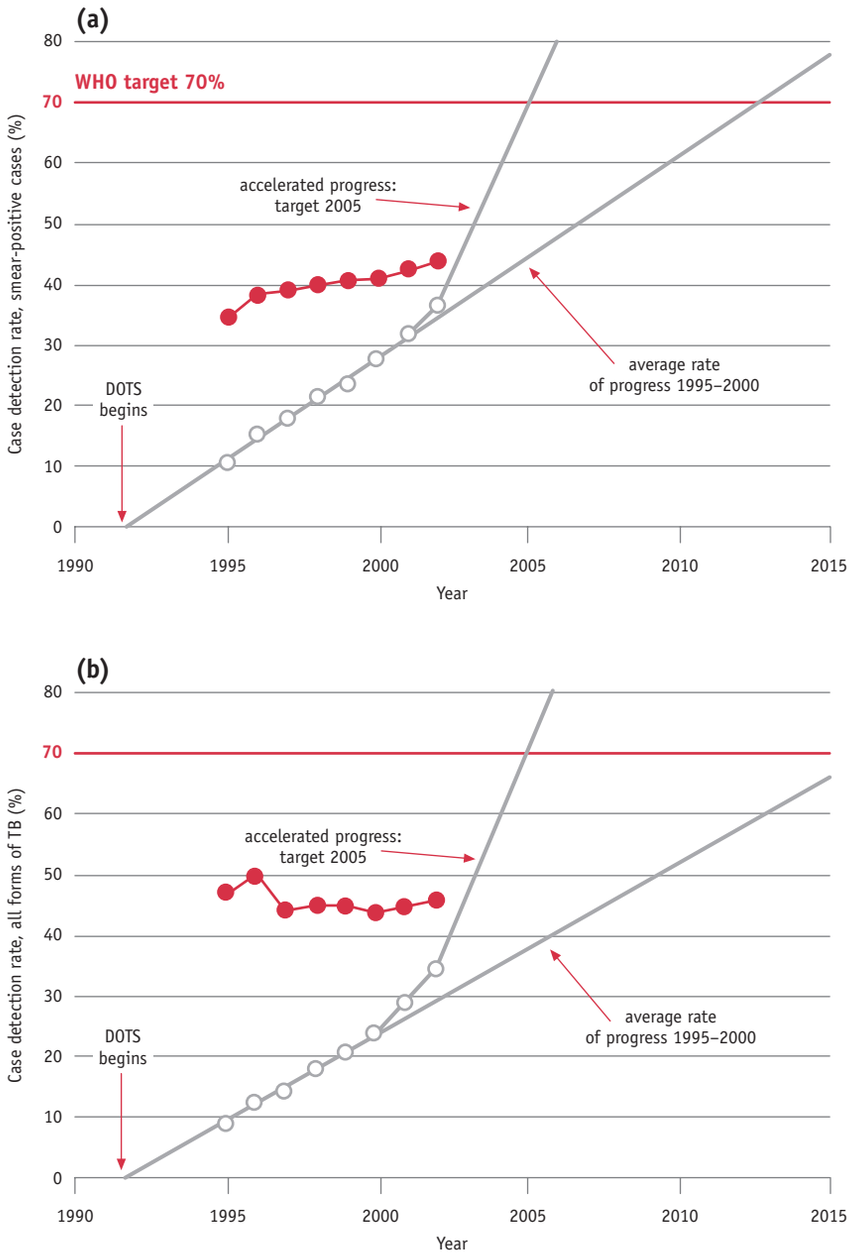
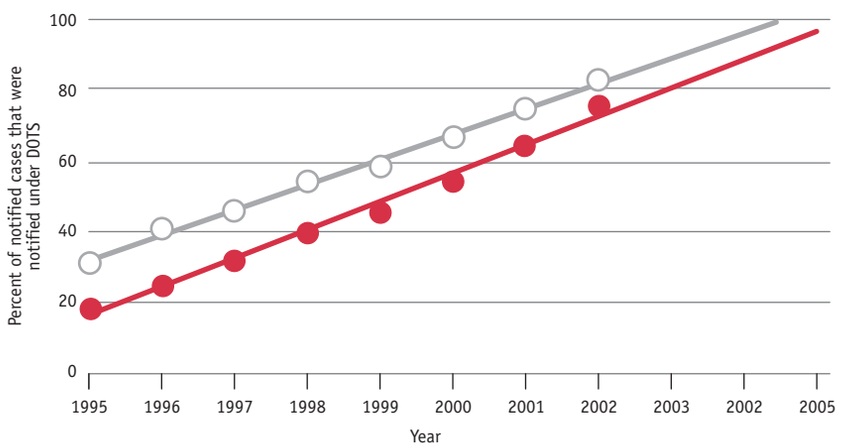


FIGURE 11

Percent of notified smear-positive cases (open circles) and of all cases (closed circles) that were notified under DOTS, 1995–2002



cases (all forms), and an extra 433 000 smear-positive cases, must be found in each of the years 2003–5.

Because case detection under DOTS has increased faster than the overall rate of case detection, the proportion of notified cases that were notified by DOTS programmes has also increased. For smear-positive cases, that proportion has increased linearly since 1995, reaching 83% in 2002 (Figure 11). Seventy-five percent of all notified TB cases were reported under DOTS in 2002. If this trend continues, all TB cases reported to WHO by 2005 will be reported by DOTS programmes.

Although more cases are recruited to DOTS programmes each year, the case detection rate within DOTS areas (measured by the ratio of case detection to population coverage) has changed little, averaging 49% worldwide between 1996 and 2002 (Figure 12). There are signs of a slow rise in the HBCs, from 42% in 1996 to 51% in 2002, driven largely by improvements in India, Indonesia, Bangladesh, and the Philippines.

Smear-positive case detection rates by DOTS programmes in 2002 were lowest in the European Region (20%) and highest in the Americas (46%; Figure 13a, Table 7). In the Americas, Europe and South-East Asia, significant numbers of smear-positive cases were reported from outside DOTS programmes and, in the Americas, the overall smear-positive case detection rate exceeded 70%. There were similar differences among regions in the detection rates of all TB cases (Figure 13b). In the Americas, Europe and South-East Asia, large numbers of cases were reported from outside DOTS programmes, and the overall case detection rate approached, or reached, 70% both in the Americas and Europe.

Treatment results, 1994–2001 cohorts

Over 1.2 million new sputum smear-positive cases were registered for treatment in DOTS programmes in

FIGURE 12

Smear-positive case detection rate within DOTS areas for high-burden countries (red) and the world (grey), 1995–2002

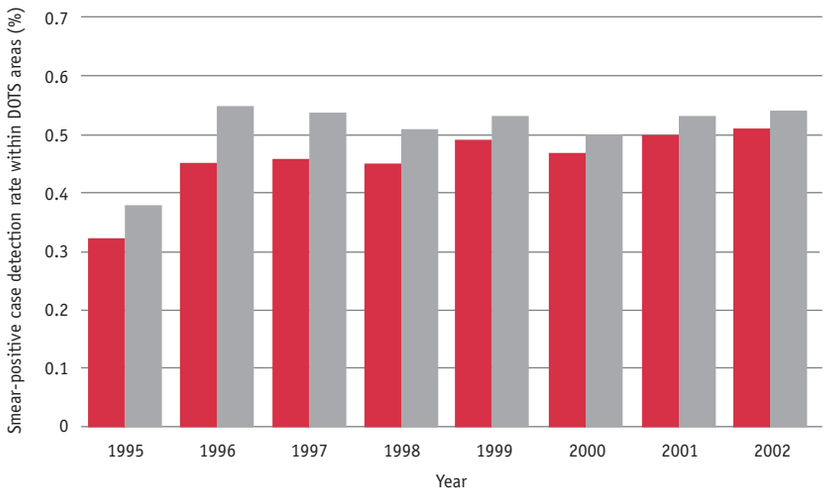
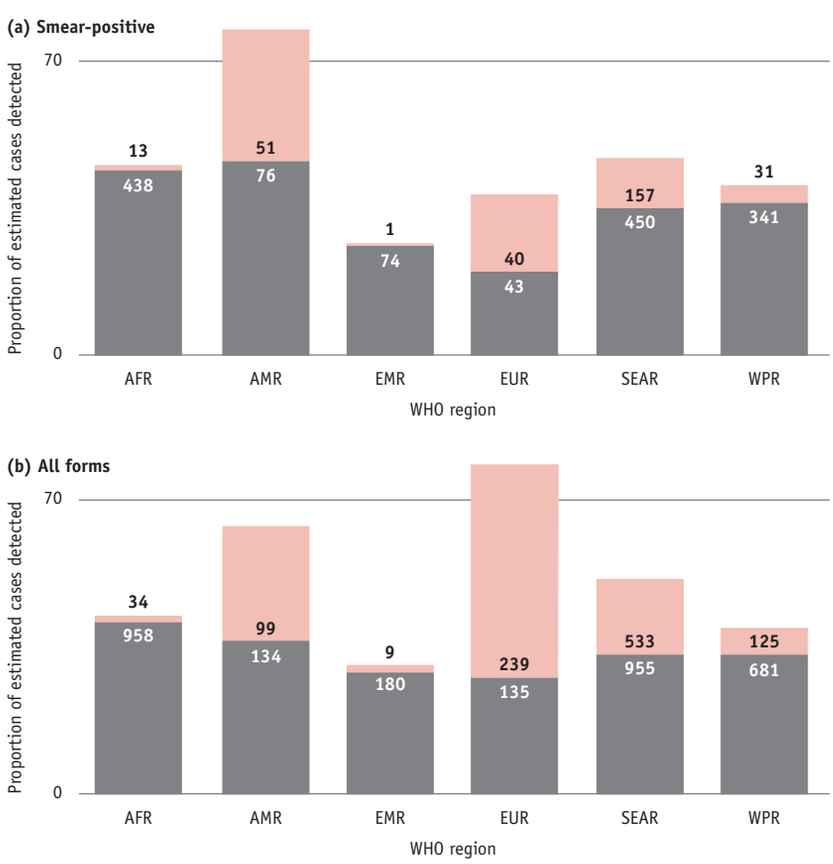


FIGURE 13

Proportion of estimated new smear-positive (a) and of all estimated new cases (b) notified under DOTS (grey portion of bars) and non-DOTS (red portion of bars), 2002. Figures indicate the number of cases (in thousands) represented by each portion of each bar.



