EUROPE

WORLD HEALTH ORGANIZATION/UNITED NATIONS DEVELOPMENT PROGRAMME REVIEW OF TUBERCULOSIS CONTROL IN THE REPUBLIC OF TAJIKISTAN

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ABBREVIATIONS

ACSM	advocacy, communication and social mobilization
AFEW	AIDS Foundation East-West
DCA	Department of Correctional Affairs
DOT	directly observed treatment
DOTS	directly observed treatment, short course
DST	drug susceptibility testing
GBAR	Gorno-Badakhshan Autonomous Region
GDF	global drug facility
GF ATM	Global Fund to fight against HIV/AIDS, Tuberculosis and Malaria
GLC	Green Light Committee
HR	human resources
IML	Institute of Microbiology and Laboratory Medicine
M&E	monitoring and evaluation
MDR	multidrug resistance
MMR	mass miniature radiography
MTB	Mycobacterium tuberculosis (complex)
NGO	nongovernmental organization
NIS	New Independent States
NRC	National TB Reference Centre Laboratory Diagnostics
NRL	National Reference Laboratory of TB
NTC	National TB Centre
NTP	National TB programme
OOP	out-of-pocket payment
PAL	Practical Approach to Lung Health
PHC	primary health care
PPM	private-public mix
PS	penitentiary system
QA	quality assurance
QMS	quality management system
R&R	recording and reporting
RNBC	Republican National TB Centre
RRS	Districts of Republican Subordination
RTBH	Republican TB Hospital
SASES	State Agency for Sanitary and Epidemiological Service
SES	Sanitary and Epidemiology Service
SRL	supranational reference laboratory
SS-	sputum smear-negative
SS+	sputum smear positive
TB	tuberculosis
UNDP	United Nations Development Programme

Antituberculosis drug abbreviations

E	ethambutol	Z	pyrazinamide	Km	kanamycin
H	isoniazid	Amk	amikacin	Pt	protionamide
S	streptomycin	Cm	capreomocyn		

OBJECTIVES OF THE NATIONAL TUBERCULOSIS PROGRAMME REVIEW

The review's objectives are to review progress in TB control with emphasis on DOTS strategy implementation, summarize the experience, lessons learnt and methods of work and to make recommendations for international donors, technical agencies and the Ministry of Health.

The review was coordinated by The World Health Organization (WHO) and the Ministry of Health of Tajikistan's National TB Control programme, and conducted by WHO and the United Nations Development Programme (UNDP) with participation of other international organizations. Financial support and logistics were provided by WHO and UNDP, and the results of the assessment were presented at a meeting with the Ministry of Health. The finalized report is being disseminated in Russian and English.

Methods and expectations

The methods used include: statistical analysis of demographic, socioeconomic, general health, TB-related and TB infrastructure indicators; review of past trends in epidemiology; analysis of variations in selected indicators in DOTS Plus pilot project regions prior to and during international support; review of project reports submitted by international organizations and external assessment reports; review of the civil and penitentiary sectors; interviews of Tajik and international project counterparts and donor organizations (standardized data collection tools and checklists to obtain qualitative data and data not available at the national level); visits by the international and national expert group to two regions with different TB epidemiological situations, to review data validity and to observe organization and delivery of TB services.

The expected outcomes of the review include: progress in TB control with particular emphasis on the quality of DOTS implementation; collaboration among the key stakeholders; changes in the projects' implementation mechanisms and descriptions of effective methods, existing problems and lessons learnt; sustainability of changes resulting from internationally-supported TB control projects; and recommendations to international organizations and donors for further assistance and to the Ministry of Health for changes in TB control strategy and international collaboration.

EXECUTIVE SUMMARY

Main achievements in TB control in the Republic of Tajikistan include:

- good political commitment at the central level;
- introduction of all DOTS strategy elements from 2002 through 2007, with 100% coverage of the Republic's territory;
- approval of the TB control programme for 2003–2010;
- improvement in treatment of patients in Machiton;
- the most successful introduction of the DOTS strategy in Vahdat;
- four applications to the GF, approval of applications to the GLC and GDF;
- registration and stable supply of first-line drugs;
- health care system reform that could benefit the TB control programme; and
- improved cooperation between the Ministry of Justice and Ministry of Health.

