Afghanistan

Afghanistan has undertaken a programme of health service reconstruction. With help from international partners, funds have been mobilized to create an NTP and to start DOTS activities. The DOTS strategy is included in the country's basic package of health-care services (BPHS). Afghanistan has brought together many NGOs in a common effort to deliver DOTS services, and their involvement has been critical in carrying out programme activities. Along with the general health system, TB control services face several impediments, notably an inadequate number of health facilities, continuing insecurity in many areas and staff shortages at all levels. Nevertheless, the NTP has made substantial progress in recent years. DOTS coverage has increased slowly and treatment success rates have been close to or above the global target for four consecutive years. Improving the currently low case detection rate will require improvements in the security situation. In Afghanistan, more women than men seek treatment from the public TB control programme; it is possible that more men than women are treated by private practitioners. Private physicians and other health-care providers including community volunteers are being encouraged to engage in DOTS.

System of TB control

Over the past two decades, the health service infrastructure collapsed; reconstruction is hampered by the dangers of working in regions where the central government is not fully in control. Nevertheless, progress has been made in rebuilding the general health system, including TB services. The DOTS strategy is a component of the BPHS, and since 2002 the NTP has been strengthened at all levels.

The NTP consists of a central unit under the MoPH General Directorate of Health Care and Promotion, which is responsible for the overall implementation and management of the NTP, and for policy development. The National TB Institute (NTI) at the central level in Kabul supports training, technical assistance, operational research and laboratory activities. In provinces and districts, TB coordinators supervise and monitor DOTS activities in general health service facilities on four levels: health posts, basic health centres, comprehensive health centres and district hospitals.

There is no national reference library (NRL) in Afghanistan, but the NTI is upgrading its activities so that it can function as an NRL. Additionally, there are eight regional and 144 district laboratories for diagnostic activities.

Surveillance and monitoring

Surveillance was improved with the introduction of the DOTS strategy in the late 1990s and, although the 2003 estimate of 53% DOTS coverage is probably optimistic, there was a steady rise in the number of smear-positive cases diagnosed between 1997 and 2002. With these improvements, the estimated case detection rate was 19% in 2002 and 18% in 2003. Although the case detection rate is not expected to be much higher than this, a tuberculin skin-test survey carried out in Kabul in 2000[1] suggests that the national incidence rate of 150 smear-positive cases per 100 000 population could be an overestimate. This is one aspect of case detection that needs further scrutiny in Afghanistan. Another is the unusual finding, noted in *Global Tuberculosis Control 2004*, that many more women seek treatment from the DOTS programme than men, especially among young adults. Operational research to address this issue is almost complete,

PROGRESS IN TB CONTROL IN AFGHANISTAN

Indicators

DOTS treatment success, 2002 cohort	87%
DOTS detection rate, 2003	18%
NTP budget available, 2004	100%
Government contribution to NTP budget, including loans, 2004	8%
Government contribution to total TB control costs, including loans, 2004	NA
Government health spending used for TB control, 2004	NA

Major achievements

- Formation of the organizational structure and terms of reference of the central NTP unit under the General Directorate of Health Care and Promotion of the MoPH
- Definition of the structure and roles of the TB laboratory network, including the National TB Institute and provincial and district laboratories
- Revision of the national TB guidelines and translation into Dari and Pashtu languages
- Training of over 900 health personnel on DOTS implementation and expansion

Major planned activities

- Expand DOTS and integrate TB control activities into the basic package of essential health services
- Improve capacity of NGOs and other partners, and involve the private sector and the community in TB activities
- Provide adequate supplies and equipment for laboratories throughout the country in a timely manner
- Establish an EQA system for smear microscopy

NA indicates not available.

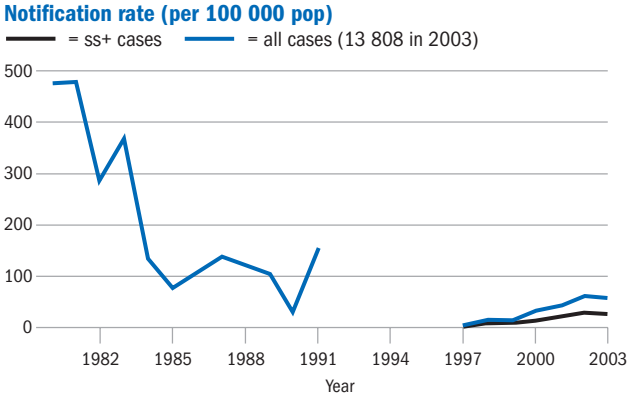
[1] Dubuis M et al. A tuberculin skin test survey among Afghan children in Kabul. *International Journal of Tuberculosis and Lung Disease* 2004, 8:1065–1072.

AFGHANISTAN

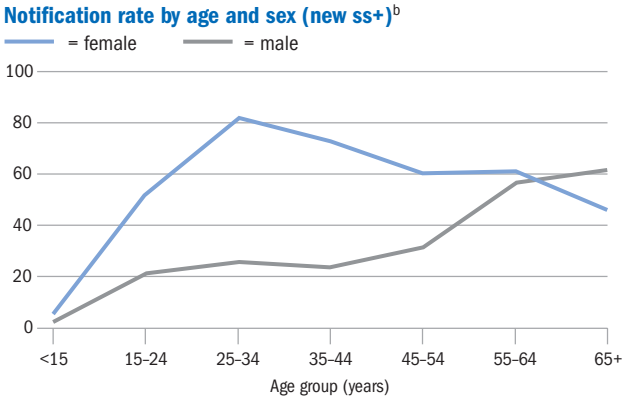
LATEST ESTIMATES[a]	
Population	**23 896 943**
Global rank (by est. number of cases)	21
Incidence (all cases/100 000 pop/year)	333
Incidence (new ss+/100 000 pop/year)	150
Prevalence (all cases/100 000 pop)	671
TB mortality (all cases/100 000 pop/year)	93
TB cases HIV+ (adults aged 15–49, %)	0.0
New cases multidrug resistant (%)	7.3

TRENDS	2000	2001	2002	2003
DOTS coverage (%)	15	12	38	53
Notification rate (all cases/100 000 pop)	33	46	60	58
Notification rate (new ss+/100 000 pop)	14	21	28	27
Detection of all cases (%)	10	14	18	17
Case detection rate (new ss+, %)	9.0	14	19	18
DOTS case detection rate (new ss+, %)	9.0	14	19	18
DOTS case detection rate (new ss+)/coverage (%)	60	117	50	34
DOTS treatment success (new ss+, %)	86	84	87	–

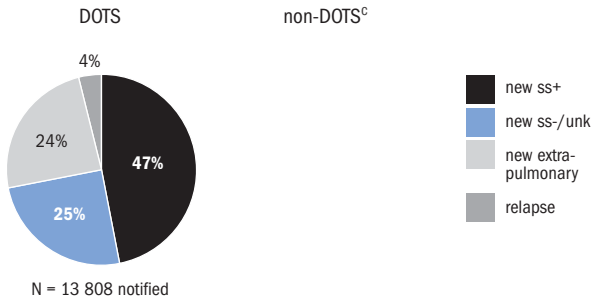
Notification rate (per 100 000 pop)



Notification rate by age and sex (new ss+)[b]

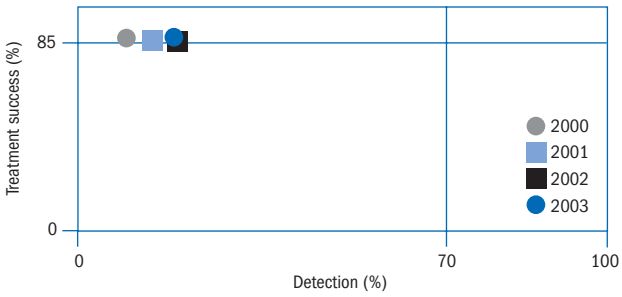


Case types notified

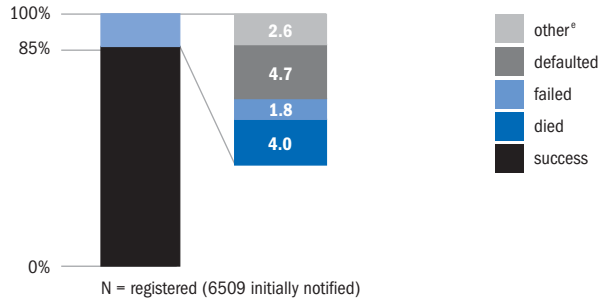


N = 13 808 notified

DOTS progress towards targets[d]



DOTS treatment outcomes (new ss+)



N = registered (6509 initially notified)

Non-DOTS treatment outcomes (new ss+)

Notes

ss+ indicates smear-positive; ss-, smear-negative; pop, population; unk, unknown.