2001, approximately the same number that were notified that year (Table 8, Annex 3 lists notified and registered cases for 2001 by country). However, there were marked discrepancies between notifications and registrations (>10% of cases notified) in data submitted by South Africa, Thailand, Brazil, and Afghanistan.

Of the registered DOTS cases, only 2.2% were not evaluated for treatment outcome (Table 8). The cure rate among registered cases was 73%, and a further 9.2% completed treatment (no laboratory confirmation of cure), giving a reported, overall treatment success rate of 82% under DOTS. An estimated 26% of all smear-positive cases arising in 2001 were treated successfully by DOTS programmes.

By contrast with DOTS programmes, the quality of reporting and the outcomes of treatment were far worse in non-DOTS areas (Table 9). Only 5 HBCs reported treatment outcomes from non-DOTS areas. The discrepancies between cases notified and registered were significant for Brazil, China, and South Africa, but not for Bangladesh or India. The overall treatment success for these 5 countries was very low because outcomes were not evaluated for the majority of patients in India (61%). Among the cases that were registered for treatment, only 25% were cured and 40% were successfully treated. The death rate among evaluated patients was lower than in DOTS programmes (3%), but the proportion lost to follow-up was far higher (default plus transfer, 23%), and a proportion of these lost patients would have died.

By WHO region, the documented treatment success rates by DOTS programmes varied from 71% in Africa to 93% in the Western Pacific Region (Figure 14a, Table 8). Fatal outcomes were most common in Africa (7%), where a higher fraction of cases are HIV-positive, and Europe (6%), where a higher fraction of cases are drug resistant (eastern Europe), or occur

TABLE 8

Treatment outcomes for new smear-positive cases, DOTS strategy, 2001 cohort[a]

					TREATMENT OUTCOMES (%)[a]								% EST[a] CASES SUCCESSFULLY
	NOTIFIED	REGISTERED[a]	REGST'D (%)	CURED	COMPLETED TREATMENT[a]	DIED	FAILED	DEFAULTED	TRANS-FERRED	NOT EVAL'D	TREATMENT SUCCESS (%)	TREATED UNDER DOTS
1 India	185 277	184 523	100	84	1.1	4.5	2.8	7.4	0.4	0.1	85 †	20
2 China	185 018	176 476	95	94	2.1	1.1	0.7	0.7	0.6	0.7	96 †	26
3 Indonesia	53 965	53 965	100	69	16	2.0	1.1	3.6	1.2	6.4	86 †	18
4 Nigeria	18 882	17 436	92	68	11	5.7	2.1	12	1.6	0.0	79	10
5 Bangladesh	38 728	38 722	100	81	3.2	4.5	0.8	6.7	3.1	0.6	84	23
6 Pakistan	6 255	6 251	100	65	11	3.2	1.1	13	5.0	1.0	77	4.0
7 Ethiopia	33 028	32 391	98	61	15	6.6	0.8	6.0	3.7	7.2	76	25
8 Philippines	59 341	55 402	93	74	13	2.3	1.3	6.0	2.7	0.0	88 †	44
9 South Africa	71 571	83 233	116	55	10	6.9	1.6	12	12	2.4	65	58
10 DR Congo	42 054	40 884	97	66	12	6.2	0.9	10	4.8	0.6	77	41
11 Russian Federation	4 079	4 079	100	64	2.9	8.3	14	6.4	3.5	0.5	67	3.5
12 Kenya	31 307	30 855	99	67	13	5.1	0.3	8.1	6.1	0.0	80	40
13 Viet Nam	54 238	54 238	100	91	1.6	3.1	0.9	1.5	1.9	0.1	93 †	74
14 UR Tanzania	24 685	24 235	98	76	4.3	10	0.4	4.2	4.5	0.0	81	37
15 Brazil	4 086	1 394	34	36	32	4.9	0.4	8.5	4.2	15	67	1.9
16 Uganda	17 291	17 291	100	28	28	6.1	0.5	17	5.0	15	56	25
17 Zimbabwe	15 370	16 569	108	63	7.1	12	0.1	8.4	9.0	0.0	71	36
18 Mozambique	13 964	14 047	101	75	2.3	9.7	1.2	8.7	2.6	0.3	77	35
19 Thailand	28 363	19 717	70	71	4.0	10	1.7	8.5	3.1	1.5	75	42
20 Afghanistan	4 639	6 292	136	53	32	3.8	1.7	7.0	3.2	0.0	84	16
21 Cambodia	14 361	14 277	99	89	2.5	4.0	0.4	2.9	0.9	0.0	92 †	40
22 Myanmar	20 686	20 887	101	74	7.7	5.2	1.7	9.5	2.2	0.0	81	51
High-burden countries	**927 188**	**913 164**	**98**	**77**	**6.7**	**4.4**	**1.4**	**6.2**	**3.0**	**1.4**	**84**	**25**
AFR	352 788	378 984	107	58	13	7.2	1.1	10	6.6	3.8	71	29
AMR	73 877	68 142	92	63	17	4.7	1.0	4.8	3.0	5.9	81	32
EMR	61 879	65 285	106	69	14	3.4	1.5	7.2	3.0	2.1	83	20
EUR	28 141	30 449	108	61	14	5.9	8.1	5.5	2.2	3.2	75	11
SEAR	353 423	345 270	98	80	4.6	4.4	2.1	6.7	1.2	1.2	84	22
WPR	333 127	321 230	96	86	6.6	2.3	1.0	2.2	1.2	0.7	93	32
Global (DOTS)	**1 203 235**	**1 209 360**	**101**	**73**	**9.2**	**4.7**	**1.5**	**6.5**	**3.1**	**2.2**	**82**	**26**

[a] Cohort: cases diagnosed during 2001 and treated/followed-up through 2002. See table 2 and accompanying text for definitions of treatment outcomes. If the number registered was provided, this (or the sum of the outcomes, if greater) was used as the denominator for calculating treatment outcomes. If the number registered was missing, then the number notified (or the sum of the outcomes, if greater) was used as the denominator. Est: estimated cases for 2001 (as opposed to notified or registered).

† Treatment success ≥ 85%.

TABLE 9

Treatment outcomes for new smear-positive cases, non-DOTS strategy, 2001 cohort[a]

					TREATMENT OUTCOMES (%)[a]							
	NOTIFIED	REGISTERED[a]	REGST'D (%)	CURED	COMPLETED TREATMENT[a]	DIED	FAILED	DEFAULTED	TRANS-FERRED	NOT EVAL'D	TREATMENT SUCCESS (%)
1 India	199 550	199 550	100	17	9.0	0.4	0.8	10	1.8	61	26
2 China	19 573	14 024	72	77	8.6	1.3	3.0	5.4	2.2	2.4	86 †
3 Indonesia	—	—	—	—	—	—	—	—	—	—	—
4 Nigeria	—	—	—	—	—	—	—	—	—	—	—
5 Bangladesh	2 049	2 049	100	43	22	0.8	1.6	24	8.0	1.3	65
6 Pakistan	—	—	—	—	—	—	—	—	—	—	—
7 Ethiopia	—	—	—	—	—	—	—	—	—	—	—
8 Philippines	—	—	—	—	—	—	—	—	—	—	—
9 South Africa	12 237	17 322	142	24	15	5.7	0.9	8.7	14	32	39
10 DR Congo	—	—	—	—	—	—	—	—	—	—	—
11 Russian Federation	—	—	—	—	—	—	—	—	—	—	—
12 Kenya	—	—	—	—	—	—	—	—	—	—	—
13 Viet Nam	—	—	—	—	—	—	—	—	—	—	—
14 UR Tanzania	—	—	—	—	—	—	—	—	—	—	—
15 Brazil	34 392	40 043	116	16	38	3.9	0.3	8.4	6.8	26	54
16 Uganda	—	—	—	—	—	—	—	—	—	—	—
17 Zimbabwe	—	—	—	—	—	—	—	—	—	—	—
18 Mozambique	—	—	—	—	—	—	—	—	—	—	—
19 Thailand	—	—	—	—	—	—	—	—	—	—	—
20 Afghanistan	—	—	—	—	—	—	—	—	—	—	—
21 Cambodia	—	—	—	—	—	—	—	—	—	—	—
22 Myanmar	—	—	—	—	—	—	—	—	—	—	—
High-burden countries	**267 801**	**272 988**	**102**	**20**	**14**	**1.3**	**0.8**	**10**	**3.4**	**51**	**34**
AFR	34 785	25 591	74	32	16	6.2	1.4	10	11	23	48
AMR	55 506	54 042	97	23	34	4.1	0.6	9.5	6.7	21	58
EMR	726	726	100	34	23	1.4	0.4	18	4.4	19	57
EUR	23 117	21 530	93	39	27	4.8	3.9	5.8	1.8	17	67
SEAR	208 041	206 241	99	18	9.1	0.5	0.9	10	1.9	59	27
WPR	37 804	24 960	66	65	9.1	2.0	2.6	4.2	4.1	13	74
Global (non-DOTS)	**359 979**	**333 090**	**93**	**25**	**15**	**1.9**	**1.2**	**9.5**	**3.6**	**44**	**40**

—Indicates not available.
[a] See notes for Table 8.

among the elderly (western Europe). Treatment interruption (default) was most frequent in the African (10%), Eastern Mediterranean (7%), and South-East Asia Regions (7%). Transfer without follow-up was also especially high in Africa (7%). Treatment failure was conspicuously high in the European Region (8%), mainly because a high proportion of patients in eastern Europe are recorded as failures (11%).

DOTS treatment success was 80% or more in 11 HBCs, and exceeded the 85% target in 6 of these countries (Table 8). It was under 70% in South Africa, the Russian Federation, Brazil, and Uganda. In South Africa, 24% of patients defaulted from treatment, or were transferred without follow-up. In Russia, 14% failed treatment. In Brazil and Uganda, the treatment results for 15% of patients were not evaluated in any way. An additional 17% defaulted from treatment in Uganda, which reported the lowest proportion of successful treatments among the 22 HBCs (56%).