Main challenges in TB control and recommendations

Main challenges	Recommendations
Notification and diagnostics	
1. Non-compliance with international TB definitions	1. Comply.
2. Ineffective laboratory service: a. low-quality work, particularly due to inadequate training and lack of external control (due to high quantity of microscopic laboratories);	2. a. Establish a general training plan, programmes for medical staff relative to the Stop TB strategy; reduce microscopic laboratories according to WHO standards.
b. weak cooperation between clinicians and laboratory specialists;	b. Improve management of laboratory service, to enhance cooperation.
c. lack of culture research and resistance testing per WHO recommendations at the initial stage;	c. Develop external quality control for laboratory tests.
d. undefined status and responsibilities Republican TB Centre lab, the future laboratory in Machiton and regional laboratories;	d. Develop regulations and responsibilities.
e. detection is free, but access is unofficially paid;	e. Ensure access to free detection and diagnostics through increased public awareness.
f. unsystematic use of fluorography.	f. Revise approaches to fluorography tests (clearly defining the risky groups for active TB detection).

Main challenges	Recommendations
Treatment	
1. Non-compliance with international definitions in evaluation of treatment results; 2. Non-compliance with international treatment standards; 3. Directly observed treatment not provided; 4. TB treatment is free, but paid unofficially.	1. Comply. 2. Comply. 3. Provide it. 4. Provide free TB treatment through increased public awareness.
Drug supply	
1. Non-enforcement of the Ministry of Health prohibition of open sale of TB drugs without prescription; 2. Stocking drugs beyond their use date.	1. Ensure effective enforcement and further expertise. 2. Clearly plan drug provision.
Epidemiological surveillance, monitoring and evaluation of the control programme	
1. Insufficient information in the registration documents (ambulatory cards, case histories, standard registration-reporting form) for management of TB patients; 2. Weak intra- and inter-agency integration of TB data and insufficient use of monitoring and evaluation results in managerial decision-making; 3. Detection and treatment data analysis not carried out for further planning of control activities.	1. Ensure the quality of information collection (anamnesis) for management of TB patients, based on the primary medical documentation. 2. Improve integration; take monitoring and evaluation results into account through the TB Coordination Committee. 3. Set up an effective monitoring and evaluation system, data interpretation and specialist training at all levels.
Multidrug-resistant tuberculosis (MDR TB)	
1. No detailed guidelines for MDR-TB management; 2. Non-standard regimens in treatment of MDR TB patients; 3. Insufficient state funding of drugs for treatment of adverse effects of second-line TB drugs.	1. Develop detailed guidelines. 2. Strictly adhere to GLC-approved regimens. 3. Provide drugs for treatment of adverse effects over the entire course of MDT-TB treatment.
TB–HIV/AIDS coinfection	
Inadequate coverage of patients with HIV and TB for coinfection detection.	Coordinate AIDS and TB services; extend coinfection detection efforts; add expertise.
TB in prisons	
1. Lack of timely diagnostics and treatment in the penal system; 2. Inadequate integration of penitentiary	1. Assure timely access to quality diagnostics and treatment in the penal system and post-release. 2. Establish an intersectoral cooperative plan

Main challenges	Recommendations
and civil sectors. 3. Lack of TB control programme guidelines.	between the ministries of Health and Justice based on the Stop TB strategy and joint semiannual evaluation of control activities in penal institutions. 3. Produce guidelines.
Infection control	
Lack of modern standards for TB infection control; lack of infection control in all TB institutions	Revise or introduce norms and regulations for TB infection control per international standards.

The health care system	
1. Inadequate involvement of the TB control programme in health care reform; 2. Inadequate addressing of the social determinants of health and TB in the National Health Sector Strategy and National TB Programme; 3. Inadequate integration of the TB control programme in PHC; 4. Excessive hospitals and beds for TB; lack of specialized departments for MDR TB; 5. Insufficient motivation of medical staff due to low salaries, thus high personnel replacement and lack of staff; 6. Lack of clear epidemiological control service regulations and responsibilities.	1. Foster involvement. 2. Foster inclusion. 3. Foster better integration; include TB detection and treatment rates in PHC quality criteria. 4, 5. Strengthen TB control under health care reforms through better funding, development of national strategies of HR development and improvement of infrastructure. 6. Define state epidemiological control functions under health care reforms.
Involvement of all medical services suppliers	
	All suppliers of medical services must follow international standards of TB care under the new TB control programme.
Activation of people with TB and communities	
Inadequate involvement of civil society and patients in TB control	Strengthen hygienic awareness; attract communities to TB control; define TB patients' rights and responsibilities; initiate social support, including meals in inpatient departments, motivation of patients in the course of ambulatory treatment, reimbursement of transport expenses.
Political and financial commitment	
Insufficient state funding of the National TB Control Programme	Increase funding of TB activities at all levels, beyond the considerable financial assistance from international donors. Take action on the social determinants of health, to achieve health equity and decrease TB vulnerability.