Absence of a graph indicates that the data were not available or applicable.

[a] See Methods for data sources. Prevalence and mortality estimates include patients with HIV.

[b] The sum of cases notified by age and sex is less than the number of new smear-positive cases notified for some countries.

[c] Non-DOTS is blank for countries which are 100% DOTS, or where no non-DOTS data were reported.

[d] DOTS case detection rate for given year, DOTS treatment success rate for cohort registered in previous year.

[e] "Other" includes transfer out and not evaluated, still on treatment, and other unknown.

and the results will be available in early 2005.

Treatment success among DOTS patients registered in 2002 was 87%, and has exceeded the 85% target in three of the last four annual cohorts. With respect to monitoring progress towards the Millennium Development Goals, the focus in Afghanistan is still on assessing TB burden and trends, and on evaluating DOTS implementation.

Improving programme performance

Given the dangers of working in some provinces, national and international experts are sometimes unable to carry out supervision and monitoring visits. Nevertheless, a network of 46 national TB experts has been established, including an NTP manager, a deputy NTP manager, a National Surveillance Officer, a National Logistics Officer, the NTI director and a deputy, eight regional coordinators and 32 provincial coordinators. National TB guidelines have been revised and translated into the Dari and Pashtu languages.

More than 900 health personnel have been trained to provide DOTS services since early 2002. Once the organization of the NTP is complete, the priorities will be to further develop the HR development strategy and to increase training of staff at all levels. A national workshop on HR development for TB control was conducted by the NTP and WHO in March 2004 to revise the basic curricula for all health personnel through the development of appropriate learning materials and training schedules. Five medical schools are preparing training material and courses for all disciplines and are introducing DOTS into the undergraduate curriculum.

Reconstruction of health services has taken place through contracting NGOs to provide basic health services, including TB control, in geographically defined areas. Contracts have been made with 30 NGOs.

In September 2003, the NTP and WHO, in agreement with other partners, procured anti-TB drugs in bulk through the GDF; this supply should cover the needs for 2004 and part of 2005. To maintain regular supplies to all regions, a national warehouse of anti-TB drugs and laboratory consumables was set up at the NTI, and a computer programme for calculating drug needs and requests has been developed. There are no data on drug resistance, DST is not performed and second-line drugs are not available.

Other areas in which programme performance needs to be improved include diagnostic and laboratory services, links with other health-care providers and links with the community. The need for collaborative TB/HIV activities is unclear, given the lack of information about the prevalence of HIV.

Diagnostic and laboratory services

Diagnostic and laboratory services in Afghanistan face major difficulties because of inadequate laboratory equipment and supplies, limited numbers of trained staff and high staff turnover. In 2004, microscopes, reagents and other laboratory materials, including microscopy slides and sputum containers, were purchased and distributed with support from donors. Once basic infrastructure is developed, the priorities will be training of staff, the establishment of an EQA system, and regular monitoring and supervision.

TB/HIV coordination

No data are available on the prevalence of HIV in the general population or in TB patients. A rapid appraisal of the HIV situation is planned, which will provide an estimate of the prevalence of HIV in the general population and among various vulnerable groups.

Links with other health-care providers

The NTP regards the involvement of private sector providers as an important component of DOTS implementation and expansion. Many patients are treated privately, but private physicians are not yet involved in DOTS services. The NTP plans to establish a PPM-DOTS task force and to develop PPM guidelines. Progress in including all relevant public sector providers in DOTS has been made, and public hospitals, medical colleges, prison health-care services and army health facilities are now involved in many areas.

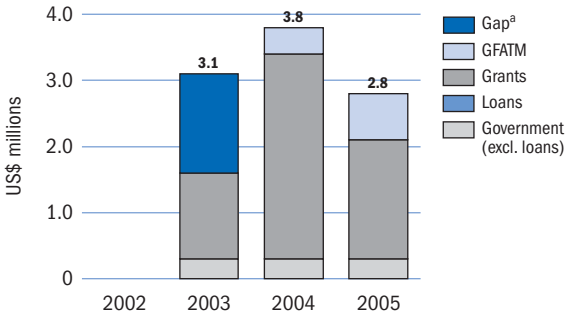
Links with the community

There is community involvement in TB control activities in Kabul City, where around 10 000 widows have been trained to assist with health education. In Nemruz Province, local people help with TB case referral.

Partnerships

An interagency coordination committee (ICC) for TB control has been established and holds regular meetings in Kabul. A country coordination mechanism (CCM) to facilitate support from the GFATM also exists, and meets monthly to address technical and operational issues. WHO and JICA are the main technical partners, and several NGOs including the Anti-TB Association, CARE International, COOPI, GMS, LEPCO, MEDAIR and MSF are providing additional technical assist-

NTP budget by source of funding



[a] Funding gaps exist in 2004 and 2005. However, they have not been quantified due to the rapidly changing social, economic and security situation and are therefore not shown in the graph. See text for further details.

ance. CIDA, the Government of Italy and USAID are the major funding partners.

Budgets and expenditures

Budget and expenditure data are limited for Afghanistan. The NTP budget has been approximately US$ 3–4 million in each year 2003–2005. Almost all funding is provided by grants, including from the GFATM. It is extremely difficult to estimate either the total funds needed or the funding gap because of the highly volatile situation in the country. Although a funding gap of US$ 1.5 million was reported for 2003 (see *Global Tuberculosis Control 2004*), the general situation has deteriorated and it is likely that in 2004 and 2005 the funding gap is much greater. This is illustrated by the funding gap for the BPHS, which includes TB control. For the years 2004 and 2005, the funding gap for the BPHS is US$ 49 million and US$ 43 million respectively, and is expected to increase to US$ 70 million in 2006.

A breakdown of the NTP budget by line item is not available for any year 2003–2005, although expenditures on drugs were reported to be about US$ 1 million in 2003 (equivalent to about US$ 74 per patient treated), and relatively large investments in infrastructure were made in the same year.

Bangladesh

Bangladesh adopted the DOTS strategy in 1993. Since then, the NTP has expanded to cover nearly all of the country. For many years, NGOs have been largely responsible for delivering DOTS services and have had a formal involvement in the NTP since 1994. Their collaboration has been instrumental in promoting DOTS and achieving high DOTS coverage. Participation of NGOs in programme delivery continues to be an enormous asset, while the government ensures coordination and sustainability of TB control. With TB control a government priority, recognized as an essential service to be delivered by the health system, the NTP needs to build capacity and strengthen programme management. This is now a matter of urgency as there has been a large increase in funding, mainly from the GFATM, and the amount of money available for TB control almost tripled in 2004 and 2005. Thanks to this encouraging financial position, ambitious plans have been made to dramatically increase case detection and to accelerate a comprehensive programme to strengthen laboratories. With many and diverse partners from the public and private sectors, clear central leadership will be crucial to ensure coordination, to maintain momentum and to undertake the expanded activities now made possible through the additional funding.

System of TB control

The NTP is recognized as a priority in the revised Health, Nutrition and Population Sector Programme. Under the guidance of the Director-General of Health Services, the NTP manager is responsible for the NTP at central level. At the subnational level, the NTP is integrated into the divisional, district and upazila (subdistrict) general health services. Chest disease clinics, located in district capitals and metropolitan cities, support the NTP by offering diagnostic and treatment services for surrounding areas and serving as referral centres for entire districts. NGOs provide NTP services at upazila level in collaboration with the government; some have their own health-care infrastructure. At the peripheral level, health inspectors and assistants, medical assistants, village doctors and NGO community health workers provide basic services such as identification and referral of TB suspects, provision of DOT, tracing of defaulters and various behaviour-change communication activities.

The NTP has established a network of nearly 600 sputum microscopy centres, each one covering a population of about 230 000, on average. There is one NRL, which is part of the central public health laboratory, and 45 intermediary laboratories in chest disease clinics. Peripheral laboratories are found in upazila health complexes, in private urban facilities, medical colleges and in health services for special population groups including health services in prisons, the police and industry.

Surveillance and monitoring

The incidence rate of TB in Bangladesh is uncertain because the estimate is based on a 40-year-old tuberculin survey and on local prevalence surveys that may not be nationally representative. Between 1980, when WHO records began, and the introduction of DOTS in 1993, the case notification rate appeared to be in slow decline, despite some variation. Since 1994, there has been a significant rise in the average age of TB patients, allowing for demographic changes, and the notification rates for men are higher in older age groups. Together, these observations suggest that the TB incidence rate is falling, and this assumption underpins the projected year-on-year changes in the estimated smear-positive incidence rate for Bangladesh.

