

South Africa

In 1996, South Africa established an NTP and adopted DOTS as its TB control strategy. Despite government commitment to making TB control a priority, and the implementation of the DOTS strategy in all provinces and almost all districts, it is not known with confidence how much TB there is in the country. Inadequate case reporting systems, a shortage of trained staff at the provincial level and problems associated with the laboratory network hinder effective TB surveillance. Recognizing these shortcomings, the NTP has recently taken a number of steps to remedy the situation, and better data can be expected in the future. However, treatment success rates remain low and many patients are lost to follow-up. A concerted effort will be needed if South Africa is to reach the target cure rates. TB/HIV coinfection is a significant public health problem and is being addressed through a national programme of collaborative TB/HIV activities. MDR-TB prevalence is estimated to be about 2% in new TB patients and 7% in re-treatment cases. Second-line

drug treatment is available in provincial MDR-TB units, though at high cost. A number of NGOs are involved in providing TB services and are also mobilizing support in the communities, but more needs to be done to encourage broader private sector participation.

System of TB control

South Africa's health system is decentralized. The National Department of Health provides general guidelines, but the implementation and delivery of services is the responsibility of the provincial authorities. The management structure and the implementation of TB control services vary considerably among provinces. The development of administrative districts, with health management structures in each province, is in progress and not yet complete. The basic unit for TB control and management is the individual primary care institution. Community health workers play an important role in patient care, but their involvement needs to be better organized and recorded.

The National Health Laboratory Service (NHLS) is the main provider of TB laboratory services in eight of the nine provinces in South Africa (all except KwaZulu-Natal) and is divided into central, coastal and northern regions. The laboratories of the NHLS are centralized, work under contract, and include primary health-care, regional, academic and referral laboratories. Communication between them is through a laboratory information system. Smear microscopy is performed in all laboratories; culture, identification and DST are performed in 11 referral laboratories throughout the country. In KwaZulu-Natal, 73 laboratories do smear microscopy, two have culture facilities and one referral laboratory carries out DST.

Surveillance and monitoring

The incidence of TB in South Africa is uncertain because of weaknesses in the reporting system. Furthermore, the rise in TB incidence caused by the spread of HIV cannot easily be distinguished from improvement in case detection. It is likely, however, that the actual incidence of TB is higher than the current WHO estimate because case detection in 2003 was reported to be 118%.¹

The treatment success rate in the 2002 cohort was 68% and has been consistently low since recording began in 1996. In 2002–2003, 22% of new smear-positive patients were lost to follow-up, either through default or transfer, and 9% died. A further 14% completed treatment but without evidence of smear conversion. The outcome among re-treatment cases was substantially worse, with a treatment success rate of 53% and with 34% lost to follow-up. As noted in the 2004

PROGRESS IN TB CONTROL IN SOUTH AFRICA

Indicators

DOTS treatment success, 2002 cohort	68%
DOTS case detection rate, 2003	118% ¹
NTP budget available, 2004	NA
Government contribution to NTP budget, including loans, 2004	NA
Government contribution to total TB control costs, including loans, 2004	NA
Government health spending used for TB control, 2004	7%

Major achievements

- Implementation of the advocacy and social mobilization plan in five provinces (Eastern Cape, Western Cape, Gauteng, Limpopo and Free State)
- Implementation of a uniform, cohort-based reporting and recording system in all provinces
- Development of guidelines for care of HIV-infected TB patients, including access to ART

Major planned activities

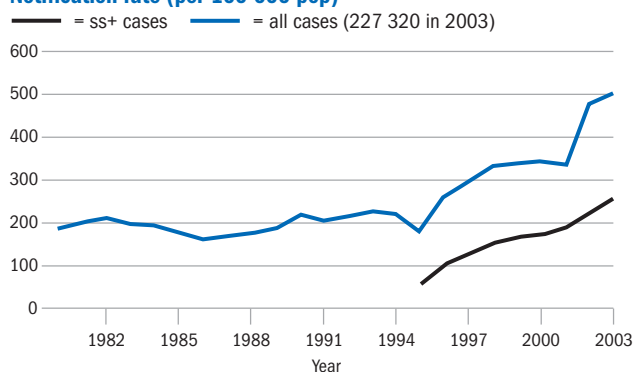
- Strengthen DOT in the provinces and improve quality of data collected
- Implement and strengthen collaborative TB/HIV activities in subdistricts
- Shorten delays in diagnosis by sputum smear microscopy
- Improve laboratory infrastructure and coverage of services in remote areas

NA indicates not available.

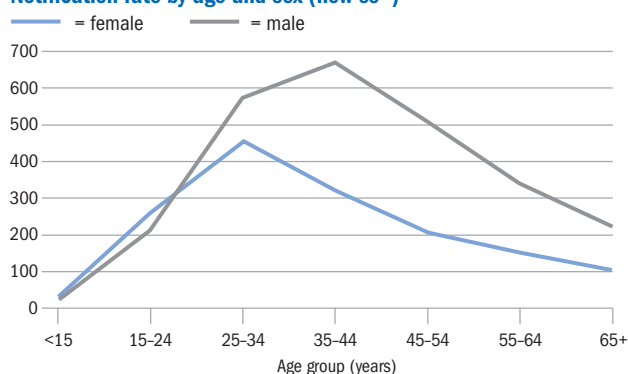
¹ Note that the "case detection rate" can exceed 100% because this is calculated as the ratio of cases reported in a given year to the estimated incidence in that year. Because the numerator is derived from the pool of prevalent cases, a proportion of which has arisen in previous years, the ratio can exceed 100%.

LATEST ESTIMATES ^a		TRENDS	2000	2001	2002	2003
Population	45 026 470	DOTS coverage (%)	77	77	98	99.5
Global rank (by est. number of cases)	8	Notification rate (all cases/100 000 pop)	344	334	481	505
Incidence (all cases/100 000 pop/year)	536	Notification rate (new ss+/100 000 pop)	173	189	221	258
Incidence (new ss+/100 000 pop/year)	218	Detection of all cases (%)	74	68	94	94
Prevalence (all cases/100 000 pop)	458	Case detection rate (new ss+, %)	91	95	106	118
TB mortality (all cases/100 000 pop/year)	73	DOTS case detection rate (new ss+, %)	75	81	105	118
TB cases HIV+ (adults aged 15-49, %)	61	DOTS case detection rate (new ss+)/coverage (%)	97	105	107	119
New cases multidrug resistant (%)	1.6	DOTS treatment success (new ss+, %)	66	65	68	—

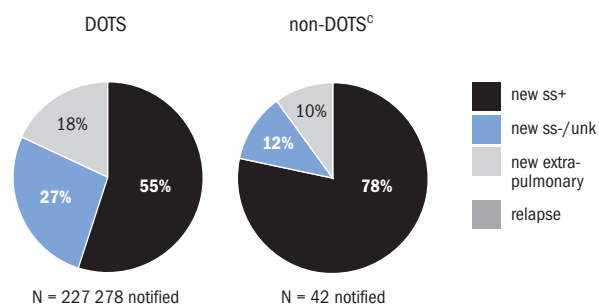
Notification rate (per 100 000 pop)



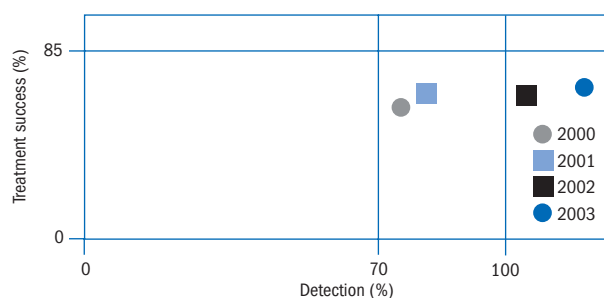
Notification rate by age and sex (new ss+)^b



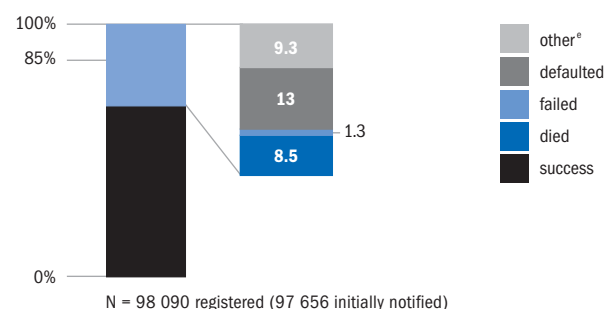
Case types notified



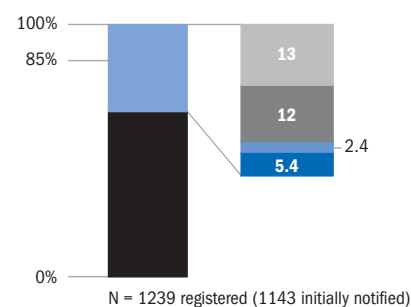
DOTS progress towards targets^d



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.