1. BACKGROUND

1.1 Country health profile

In 2005, Tajikistan spent just under $16 per capita for the health care services, among the lowest in the world *(1)*. Budget allocations, down from 4.5% of GDP in 1991 to 1.3% in 2005, are insufficient for stable operation and development of the health care system *(2)*. Economic, political and social crises have resulted in a deterioration of health status indicator, which currently characterize the country as having low health status compared to CEE countries and other CIS countries. Data interpretation has to be qualified because of the breakdown in information collection systems during the civil war of 1992–1997.

Although Tajikistan may be no longer facing a humanitarian crisis, the health status of the people remains precarious, and it should be noted that Tajikistan's official statistics could substantially underreport health problem severity. Life expectancy for men and women declined in the 1990s, but has remained more or less constant in the last decade, at just under 69 years. Official statistics report the country's Infant Mortality Rate (IMR) at just 28 per 1000 live births. Survey results suggest that the IMR in the late 1990s probably ranged from 78–87 per 1000 live births.1 A UNICEF study in Khatlon revealed that the IMR in rural areas is much higher (109 per 1000 live births) than in urban areas (52 per 1000 live births), and that 71% of mortalities occurred after home deliveries. WHO estimates the maternal mortality figure at 100 deaths per 100 000 live births (4). According to the household survey (5) about 37% of pregnant women did not receive perinatal care, and the number of home deliveries without skilled attendance increased up to 42.1% of registered births.

The general level of nutrition is poor. Average caloric intake was 1720.3 per person per day (kcal) 2000, compared to the CIS average of 2802.88 and the EU average of 3485.68. The diet consists of fatty foods, with low availability of fruits and vegetables. High levels of anaemia and iron deficiency are recorded for women and children. Malnutrition and micronutrient disorders, particularly among pregnant and lactating women and children under five, have been increasingly serious problems over the past ten years. Iron deficiency was identified among 65% of pregnant women, and 30–45% of children under five. According to a nutrition survey conducted by Action Against Hunger in 2004, the average rate of chronic malnutrition in Tajikistan is 31.4%, which was not so different from the 30% rate in 2002. Infants with low birth weight and malnutrition are under increased risk of morbidity and mortality.

The leading causes of death in Tajikistan in 2002 were cardiovascular diseases (33%) and diseases of the respiratory system (12%). In addition to neonatal causes, main causes of deaths for children under five are pneumonia (20%) and diarrhoeal diseases (16%) *(6)*.

Communicable diseases
Rising rates of communicable diseases have given cause for concern, with current epidemics of diphtheria and typhoid, and growing pre-epidemic malaria and TB incidents in recent years. The rise is linked to poor or late diagnosis, public ignorance of disease prevention methods and high treatment costs.

HIV/AIDS and sexually transmitted infections (STIs) are serious and growing problems, especially in high-risk groups, particularly young people and migrants. Control is complicated by social and cultural attitudes towards these diseases. According to the data of the National HIV/AIDS Centre, there were 1595 registered HIV cases in 2009, but the real figure is 10 times higher, and the estimated number of PLHIV in the country is around between 5000 and