The smear-positive case detection rate increased rapidly after the introduction of DOTS, stabilized between 1998 and 2001 at around 23%, but has recently increased again, reaching 33% in 2003. Most of these gains have been made as the role of upazila health complexes in case-finding has increased, in addition to chest

PROGRESS IN TB CONTROL IN BANGLADESH

Indicators

DOTS treatment success, 2002 cohort	84%
DOTS case detection rate, 2003	33%
NTP budget available, 2004	94%
Government contribution to NTP budget, including loans, 2004	28%
Government contribution to total TB control costs, including loans, 2004	43%
Government health spending used for TB control, 2004	3%

Major achievements

- Expansion of DOTS and initiation of PPM-pilot projects in Dhaka City
- Introduction of DOTS in prisons, academic institutions and workplaces
- Sustained strong collaboration between the government and NGOs
- Revision of national guidelines, incorporating new treatment regimens with FDCs, and laboratory guidelines
- Expansion of EQA for smear microscopy to most microscopy centres

Major planned activities

- Create new microscopy centres in populations of more than 300 000
- Provide basic training for newly appointed technicians and refresher training for all laboratory staff
- Implement activities according to GFATM project proposal, in order to improve case detection

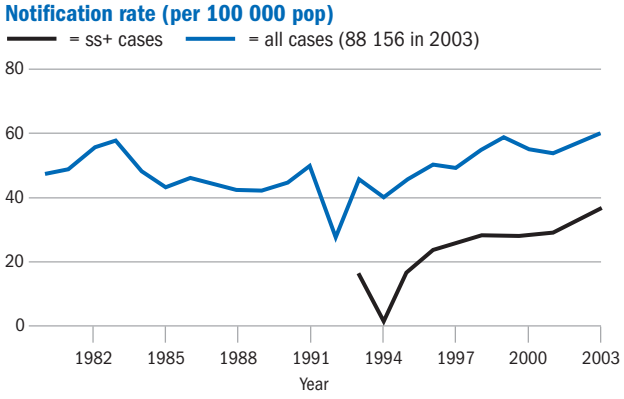
NA indicates not available.

BANGLADESH

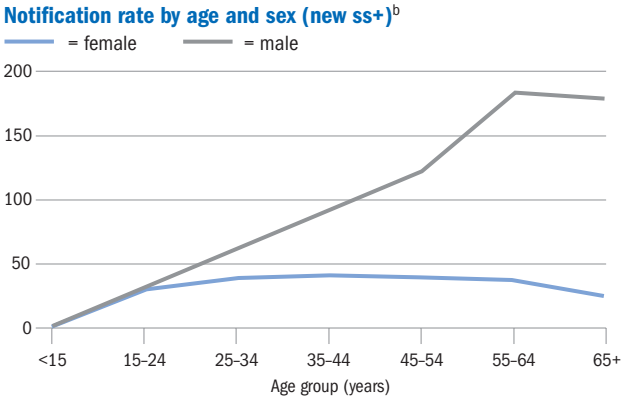
LATEST ESTIMATES[a]	
Population	**146 736 131**
Global rank (by est. number of cases)	5
Incidence (all cases/100 000 pop/year)	246
Incidence (new ss+/100 000 pop/year)	111
Prevalence (all cases/100 000 pop)	490
TB mortality (all cases/100 000 pop/year)	57
TB cases HIV+ (adults aged 15–49, %)	0.1
New cases multidrug resistant (%)	1.4

TRENDS	2000	2001	2002	2003
DOTS coverage (%)	92	95	95	99
Notification rate (all cases/100 000 pop)	55	54	57	60
Notification rate (new ss+/100 000 pop)	28	29	33	37
Detection of all cases (%)	22	22	23	24
Case detection rate (new ss+, %)	25	26	29	33
DOTS case detection rate (new ss+, %)	23	25	29	33
DOTS case detection rate (new ss+)/coverage (%)	26	26	30	33
DOTS treatment success (new ss+, %)	83	84	84	–

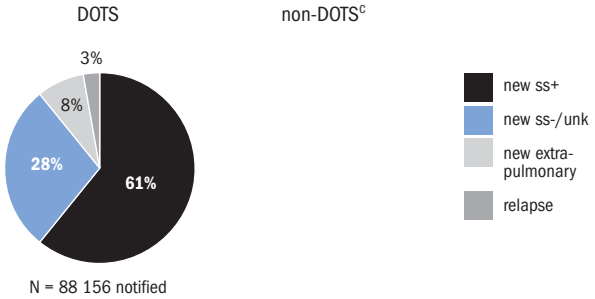
Notification rate (per 100 000 pop)



Notification rate by age and sex (new ss+)[b]

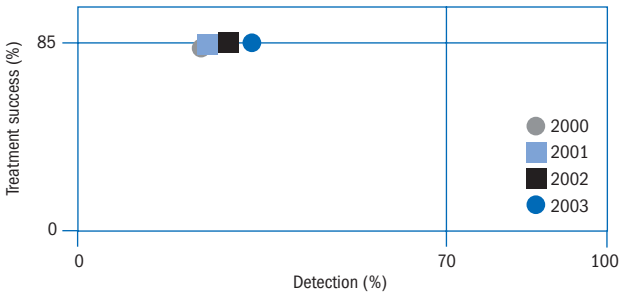


Case types notified

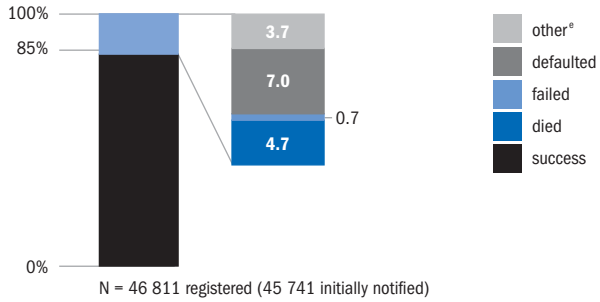


N = 88 156 notified

DOTS progress towards targets[d]



DOTS treatment outcomes (new ss+)



N = 46 811 registered (45 741 initially notified)

Non-DOTS treatment outcomes (new ss+)

Notes

ss+ indicates smear-positive; ss-, smear-negative; pop, population; unk, unknown.

Absence of a graph indicates that the data were not available or applicable.

[a] See Methods for data sources. Prevalence and mortality estimates include patients with HIV.

[b] The sum of cases notified by age and sex is less than the number of new smear-positive cases notified for some countries.

[c] Non-DOTS is blank for countries which are 100% DOTS, or where no non-DOTS data were reported.

[d] DOTS case detection rate for given year, DOTS treatment success rate for cohort registered in previous year.

[e] "Other" includes transfer out and not evaluated, still on treatment, and other unknown.

disease clinics, which were the dominant source of patients in 1995. Since 2000, the DOTS programme has also reported more patients from metropolitan areas. Despite these improvements, and notwithstanding uncertainty concerning the true incidence rate, case detection by the DOTS programme is still low. Treatment success was 84% for the 2002 cohort and has been 80% or more since 1998. Default (7%) was the most important reason why treatment success was still below the 85% target in 2002. Stimulated by the need to make a better assessment of the scale of the TB problem, and to provide a baseline for evaluating the epidemiological impact of DOTS, the NTP has drawn up plans to carry out a national disease prevalence survey.

Improving programme performance

In 2002, DOTS was expanded to Dhaka city. In 2003, national guidelines were updated to strengthen the implementation of DOTS, including the control of childhood TB. Laboratory manuals have been revised and distributed throughout the country; specific guidelines for involving private practitioners and delivering DOTS services in workplaces are being developed. In view of proposed DOTS expansion activities funded by the GFATM, there is a need to strengthen capacity at the central level. Additional management capacity and technical assistance are urgently needed if the planned activities are to be implemented on schedule.

Collaboration with NGOs and additional partners in the metropolitan city centres has been expanded. With the increasing number of partners, strong supervision and standardized systems for referral, recording and reporting need to be developed. With different NGOs working in the same area, the supervision, structure and accountability between NGOs, the NTP and the Chief Health Officer in metropolitan city areas also need to be addressed.

A TB control steering committee was established to support, direct and monitor procedures and activities to ensure that NTP and global targets are reached. In late 2003, as noted above, international partners assisted the government in developing a plan for a national prevalence survey in Bangladesh.