WHO report, it remains unclear why so many patients are lost to follow-up, and efforts need to be made to promote better adherence and to achieve better treatment outcomes.

Because the surveillance and monitoring data are still weak, and the electronic TB register was introduced only at the end of 2003, it is difficult to assess the TB burden and trends and to evaluate the impact of the DOTS programme. A national disease prevalence survey would help to determine how much TB there is in South Africa and would provide a baseline against which to measure the future impact of DOTS and related control methods for HIV and AIDS.

Improving programme performance

The current TB control plan, the "Medium Term Development Plan" (2002–2005), was developed and endorsed by the national government and by eight of the country's nine provinces. A 10-year review of the programme is scheduled in 2005, and a new five-year plan will be developed in line with the strategies developed by the Department of Health.

South Africa has overcome some of the important constraints to achieving the global targets identified in the last report. A uniform, cohort-based recording and reporting system has been set up in all provinces, and the establishment of the electronic TB register will allow tracking of patients between health facilities. While staffing shortages still pose a problem at the provincial level, there has been an increase in staff at the national level. To address the lack of capacity, a training manual has been developed for medical practitioners and training workshops are being held in all provinces. The WHO training manual for trainers of facility health-care workers is being adapted and training of trainers will be conducted in all provinces. A database of trained staff has been established. A national TB manual is being developed.

A national advocacy and social mobilization plan entitled "Stop TB – because you can" is being used to improve community awareness about TB through sustained and highly visible

campaigns. The plan has been used to advocate the need for more resources for TB control at all levels of the government and to bring together all partners involved in TB control. It is now implemented in five provinces (Eastern Cape, Western Cape, Gauteng, Limpopo and Free State).

New drug combinations, following the WHO-recommended treatment guidelines, were phased in during 2003 but this led to problems with drug supplies and to a shortage of first-line drugs. Furthermore, the sole supplier of streptomycin has stopped manufacturing the drug. While FDCs are now available in most districts, some districts have yet to train health staff in treatment regimens using FDCs.

Data collected from the most recent prevalence survey (2000–2002) estimated 7500 prevalent MDR-TB cases and about 450 new MDR-TB cases per year, corresponding to MDR-TB levels of 1.7% (new cases) and 6.6% (re-treatment cases). Treatment facilities for MDR-TB have been established in eight provinces. The Medical Research Council is currently developing a national policy on MDR-TB management. A standardized treatment regimen is provided to MDR-TB patients. The country is not planning to submit an application to the GLC as most second-line drugs are available in the country and many are locally produced.

Diagnostic and laboratory services

Nearly all laboratories participate in a quarterly EQA programme run by the NHLS, but the current programme does not yet completely satisfy international guidelines. The delays in sputum smear diagnosis are still too long and reporting mechanisms are inadequate in some laboratories. The NHLS plans to establish a national TB reference laboratory and to introduce a pilot EQA study for sputum smear microscopy that will comply with international guidelines. Other priorities for the NHLS are to improve the laboratory infrastructure and the coverage of services in remote rural areas, as well as training and monitoring.

TB/HIV coordination

South Africa had an estimated HIV prevalence of 22% among all adults at the end of 2003. A recent national survey estimated the HIV prevalence among TB patients to be 55% in 2002, close to the WHO estimate of 61% in 2003. There is a national TB/HIV coordinating body for collaborative activities, which have been implemented in 44 out of 174 subdistricts; it is planned to cover the entire country by 2007. TB/HIV provincial coordinators and national staff have been recruited and national guidelines for care of HIV-infected TB patients, including access to ART, have been developed. VCT is offered routinely to TB patients, but the acceptance rate remains low.

Links with other health-care providers and the community

A few public and private hospitals as well as prison health services implement DOTS. Several large private corporations, in particular in the mining industry, provide DOTS through their corporate health facilities and contribute about 20% of all reported cases. Several NGOs are involved in the delivery of TB control services and many have recruited community health workers and volunteers as DOTS providers. As noted in last year's report, a PPM-DOTS plan is still needed and more private sector participation should be encouraged.

Partnerships

South Africa has a country TB coordinating group that meets four times a year. Many partners and technical agencies support DOTS implementation and expansion, including CDC (surveillance and TB/HIV activities), DFID (district management and inpatient care of TB patients), IUATLD (laboratory support and programme management), KNCV (training and research) and WHO (training and TB/HIV activities). USAID is one of the main sources of funds and the GFATM has approved one grant to fund TB/HIV activities.

Budgets and expenditures

As in previous years, South Africa did not submit financial information to

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WHO because the NTP does not have access to district and provincial financial data. South Africa was awarded one TB/HIV grant from the GFATM in round 2 for US\$ 8.4 million over two years; to date no funds have been disbursed. The Government of Belgium is also funding TB/HIV activities to the amount of US\$ 8.3 million over five years, of which US\$ 1.2 million has been disbursed. Estimates made in previous WHO reports suggest that the total annual cost of TB control in South Africa is about US\$ 300 million.

Thailand

Thailand has had nationwide DOTS coverage since 2002 and reached the global target for case detection in 2003. Recent data suggest that the incidence of TB is declining slowly in Thailand. Considerable efforts are being made to extend TB control services to marginalized and deprived population groups, and this has boosted the case detection rate. However, treatment success is still well below the DOTS target and too many patients die, fail to complete their treatment or are lost to follow-up. In contrast to most HBCs, diagnostic laboratories in Thailand are relatively well equipped and maintained, but the shortage of adequately trained staff is still a problem. The estimated prevalence of HIV in Thailand is higher than in any other country in the WHO South-East Asia Region. A national TB/HIV coordinating body has been set up and is planning joint TB/HIV activities. The recent reform and decentralization of the country's health sector is changing the responsibilities and funding arrangements for TB control; the full implications of this for TB control are still unclear.

System of TB control

The central office of the NTP has become a cluster within the Bureau of AIDS, TB and STIs, following the recent reorganization of the Department of Disease Control (DDC) of the MoPH. The TB cluster is responsible for the development of technical policies, planning and monitoring of TB control in the country. The procurement and distribution of anti-TB drugs have been decentralized to the provincial and district levels as part of the health-sector reform process. Twelve regional TB centres and the TB cluster in Bangkok are responsible for monitoring, training and supervising of provincial and district-level staff. Health inspectors monitor the provincial hospitals and health offices and have a strong influence on provincial and district health-care programmes. Certain programmes are now given priority and

efforts have been made to include TB control among these priority programmes.

Under the health-sector reform project, a number of managerial tasks for the TB control programme, including planning and budgeting for activities such as training and supervision, have been decentralized to the provincial and district levels. District TB Coordinators (DTCs) are responsible for coordinating TB control activities, and work in close collaboration with the TB clinics in the hospitals. One effect of the health-sector reform policies will be to weaken the role of provincial and district health offices, as planning and budgeting authority will now rest with the provincial and district hospitals. In many districts, clinic staff in TB hospitals have assumed some of the responsibilities of the DTCs.