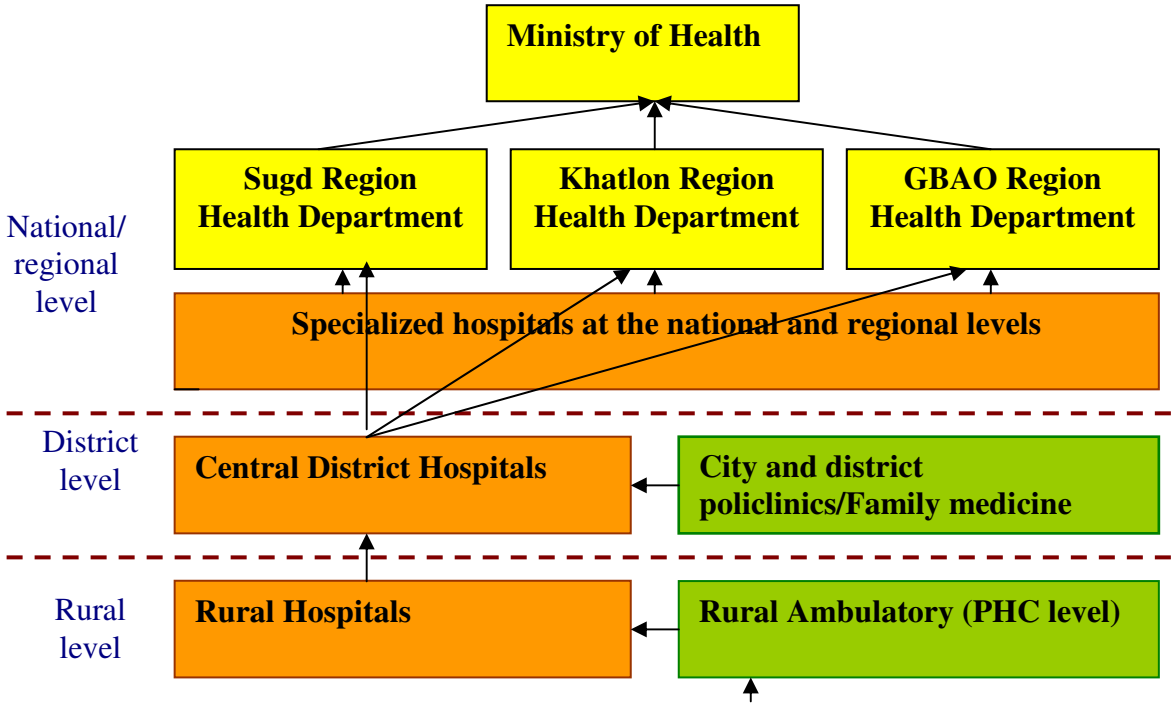
23 000 *(2)*. Increasing HIV prevalence among the injection drug users (IDUs) is a new problem for Tajikistan, tending to spread due to drug trafficking from Afghanistan to neighbouring countries. Growing numbers of sex workers and migrant workers have also contributed to the situation. HIV diagnosis capacity has been upgraded with international support, and ARV treatment protocols are in place. Syphilis incidence in Tajikistan for 2001 was 11.71 per 100 000, compared to the CIS average of 106.4 and the gonococcus infection rate was 13.84 per 100 000, compared to the CIS average of 78.06 and EU average of 7.43.

Respiratory diseases are responsible for a considerable burden of suffering and death in all age groups worldwide. Survey data from various international studies indicate that approximately 20–30% of patients in PHC facilities are respiratory cases, and of them around 80% have acute respiratory infections, 10–25% have chronic respiratory diseases, and 5–10% are TB suspects or 1–2% have TB. In Tajikistan due to poor quality of health statistic, there is no information on a number of patients with the respiratory diseases (asthma, COPD, Lung carcinoma, pneumonia etc) and infectious diseases other than TB.

1.2 The health system

Tajikistan, like other former Soviet republics, has inherited a centralized, government-supported health system (Semashko model), very heavily reliant on hospitals and the secondary health care sector. Public funds contributed just $4 per capita, or 20% of the total, while household out-of-pocket payments (OOPs) accounted for 70% of health expenditure. The state budget for the health sector has declined steadily over the last decade, from 4.5% of GDP to 1.3% in 2005 *(2)*.

Fig. 1 General structure of health care services



Primary care (PHC)

Much PHC infrastructure was destroyed in the civil war of 1992–1997 *(7)*, and there were major problems due to lack of salaries and drugs. Previously health reforms were focused on maintenance of existing services, rather than restructuring, but the government has agreed to a

comprehensive reform plan, including PMC development. Services will be based on the previous administrative structure, with local "health houses" for population bases of 3000, rural health centres for 6000–9000 and district and urban health centres. Staff will vary with the size and tasks of the centres, but all will be responsible for providing basic health care, health education, mother and child health and public health services.