Short-course treatment for all TB cases has been further standardized with the introduction of new treatment regimens and FDCs. The new treatment regimens follow WHO recommendations and are more consistent with private sector prescription practices, which may facilitate increased referral of patients. They also simplify drug management at all levels. The difficulties of ensuring drug quality and an uninterrupted drug supply have been alleviated by the successful application for funding by the NTP to the GDF. There is no national policy on the management of MDR-TB, and MDR-TB cases are not treated within the NTP. However, the Damien Foundation Bangladesh (DFB) treats all confirmed MDR-TB cases in the areas it covers. The National Institute of Diseases and Chest Hospitals also treats MDR-TB. Some second-line drugs are produced in the country.

A budget for both DRS and DOTS-Plus will be included in the country's application to the fifth round of the GFATM. Should the GFATM application be approved, Bangladesh will apply to the GLC for reduced-price quality-assured second-line drugs and for technical assistance in implementing sound MDR-TB control measures.

Three other areas in which programme performance needs to be improved are diagnostic and laboratory services, TB/HIV coordination and links with other health-care providers.

Diagnostic and laboratory services

EQA is becoming a routinely accepted standard in many NGO-supported areas in Bangladesh, and NGOs are offering their services to the government to expand EQA. A major challenge for the NTP is to refocus the NRL on training, EQA, expansion of culture services and drug susceptibility testing, in addition to routine microscopy work. Future laboratory priorities include basic training for newly appointed technicians and refresher training for all laboratory staff on smear microscopy and quality assurance. Diagnostic services will be expanded by establishing new microscopy centres in upazilas with population coverage greater than 300 000. By 2005, EQA for smear microscopy should be available in all urban and rural diagnostic centres.

TB/HIV coordination

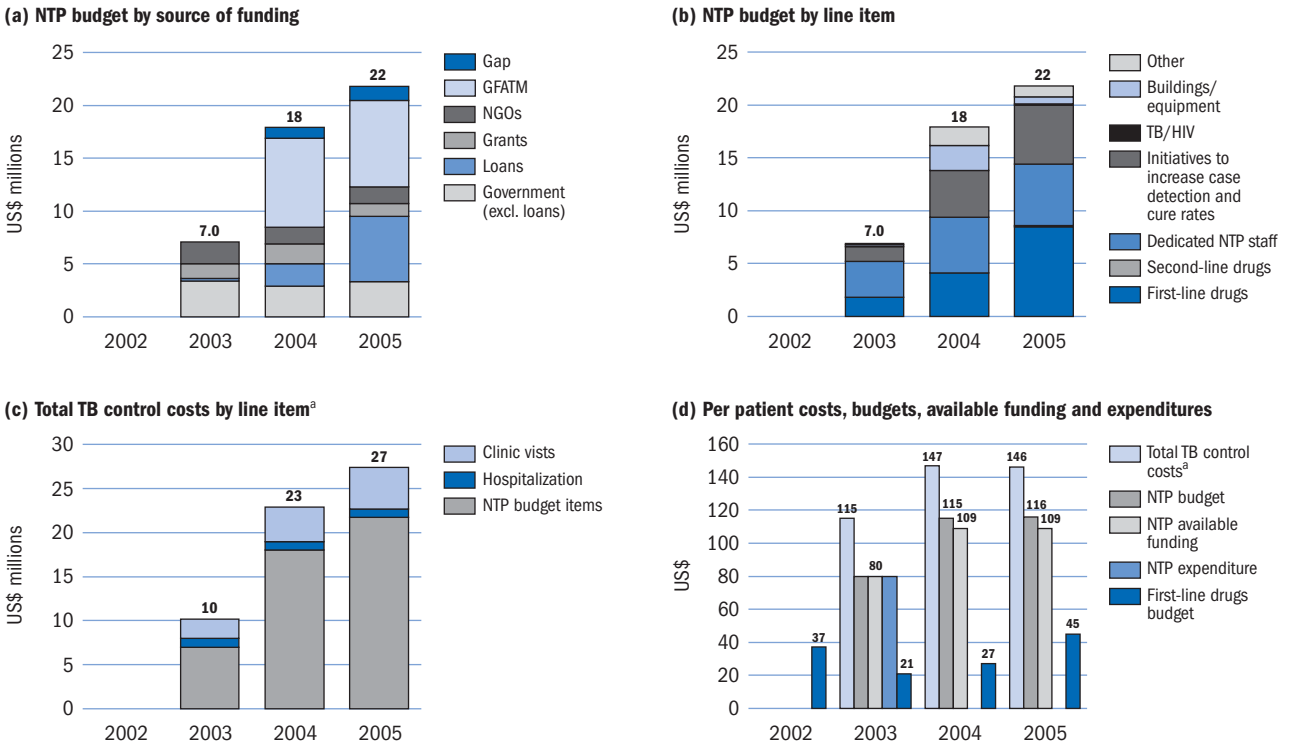
The HIV prevalence in the adult population (aged 15–49 years) and the proportion of HIV-positive patients among adult TB cases are still low at 0.01% and 0.1%, respectively, according to the latest UNAIDS and WHO estimates. A similar figure for HIV prevalence among TB cases was found in Dhaka in 1999. There is as yet little collaboration between the NTP and the national HIV/AIDS programme.

Links with other health-care providers

Most DOTS implementation in Bangladesh has been done by NGOs, and during 2004 their involvement has increased. The main NGO partners include the Bangladesh Rural Advancement Committee (BRAC) and DFB, who together cover most of the rural districts in the country; urban areas are covered mainly by other NGOs. There are a number of PPM-DOTS initiatives in Bangladesh. Several private chest physicians in Dhaka have become involved in DOTS services, and the participation of more private practitioners is needed. DFB is expanding its cadre of private "village doctors", who are currently responsible for the detection of about 10% of patients and the provision of DOT to 45% of patients in DFB areas. BRAC has started similar initiatives in periurban areas, while in rural areas they deliver DOT through a network of community workers. Recently, the NTP and collaborating NGOs have begun to include medical colleges, prison health services and the private corporate sector in DOTS activities.

Partnerships

Several technical partners participate in TB control activities in Bangladesh, led by BRAC and the DFB. Thanks to the joint efforts of the partners, the CCM has made a successful application for funding from the GFATM. Financial support is also provided by



[a] Total TB control costs for 2002 and 2003 are based on expenditures, whereas those for 2004 and 2005 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

CIDA, the World Bank and other partners through general funding for the health sector.

Budgets and expenditures

The TB control budget data reported to WHO include both a budget for the NTP and the budgets for the two major NGOs that are responsible for DOTS implementation in most of Bangladesh (i.e. BRAC and DFB). The budgets for both 2004 and 2005 are substantially higher than in previous years, at about US$ 20 million compared with US$ 7 million in 2003. This reflects an ambitious plan to more than double the number of patients treated between 2003 and 2005. Most of the budget is funded for both 2004 and 2005, mainly because of increased funding from a World Bank credit and a substantial GFATM grant. There is a funding gap of US$ 1–2 million in both 2004 and 2005; this money is needed to cover the national prevalence survey, to recruit staff in order to strengthen management at the central level and to carry out additional activities to increase case detection and treatment success rates. The substantially improved funding position means that spending on TB control by the NTP and the major NGOs could almost triple between 2003 and 2005. The larger budgets in 2004 and 2005 will allow for increased spending on first-line drugs, in line with projected increases in the number of patients treated as well as the development of a buffer stock in 2005 (this buffer stock is the reason for the relatively high budget for first-line drugs in 2005). They will also allow for some investment in infrastructure, and increased spending on initiatives aimed at improving case detection. The NTP budget per patient is projected to increase from US$ 80 in 2003 to US$ 116 in 2005; if this happens, the total cost of TB control, including visits to health clinics for observation of treatment and monitoring, and limited hospitalization, is projected to increase from US$ 10 million in 2003 to US$ 27 million in 2005 (from US$ 115 to US$ 146 per patient treated). It remains to be seen whether the increased funding can be absorbed effectively and whether increased expenditures result in improved case detection.