Laboratory diagnostic services in Thailand are provided by one NRL, 167 provincial and 678 district laboratories. All laboratories do smear microscopy, about 85 do mycobacterial culture and eight have facilities for

DST. Regional and university laboratories perform culture on request for sputum smear-negative cases.

Surveillance and monitoring

Annual case notifications from 1980 to 1995 suggest that the underlying trend in incidence is downwards, masked since 1998 by improvements in case detection. Notification rates are highest in elderly men and women, which is consistent with a long-term downward trend in TB incidence. However, the recent impact of HIV on TB incidence cannot be determined from the nationally aggregated data. The prevalence of HIV among adult TB cases was estimated to be 8.7% in 2003, but HIV prevalence has been falling for several years, and TB incidence may also still be falling.

According to the most recent estimate, Thailand has exceeded the target for case detection, reaching 72% in 2003, following the rapid increase in DOTS population coverage between 1995 and 2002. In contrast, treatment success was well below target at 74% in the 2002 cohort, mainly

PROGRESS IN TB CONTROL IN THAILAND

Indicators

DOTS treatment success, 2002 cohort	74%
DOTS case detection rate, 2003	72%
NTP budget available, 2004	100%
Government contribution to NTP budget, including loans, 2004	NA
Government contribution to total TB control costs, including loans, 2004	NA
Government health spending used for TB control, 2004	0.5%

Major achievements

- A meeting of TB coordinators from the regions, Bangkok and the prison service that addressed the referral and transfer system and overall strengthening of the TB network
- Recent DOTS expansion to marginalized population groups including people in border areas, migrants, prisoners and the urban poor leading to increased case detection

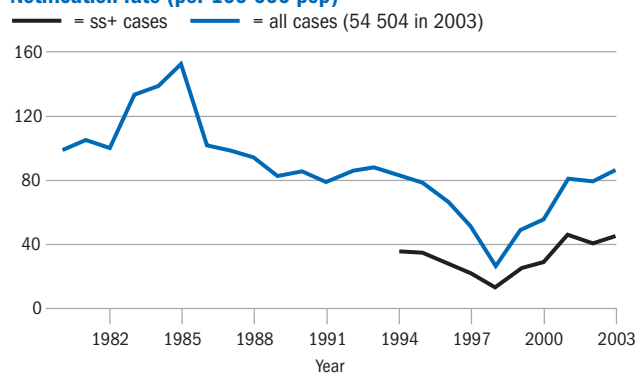
Major planned activities

- Implement TB/HIV collaborative activities including routine VCT for all TB patients, according to national guidelines
- Develop a comprehensive human resource plan for all levels of the NTP
- Build capacity for mycobacterial culture in provincial hospitals and strengthening the existing culture facilities in regional TB reference laboratories

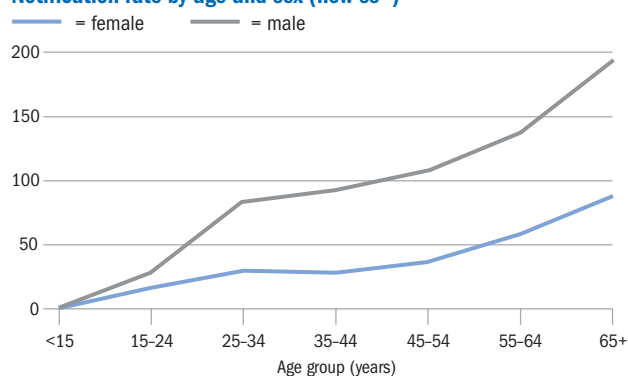
NA indicates not available.

LATEST ESTIMATES ^a		TRENDS	2000	2001	2002	2003
Population	62 833 330	DOTS coverage (%)	70	82	100	100
Global rank (by est. number of cases)	17	Notification rate (all cases/100 000 pop)	56	81	80	87
Incidence (all cases/100 000 pop/year)	142	Notification rate (new ss+/100 000 pop)	29	46	41	45
Incidence (new ss+/100 000 pop/year)	63	Detection of all cases (%)	39	57	56	61
Prevalence (all cases/100 000 pop)	208	Case detection rate (new ss+, %)	46	73	65	72
TB mortality (all cases/100 000 pop/year)	19	DOTS case detection rate (new ss+, %)	46	73	65	72
TB cases HIV+ (adults aged 15-49, %)	8.7	DOTS case detection rate (new ss+)/coverage (%)	66	89	65	72
New cases multidrug resistant (%)	0.9	DOTS treatment success (new ss+, %)	69	75	74	—

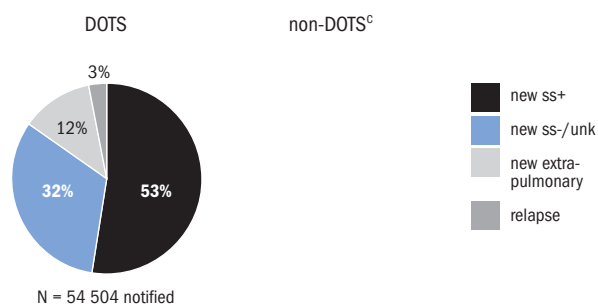
Notification rate (per 100 000 pop)



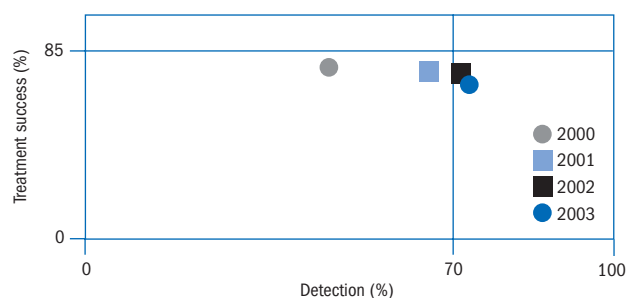
Notification rate by age and sex (new ss+)^b



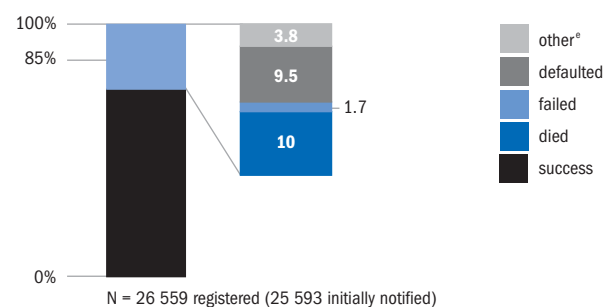
Case types notified



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.

because 11% of patients died while on treatment and 13% defaulted or were transferred between treatment centres without subsequent follow-up of treatment outcome. Among patients registered for re-treatment, the success rate was only 62%; 17% of patients died while on treatment. There has been no systematic improvement in treatment success in Thailand since data were first submitted to WHO in 1995. Given the rapid recent increase in DOTS coverage, and the apparently high rate of case detection, Thailand should consider assessing the quality of treatment observation and ensure that reporting and recording are accurate. A recent programme review showed that parts of the database were incomplete and inconsistent.

Improving programme performance

In 2003, Thailand introduced a countrywide health insurance scheme for all clinical services known as the universal coverage (UC) scheme. The budget for this programme covers drugs and supplies for an “essential package of care” delivered at MoPH facilities and other health-care facilities under contract with the MoPH. Since 2002, following health-sector reforms, anti-TB drugs have been financed through the UC scheme. It is intended that training, supervision and monitoring activities for specific disease control programmes be financed through a non-UC budget available through the DDC at the MoPH. The TB cluster at the central level must use non-UC funds for the organization of national training courses, supervision in the regions and the organization of monitoring meetings for regional staff. During 2004, many training and monitoring activities required by NTP policy could not be carried out because of lack of funding at the peripheral level. Although funds are available for supervisory activities in 2004, the funding of training activities and monitoring meetings will require further negotiation with the DDC. The administrative process for the provision of non-UC funds at provincial and district levels is still being developed.