Promotion of family practice is the core of the PHC strategy, supported by a commitment to modernize and rationalize the infrastructure, train staff in family medicine and redirect resources to create incentives for primary treatment. Significant activities, such as guidelines for PHC disease management, have been completed. Specialists are retraining as PHC general practitioners and family medicine has been integrated into undergraduate programmes of the medical university and colleges.

Secondary Care

The health care system, due to its historical origins, is based on hospitals and polyclinics. Initial health reforms were committed to reducing hospital beds, with the savings to be invested in PHC development. The closure of beds was disrupted by the war, but nonetheless their number declined from 820 per 100 000 in 1995 to 640 in 2001 and 612 in 2003. The acute admissions rate was 9.24 per 100 000 in 2001, compared to the CIS average of 19.38. The acute stay duration remained 12 days in 2003, compared to the CIS average of 12.52, but bed occupancy increased to 83% in that year, from 54.5% in 2001 (CIS average: 84.99).

Hospital capacity was reviewed under the Concept of Health Reform of 4 March 2002, and by the Asian Development Bank Team in preparation for the second health project *(8)*. A nursing centre for rehabilitation has been established, as a genuine alternative to acute hospitalization for patients requiring extensive inpatient care.

Access to services and health care costs

Analysis of health care utilization shows that the expected cost was the main reason given by a third of respondents for not using health care *(9)*. The poorest 20% of the population were nearly twice as likely to report affordability as the main reason than the richest 20%. Even among the latter, a third noted a lack of resources, perhaps not surprisingly, given the high percentage of the population living below the poverty line.[2]

Evidence suggests that many services normally the responsibility of health professionals are performed by family members. In the lowest income groups, 66% of inpatients from poor households reported that family members administered medications and 43% administered injections. The respective figures for the richest 20% were 54% and 24%. Nearly a third of the reviewed families went into or increased debt to be able to meet hospital costs, and nearly third of them sold household assets *(10)*.

Health financing

Health care was relatively well-funded prior to 1990, at about 6% of GDP, but since 1995, it has remained below 2%, less than the CIS average *(11)*. By the end of the 2004 per capita spending was no more than $2.00, about 6.5% of the state budget, and is now at perhaps 5% of its 1990's value.

Hospitals take the largest proportion of the health budget, 78% in 1998. PHC was allocated 11% of the state health budget, with the Sanitary Epidemiology Service (SES) receiving 3%. The Minister of Health is responsible for health policy, but has no direct control over the

[2] Based on a purchasing power parity (ppp) of $ 4.30 per day;

overall health budget, which is allocated by the Ministry of Finance. Central government allocations go to the region administrations, to be managed by their finance departments. From here the health budget allocations could vary in different districts and villages.

The Ministry of Health has proposed a series of financial reforms as part of the overall health service reforms including:

- per capita funding for regions and districts
- accumulation of funding
- contracting for services on the basis of results rather than inputs
- copayment for services
- identification of other sources of funding.

Resource Allocation
Historically, resources have been allocated based on capacity, staff and bed numbers and bed occupancy rates in line with the former Soviet Semashko system. The health service reforms stipulate that future central revenue be allocated to regions according to a population need-based formula, and that funds for PHC facilities be earmarked at the district level. Hospitals will receive more flexible budgets, and will be eligible to keep part of any savings accrued through increased efficiency. Currently the Ministry of Health is testing a per-capita allocation model on a pilot basis intended for implementation throughout the country.

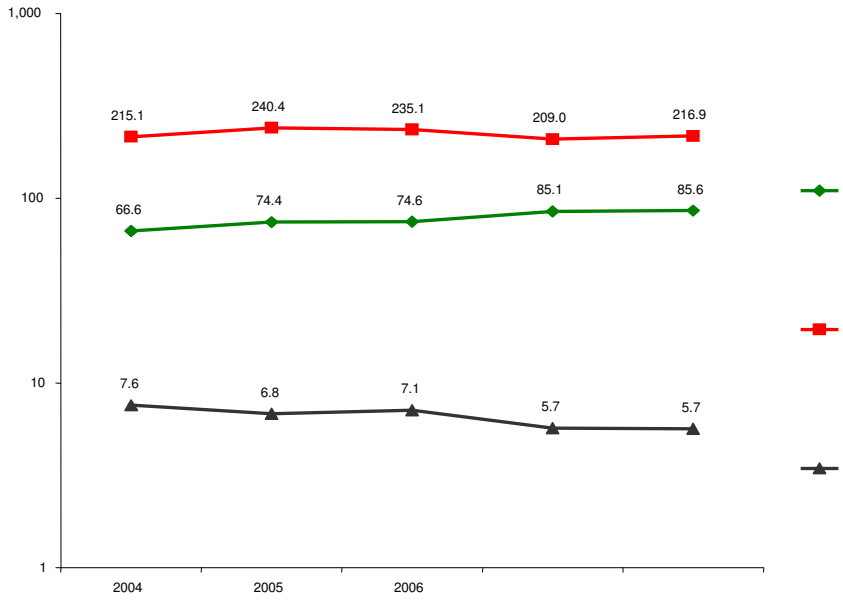
Human Resources
Physicians are trained in the Tajik State Medical University. There is a five-year basic education, followed by post-graduate training in family medicine or another specialty. The Tajik Medical Institute of Postgraduate Training is separated from the Medical University, and provides the whole postgraduate training for health professionals. The Faculty of Family Medicine was opened in 1999.