Brazil

Brazil is one of the largest countries in the WHO Region of the Americas and it has the highest TB burden in the region. Providing TB control and other health services throughout the country poses immense organizational and logistic challenges. However, the data from recent years indicate a steady downward trend in TB incidence in Brazil. Although DOTS is currently available to only some 35% of the population, a concerted effort is being made to include all of the 315 high-burden municipalities by 2007. There is increasing awareness of the public health importance of TB by the new Brazilian health authorities, who have recognized the DOTS strategy as the best solution to Brazil's TB control problems. The Brazilian MoH has now prioritized the DOTS strategy in its new programme for TB control. TB and leprosy were declared national priority diseases in 2004 and increased government funds were assigned to control them. In addition, 2004 saw the launch of Brazil's Stop TB Partnership involving numerous technical and donor agencies and other public and private sector partners in TB control.

System of TB control

Brazil adopted the DOTS strategy in 1998, establishing it in four states as demonstration areas. Brazil has a massive and complex decentralized health-care system. At the state and municipal levels, the TB control programme is represented by local TB coordinators who are responsible to the respective state and municipal health secretaries. Recently, the government created the position of Secretary of Health Surveillance (SVS) within the new structure of the MoH, which has given added priority to TB control. The SVS has also facilitated collaboration of the NTP with the national laboratory and the HIV/AIDS programmes. TB patients are treated in the out patient facilities of the public health service and only a few complicated cases require hospitalization.

TB laboratory services are carried out by the National Public Health Laboratories Network. There is one NRL, 27 central public health laboratories (one per state) and more than 4000 local laboratories.

Surveillance and monitoring

Among the HBCs, Brazil has a relatively comprehensive TB surveillance system, and the observed downward trend in the case notification rate probably represents a real decline in incidence. The rate of fall is about 3% per year both for smear-positive and for all TB cases, but a faster rate of decline should be achievable by an expanded DOTS programme. DOTS coverage increased to 34% in 2003 and the case detection rate to 18%, giving a detection rate of 55% within DOTS areas. However, an estimated 81% of all new smear-positive TB cases are found nationally (by DOTS and non-DOTS services), suggesting that Brazil could meet and even exceed the target of 70% case detection simply by ensuring that patients already notified are correctly diagnosed and treated by DOTS services.

As DOTS coverage increases, the monitoring of patients on treatment needs to be carried out more rigorously. The treatment success rate under DOTS in 2002 was 75%, with 18% of patients lost through default or transfer to other treatment centres without follow-up. A large proportion of patients (29%) completed treatment without evidence of smear conversion. Among patients registered for re-treatment, only 36% were cured. An additional 24% completed treatment, but the demonstration of smear conversion is vital for re-treatment patients, who could be carrying drug-resistant bacilli. Treatment success rates were even lower among the subset of patients receiving re-treatment after default (51%) or failure (42%). As control efforts intensify, Brazil's system of routine surveillance should be strengthened as the main instrument for monitoring trends in TB cases and deaths and for evaluating the future impact of control measures.

PROGRESS IN TB CONTROL IN BRAZIL

Indicators

DOTS treatment success, 2002 cohort	75%
DOTS case detection rate, 2003	18%
NTP budget available, 2004	100%
Government contribution to NTP budget, including loans, 2004	86%
Government contribution to total TB control costs, including loans, 2004	94%
Government health spending used for TB control, 2004	0.3%

Major achievements

- Approval of TB national plan (2004–2007) by the government
- Launch of the Stop TB Partnership in October 2004
- Organization of 15 regional meetings to discuss the national TB plan and strategies for DOTS expansion, attended by all 27 state TB control coordinators and by the municipal TB control coordinators of all 315 priority municipalities
- Creation of a Task Force Group to monitor and assist the states and priority municipality in DOTS implementation

Major planned activities

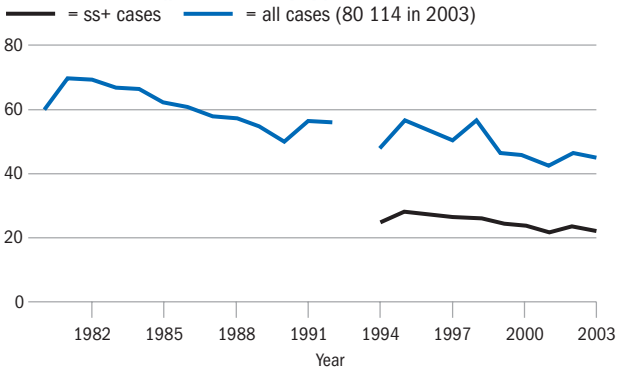
- Establish a TB/HIV coordination body in 2005 to implement strategies to increase provision of VCT to TB patients
- Increase microscopy coverage in all 315 priority municipalities and improve quality control of existing microscopy centres
- Implement a national workplan involving different sectors of civil society and the community for TB control

BRAZIL

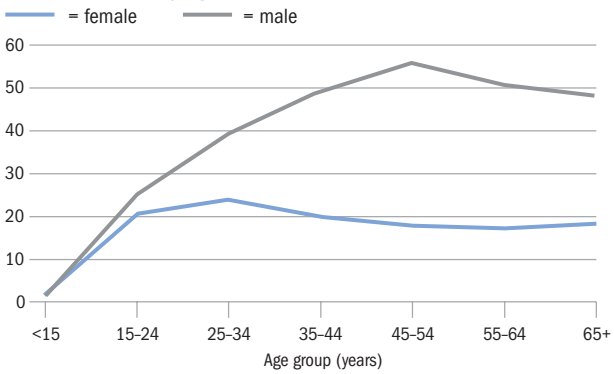
LATEST ESTIMATES[a]	
Population	**178 470 430**
Global rank (by est. number of cases)	15
Incidence (all cases/100 000 pop/year)	62
Incidence (new ss+/100 000 pop/year)	28
Prevalence (all cases/100 000 pop)	92
TB mortality (all cases/100 000 pop/year)	8.2
TB cases HIV+ (adults aged 15–49, %)	3.8
New cases multidrug resistant (%)	0.9

TRENDS	2000	2001	2002	2003
DOTS coverage (%)	7.0	32	25	34
Notification rate (all cases/100 000 pop)	45	43	46	45
Notification rate (new ss+/100 000 pop)	24	22	23	22
Detection of all cases (%)	67	65	72	73
Case detection rate (new ss+, %)	79	75	82	81
DOTS case detection rate (new ss+, %)	7.5	8.0	9.6	18
DOTS case detection rate (new ss+)/coverage (%)	108	25	38	55
DOTS treatment success (new ss+, %)	73	67	75	–

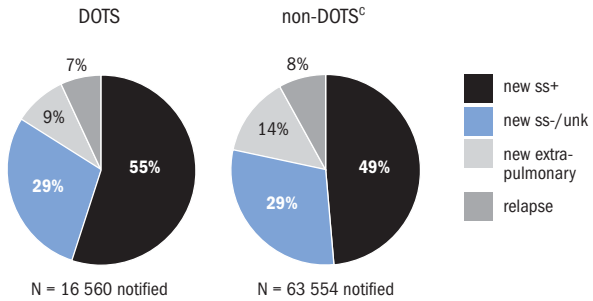
Notification rate (per 100 000 pop)



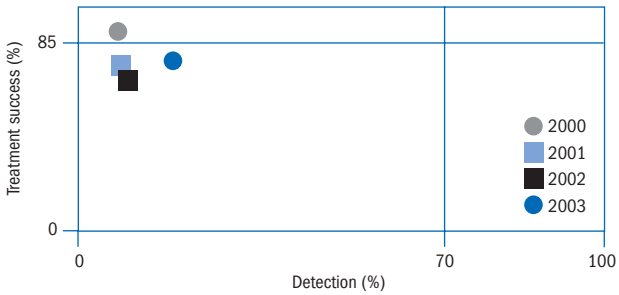
Notification rate by age and sex (new ss+)[b]



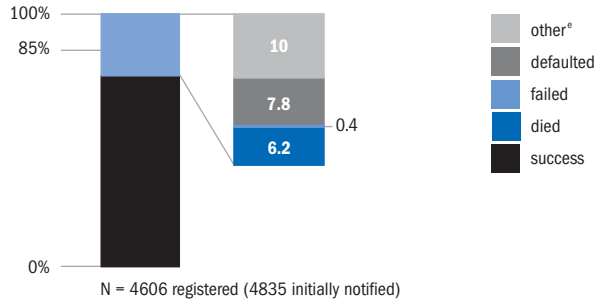
Case types notified



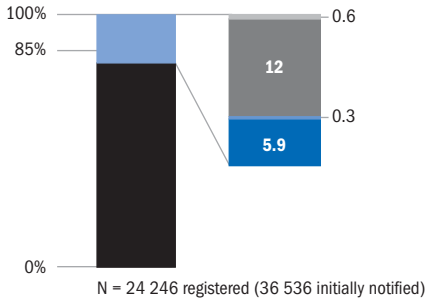
DOTS progress towards targets[d]



DOTS treatment outcomes (new ss+)



Non-DOTS treatment outcomes (new ss+)



Notes

ss+ indicates smear-positive; ss-, smear-negative; pop, population; unk, unknown.