A comparison of treatment results for 8 consecutive cohorts (1994–2001) shows that the overall success rates have been above 80% under DOTS since 1998 (Table 10). Treatment success rates were worse outside DOTS programmes in all regions, principally because large fractions of cases were not evaluated (Figure 14b).

In DOTS areas, over 186 000 cases were registered for retreatment in 2001 (Table 11). Some patients remain on treatment (included with those "not evaluated"), but the latest data give an overall treatment success rate of 73%. More failures and deaths are expected among patients being treated on a second or subsequent occasion, but the success rate is low in this cohort, as in the year 2000 cohort, mainly because of the high default rate.

Progress towards targets for case detection and treatment success

Data on both treatment success and case detection were provided by 173 DOTS countries. In 63 countries, DOTS detection and treatment success rates exceeded 50% and 70%, respectively

TABLE 10

Treatment success for new smear-positive cases (%), 1994–2001 cohorts[a]

	DOTS PROGRAMMES								WHOLE COUNTRY							
	1994	1995	1996	1997	1998	1999	2000	2001	1994	1995	1996	1997	1998	1999	2000	2001
1 India	83	79	79	82	84	82	84	85	*	25	21	18	27	21	77	54
2 China	94	96	96	96	97	96	95	96	91	93	94	95	95	95	93	95
3 Indonesia	94	91	81	54	58	50	87	86	*	*	*	*	*	*	*	*
4 Nigeria	65	49	32	73	73	75	79	79	*	*	*	*	*	*	*	*
5 Bangladesh	73	71	72	78	80	81	83	84	*	*	63	73	77	79	81	83
6 Pakistan	74	70	—	67	66	70	74	77	69	*	—	*	23	*	*	*
7 Ethiopia	74	61	73	72	74	76	80	76	*	*	71	*	*	74	*	*
8 Philippines	80	—	82	83	84	87	88	88	88	60	35	78	71	*	*	*
9 South Africa	—	—	69	73	74	60	66	65	78	58	61	68	72	57	63	61
10 DR Congo	71	80	48	64	70	69	78	77	72	74	48	64	*	*	*	*
11 Russian Federation	—	65	62	67	68	65	68	67	—	*	57	*	*	*	*	*
12 Kenya	73	75	77	65	77	78	80	80	*	*	*	*	*	79	*	*
13 Viet Nam	91	91	90	85	93	92	92	93	*	89	89	85	92	92	*	*
14 UR Tanzania	80	73	76	77	76	78	78	81	*	*	*	*	*	*	*	*
15 Brazil	—	—	—	—	91	89	73	67	70	17	20	27	40	78	71	55
16 Uganda	—	—	33	40	62	61	63	56	—	44	*	*	*	*	*	*
17 Zimbabwe	—	—	—	—	70	73	69	71	52	53	32	69	*	*	*	*
18 Mozambique	67	39	54	67	—	71	75	77	*	*	55	65	—	*	*	*
19 Thailand	—	—	78	62	68	77	69	75	58	64	*	58	*	*	*	*
20 Afghanistan	—	—	—	45	33	87	86	84	—	—	—	*	*	86	85	*
21 Cambodia	84	91	94	91	95	93	91	92	*	*	*	*	*	*	*	*
22 Myanmar	—	66	79	82	82	81	82	81	77	67	79	*	*	*	*	*
High-burden countries	**87**	**83**	**78**	**81**	**83**	**81**	**84**	**84**	**83**	**53**	**50**	**56**	**62**	**60**	**81**	**72**
AFR	59	62	57	63	70	69	72	71	60	60	56	64	70	68	71	70
AMR	77	77	81	81	80	83	81	81	65	50	51	58	67	79	77	70
EMR	82	87	86	79	76	83	83	83	79	79	66	73	56	79	81	83
EUR	68	69	72	72	76	77	77	75	67	67	58	72	63	75	75	72
SEAR	80	74	77	72	72	73	83	84	66	33	31	29	40	34	79	63
WPR	90	91	93	93	95	94	92	93	87	80	72	91	92	91	90	91
Global	**77**	**79**	**77**	**79**	**81**	**80**	**82**	**82**	**75**	**57**	**54**	**60**	**64**	**64**	**80**	**73**

—Indicates not available.
* No additional data beyond DOTS report, either because country is 100% DOTS, or because no non-DOTS report was received.
[a] See notes for Tables 8.

FIGURE 14

Outcomes for those patients not successfully treated in (a) DOTS and (b) non-DOTS areas, by WHO region, 2001 cohort. The true outcome of treatment is unknown for a high proportion of patients in non-DOTS areas.

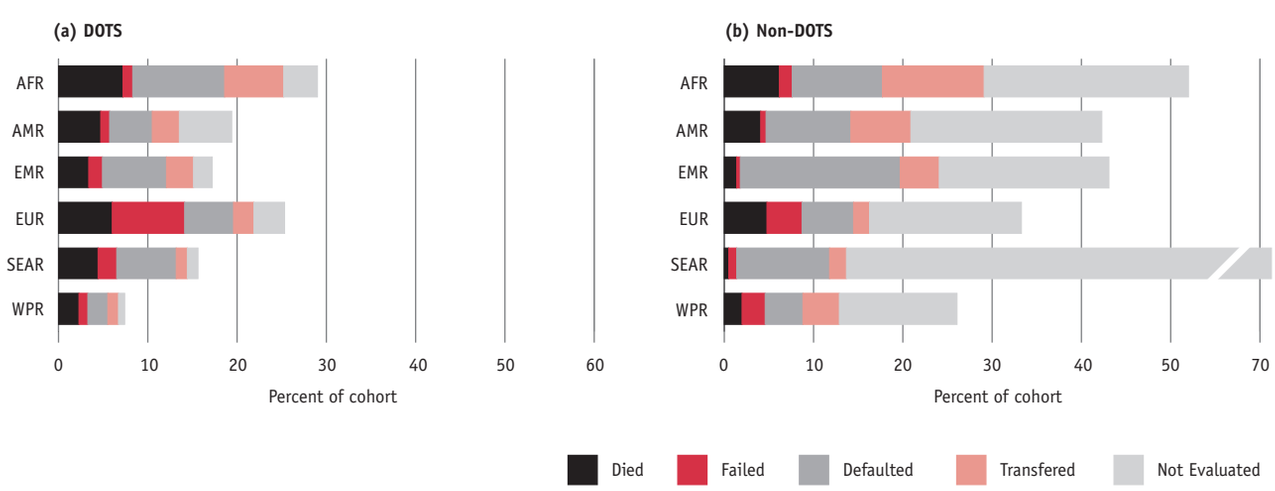


TABLE 11

Retreatment outcomes in DOTS programmes, 2001 cohort[a]

			TREATMENT OUTCOMES (%)*							
		REGISTERED	CURED	COMPLETED TREATMENT*	DIED	FAILED	DEFAULTED	TRANS-FERRED	NOT EVAL'D	TREATMENT SUCCESS (%)
1	India	68 012	66	3.3	7.5	6.5	16	1.3	0.1	69
2	China	35 991	88	4.9	2.0	2.0	1.2	0.8	1.0	93 †
3	Indonesia	2 708	58	25	2.2	1.8	3.6	1.5	8.2	83
4	Nigeria	1 847	62	8.9	8.9	6.0	12	2.3	0.0	71
5	Bangladesh	1 922	75	1.6	4.6	1.4	5.3	2.5	9.3	77
6	Pakistan	—	—	—	—	—	—	—	—	—
7	Ethiopia	1 505	55	9.4	6.8	3.1	5.6	2.5	18	64
8	Philippines	—	—	—	—	—	—	—	—	—
9	South Africa	17 869	43	10	8.8	2.3	17	16	2.3	53
10	DR Congo	—	—	—	—	—	—	—	—	—
11	Russian Federation	854	31	18	12	26	6.1	7.1	0.0	48
12	Kenya	2 635	68	10	9.8	0.5	6.6	5.7	0.0	77
13	Viet Nam	5 895	80	5.5	5.2	5.5	2.0	1.9	0.0	85 †
14	UR Tanzania	3 847	46	30	14	1.2	5.1	3.9	0.0	76
15	Brazil	238	17	30	4.2	3.8	19	4.2	22	47
16	Uganda	1 249	36	27	11	0.4	16	6.2	3.9	63
17	Zimbabwe	1 084	54	6.6	1.0	8.9	20	9.2	0.0	61
18	Mozambique	1 470	70	1.0	12	2.4	12	2.7	0.0	71
19	Thailand	2 033	45	4.0	13	5.1	6.3	4.2	22	49
20	Afghanistan	—	—	—	—	—	—	—	—	—
21	Cambodia	707	87	4.2	4.5	1.3	1.7	0.8	0.0	92 †
22	Myanmar	3 561	64	10	8.3	4.8	8.9	3.7	0.0	74
High-burden countries		**153 427**	**68**	**6.3**	**6.5**	**4.5**	**11**	**3.4**	**1.4**	**74**
	AFR	40 286	49	13	9.3	2.4	13	10	2.9	62
	AMR	3 531	62	7.5	6.5	3.9	11	4.0	5.6	69
	EMR	6 564	58	13	4.9	5.2	10	4.0	5.8	70
	EUR	8 646	47	11	10	14	10	2.8	4.5	58
	SEAR	82 626	65	4.4	7.4	6.1	14	1.6	1.1	70
	WPR	44 627	85	5.8	2.6	2.8	1.8	1.0	1.1	91 †
Global		**186 280**	**65**	**7.3**	**6.7**	**4.8**	**11**	**3.4**	**1.9**	**73**

—Indicates not available.
† Treatment success > 85%.
[a] See notes for Table 8.

FIGURE 15

DOTS status in 2002: countries close to targets

63 countries reported treatment success rates for 2001 cohort over 70% and DOTS detection rates for 2002 over 50%. 18 countries (including Kiribati, Tonga, and Lebanon, out of range of graph) have reached targets.