During the expansion of DOTS activities from 1996–2001, initial

training was carried out for health-care workers at all levels. However, because of the high turnover of staff and the lack of systematic refresher courses, there is now a shortage of adequately trained TB control staff in Thailand. As noted last year, many of the regional TB offices have been weakened because staff posts have been cut and additional duties have been assigned to existing staff. A comprehensive HR development plan has been prepared; the immediate challenge is to ensure that sufficient funding is available to implement it.

Referral and transfer systems between treatment units and between prisons and MoPH facilities are weak. Timely information is often not communicated and there is no specific budget for communication between provinces. A TB network meeting was held in 2003 for the TB coordinators of the 12 regions, Bangkok and the prison service to address the referral and transfer system and overall strengthening of the TB network. Efforts are being made to improve data collection, and there are plans to introduce an electronic data management system.

The recent DOTS expansion to marginalized population groups including people living in border areas, migrants, prisoners and the urban poor have contributed to the high case detection rate in Thailand. NGOs and other organizations outside the MoPH system have been particularly active in expanding DOTS services to these groups.

Funding for anti-TB drugs has been adequate in the past but may be threatened if the purchase of drugs must be financed from fixed province and district budgets. Currently, most anti-TB drugs used by the NTP are manufactured in Thailand and are more costly than internationally procured drugs. Renegotiating prices with the government pharmaceutical organization or exploring additional procurement channels may help to release local funds for other TB-related activities such as training and supervision. The prevalence of MDR-TB among new cases decreased from 2.1% in 1997 to 0.9% in 2001. A nationwide drug resistance survey is

planned for 2005. At present, the NTP does not diagnose and treat MDR-TB patients. However, policy guidelines on MDR-TB management are being developed.

Three areas where 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

Compared with most other HBCs, Thailand has relatively well-equipped laboratories with few supply or maintenance problems. Thailand is planning to broaden the range of diagnostic services for TB by developing further capacity for doing TB culture in provincial hospitals and by strengthening the existing culture facilities of regional TB reference laboratories. The rapid detection of drug resistance is a priority for the NRL. EQA activities cover all TB laboratories in MoPH facilities, and efforts are to be made to include the private sector in the quality assurance scheme. Laboratory training activities are being expanded to include training for all TB control staff and targeted training for laboratory staff in technical areas where laboratory performance needs to be improved.

TB/HIV coordination

The estimated prevalence of HIV in Thailand (1.5% of adults aged 15–49 at the end of 2003) is the highest in the WHO South-East Asia Region. The prevalence of HIV among TB patients in sentinel surveys was between 10% and 15% in the country as a whole, but up to 30% in some regions (higher than the WHO estimate of 9% of adult TB patients). A national TB/HIV coordinating body was first established in 2001 and a national TB/HIV strategy has been in place since 2004. National TB/HIV guidelines were prepared in 2004 and will be implemented in January 2005.

VCT is offered to all TB patients in four pilot provinces: Chiang Rai, Ubon Ratchathani, Phuket and two districts in Bangkok. Data on specific indicators such as the proportion offered counselling, the proportion tested and the proportion found to be HIV posi-

tive will be collected and analysed. It is planned to train all TB clinic staff in the country in VCT by 2005.

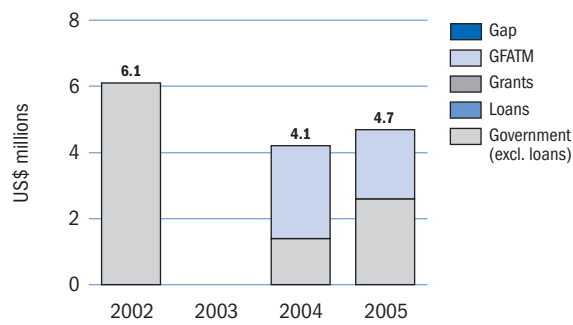
Links with other health-care providers

The NTP has established a task force for PPM DOTS and has begun to collaborate with some private hospitals, private physicians and NGOs. There is a need to strengthen ties with all public sector providers and institutions involved in TB treatment and diagnosis, especially since the health-sector reform process has led to a more diversified network for delivering TB care. Public hospitals throughout the country are involved, but the participation of medical colleges and of prison and military health services remains limited.

Partnerships

CDC, RIT and WHO are the main technical partners in Thailand, assisting with DOTS expansion and TB/HIV activities. CDC (USAID) and GFATM are the major funding partners for surveillance, laboratory services, training and collaborative TB/HIV activities.

NTP budget by source of funding



Budgets and expenditures

Comprehensive data on NTP budgets and expenditures are not available for the period 2003–2005. This is because, under the new health insurance scheme introduced in 2003, provincial and district hospitals receive budgets (calculated on the basis of fixed per capita rates) to provide a package of clinical care. It is not clear how much funding for the TB control programme is provided from these budgets. Meanwhile, programme support functions such as training and supervision are covered through a separate budget. Budget figures reported to WHO for 2004 and 2005 therefore reflect only

the budget managed by the TB cluster in Bangkok. As a result, the reported budget has fallen from US\$ 6.1 million in 2002 to US\$ 4.7 million in 2005, despite an increase in funding from the GFATM. The development of national budgets in future will depend on the NTP’s ability to implement a comprehensive financial monitoring system that allows budgets and available funding to be reported by all provinces and districts. Estimates made in previous WHO reports indicate that the total cost of TB control is about US\$ 10 million per year, and around US\$ 170 per patient treated.

Uganda

Uganda is pursuing universal access to DOTS as its TB control strategy. All districts were implementing DOTS as far back as 1997, but the low coverage of general health services means that more than 50% of the population are still without access to TB services, although this proportion is decreasing. TB is a component of Uganda's minimum health-care package, and TB services are integrated in primary health care. However, many health facilities do not yet provide TB diagnosis and care. In 2000, Uganda adopted the community-based TB care model as the best strategy to control TB in the country. Community involvement is recognized as crucial for the success of TB control in Uganda. The NTP is committed to expanding community-based DOTS (CB-DOTS) to all 56 districts; 51 districts have already been covered. Although GFATM funds were approved for Uganda in round 2, a substantial funding gap still remains, meaning that some of the planned activities for 2005 may not be carried out. In December 2004, the Uganda Stop TB Partnership (USTP) was

launched as a major initiative to raise awareness of TB as an important public health problem and to mobilize additional resources for TB control.

System of TB control

Uganda has a decentralized system of governance, with central ministries responsible for policies, standards, quality control, resource mobilization and training. Districts are responsible for management of services at peripheral level. Health service delivery, including TB control, is the responsibility of the health subdistricts (HSDs), which are the functional units for TB control. A total of 214 HSDs each serve about 100 000 people. TB service delivery is fully integrated in the primary health-care system.

TB control in Uganda is organized with a central unit at the MoH run by the NTP manager and one administrative officer. Hitherto, the NTP manager has been assisted by six zonal tuberculosis and leprosy supervisors (ZTLSs) based at the periphery, who oversee TB control in their zones. At district level, a district health team

(DHT) oversees TB control. The District Tuberculosis and Leprosy Supervisor, a member of the DHT, is responsible for TB control including data collection, analysis and reporting. Below this level, general health workers handle TB control activities as part of their general duties.

The MoH has recently developed the second five-year "Health Sector Strategic Plan" (HSSP II) covering 2005/2006–2009/2010. HSSP II envisages continued implementation of the minimum health-care package of which TB is one component and foresees continued use of TB performance indicators for monitoring progress of HSSP II implementation. As part of continuing health sector reform, the NTP plans to recall the ZTLSs to the centre in order to form, under the guidance of the NTP manager, a strong central team with improved capacity in policy formulation and technical guidance to districts and partners on TB management. The ZTLSs will provide a strong technical link between government and partners, and support to the DHTs. Each district has three or more health facilities providing TB diagnostic and treatment services. Through CB-DOTS, treatment is provided at the community level. CB-DOTS is an important service delivery mechanism that is patient-centred and based on participation by civil society, providing accessible, cost-effective TB care; this mechanism is vital to the success of TB control in Uganda.