Tajikistan has fewer health care professionals per capita than other CIS republics. In 2005 there were 203 physicians per 100 000 population, compared to the CIS average of 372, and EU average of 317 per. Of these, 54% worked in hospitals, and about 11% worked as general practitioners *(11)*. Health workers are amongst the lowest paid in the European Region. For example, in 2003 the average monthly salary among employees in the health sector was $6.8 comparing with the workforce average of $15, and $33 for skilled workers in key enterprises such as the state mining, electrical and manufacturing companies *(12)*. Health care salaries reflect the low status of the health professionals relative to other workers, as they are deemed to be a non-production sector. Many health workers rely on informal payments and in-kind gifts from patients, as well as multiple jobs.

2. TB EPIDEMIOLOGY

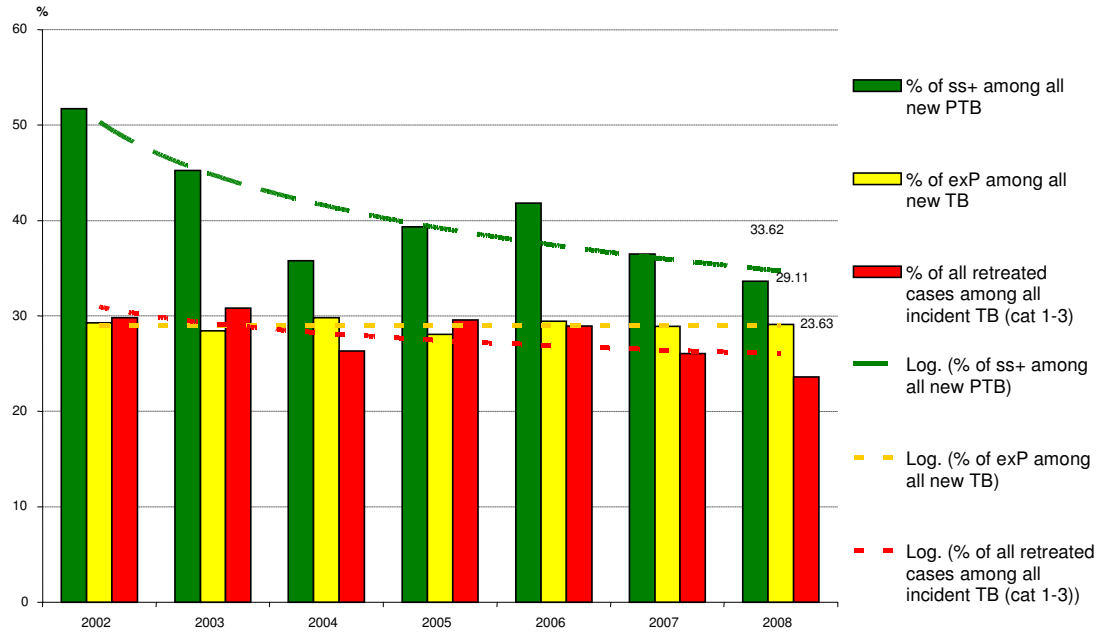
Even with steady annual GDP growth since 1997, Tajikistan remains a low-income country (with nominal GDP of $795 per capita) *(13)*. Difficulties during the transition period led to deterioration of health, with tuberculosis re-emerging as a major public health threat during the 1990s. In 2007 Tajikistan had the highest estimated TB incidence in the European Region – 231 per 100 000 population for all TB cases, and 103 for new smear-positives. Estimated TB prevalence and mortality rates were 322 and 46 per 100 000, respectively. The estimated primary and recurrent prevalence of MDR-TB were 16% and 41%, respectively, and the prevalence of HIV infection among new TB cases was 4% *(14)*. The case detection rate for all new cases was 39% with 32% for new smear-positives. Reported treatment success rates were 85% for new smear-positives and 67% for retreated smear-positive cases.