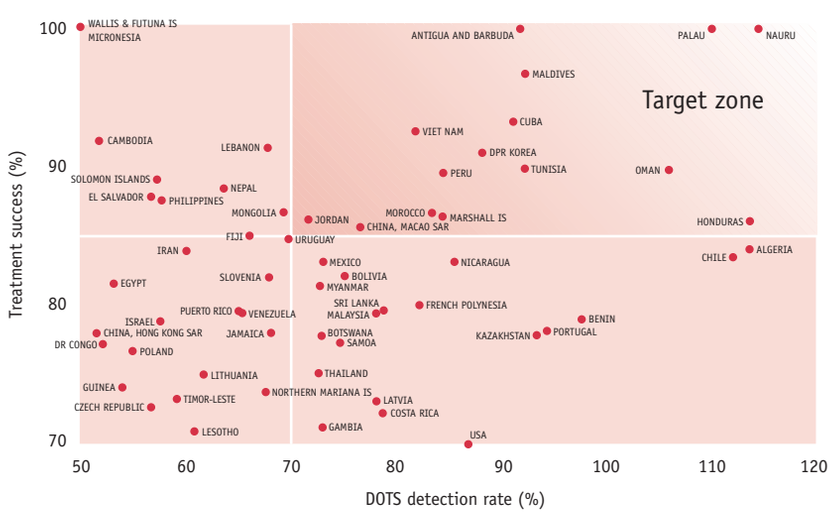


TABLE 12

Progress in DOTS implementation: high-burden countries, 2001–2002

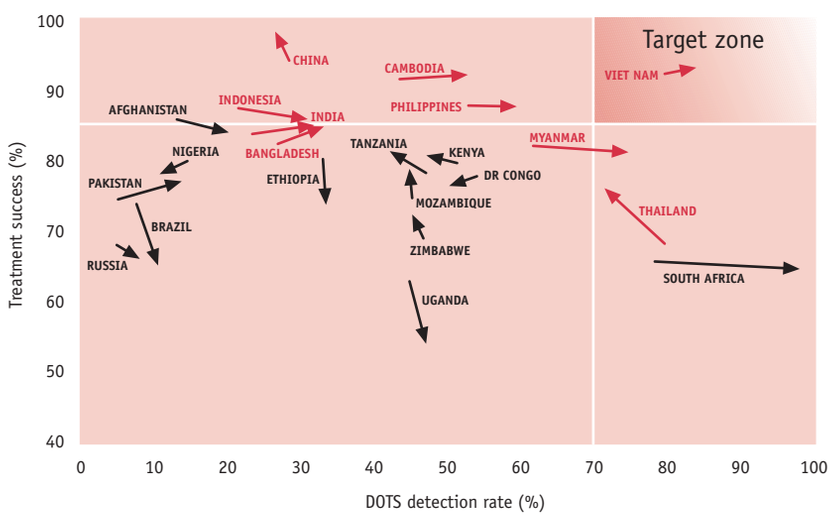
LOW TREATMENT SUCCESS (<70%)	DOTS: HIGH TREATMENT SUCCESS (≥ 70%) — INTERMEDIATE CASE DETECTION[a] (10–49%)		HIGH CASE DETECTION[a] (≥50%)
Brazil	Afghanistan	Indonesia	**Cambodia**
Russian Federation	Bangladesh	Kenya	DR Congo
South Africa	China	Mozambique	Myanmar
Uganda	Ethiopia	Nigeria	Philippines
	India	**Pakistan**	**Thailand**
		UR Tanzania	Viet Nam
		Zimbabwe	

[a] DOTS detection rate: proportion of estimated smear-positive cases notified through DOTS programmes.
Bold: countries that moved one or more categories up since 2001.
Underline: countries that moved one or more categories down since 2001.

FIGURE 16

DOTS progress in high-burden countries, 2001–2002

Treatment success refers to cohorts of patients registered in 2000 or 2001, and evaluated, respectively, by the end of 2001 or 2002.



(Figure 15). These countries appear to have reached (n = 18), or are close to reaching, WHO targets, but together accounted for only 15% of all new smear-positive cases in 2001.

Viet Nam was still the only HBC to have reached targets for both case detection (>70%) and treatment success (>85%). However, case detection rates were over 50%, and treatment success rates over 70%, in DR Congo, Cambodia, Myanmar, Thailand, and the Philippines (Table 12, Figure 16). Three countries had low rates of both case detection (<50%) and treatment success (<70%): they were Brazil, Russia, and Uganda. More details of progress in each of the 22 HBCs can be found in the profiles at Annex 1.

Of 145 countries that provided data for both 2000 and 2001 cohorts, 66 (46%) showed higher treatment success rates for the 2001 cohort, and 39 (27%) improved case detection by more than 5%. Annex 4 tabulates case detection and treatment success rates by country over the 8 years for which we have data.

Planning and DOTS implementation

Constraints and remedial actions

The country profiles in Annex 1 (objective 2) incorporate information from the summary planning tables (objective 1) that were prepared for the 2003 DEWG meeting. Thirteen major constraints to reaching the targets for case detection and treatment success were identified in the 22 HBCs (Table 13). Although TB control efforts in many countries are hampered by nearly all of these constraints, the table focuses on the principal obstacles in each country.

The 6 constraints most commonly identified were: lack of qualified staff; poor monitoring and evaluation; inadequate infrastructure; weak laboratories; insufficient engagement in DOTS of private practitioners and other health providers; and limited commitment to, and capacity for, implementing DOTS in peripheral health services:

1. Lack of qualified staff. As in 2003, the lack of qualified staff is considered to be the largest barrier to reaching the targets for case detection and cure. China, DR Congo, Ethiopia, India, Indonesia, Nigeria, Pakistan, South Africa, Tanzania, Uganda, and Zimbabwe report major deficiencies in staff at central level. Following decentralization, there has been inadequate planning for, and provision of, the technical support that

TABLE 13

Constraints to reaching targets for case detection and cure; high-burden countries, 2003. Shaded columns indicate the 6 most important constraints

		FINANCING	INFRASTRUCTURE	ACCESS TO DOTS	LABORATORIES	HUMAN RESOURCES	HIV/AIDS	COMMUNITY AWARENESS	OTHER PROVIDERS	DRUGS OR DRUG POLICY	POLITICAL COMMITMENT	MONITORING	DECENTRALIZATION OF HEALTH SECRVICES	ADMINISTRATIVE DYSFUNCTION OR POLICY BARRIERS
1	India					X		X	X					X
2	China		X	X		X					X	X		
3	Indonesia					X			X			X	X	
4	Nigeria	X	X	X	X	X					X	X	X	X
5	Bangladesh					X			X	X		X	X	X
6	Pakistan		X		X	X		X	X				X	
7	Ethiopia		X		X	X					X	X	X	X
8	Philippines							X	X			X		
9	South Africa				X	X	X				X	X	X	
10	DR Congo	X	X		X	X				X	X	X		
11	Russian Federation	X		X						X		X		X
12	Kenya		X			X	X		X					
13	Viet Nam								X	X				
14	UR Tanzania		X		X	X	X		X					
15	Brazil											X	X	
16	Uganda		X		X	X	X							
17	Zimbabwe	X	X	X		X	X				X	X		
18	Mozambique		X		X	X	X				X		X	
19	Thailand					X					X	X	X	
20	Afghanistan		X	X	X	X		X	X			X		X
21	Cambodia			X		X	X	X	X					
22	Myanmar		X		X	X		X						
	Total	**4**	**12**	**6**	**10**	**18**	**7**	**6**	**10**	**4**	**8**	**13**	**9**	**6**

would enable staff at provincial and district levels to successfully assume the new responsibilities assigned to them. Afghanistan, Bangladesh, Cambodia, Kenya, Mozambique, Myanmar, and Pakistan have staff with inadequate qualifications working at the peripheral level.

2. Poor monitoring and evaluation. Recording and reporting remain weak in Afghanistan, Bangladesh, Brazil, China, DR Congo, Ethiopia, Indonesia, Nigeria, the Philippines, South Africa, Russian Federation, Thailand, and Zimbabwe. Timely and reliable data are essential for planning corrective actions and for monitoring trends.
3. Inadequate infrastructure. Lack of transportation infrastructure in the form of roads and vehicles, poor communication networks, unreliable or non-existent electricity supplies, inadequate buildings and equipment, and weak primary health care systems all impede NTP efforts to control TB. The following countries suffer deficiencies in at least one of these areas: Afghanistan, China, DR Congo, Ethiopia, Kenya, Myanmar, Mozambique, Nigeria, Pakistan, Tanzania, Uganda, and Zimbabwe.
4. Weak laboratories. Progress in Afghanistan, DR Congo, Ethiopia, Mozambique, Myanmar, Nigeria, Pakistan, South Africa, Tanzania, and Uganda is constrained by poor laboratory quality control, the lack of a laboratory network, or limited access to laboratory services. Among possible solutions are systematic implementation of EQA organized by reference laboratories, and involving laboratories that are currently used for other purposes in TB control. Myanmar plans to buy diagnostic equipment with funds from the GFATM.
5. Poor involvement in DOTS of private or non-NTP public providers. Many countries fail to make best use of existing health system capacity by not involving all clinicians and facilities, both public and private, in providing DOTS services. Inadequate partnership in TB control between the NTP and other bodies and institutions is a major obstacle to success in Afghanistan, Bangladesh, Cambodia, India (with exceptions), Indonesia, Kenya, Pakistan, the Philippines (with exceptions), Tanzania, and Viet Nam. PPM projects

(e.g. India, the Philippines) seek to involve private practitioners in DOTS delivery, with the goals of standardizing care and improving the reporting and monitoring of patients. Other projects are working to involve non-participating public health facilities, such as hospitals in major cities.