Absence of a graph indicates that the data were not available or applicable.

[a] See Methods for data sources. Prevalence and mortality estimates include patients with HIV.

[b] The sum of cases notified by age and sex is less than the number of new smear-positive cases notified for some countries.

[c] Non-DOTS is blank for countries which are 100% DOTS, or where no non-DOTS data were reported.

[d] DOTS case detection rate for given year, DOTS treatment success rate for cohort registered in previous year.

[e] "Other" includes transfer out and not evaluated, still on treatment, and other unknown.

The creation of the SVS will strengthen Brazil's TB surveillance system by integrating TB with surveillance and control of other endemic diseases and improving coordination; however, it is also important to optimize Brazil's information system (SINAN) for TB surveillance and DOTS monitoring.

Improving programme performance

The MoH, together with health authorities at state and municipal levels, is working hard to strengthen TB control and to reorganize primary health-care services for DOTS implementation. It is important to ensure better integration and coordination of activities at the primary health-care level, particularly those included in the Family Health Programme (Programa de Saúde da Família – PSF) and the Community Outreach Programme (Programa de Agentes Comunitários – PAC). Training in DOTS TB control is currently being provided to other public and private health-care professionals. However, appropriate training and continuous good quality supervision and monitoring activities from the state to the municipal and from the municipal to the local levels are indispensable for effective DOTS implementation. Training for 20 000 Family Health Teams is planned for 2005. Another important area for improving programme performance is the provision of TB control services in high-risk populations such as the indigenous groups and prison populations.

A national TB control plan for 2004–2007 was approved by the government in 2004. It aims to strengthen the NTP and to reach 100% DOTS coverage in the 315 priority municipalities that account for an estimated 70% of the country's TB burden. The plan includes the creation of a training task force to improve HR capacity for TB control, with the goal of offering DOTS services in all basic health-care facilities in all the priority municipalities by the end of 2007. During 2004, five regional meetings were organized to discuss the national TB plan and strategies for DOTS expansion in the first quarter; two more cycles of five regional meetings each were conducted to monitor this plan in the second and third quarter. All 27 state TB control coordinators and the municipal TB control coordinators of the priority municipalities attended one of these meetings. A Task Force Group was created in 2004 to monitor and assist the states and priority cities in DOTS implementation.

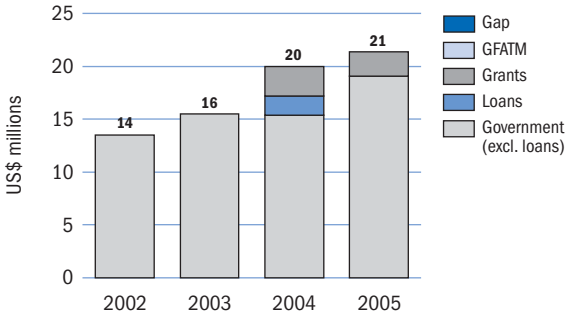
Diagnostic and laboratory services

As DOTS services expand to the 315 priority municipalities, laboratory capacity needs to be increased, and quality assurance must be introduced. The TB laboratory manual is under revision and the task force organizing training has begun the strengthening of laboratory services; this will continue in 2005. Laboratory information systems and monitoring and supervision will also be improved. During 2004, three regional managerial courses, with the support of an international consultant, were developed to increase the capacity for sputum smear microscopy and quality assurance. More than 800 laboratory personnel countrywide were trained on those topics.

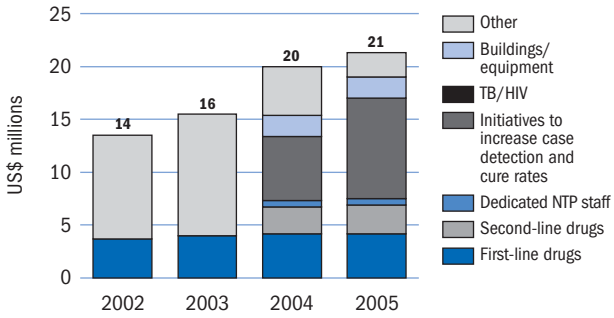
TB/HIV coordination

Brazil is a country with a concentrated HIV epidemic. In 2003, the estimated HIV seroprevalence in the general

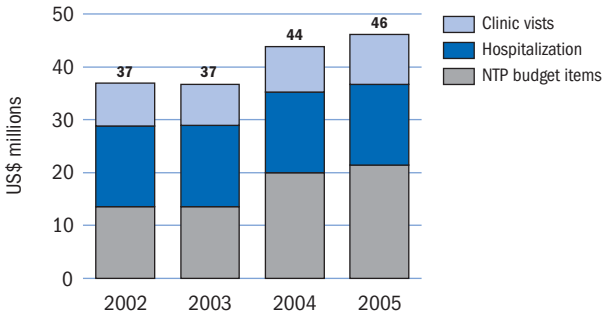
(a) NTP budget by source of funding



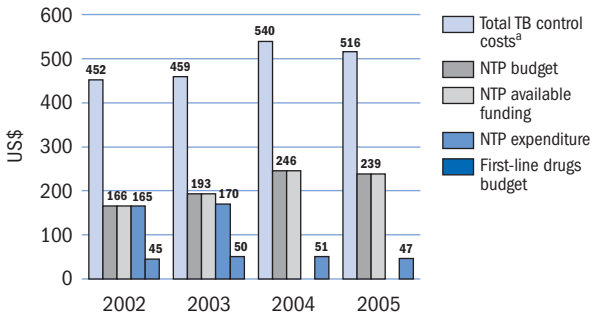
(b) NTP budget by line item



(c) Total TB control costs by line item[a]



(d) Per patient costs, budgets, available funding and expenditures



[a] Total TB control costs for 2002 and 2003 are based on expenditures, whereas those for 2004 and 2005 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

population was 0.65%. The NTP estimates that the prevalence of HIV among new TB patients was 8%. This is substantially higher than the WHO estimate of 3.8%, which may underestimate the effect of shared risk factors for TB and HIV. ART is available to all HIV-infected individuals (including TB patients) through the public health system. The recently created SVS has contributed to the collaboration between the NTP and the National AIDS Programme, and to better coordination between them. A national TB/HIV plan is now in place and includes the establishment of a TB/HIV coordination body in 2005, plus strategies to increase the provision of VCT to TB patients and to provide DOTS services to HIV-positive individuals suffering from TB.

Links with other health-care providers

Private hospitals and clinics are required to refer TB suspects and cases to government TB facilities. A small number of NGOs are involved in DOTS provision, and the NTP is planning to host a meeting of national NGOs in 2005 to formulate a collaborative agreement. Brazil has no PPM-DOTS taskforce or guidelines, but plans to strengthen ties with the Brazilian Society of Pulmonology and Phthisiology through a collaborative agreement. There are also plans to enhance the involvement of the Brazilian research network in the 2004–2007 national plan for DOTS expansion, particularly in the area of operational research.

Partnerships

Brazil has established effective international technical partnerships with agencies such as PAHO, WHO, IUATLD and CDC to support adequate DOTS implementation and expansion. Funding partners include USAID (two TBCTA projects), DFB and GLRA. The launch of the Stop TB Partnership in Brazil in October 2004 signifies another important step towards involving different sectors of civil society and the community in TB control, as does the launch of a national advocacy plan to disseminate TB and DOTS information.

Budgets and expenditures

The NTP budget has been steadily increasing, from US$ 14 million in 2002 to US$ 21 million in 2005 (a 50% increase in four years). As would be expected in an upper-middle income country, the budget is fully funded and most financing is provided by the government, although grant funding was received in 2004 and is expected in 2005. This sound funding situation reflects the commitment of both the government and the international community to TB control. The budget for first-line drugs has been consistently around US$ 4 million and around US$ 50 per patient. In 2004 and 2005, there has been an increase in the budget for activities aimed at improving case detection and cure rates, including an extensive training programme and upgrading of the laboratory network. NTP expenditures were US$ 14 million, equivalent to about US$ 170 per patient treated, in both 2002 and 2003. When costs not covered by the NTP budget are included (i.e. 2509 dedicated TB hospital beds and visits to clinics for DOT and monitoring during treatment), the cost per patient treated is estimated at US$ 450–550 during the period 2002–2005. The total cost of TB control is estimated at US$ 37–46 million.