The NRL in Kampala is responsible for training, DST and EQA. The national coordinator of the laboratory network is responsible for the NRL. Ten regional laboratories based at regional hospitals also provide training and EQA, in addition to smear microscopy. The district laboratories' main responsibility is the supervision of peripheral laboratories, which serve as the main diagnostic units.

PROGRESS IN TB CONTROL IN UGANDA

Indicators

DOTS treatment success, 2002 cohort	60%
DOTS detection rate, 2003	44%
NTP budget available, 2004	83%
Government contribution to NTP budget, including loans, 2004	32%
Government contribution to total TB control costs, including loans, 2004	38%
Government health spending used for TB control, 2004	2%

Major achievements

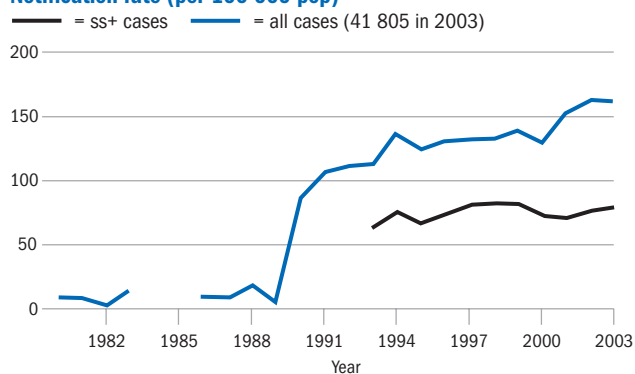
- Expansion of community-based DOTS (CB DOTS) to an additional 11 districts, corresponding to an additional 20% of the country's population
- Formation and launch of the Uganda Stop TB Partnership (USTP) to better harness efforts of all partners on TB control
- Secured additional staff to build NTP capacity; secured additional resources through ISAC

Major planned activities

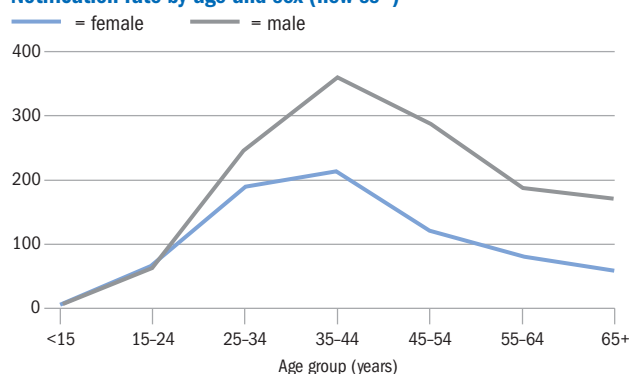
- Complete expansion and consolidation of CB DOTS, ensuring district-wide coverage and high quality of services
- Institute EQA of all laboratories in the country, and strengthen it where it exists
- Update NTP strategic TB control plan to include PPM DOTS as part of the DOTS expansion plan
- Operationalize the USTP

LATEST ESTIMATES ^a		TRENDS	2000	2001	2002	2003
Population	25 826 968	DOTS coverage (%)	100	100	100	100
Global rank (by est. number of cases)	16	Notification rate (all cases/100 000 pop)	129	152	163	162
Incidence (all cases/100 000 pop/year)	411	Notification rate (new ss+/100 000 pop)	73	71	76	79
Incidence (new ss+/100 000 pop/year)	179	Detection of all cases (%)	38	42	42	39
Prevalence (all cases/100 000 pop)	652	Case detection rate (new ss+, %)	50	46	46	44
TB mortality (all cases/100 000 pop/year)	96	DOTS case detection rate (new ss+, %)	50	46	46	44
TB cases HIV+ (adults aged 15-49, %)	21	DOTS case detection rate (new ss+)/coverage (%)	50	46	46	44
New cases multidrug resistant (%)	0.5	DOTS treatment success (new ss+, %)	63	56	60	—

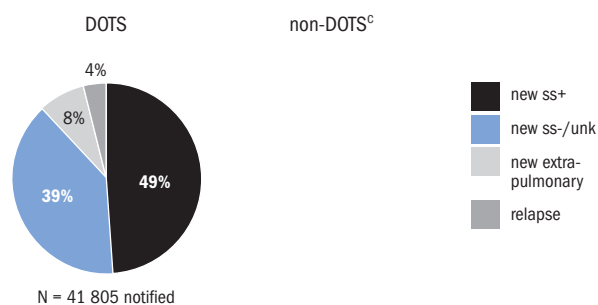
Notification rate (per 100 000 pop)



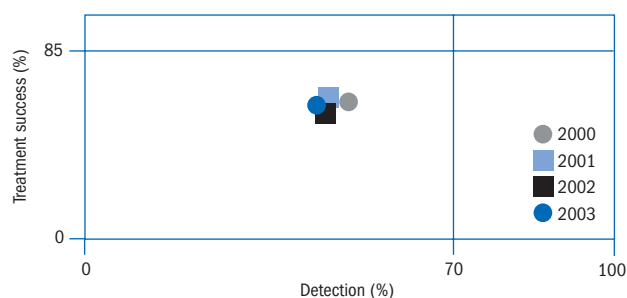
Notification rate by age and sex (new ss+)^b



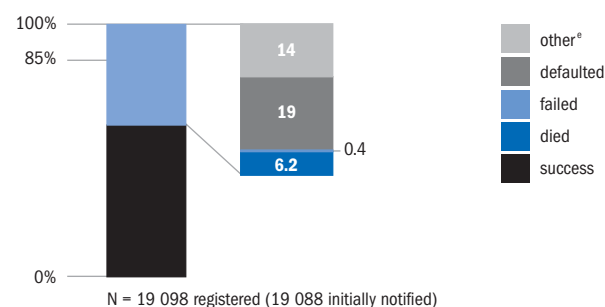
Case types notified



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.

Surveillance and monitoring

While strong evidence exists that HIV prevalence has been falling in Uganda since the early 1990s, the notification rate of TB cases (all forms) has increased since 2000. The notification rate of new smear-positive cases has remained steady for the past decade. In order to estimate the case detection rate, it has been assumed that the increase in the notification rates of all forms of TB reflects an increase in incidence – and that the case detection rate of new smear-positive cases has fallen since 2000 from 50% to 44%. A plausible alternative explanation is that the case detection rate has improved as the coverage of CB DOTS has been extended throughout the country – and that TB incidence has stabilized or begun to fall. However, given the low access to health services (less than 50%), it is unlikely that the case detection rate is much higher than estimated here.

Notwithstanding the uncertainty surrounding the assessment of the case detection rate, it is clear that the NTP must work to improve treatment outcomes, which have been consistently low. Only 60% of new smear-positive patients were successfully treated in the 2002 cohort; 33% defaulted, were transferred without follow-up or were not evaluated. Cure was bacteriologically confirmed in only half the patients successfully treated; the final smear examination was not done for the other patients. The pattern is similar among patients registered for re-treatment.

A small disease prevalence survey was carried out in Kampala in 2001–2002,¹ finding a prevalence of smear-positive TB of 440 cases per 100 000 population in the periurban community sampled. However, a larger national survey is needed to assess the total burden of TB in Uganda and to set a baseline against which to measure the impact of DOTS. Alternatively, or in addition, a systematic evaluation of the process of diagnosis and reporting in Uganda would allow a reassess-

ment of the case detection rate. The NTP acknowledges that progress has been hindered by non-prioritization of sputum smear examination (15% of new cases were put on treatment without sputum smear results), poor recording and the absence of strategies to recover interrupters and to capture the true treatment outcome of patients who transfer between treatment units. These factors are being addressed systematically.