6. Limited commitment to, and capacity for, implementing DOTS in peripheral health services. Decentralization aims to improve access to primary care, and to DOTS. Although decentralization has been under way for years in many countries, it continues to be a major constraint to TB control because of the lack of capacity at the periphery to handle what were previously central level responsibilities. Bangladesh, Brazil, Ethiopia, Indonesia, Mozambique, Nigeria, Pakistan, South Africa, and Thailand are still working to develop peripheral health system infrastructure and capacity, to obtain local political commitment, and to ensure the proper distribution of funding for TB control programmes. Countries with systems that were recently decentralized, such as the Philippines, are still finding it hard to expand and strengthen DOTS because they lack local political support. Possible solutions include the strengthening of central and provincial teams, and the provision of technical support to local health authorities.

Seven further constraints have been identified. They are, in brief:

7. Wavering political commitment. Weak and unstable political commitment, either centrally or peripherally, continues to obstruct TB control efforts in several countries. China still faces a lack of political commitment in some provinces and counties, and DR Congo, Ethiopia, Mozambique, Nigeria, South Africa, Thailand, and Zimbabwe reported limited commitment to TB control from central and peripheral levels. Remedial actions include providing better support to local government following decentralization, forming provincial task forces, expanding international support through high-level advocacy missions, and country-level advocacy for TB control in civil society, especially in support of patients infected with HIV.
8. Increasing TB/HIV co-infection. As in 2002, HIV was thought to be one of the main constraints to TB control in Cambodia, Kenya, South Africa, and Uganda. Three more countries joined that list in 2003: Mozambique, Tanzania, and Zimbabwe. NTPs are developing plans to collaborate more effectively with HIV/AIDS programmes. Although there are other countries with high rates of HIV infection, they have more pressing constraints that must be attended to first.
9. Limited access to DOTS. In Afghanistan, Cambodia, China, Nigeria, the Russian Federation, and Zimbabwe, some of the population has no or poor access to DOTS due to poor infrastructure, weak DOTS expansion, or lack of integration of DOTS into the primary health care system.
10. Low public awareness. Limited knowledge about TB and its treatment, and the stigma of having TB (and perhaps also HIV infection), both hamper efforts to detect and treat TB suspects in Afghanistan, Cambodia, India, Myanmar, Pakistan, and the Philippines. The implementation of effective and adequately funded COMBI plans could help to overcome this obstacle, but only India among these countries currently has such a plan.
11. Administrative constraints and adverse policy. Afghanistan, Bangladesh, Ethiopia, India, Nigeria, and the Russian Federation suffer from administrative constraints, or have policies inconsistent with the implementation of DOTS.
12. Unreliable drug supply or undeveloped drug policy. Nearly all HBCs had a secure supply of anti-TB drugs in 2003, thanks in large part to the GDF. The Russian Federation continues to have difficulties in controlling drug quality, Bangladesh does not have assured supply and distribution of drugs, DR Congo has problems with distribution of standard drugs throughout the country, and Viet Nam still lacks an effective drug policy.
13. Insufficient funds. A lack of money is no longer one of the top constraints identified by the majority of HBCs. However, there are 2 different reasons for this. On the one hand, governments (especially of richer countries) make large contributions to TB control, donors have increased their investments, and the GFATM began to disburse money in 2003. As a result, some NTPs genuinely have enough money. On the other hand, some NTPs perceive no shortfalls in funding because their budgets are incomplete, or because their plans for TB control are not sufficiently ambitious (see F*inancing DOTS expansion* below). Eleven of the HBCs reported some level of funding gap in their 2003 budgets. Some of these countries report problems in distributing funds from local or central governments to programmes (e.g. Nigeria, the Russian Federation).

Partnerships and coordination

Although coordination of partners' activities has been steadily improving through discussion within and among 3 working groups of the Stop TB Partnership (DOTS expansion, TB-HIV, and MDR-TB), there is still need for better coordination of country activities to reduce duplication of efforts. WHO and the Stop TB Partnership are working to identify overlaps, and to ensure better internal

coordination of country activities. All regions organize coordination among regional partners, to greater and lesser degrees, using mechanisms such as regional ICCs, task forces, and meetings of interested parties. NICCs have now been meeting regularly in all HBCs except Mozambique and South Africa. In countries applying to the GFATM, a well-established NICC serves as a model for organizing the Country Coordination Mechanism required by the Fund. In some countries, the NICC for TB remains a sub-committee of the CCM.

Planning for MDR-TB control

Since publication of the 2nd WHO/IUATLD report[23] on anti-TB drug resistance in the world, new data on the prevalence of MDR-TB have been collected in 7 HBCs, or from parts of these countries, including 3 that were previously surveyed between 1996 and 1999. Surveys were repeated in Thailand, China (Henan province), and in the Russian Federation (Tomsk oblast). Drug resistance data have been reported for the first time by Cambodia, China (Hubei and Liaoning provinces), South Africa (national survey), DR Congo (Kinshasa), the Russian Federation (Orel oblast), and India (North Arcot, Raichur, and Wardha districts). There are no data on MDR-TB rates for Afghanistan, Bangladesh, Ethiopia, Indonesia, Nigeria, Pakistan, the Philippines, and Tanzania. The new data, where available at the time of writing, are summarized in the text of country profiles at Annex 1, along with estimates for other countries (in data tables). The results of the new surveys will be described in full in the 3rd WHO/IUATLD report, to be published in 2004.[6]

The DOTS-Plus initiative develops global policy on the management of MDR-TB and facilitates access to second-line drugs. As part of this process, and under the continuous monitoring of the GLC, several DOTS-Plus pilot projects have been established to evaluate the feasibility and cost-effectiveness of using second-line drugs for managing MDR-TB in countries with limited resources. Projects approved by the GLC have access to quality-assured, second-line drugs at concessionary prices and benefit from technical support and monitoring. The Philippines and the Russian Federation have DOTS-Plus pilot projects approved by the GLC. India and Kenya have DOTS-Plus applications to the GLC under review, and Tanzania and Viet Nam are planning to apply.

The results of planning activities related to MDR-TB are reported in the individual country profiles for China, India, Kenya, Nigeria, the Russian Federation, South Africa, the Philippines, and Viet Nam.

Collaborative TB/HIV activities

Collaborative TB/HIV activities in the 22 HBCs are detailed in each country profile in Annex 1, and summarized in Table 14. No country has yet implemented any collaborative activities on a national scale. However, 15 of the HBCs have TB/HIV coordinating bodies, and 12 carry out small-scale, joint TB/HIV planning activities. Three of the countries that have listed HIV as a constraint (Tanzania, Uganda, Zimbabwe) do not yet have a TB/HIV coordinating body, which makes planning more difficult. The majority of the HBCs neither routinely test TB patients for HIV, nor actively look for TB among people infected with HIV, and most do not have national surveillance systems for assessing the scale of the TB/HIV problem. The twin goals of testing TB patients for HIV infection, and testing HIV-infected persons for TB, have been achieved in Brazil, Cambodia, China, India, Indonesia, Myanmar, the Russian Federation, and South Africa, but only on a limited scale in each country. Most of the HBCs do not yet monitor and evaluate collaborative TB/HIV activities, do not offer isoniazid preventive therapy, and do not routinely provide TB patients with the means to prevent HIV infection. The majority of HBCs do not provide ART, or offer little additional care and support for TB patients infected with HIV.

Financing DOTS expansion

Countries reporting to WHO

Financial data were received from 123 countries (58%; Table 15). Of the countries that reported, 77 (63%) provided complete budget data for 2003 including disaggregated budgets by line item and by funding source. Seventy-four (60%) submitted complete, disaggregated expenditure data for fiscal year 2002. A total of 113 countries (53%) provided estimates of the numbers of cases treated in 2003, the average number of clinic visits made by patients during TB treatment, and the average number of days patients were hospitalized for TB care.

Among the HBCs, only South Africa and Zimbabwe did not provide financial data (Table 16). Seventeen (77%) provided complete budget data for fiscal year 2003 and 15 (68%) submitted complete expenditure data from fiscal year 2002. Sixteen of the HBCs estimated the number of cases to be treated in 2003 and quantified the expected number of clinic visits and hospital days for these patients.

NTP budgets, total costs of TB control, and government contributions among HBCs, 2002 and 2003

The NTP budgets of the HBCs for the fiscal year 2003 totalled US$ 430 million, excluding South Africa and Zimbabwe, which provided no data (Table 17). This was lower than the 2003 budget estimate of US$ 481 million for the HBCs reported in *Global Tuberculosis Control 2003*,[5] which included budget figures for Zimbabwe but not for South Africa. The difference is largely due to a change in

[20] WHO/IUATLD. Anti-tuberculosis Drug Resistance in the World. Report No. 2. Prevalence and Trends. Geneva, WHO/CDS/TB/2000.278

TABLE 14

Status of collaborative TB/HIV activities; high-burden countries, October 2003[a]

		TB/HIV COORDINATING BODIES	HIV SURVEILLANCE IN TB PATIENTS	JOINT TB/HIV PLANNING	MONITORING & EVALUATION OF TB/HIV	INTENSIFIED TB CASE FINDING IN PLWHA	ISONIAZID PREVENTIVE THERAPY	TB CONTROL IN CONGREGATE SETTINGS[b]	HIV TESTING FOR TB PATIENTS	HIV PREVENTIVE METHODS TO TB PATIENTS	COTRIMOXAZOLE PREVENTIVE THERAPY	HIV CARE AND SUPPORT TO TB PATIENTS	ART FOR HIV-INFECTED TB PATIENTS
1	India	X		X	X	X		X	X		X	X	X
2	China				X	X	X		X				
3	Indonesia	X				X			X	X			
4	Nigeria	X	X	X				X					
5	Bangladesh												
6	Pakistan	X	X										
7	Ethiopia	X		X			X						
8	Philippines	X		X	X	X							
9	South Africa	X		X	X	X			X	X		X	
10	DR Congo	X		X				X	X	X	X	X	
11	Russian Federation	X	X	X	X	X	X	X	X	X	X	X	X
12	Kenya	X											
13	Viet Nam	X	X										
14	UR Tanzania			X									
15	Brazil	X	X	X	X	X	X	X	X	X		X	X
16	Uganda					X	X	X		X	X		
17	Zimbabwe			X	X		X	X	X	X		X	
18	Mozambique	X	X	X					X	X		X	
19	Thailand	X	X				X	X					X
20	Afghanistan												
21	Cambodia	X	X	X	X	X		X	X	X	X		
22	Myanmar				X	X		X	X	X		X	
	Total	**15**	**8**	**12**	**9**	**10**	**7**	**10**	**11**	**10**	**5**	**8**	**4**

[a] Any listed activities carried out by MoH, NGOs or research organizations are included in this table.
[b] for example prisons, army barracks, homeless shelters.