COUNTRY PROFILE

Cambodia

Cambodia achieved nationwide DOTS coverage at district level in 1998, at a time when the health services were still relatively centralized. Since then, a policy of progressive decentralization has been followed, designed to improve the access of the population to health care. With the establishment of peripheral health centres, the NTP has gradually introduced its activities in these settings, resulting in substantially improved access to TB control services. By the end of 2004, the remaining health centres will be included. A national TB prevalence survey in 2002 yielded a great deal of valuable information, which continues to be applied in strengthening the programme. Results will be published and will serve as an important basis for the assessment of the burden of TB and the impact of DOTS services on the TB epidemic. The shortage of staff to support the expanding programme is now being addressed, and there are plans to tackle the urgent need for better coordination between the TB and HIV control programmes.

System of TB control

Cambodia's NTP operates under the responsibility of the National Center for Tuberculosis and Leprosy Control (CENAT) and within the overall national health system. It comprises TB referral hospitals, provincial TB centres and district TB units. In 1994, TB control was decentralized from provincial hospitals to district hospitals, and in 1999 to health centres. As of 2003, more than 145 TB units and 700 health centres are implementing the DOTS strategy.

There are 180 laboratories in the country including the TB reference laboratory of CENAT, which is responsible for the development of training materials, training of laboratory technicians, and supervision and quality assurance of the provincial laboratories. The reference laboratory carries out culture of mycobacteria and HIV testing but not regular drug susceptibility testing, which will be started in the near future. There are 24 provincial laboratories with responsibility for the supervision and training of health centre staff in sputum smear microscopy and quarterly reporting to CENAT.

Surveillance and monitoring

Cambodia's case detection rate under DOTS was 60% in 2003, after the noticeable upturn in case detection since 2001. This assessment of the case detection rate is based on an estimate of incidence that pre-dates the 2002 prevalence survey. Analysis of the results of that survey will allow a reassessment of the burden of TB in the country and of the case detection rate. The proportion of all cases diagnosed as smear-positive in 2003 was 67%, falling from the highest recorded level of 82% in 1999, possibly because of improvements in diagnosis (fewer false-positives).

The treatment success rate reported among new smear-positive cases has exceeded 90% since 1995, which is unusually high given that 13% of TB patients were thought to be coinfected with HIV in 2003. The success rate for re-treatment patients in 2002 was also remarkably high (89%). Despite some uncertainty about case detection and treatment success, Cambodia is in a strong position to evaluate the future impact of the expanding DOTS programme on TB prevalence, incidence and deaths. As found in population-based surveys in other countries, the 2002 survey in Cambodia has yielded much more than an estimate of prevalence, including data that suggest numerous ways improving routine diagnosis and treatment.

Improving programme performance

The strong commitment of the Cambodian government to poverty elimination and health infrastructure development will have a positive effect on the control of TB in the future. Capacity building for DOTS expansion in all areas of the NTP continues to be a leading priority for the programme. In response to the low ac-

PROGRESS IN TB CONTROL IN CAMBODIA

Indicators

DOTS treatment success, 2002 cohort	92%
DOTS case detection rate, 2003	60%
NTP budget available, 2004	81%
Government contribution to NTP budget, including loans, 2004	10%
Government contribution to total TB control costs, including loans, 2004	44%
Government health spending used for TB control, 2004	NA

Major achievements

- Implementation of DOTS in 320 additional health centres during 2003, for a total of 706 out of 856
- Community-based DOTS introduced in collaboration with NGOs in four operational districts
- Introduction of six-month short-course treatment regimen in three operational districts

Major planned activities

- Implement DOTS in an additional 150 health centres to reach 100% coverage by end 2004
- Conduct follow-up study of TB suspects detected during the national TB prevalence survey conducted in 2002
- Continue to train health-care workers on community DOTS and six-month short-course treatment regimen

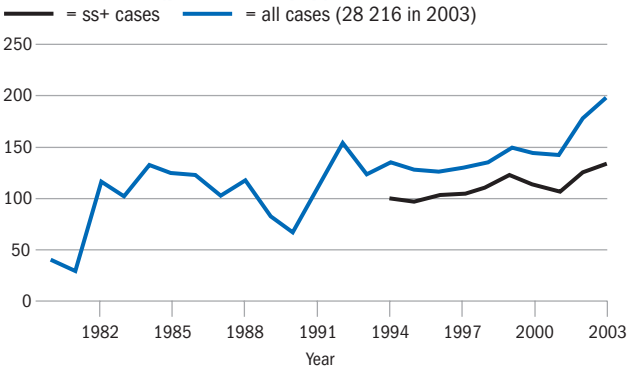
NA indicates not available.

CAMBODIA

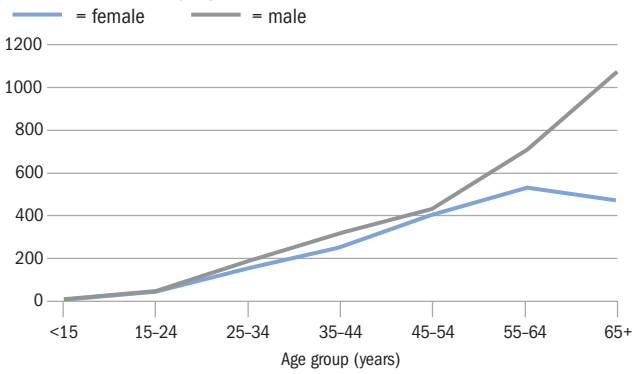
LATEST ESTIMATES[a]	
Population	**14 143 527**
Global rank (by est. number of cases)	23
Incidence (all cases/100 000 pop/year)	508
Incidence (new ss+/100 000 pop/year)	225
Prevalence (all cases/100 000 pop)	762
TB mortality (all cases/100 000 pop/year)	95
TB cases HIV+ (adults aged 15–49, %)	13
New cases multidrug resistant (%)	0.0

TRENDS	2000	2001	2002	2003
DOTS coverage (%)	99	100	100	100
Notification rate (all cases/100 000 pop)	144	142	178	199
Notification rate (new ss+/100 000 pop)	113	107	125	134
Detection of all cases (%)	27	27	35	39
Case detection rate (new ss+, %)	49	47	55	60
DOTS case detection rate (new ss+, %)	49	47	55	60
DOTS case detection rate (new ss+)/coverage (%)	49	47	55	60
DOTS treatment success (new ss+, %)	91	92	92	–

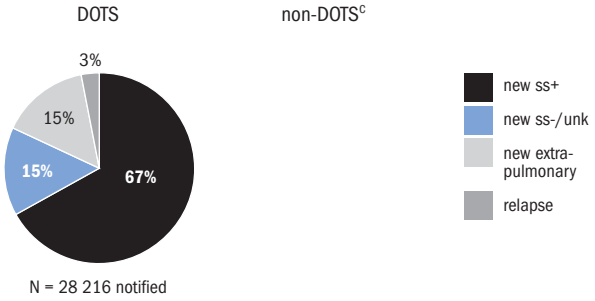
Notification rate (per 100 000 pop)



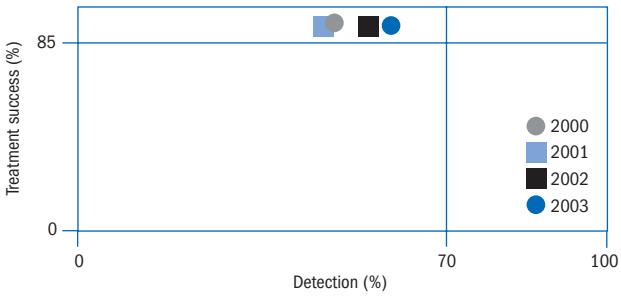
Notification rate by age and sex (new ss+)[b]



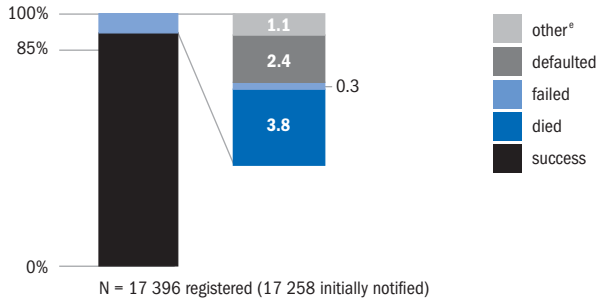
Case types notified



DOTS progress towards targets[d]



DOTS treatment outcomes (new ss+)



Non-DOTS treatment outcomes (new ss+)

Notes

ss+ indicates smear-positive; ss-, smear-negative; pop, population; unk, unknown.