Improving programme performance

Since early 2004, the NTP has benefited from the ISAC initiative, which greatly contributed to the increased capacity of the central team. An international WHO staff member supports the NTP central unit. The central unit has deployed three recently recruited professional officers at regional level to support the DHTs, with redistribution of regional supervisors to weak areas. However, major HR deficiencies still exist at the central level. CB DOTS is being expanded and, by the end of 2004, was being implemented in 51 out of 56 districts. The full impact of this expansion has not yet been seen.

CB DOTS is being implemented in a phased manner in the HSDs of some districts. Uganda has so far engaged two international NGOs (International Medical Corps and the Malaria Consortium) to implement CB DOTS in remote areas; the NTP plans to expand CB DOTS to the remaining districts early in 2005.

Supervision and monitoring activities have been expanded to all levels of TB control, including the community. A new DOTS expansion plan for the next five years is being developed by the NTP.

In 1996–1997, a DRS was conducted in areas of the country supported by GLRA, giving an estimate of 0.5% MDR in new pulmonary cases and 4.4% MDR in re-treatment cases. Resources are being sought to carry out a new DRS. Uganda plans to apply to the GLC in the context of the new DOTS expansion plan.

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 and the community.

Diagnostic and laboratory services

The two main challenges facing the diagnostic and laboratory services are the shortage of qualified laboratory personnel in the general health service and the lack of a countrywide EQA system for sputum smear microscopy. In 2003, only 12 out of 56 districts had implemented EQA for smear microscopy. In 2005, the NTP plans to establish routine EQA in the remaining districts and to strengthen it in those districts where it exists. The NTP will advocate for recruitment of qualified personnel in peripheral laboratories and will train existing personnel as microscopists in the interim.

TB/HIV coordination

An interim national TB/HIV coordinating body comprising the managers of the NTP and of the National AIDS Control Programme and partners (including the AIDS Information Centre, the AIDS Support Organization, GLRA, USAID-funded organizations and WHO) was formed in 2004 to formulate a policy as well as to prepare a proposal for collaborative TB/HIV activities. The committee will ensure phased implementation of collaborative TB/HIV activities in pilot districts and, based on the experiences gained, will frame the policy and strategy for rapid nationwide expansion.

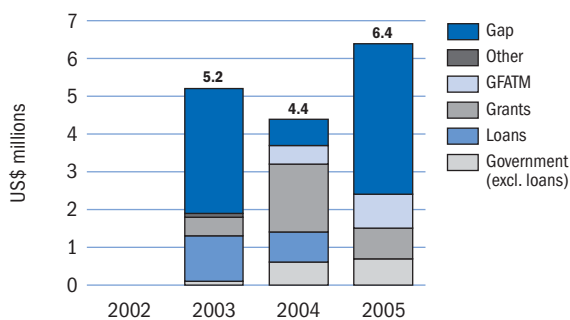
In 2004, WHO appointed an NPO to coordinate TB/HIV activities and oversee the establishment of the committee; its first meeting was planned for mid-January 2005.

Links with other health-care providers

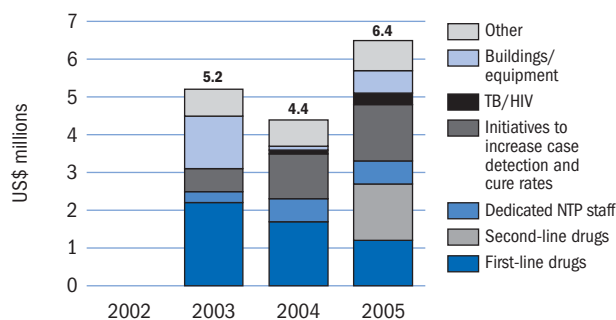
A situation analysis has shown that many patients in urban areas are treated in the private sector. The NTP has initiated a small-scale collaborative project with private hospitals, with plans to expand this initiative to involve individual private medical practitioners. NGOs play an important role in DOTS implementation, and the NTP has involved many general hospitals, a few medical colleges, and prison, army and police health facilities in TB control.

¹ Guwatudde D et al. Burden of tuberculosis in Kampala, Uganda. *Bulletin of the World Health Organization*, 2003, 81:799–805.

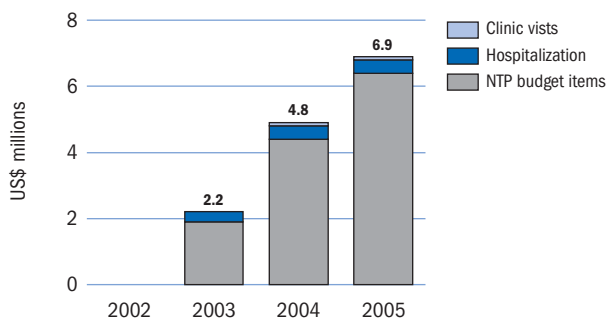
(a) NTP budget by source of funding



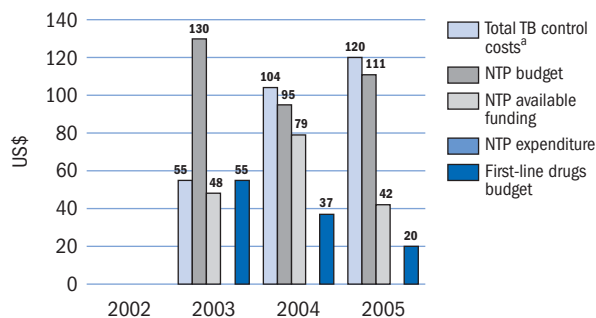
(b) NTP budget by line item



(c) Total TB control costs by line item^a



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



^a Total TB control costs for 2003 are based on available funding, 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.

Links with the community

The success and sustainability of CB DOTS is largely dependent on community involvement and ownership of the programme. In the CB-DOTS strategy, communities participate in selecting lay community members to support patients and ensure treatment compliance. The selected community members work on a voluntary basis, observing and recording the ingestion of each day's medication. In addition, they encourage patients to go for follow-up sputum smears and suspects to go for examination in health units. Community volunteers are responsible to the community and also to the formal health system through a public health worker who supervises and replenishes drug supplies.

Partnerships

The MoH is committed to attaining the targets for DOTS implementation, and has indicated an interest in forming a strong partnership to help the country accelerate towards the 2005 targets. The formation of the USTP was spearheaded by the MoH and supported by WHO and the Global Stop TB Partnership, as well as other part-

ners, in the context of the ISAC initiative. The USTP was launched in December 2004, with the aims of harnessing the contributions of all stakeholders to TB control and raising the profile of TB as a major public health problem. WHO Uganda has offered to host the USTP Secretariat; a Memorandum of Understanding is being prepared to guide their operations.

Budgets and expenditures

The NTP budget has been between US\$ 4.4 million and US\$ 6.4 million during the period 2003–2005 (equivalent to US\$ 95–130 per patient). Despite the approval of a GFATM grant in round 2, Uganda suffers from a persistent funding gap, which is expected to reach US\$ 4 million in 2005, representing 62% of the NTP budget.

The budget for first-line anti-TB drugs has decreased from US\$ 2.2 million in 2003 to US\$ 1.2 million in 2005, whereas the expected number of patients to be treated is rising. The drug budget per patient treated has thus been reduced from US\$ 55 to US\$ 20. This budget for first-line drugs is fully funded. In contrast, while the

budgets for initiatives to increase case detection and cure rates and for collaborative TB/HIV activities have been increasing between 2003 and 2005, implementation of all of the planned activities will depend on the availability of additional funds. A need for second-line drugs has also been identified; a budget of US\$ 1.5 million has been included in 2005, which is for a stock sufficient to treat 1000 MDR-TB patients. However, funding has not yet been secured.

The total cost of TB control, including the costs of clinic visits and hospital stays as well as the NTP budget, will increase from an estimated US\$ 2.2 million in 2003 to US\$ 6.9 million in 2005 (US\$ 55–120 per patient), provided the existing budget gap for 2005 is filled. If no additional funds are secured, total costs will reach only about US\$ 3 million in 2005; the cost per patient will be US\$ 51. The costs of clinic visits, at around US\$ 0.1 million, is relatively low given the small number of visits required to health facilities following the nationwide introduction of CB DOTS.