TABLE 15

Budget and expenditure data received: all countries, 2003

	NUMBER OF COUNTRIES	REPORTS RECEIVED	BUDGET DATA			EXPENDITURE DATA			NO. PATIENTS TO BE TREATED QUANTIFIED
			COMPLETE	PARTIAL	NONE	COMPLETE	PARTIAL	NONE	
AFR	46	28	19	6	1	16	3	7	25
AMR	44	25	16	7	2	14	9	2	23
EMR	23	11	6	5	0	5	4	2	10
EUR	53	25	9	3	13	10	2	13	23
SEAR	11	11	9	2	0	9	2	0	11
WPR	36	23	18	5	0	20	3	0	21
Global	**213**	**123**	**77**	**28**	**16**	**74**	**23**	**24**	**113**

TABLE 16

Budget and expenditure data received: high-burden countries, 2003

	NUMBER OF COUNTRIES	REPORTS RECEIVED	BUDGET DATA			EXPENDITURE DATA			NO. PATIENTS TO BE TREATED QUANTIFIED
			COMPLETE	PARTIAL	NONE	COMPLETE	PARTIAL	NONE	
AFR	9	7	6	1	0	4	0	3	6
AMR	1	1	1	0	0	1	0	0	1
EMR	2	2	1	1	0	0	2	0	0
EUR	1	1	1	0	0	1	0	0	1
SEAR	5	5	4	1	0	5	0	0	4
WPR	4	4	4	0	0	4	0	0	4
Global	**22**	**20**	**17**	**3**	**0**	**15**	**2**	**3**	**16**

TABLE 17

Total TB control costs and government contributions: high-burden countries, 2002 and 2003

		TOTAL NTP COSTS (US$ MILLIONS)		TOTAL TB CONTROL COST (US$ MILLIONS)		TOTAL COST PER PATIENT TREATED (US$)		GOVERNMENT CONTRIBUTION TO TOTAL TB CONTROL COST			
								AS % OF TOTAL TB CONTROL COST		AS % GOVERNMENT HEALTH EXPENDITURES	
		2002 (EXPENDITURES)	2003 (BUDGET)	2002 (ACTUAL)	2003 (PLANNED)	2002 (ACTUAL)	2003 (PLANNED)	2002 (ACTUAL)	2003 (PLANNED)	2002 (ACTUAL)	2003 (PLANNED)
1	India	25	42	75	96	72	73	93	88	1	2
2	China	61	95	61	95	153	199	95	77	0.3	0.3
3	Indonesia	18	32	22	38	148	172	92	67	2	2
4	Nigeria	NA	13	NA	19	NA	380	NA	55	NA	8
5	Bangladesh	7[d]	17	12	28	155	171	NA	62	2	2
6	Pakistan	NA	6	7[e,g]	8	NA	146	NA	59	NA	1
7	Ethiopia	5	11	8	14	76	129	53	41	4	5
8	Philippines	6	7	34	36	296	298	99	93	3	3
9	South Africa[a]	NA	NA	300	300	1491	1491	100	100	6	6
10	DR Congo	7	10	17	23	251	288	63	58	3	4
11	Russian Federation[b]	124	124	175–225	175–225	1419–1824	1419–1824	99	99	2	2
12	Kenya	4	11	5	14	71	125	79	46	2	4
13	Vietnam	4	7	14	17	158	172	96	91	3	4
14	UR Tanzania	NA	5	14[e,h]	16	NA	231	NA	75	NA	6
15	Brazil	13	16	39	41	669	704	100	100	0.2	0.2
16	Uganda	2	5	2	6	70	115	65	31	2	2
17	Zimbabwe	NA	NA	22[e,i]	22[e,i]	NA	NA	NA	NA	NA	NA
18	Mozambique	NA	8	10[e,j]	10[e,j]	NA	NA	NA	NA	NA	NA
19	Thailand	7	7[e,f]	9	9[e,f]	198	NA	100	100	0.3	NA
20	Afghanistan[c]	2	3	2	3	174	280	0	0	0	0
21	Cambodia	3	6	5	9	217	300	78	46	5	6
22	Myanmar[c]	1	5	1	5	21	65	25	6	NA	NA
High-burden countries		**289**	**430**	**834–884**	**984–1031**	**158[k]**	**199[k]**	**95[k]**	**75[k]**	**2[k]**	**2[k]**

NA Indicates not available.

[a] No data were provided by the NTP; the cost per patient was estimated using recently published costing studies, and multiplied by the number of patients notified in 2002 to give the estimated total cost.

[b] Data were not provided for 2002; numbers for 2002 were assumed to be the same as those provided for 2003.

[c] Reflects NTP budgets and expenditures only, insufficient data available to estimate costs not included in the NTP budget.

[d] Estimate based on data provided in GFATM proposal.

[e] Data not provided on WHO surveillance form.

[f] Costs for 2003 assumed to be equal to those for 2002.

[g] Cost per patient estimated using data submitted in previous years, and multiplied by the number of cases that were notified in 2002 to give estimate of total cost.

[h] Total cost estimated by multiplying cost per patient for 2003 by number of cases notified in 2002.

[i] Estimate based on previous costing analyses, with cost per patient multiplied by the number of cases notified in 2002.

[j] Cost per patient estimated using budget data and by assuming that care is provided on an outpatient basis (as stated in GFATM proposal). Total cost estimated by multiplying the cost per patient by number of cases notified in 2002.

[k] Median value.

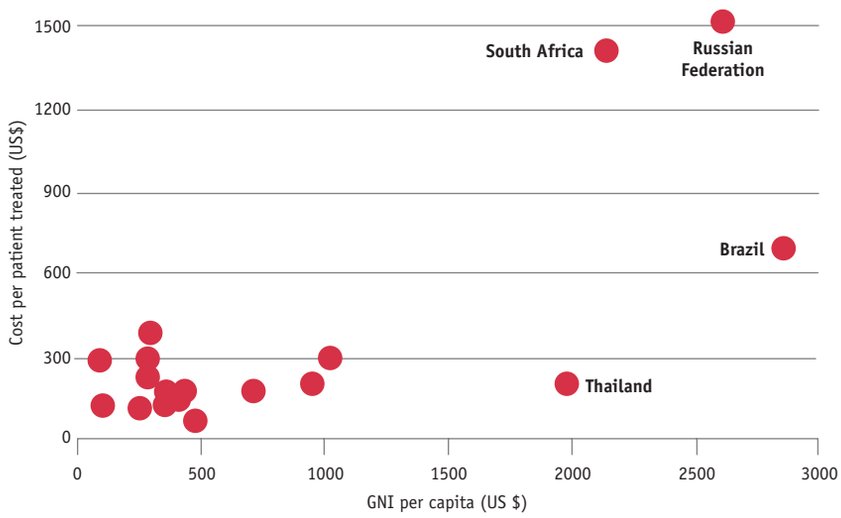
the budget for the Russian Federation. No data were provided by the Russian Federation MoH in 2002; instead, we used an estimate of US$ 200 million based on recent costing studies.[18] For this report, the Russian Federation provided data for 2003 for all expenditures at federal level and for staff expenditures at oblast (regional) level, which totalled US$ 125 million. The oblast data did not include all items funded locally. If these were included, the estimate would probably be similar to that in last year's report.

The total costs of TB control were calculated for the HBCs by adding the 2003 NTP budgets to the costs associated with TB control that were not financed through the NTP (e.g. salaries of health workers and infrastructure costs). The total costs for the HBCs in 2003 were estimated at around US$ 1 billion (Table 17). This is an increase of around US$ 150 million (about 18%) from 2002 expenditures of US$ 834–884 million.

The total expenditures for 2002 were lower than the estimates published in last year's report (US$ 976 million).[5] This is primarily because the estimates in last year's report assumed that the number of patients treated by NTPs would be consistent with the progress needed to reach 70% case detection in 2005. In practice, the 2002 notification data show that they treated fewer cases. There was no consistent association between the change in case load between 2002 and 2003 (cases detected by countries in 2002 compared with cases expected in 2003) and the change in costs (2002 expenditures compared with 2003 budgets). All countries that reported 2002 expenditures and 2003 budgets reported an increase in costs in 2003.

FIGURE 17

Cost per patient treated by GNI per capita: high-burden countries, 2003



The total cost per patient treated in the HBCs in 2003 ranged from US$ 65 in Myanmar to US$ 1419–1824 in the Russian Federation (Table 17). The median total cost per patient was US$ 199 (China). Fourteen of the countries (74% of those providing data) had costs per patient between US$ 125 and US$ 380. Two countries had costs per patient below US$ 100 (India and Myanmar). Three countries stand apart from the rest: in Brazil, the Russian Federation and South Africa, the costs per patient were above US$ 700. Patient care is expensive in these countries partly because the prices of labour and capital are higher, linked to higher GNI (Figure 17). However, costs are also inflated by the heavy reliance on hospital treatment and expensive diagnostic techniques in South Africa and the Russian Federation. In Thailand, the cost per patient was low (US$ 198) relative to GNI (US$ 1980). One explanation is that patients make relatively few visits to clinics during treatment (12 on average).

Between 2002 and 2003, the costs per patient changed little in India and the Philippines (Table 17). This is because, while geographical expansion of DOTS has proceeded rapidly in India, the strategy for implementation has remained the same. The Philippines was already close to full DOTS coverage in 2002.

In other countries, the cost per patient increased markedly between 2002 and 2003 for reasons that differed among countries. Costs have increased in Vietnam because a national prevalence survey was included in the 2003 budget, and because the NTP is expanding to remote areas where detecting and treating cases is more difficult. In Bangladesh, the budget for fiscal year 2003 includes substantial funding for new initiatives such as improvement in the quantity and quality of diagnostic services and training. In Myanmar, the increase is due to large planned investments in vehicles for supervision and in diagnostic equipment. This adds considerably to costs in the year in which these items are bought, though the benefits will be spread over several years.