Absence of a graph indicates that the data were not available or applicable.

[a] See Methods for data sources. Prevalence and mortality estimates include patients with HIV.

[b] The sum of cases notified by age and sex is less than the number of new smear-positive cases notified for some countries.

[c] Non-DOTS is blank for countries which are 100% DOTS, or where no non-DOTS data were reported.

[d] DOTS case detection rate for given year, DOTS treatment success rate for cohort registered in previous year.

[e] "Other" includes transfer out and not evaluated, still on treatment, and other unknown.

cess to health services and DOTS in some areas, DOTS services were expanded to 320 additional health centres in 2003. There are plans to implement DOTS in the remaining 150 health centres by the end of 2004. A six-month short-course chemotherapy regimen has been introduced in pilot studies in three operational districts, and training in the new regimen for health-care workers will continue into 2005. A follow-up study of TB suspects detected during the 2002 prevalence survey has started and will be completed during 2004. A drug resistance survey conducted in 2000–2001 found that the prevalence of MDR-TB was negligible among new cases and 3% among re-treatment cases.

The lack of human resource capacity remains a challenge for the NTP. At the request of CENAT, a representative from KIT met with key personnel and staff focus groups to assess human resource development needs in 2003. A workshop was subsequently organized to develop an outline for management training; training activities have been intensified and new staff have been recruited. There is still an urgent need for both in-country and international training for staff (including managers), and to recruit more staff. The NTP is planning to address these issues through recruitment of staff from outside the NTP with the aid of partners, making use of additional funding from the GFATM and the World Bank.

Other areas where programme performance needs to be improved are diagnostic and laboratory services, TB/HIV coordination and links with other health-care providers and the community.

Diagnostic and laboratory services

Two of 24 provincial laboratories have been upgraded during 2003 to perform culture and drug susceptibility testing. The EQA system, introduced in 2002, is still under development and must be strengthened and expanded. There are too few staff with sufficient training to run the laboratory and diagnostic services in Cambodia. During 2005, training programmes will improve technical knowledge and enhance staff motivation. Drug susceptibility testing is not available in Cambodia, but its introduction is considered a priority.

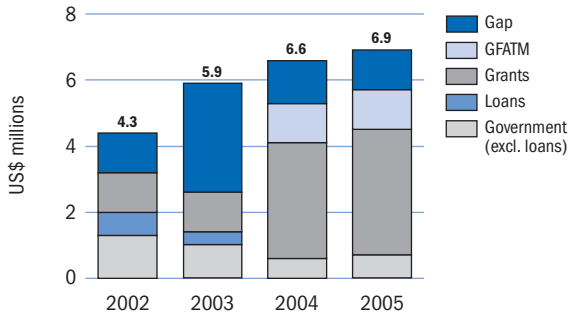
TB/HIV coordination

A national TB/HIV prevalence survey in 2003, carried out by the VCT service at CENAT, estimated HIV seroprevalence among TB patients at 12% (similar to the WHO estimate of 13% among adult TB patients). As yet, there are no data on TB incidence or mortality among PLWHA. TB/HIV collaborative pilot studies in four provinces included screening and treatment for TB among PLWHA, isoniazid preventive treatment for PLWHA who are infected with *M. tuberculosis*, surveillance of HIV in TB patients and ART for HIV-infected TB patients. A workshop to assess the pilot projects concluded that TB/HIV collaboration is hampered by the disease-specific focus of the individual programmes, the quality of TB/HIV counselling and lack of joint IEC material. IEC materials and standardized reporting and recording forms for TB/HIV activities are being developed.

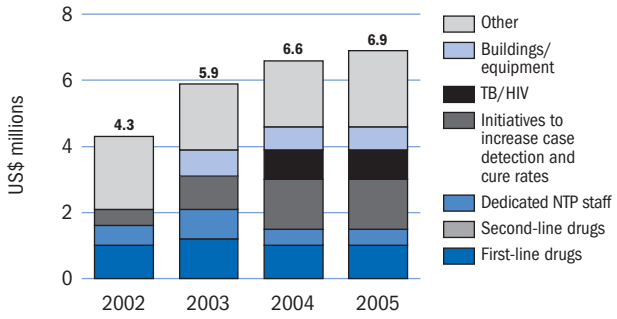
Links with other health-care providers

The 2002 prevalence survey showed that among people with TB symptoms who sought any type of health care, 89% went first to the private sector

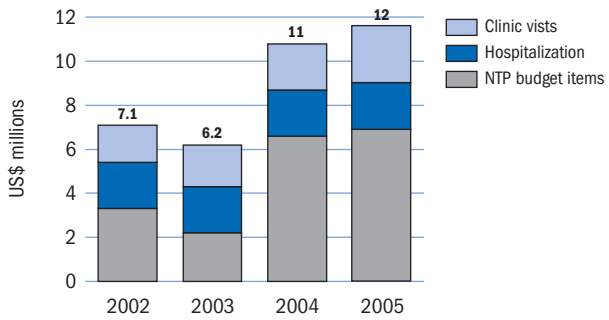
(a) NTP budget by source of funding



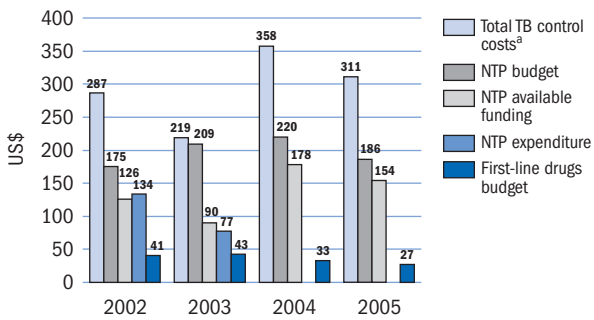
(b) NTP budget by line item



(c) Total TB control costs by line item[a]



(d) Per patient costs, budgets, available funding and expenditures



[a] Total TB control costs for 2002 and 2003 are based on expenditures, whereas those for 2004 and 2005 are based on budgets. Estimates of the costs of clinic visits and hospitalization are WHO estimates based on data provided by the NTP and from other sources. See Methods for further details.

(pharmacies and doctors). However, the private sector has not yet been formally involved in the NTP in Cambodia. The majority of private providers diagnose and treat TB but the quality of the services provided by them is generally poor, as shown in a study carried out by CENAT in collaboration with the Quality Assurance Project of Cambodia's University Research Corporation. However, many private providers are interested in collaborating with the NTP, and a pilot project involving private practitioners and pharmacies will be launched in 2005.

Links with the community

Community-based DOTS has been introduced in four districts, and training started in 2004 for community-based DOT workers.

Partnerships

Cambodia has a diverse group of technical partners including CDC (TB/HIV pilot programme activities), JICA (training and supervision, laboratory technical support, IEC, procurement, operational research, TB/HIV), KNCV (training and workshops, community DOTS) and WHO (training and supervision, laboratory technical support, IEC, procurement, TB/HIV). The main financial partners are CIDA, GFATM, JICA, USAID, WHO and the World Bank.

Budgets and expenditures

The NTP budget has increased from about US$ 4 million in 2002 to almost US$ 7 million in 2005, in line with planned increases in case detection. Available funding almost doubled between 2002 and 2005, from about US$ 3 million in 2002 to almost US$ 6 million in 2005. This improvement is becasue of a large increase in grant funding, including from the GFATM. However, funding gaps have persisted in each year from 2002 to 2005. In both 2004 and 2005, the gap is about US$ 1 million, equivalent to about 15% of the total budget requirement. The increased budgets in 2004 and 2005 are mainly a result of higher proposed spending on TB/HIV collaborative activities, and initiatives to increase case detection and cure rates (e.g. implementation of community-based care in remote areas and active case-finding).

Reported expenditures were lower than available funding in both 2002 and 2003. On a per patient basis, the NTP budget has varied from between US$ 175 (in 2002) and US$ 220 (for 2004), while actual expenditures per patient were US$ 134 and US$ 77 in 2002 and 2003, respectively. When costs not covered by the NTP budget are included (i.e. 1200 dedicated TB hospital beds and visits to clinics for DOT and monitoring during treatment), the cost per patient treated is estimated to range from around US$ 220 to US$ 360. The total cost of TB control was about US$ 7 million in 2002. Provided the 2005 budget is fully funded and spent and the projected number of cases are treated, this will rise to almost US$ 12 million in 2005.