United Republic of Tanzania

The United Republic of Tanzania was among the first countries to adopt the DOTS strategy. Nationwide DOTS coverage was attained in 2002, largely through the successful integration of TB control in the general health services. After reaching a peak in 2001, the number of reported TB cases has remained steady, which may perhaps indicate an end to the rise in TB incidence previously associated with the HIV epidemic. As the HIV prevalence has been constant in the country since 1996, the DOTS programme should be able to achieve a progressive reduction in TB incidence from now on. Improvements have been made in the treatment of patients, but a relatively high death rate is still an obstacle to reaching the global target for successful treatment. While progress has been made in control of both TB and HIV and in ART scale-up, the TB and HIV control programmes have not worked together in the past, and the particular needs arising from the epidemic of TB/HIV coinfection have not received special attention until recently. The government has now developed comprehensive plans for collaborative TB/HIV activities and, thanks to an award from the GFATM,

it should be possible to implement them all. Building on the well-managed TB control programme, the collaborative TB/HIV activities will give additional impetus to TB case-finding and treatment. The MoH is also preparing to establish DOTS-Plus within the regular DOTS programme. Further strengthening of human resources, particularly at central level, is essential to meet the needs of these rapidly expanding programme activities.

System of TB control

The NTP is well organized and managed. Under the direction of a small central unit, the regional and district TB coordinators supervise the activities of hospitals and other health centres and monitor programme performance, using formal quality assurance practices. The district health committees are responsible for developing district health plans that include both TB and HIV. Recognizing the importance of the dual epidemic of TB and HIV, the NTP has decided to implement the full package of collaborative TB/HIV activities as part of a comprehensive TB and HIV/AIDS control strategy.

The NRL oversees 2 zonal, 18 re-

gional and 701 district laboratories. Culture is done at the NRL and zonal laboratories, while DST is carried out only at the NRL.

Surveillance and monitoring

The total annual TB notification rate has increased three-fold between 1980 and 2001, and has fallen slightly since then. The notification rate of smear-positive cases has fallen slightly since 1998. Assuming that this is a consequence of the earlier levelling off of the HIV epidemic rather than a decline in case detection rates, the DOTS programme should now begin to reduce the incidence of TB, provided the programme performance is maintained or improved. The estimated rate of smear-positive case detection in 2003 (43%) was low, but the reliability of this estimate is not easily verified using the available tuberculin testing data because the usual methods of analysis based on the Stýblo ratio may not apply when the prevalence of HIV is high (see Methods). For this reason, a systematic and quantitative assessment of the completeness of surveillance data or a survey of the prevalence of disease would be very informative. Given the high rate of HIV infection in the country, the treatment success rates are good: 80% for new cases, 79% for relapse cases, 65% for re-treatment after failure and 71% for re-treatment after default. Treatment outcomes for new smear-positive patients have improved steadily since 1995, but the high death rates (11% for the 2002 cohort) are the main obstacle to reaching the 85% target for treatment success.

Improving programme performance

To improve case detection, the number of diagnostic centres has been increased in the districts, and a start has been made on integrating the delivery of TB control into the general health services and into the private sector. In 2003, 1250 general health-

PROGRESS IN TB CONTROL IN THE UNITED REPUBLIC OF TANZANIA

Indicators

DOTS treatment success, 2002 cohort	80%
DOTS case detection rate, 2003	43%
NTP budget available, 2004	76%
Government contribution to NTP budget, including loans, 2004	14%
Government contribution to total TB control costs, including loans, 2004	64%
Government health spending used for TB control, 2004	11%

Major achievements

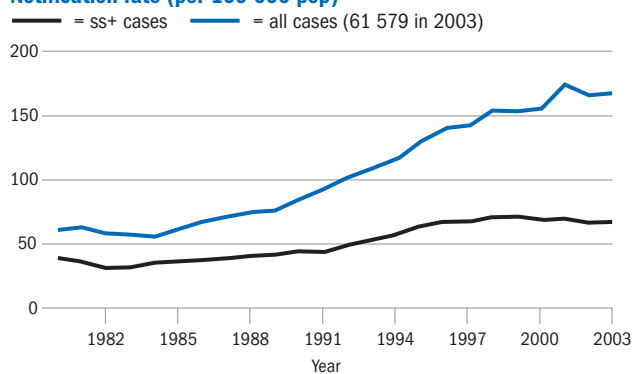
- Increased number of diagnostic centres at district level
- Training of 1250 general health-care workers in case detection and treatment
- Maintained high treatment success despite high prevalence of HIV among TB patients
- Strengthening of MDR-TB services and infrastructure in preparation for application to the GLC

Major planned activities

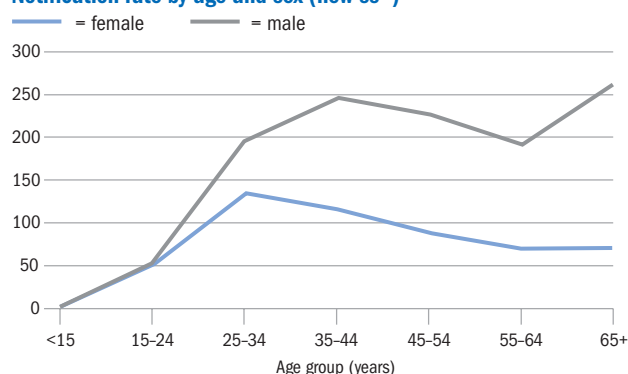
- Expand DOTS by involving communities, the private sector, specialist TB clinics, medical colleges and prison health services
- Introduce DOTS-Plus activities
- Expand collaborative TB/HIV activities to all districts by 2007

LATEST ESTIMATES ^a		TRENDS	2000	2001	2002	2003
Population	36 976 622	DOTS coverage (%)	100	100	100	100
Global rank (by est. number of cases)	14	Notification rate (all cases/100 000 pop)	156	173	166	167
Incidence (all cases/100 000 pop/year)	371	Notification rate (new ss+/100 000 pop)	69	69	67	67
Incidence (new ss+/100 000 pop/year)	157	Detection of all cases (%)	45	49	46	45
Prevalence (all cases/100 000 pop)	524	Case detection rate (new ss+, %)	47	46	43	43
TB mortality (all cases/100 000 pop/year)	86	DOTS case detection rate (new ss+, %)	47	46	43	43
TB cases HIV+ (adults aged 15-49, %)	36	DOTS case detection rate (new ss+)/coverage (%)	47	46	43	43
New cases multidrug resistant (%)	1.2	DOTS treatment success (new ss+, %)	78	81	80	—

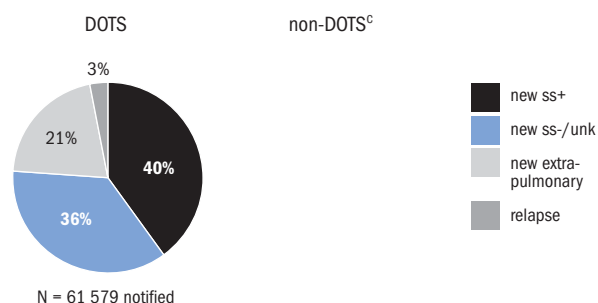
Notification rate (per 100 000 pop)



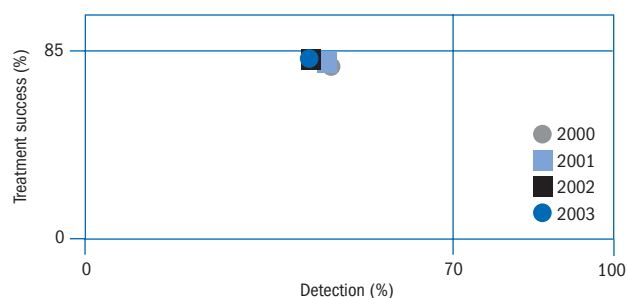
Notification rate by age and sex (new ss+)^b



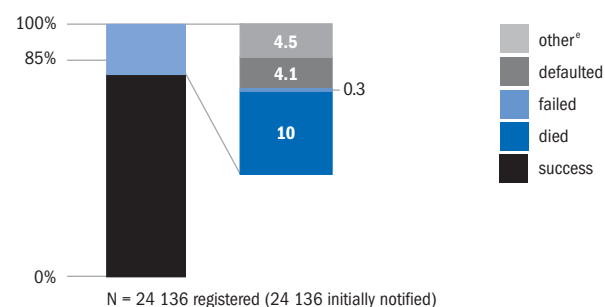
Case types notified



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.

care workers were trained on case detection and treatment. The central unit has produced training guidelines and a facilitator module for clinical officers and will develop training guidelines for nurses.