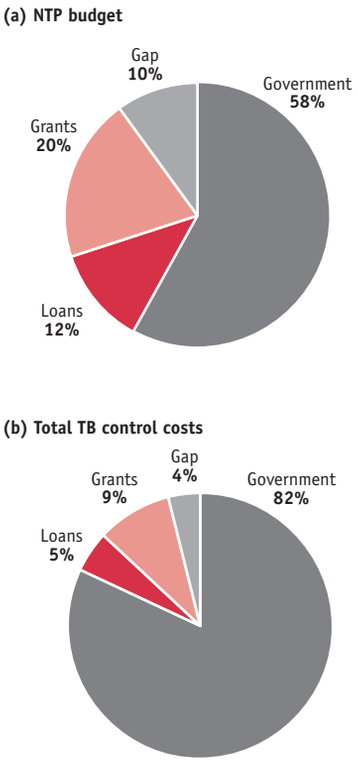
There will inevitably be delays between investments in TB control and the consequent increase in case detection. For example, where NTPs (e.g. Kenya) have introduced new initiatives to increase case detection – by involving, for example, the private sector, HIV/AIDS control programmes, or lay members of communities who can recognize TB symptoms and supervise treatment – the yield in new TB cases will not be immediate. Another possible explanation for increasing per patient costs is that the targets for case detection set by NTPs are not sufficiently ambitious relative to the large increases in their budgets.

Funding sources and gaps for fiscal year 2003 in high-burden countries

The relative contributions of different funding sources to NTP budgets and total TB control costs in the HBCs are shown in Figures 18 and 19. Overall, the governments of the HBCs contributed 70% of money specified in NTP budgets, through loans (12%) and national funds (58%). Government contributions to the total cost

FIGURE 18

Funding sources: high-burden countries, 2003

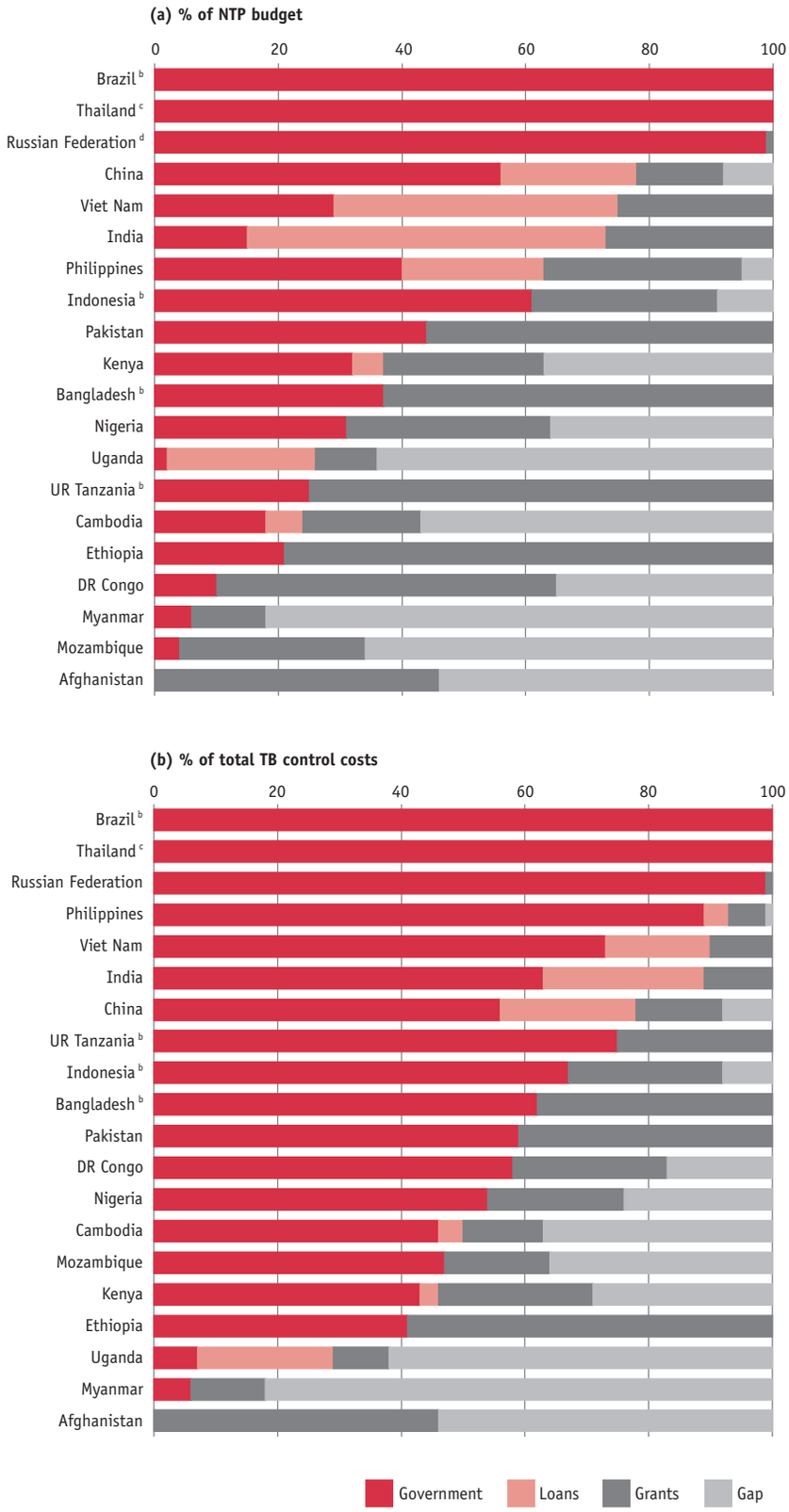


of TB control were higher, because governments typically fund all the general health care staff and infrastructure used by TB patients during treatment. In 2003, the government contribution to total costs in the HBCs was 87%, of which 5% came from loans and 82% from national funds. Grants contributed 20% of the funds for NTP budgets and 9% of total costs.

The funding gap for HBCs totalled US$ 41 million, excluding South Africa and Zimbabwe, which did not provide data. This is a decline from the previous estimate of US$ 52 million,[5] which excluded South Africa. Bangladesh, Brazil, China, DR Congo, Ethiopia, Nigeria, Pakistan and the Philippines reported a decrease in the funding gap since the publication of last year's report. Except for Nigeria, the decline reflects the availability of increased funding, largely from governments (including loans) and the GFATM. It is not clear why the funding gap was reduced in Nigeria.

FIGURE 19

Sources of funding for (a) NTP budgets and (b) total TB control costs; high-burden countries, 2003[a]



[a] Data not available for South Africa and Zimbabwe.
[b] Loan contributions may be underestimated because loans supporting the health sector as a whole may not have been included in the data submitted to WHO.
[c] 2003 data not available; 2002 data are shown.
[d] Expenditure rather than budget data shown.

FIGURE 20

Government contribution to total TB control costs by GNI per capita; high-burden countries, 2003

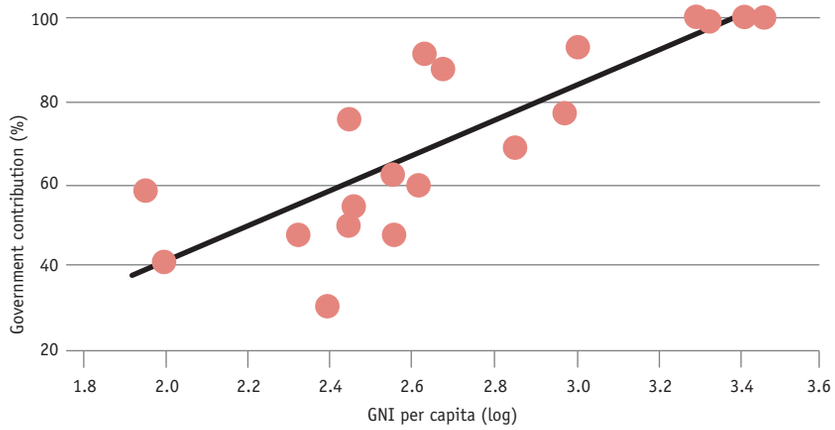


TABLE 18

GNI per capita (US$)

% OF TOTAL TB CONTROL COSTS CONTRIBUTED BY GOVERNMENT	GNI PER CAPITA		
	< 400	400–800	> 800
0–50	Afghanistan[a] Cambodia Ethiopia Kenya Mozambique[b] Myanmar[a] Uganda		
51–90	Bangladesh DR Congo Nigeria UR Tanzania Zimbabwe[a,b]	India Indonesia Pakistan	China
91–100		Viet Nam	Brazil Philippines Russia South Africa Thailand

[a] No GNI data available; classification based on estimates.
[b] No data available on government contribution to total TB control costs; classification based on estimates.

Other HBCs reported an increase in the funding gap, including Cambodia, Indonesia, Kenya, Myanmar and Uganda. The increased funding gap followed an increase in overall budget requirements, reflecting additional planned activities that support acceleration of DOTS expansion. The budgets for these countries suggest that they have been planning effectively to meet the targets for case detection and treatment success. The budget gap in Afghanistan increased due to a decline in external funding.

The importance of grant funding and funding gaps was greater in some countries than overall figures for the HBCs suggest. Grant funding was large as a share of both the total NTP budget and total TB control costs in Ethiopia, Afghanistan, Bangladesh, Pakistan, and as a share of the NTP budget in Tanzania and DR Congo. Funding gaps that are large relative to total needs remain in Myanmar, Mozambique, Uganda, Afghanistan, Cambodia, Kenya, Nigeria and DR Congo.

Wealthier countries generally financed a larger proportion of their TB control costs (Figure 20, Table 18). The governments of all HBCs with a GNI per capita of more than US$ 400 contributed more than half of the total costs of TB control in 2003. In 5 of the 6 middle-income countries with GNIs of more than US$ 800 per capita, the governments covered more than 90% of all the costs in 2003. These included Brazil, the Philippines, the Russian Federation, South Africa, and Thailand. China had a GNI of US$ 940 and contributed 77% to the total cost of TB control. Government contributions in China and the Philippines included loans. Among the countries with a GNI between US$ 400 and US$ 800, the percentage of total costs covered by governments ranged from 59% in Pakistan to 91% in Vietnam. India and Viet Nam included loans as part of the government contribution to TB control. Among the countries with a GNI of less than US$ 400, the percentage of the total costs covered by governments ranged from 6% in Myanmar to 75% in Tanzania (the government contribution to TB control may be close to zero in Afghanistan, but no figure for non-NTP costs was available). The government contribution to total TB control costs was less than 10% in only 2 countries, Afghanistan and Myanmar. In all HBCs with some external funding, an increase in total TB control costs between 2002 and 2003 was accompanied by a decrease in the proportion of the costs covered by the government.

Government contributions to TB

control were also considered as a share of overall government spending on health (Table 17). Among the HBCs, TB control costs accounted for between 0% (Afghanistan) to 8% (Nigeria) of government spending on health. The median was 2% (Bangladesh, India, Indonesia, Russian Federation, and Uganda). The percentage of government spending on health that was used for TB control increased between 2002 and 2003 in 6 of the HBCs. It did not decrease in any of the countries where data were available for both years.

GFATM contribution to TB control in 2003

The GFATM makes awards for TB control in 4 categories: TB, TB/HIV, HIV/AIDS, and integrated TB/HIV/malaria. By the end of 2003, the Fund had approved a total 5-year budget of US$ 608 million for TB proposals and US$ 319 million for TB/HIV proposals in 56 countries (Table 19). While TB/HIV proposals include both TB and HIV activities, it was not possible to disaggregate the contribution to TB control from the budgets provided, so the total of each award is included in Table 19. Additional funds were approved for collaborative TV/HIV activities within HIV/AIDS proposals, but since the amounts cannot be disaggregated from the total awards, and the contribution to TB control through HIV/AIDS proposals is expected to be low, no estimates are included in Table 19. Afghanistan submitted the only integrated TB/HIV/malaria proposal that was approved. The separate cost of TB control was not identified within the US$ 3 million budget.

The total for the first 2 years for which grants have been or are expected to be signed is US$ 294 million for TB proposals, and US$ 90 million from TB/HIV proposals. Almost 70% of the total grant funding for TB and TB/HIV will benefit HBCs. Only 3 HBCs have not been awarded GFATM funds: Brazil did not apply because, with a high GNI per capita, it has not been eligible for funding. Nigeria and Zimbabwe have so far been unsuccessful.

Among successful applicants, countries in the Africa Region will receive US$ 463 million for up to 5 years, 50% of the total approved by the Fund (Figure 21). Countries in the South-East Asia Region will receive US$ 206 million, 22% of the total. During 2003, US$ 61 million or 16% of the total approved for the first 2 years was paid to countries for TB and TB/HIV activities.

The GFATM grants awarded in 2003 for TB and TB/HIV accounted for approximately 6% of total budget for TB control in the HBCs. The grants awarded to some HBCs will fill large funding gaps, when disbursed. Indonesia's approved proposal of US$ 71 million over 5 years, for example, has an anticipated annual allocation of GFATM funding that accounts for approximately one-third of the total NTP budget. However, delays in the disbursement of GFATM funding held up progress in 2003. Between March and December 2003, Indonesia received only 17% of the budget specified in its initial 2-year grant agreement. Similarly, in Bangladesh, Ethiopia, and Myanmar, the planned disbursement by the GFATM accounts for an estimated 52%, 61% and 80% respectively of the NTP budgets in 2003–4. But only Ethiopia has so far received any money, amounting to US$ 6.5 million (59% of the anticipated 2-year total).

Resources required for TB control in high-burden countries, 2004 and 2005

The resources required in the 22 HBCs, if global targets are to be reached in 2005, and if countries make constant progress towards these targets from 2002 are, excluding the Russian Federation, US$ 0.95 billion in 2004 and US$ 1.1 billion in 2005 (Figure 22). This compares with an estimated expenditure of US$ 0.65 billion in 2002 and a budget of US$ 0.8 billion in 2003 (Table 17).

FIGURE 21

Distribution of GFATM awards by WHO region

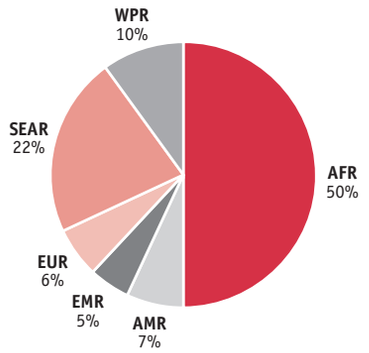
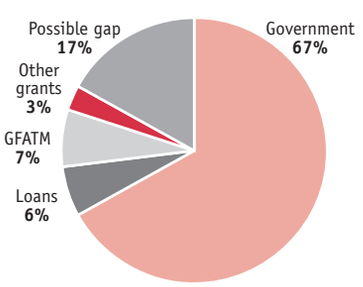


FIGURE 22

Resources required for TB control: high-burden countries, (a) 2004 and (b) 2005 (excluding the Russian Federation)

(a) 2004. Total need US$ 0.95 billion.



(b) 2005. Total need US$ 1.1 billion.

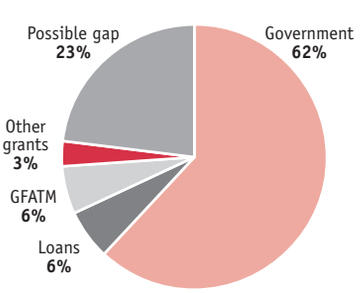


TABLE 19

Recipients of GFATM grants for TB control; high-burden countries, end 2003

	COMPONENT	ROUND	GRANT STATUS[a]	TOTAL LIFETIME BUDGETS (US$ MILLIONS)	FUNDS AWARDED FOR FIRST 2 YEARS (US$ MILLIONS)	DATE OF FIRST DISBURSEMENT	DISBURSEMENT TO DATE (US$ MILLIONS)
AFRO							
High-burden countries							
DR Congo	TB	2	G	8.0	6.4	Jul 03	1.6
Ethiopia	TB	1	G	21.3	11	Aug 03	6.5
Kenya	TB	2	G	11.2	4.9	Aug 03	0.8
	TB	3	B	3.8	1.8	—	—
Mozambique	TB	2	T	18.2	12.2	—	—
South Africa	HIV/TB	1	G	93.3	14.4	Aug 03	3.9
	HIV/TB	1	G	72.0	26.7	Aug 03	12.9
	HIV/TB	2	T	25.1	8.4	—	—
UR Tanzania	HIV/TB	3	B	87	24	—	—
	TB	3	T	1.7	1.0	—	—
Uganda	TB	2	T	9.1	6.8	—	—
Other countries (n=15)				112.5	50.5		
AMRO							
No grants to high-burden countries							
Other countries (n=9)				64.9	41.9		
EMRO							
High-burden countries							
Afghanistan	TB/HIV/ Malaria	1	T	3.1	3.1	—	—
Pakistan	TB	2	G	4.0	2.3	Dec 03	0.5
	TB	3	B	13.1	6.8	—	—
Other countries (n=3)				33.1	13.9		
EURO							
High-burden countries							
Russian Federation	TB	3	T	10.8	6.3	—	—
Other countries (n=5)				41.8	27.3		
SEARO							
High-burden countries							
Bangladesh	TB	3	B	43.8	17.2	—	—
India	TB	1	G	8.8	5.7	Jul 03	1.0
	TB	2	T	29.1	12.8	—	—
	HIV/TB	3	B	14.8	2.7	—	—
Indonesia	TB	1	G	70.7	21.6	Mar 03	3.7
Myanmar	TB	2	T	17.1	7.0	—	—
Thailand	TB	1	G	13.5	7.0	Jul 03	0.7
Other countries (n=2)				8.5	3.8		
WPRO							
High-burden countries							
Cambodia	TB	2	G	6.6	2.5	Dec 03	0.6
China	TB	1	G	48.1	25.4	Apr 03	12.7
Philippines	TB	2	G	11.4	3.4	Jun 03	0.9
Viet Nam	TB	1	G	10	2.5	—	—
Other countries (n=3, and 1 multi-country)	TB			13.2	6.2		
Global (TB-specific)				608	294		41
Global (TB/HIV)				319	90		20
Global (integrated TB/HIV/malaria)				3	3		—
Global (19 high-burden countries, 37 others, 1 multi-country)				**930**	**387**		**61**

—Indicates no funds dispersed by end 2003.

[a] B indicates board approved budget, pending Technical Review Panel clarifications and grant negotiations; T, Technical Review Panel clarifications completed, budget pending grant negotiations; G, Final grant budget.

The Russian Federation is not shown in Figure 22 because the requirements and funding gaps for 2004 and 2005, as estimated in their 5-year plan, are large enough to distort the analysis for the other 21 HBCs. The 5-year plan (2003–7) indicates that total resources required for the country are more than US$ 400 million per year, and the funding gap will be around US$ 200 million in each year. For the 21 HBCs besides the Russian Federation, about 70% of the total resources required each year are met by governments, through either regular domestic budgets or loans. A further 10% of resources required comes from grants, of which about two-thirds are from the GFATM.

This leaves a possible funding gap equivalent to about 20% of total requirements in 2004 and 2005. Of this shortfall, most is accounted for by countries that need to make major strides in case detection, and which have not yet identified sufficient funding to fully meet their needs. Countries that have received some funds from the GFATM, but still have funding gaps, include Nigeria, Pakistan, Ethiopia, and China. Countries with smaller absolute funding gaps, but gaps that are large relative to their total resource requirements, include Afghanistan, Kenya, Tanzania and Cambodia.

NTP budgets and funding gaps in other countries

In total, 99 countries provided information about their NTP budget requirements for fiscal year 2003. However, the quality of the data was variable, and uncertainties have not yet been resolved by further consultation with NTPs. A detailed analysis was not, therefore, carried out for this report. A summary table that provides the 2003 NTP budgets and funding gaps for all reporting countries can be found at www.who.int/gtb/publications/globrep/