To improve programme performance, it will be necessary to strengthen HR capacity at the central level. Currently, there are only four people to supervise and monitor the TB control programme, to expand DOTS services, to implement training at lower levels and to develop and implement collaborative TB/HIV activities. PATH, with funding from USAID, has recently developed a plan to strengthen HR capacity at central, regional and district level.

The MoH is planning to establish and integrate a DOTS-Plus component within the NTP. Following a WHO mission in spring 2004, plans have been made to: introduce DOTS-Plus, including developing a computerized TB notification system to monitor treatment outcomes among re-treatment cases; construct a new MDR-TB ward within the national TB hospital; set up a technical committee to oversee future implementation of MDR-TB activities; and provide training for medical personnel in management of MDR-TB. A drug resistance survey is scheduled to start in the middle of 2005.

Three areas where 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

The quality of the central laboratory services has been significantly improved in preparation for an application to the GLC. New equipment has been installed, and internal quality control is now mandatory; the mycobacterial culture contamination rate has been reduced from 15% to 10% in less than a year. However, laboratories at all levels are still short of qualified staff and the implementation of EQA for smear microscopy is still not

satisfactory. A further priority for the laboratory network is to improve the quality of supervision of the peripheral laboratories by the central unit.

TB/HIV coordination

A national TB/HIV strategic plan to cover all districts by 2007 has been developed and includes all the collaborative TB/HIV activities defined in the WHO interim policy. In 2003, the Tanzanian Government successfully applied to the GFATM (round 3) for resources to support collaborative TB/HIV activities in 45 of 120 districts. There is a gap in funding to scale up TB/HIV activities nationally, and there is a need to align TB/HIV activities with the national plan for scaling up access to ART to ensure that HIV-positive TB patients are able to access ART. Implementation of collaborative TB/HIV activities is slow; in order to accelerate their implementation, additional financial resources will be needed as well as increased HR capacity, particularly at central level.

Links with other health-care providers

Anti-TB drugs may only be prescribed and dispensed with the approval of the NTP and using drugs procured and distributed by the NTP. As a result, non-DOTS treatment of TB is very limited in both the private and the public sector, which facilitates the implementation of PPM-DOTS strategies. The NTP has involved NGOs and private hospitals in TB control by providing training, drugs and supervision, and is now expanding this effort to include private clinics. Links with specialist TB clinics, medical colleges and prison health services are also being strengthened.

Partnerships

A range of technical and financial partners are involved in TB control and they have formed an Interagency Coordination Committee that meets once a year. Development Cooperation Ireland, the Government of the Netherlands and the Swiss Agency for Development and Cooperation are the main sources of funds for TB control

activities. GLRA, KNCV and WHO all support programme monitoring and offer other technical assistance.

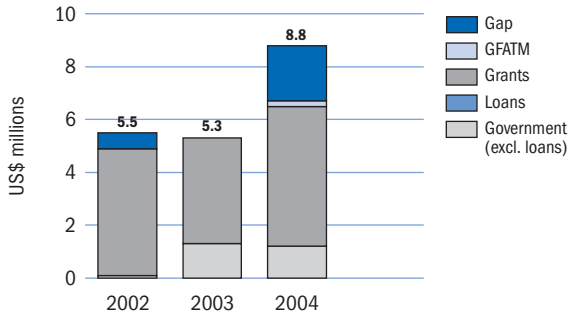
Budgets and expenditures

The NTP budget has increased from about US\$ 5 million in 2002–2003 to nearly US\$ 9 million in 2004 (from about US\$ 90 per patient in 2002–2003 to US\$ 133 in 2004). Budget data are not yet available for 2005 since the fiscal year starts in July. The budget was increased in 2004 to pay for dedicated staff, for the implementation of collaborative TB/HIV activities and for investment in buildings and equipment. The available funding has also increased, from around US\$ 5 million in 2002 and 2003 to US\$ 6.7 million in 2004. Most NTP funding comes from grants, with the government contributing US\$ 1.2 million (about 10% of the budget) in 2004. While a grant from the GFATM should make it possible to carry out the planned collaborative TB/HIV activities in selected pilot districts (provided that sufficient staff are available), a funding gap of US\$ 0.8 million remains.

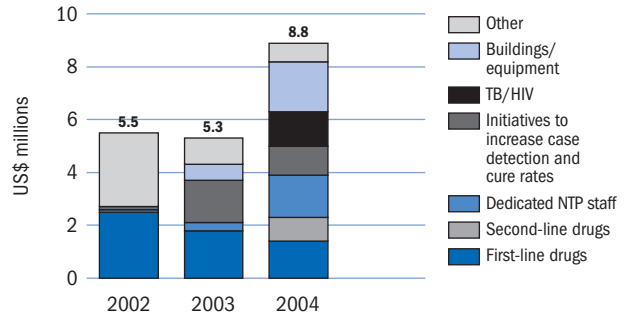
In 2003, the government contribution was only US\$ 0.6 million rather than US\$ 1.3 million as anticipated. However, total available funding was higher than expected, at US\$ 5.6 million. Expenditures in 2003 were US\$ 3.8 million, i.e. 62% of the funds received. As more funding becomes available through grants, the capacity of the programme to absorb this money may become an important issue.

The total cost of TB control, which includes the cost of dedicated TB beds, clinic visits during treatment and items included in the NTP budget, was between US\$ 15 million and US\$ 16 million in 2002 and 2003 (about US\$ 250–275 per patient treated). If the 2004 budget is fully funded and the money is spent, this could increase to US\$ 21 million in 2004 (US\$ 320 per patient treated).

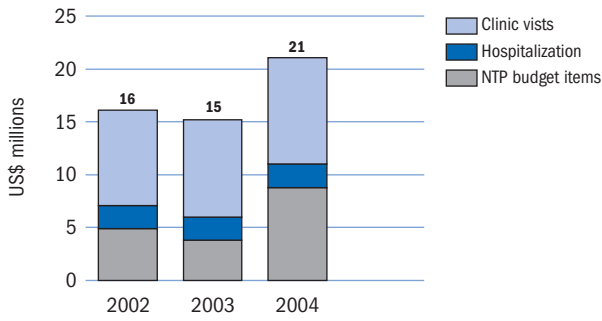
(a) NTP budget by source of funding



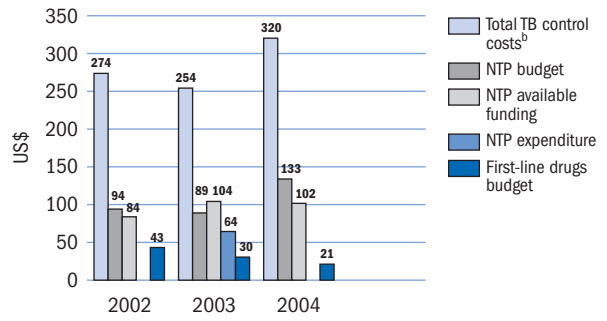
(b) NTP budget by line item



(c) Total TB control costs by line item^{a,b}



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



^a No data available for 2005 - see text for explanation.

^b Total TB control costs for 2002 are based on available funding, whereas those for 2003 are based on expenditures, and those for 2004 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.