Fig. 3. Notified impact indicators, Tajikistan, 2004–2008



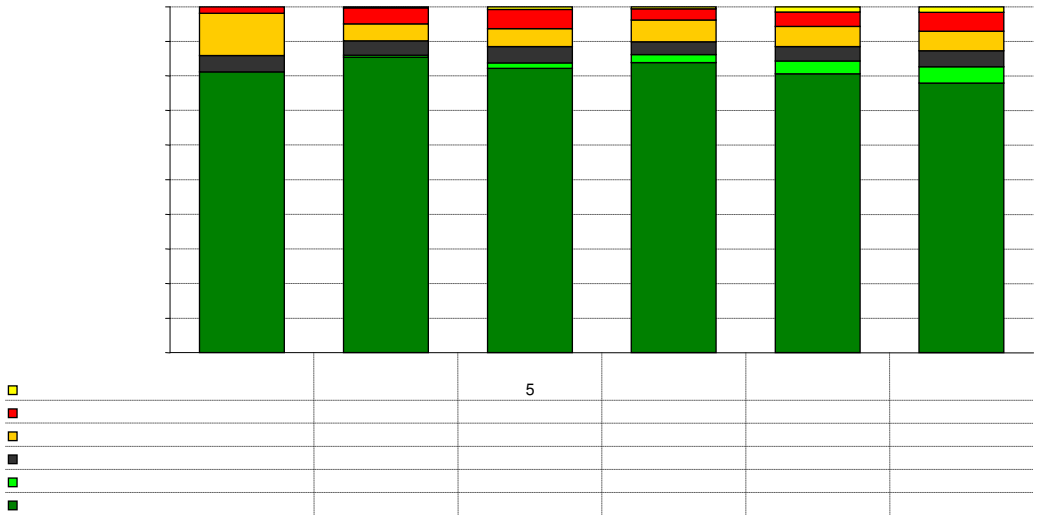
In 2008, there were 15 484 reported patients with all TB forms (216.9 per 100 000 population); 6115 were new cases (85.6 per 100 000), of which 71% (4341) were pulmonary TB and 47.4% (2057) were smear-positive. The registered mortality rate was 5.7 per 100 000. Migrant labourers constituted 10.2% (625) of newly-registered cases. Of all new cases, 7.4% (547) were in the 0–14 age group, while 70% (3587) were from the 20–54 group; 60% of new TB patients were males.

Fig. 4. Main indicators for TB detection, 2002–2008



From 2001 to 2007, DOTS was extended to 100% coverage in all districts; an uninterrupted supply of TB drugs is supported by WHO, GDF, GFATM and other organizations. MDR response activity has only started recently, so treatment is not yet in place. For 2075 new SS+ TB cases in cohort year 2007, the treated and cured rates were 82.6% (1 713) and 78.1% (1 618), respectively, with mortality of 4.6% (96), failure 5.6% (117) and default 5.5% (114). The highest rates of unsuccessful treatment were in Sugd Region (24.6%) and prisons (23.3%). The success rate for relapses was 73.1%, including 68% of 216 relapses from cohort year 2007. The highest unsuccessful rates were in districts of republican subordination, prisons and Kulyab Region, at 35.7%, 34.8 and 29.9%, respectively.

Fig. 5. Treatment outcome, new SS+ pulmonary TB cases, 2002–2007



In 2007, only 23.6% (1443) of new TB patients were tested for HIV, and 4.2% (62) of them were positive. WHO estimates HIV prevalence among TB cases at about 4% (600 cases), higher among the high-risk groups. The number of PLHIV was 1595, 339 of them newly detected in 2007. Only 8.5% (28) of the newly-detected HIV cases were screened for TB and 15 were diagnosed with it. Six TB/HIV coinfection cases were prescribed ART, and 75 out of the newly-detected HIV cases were given izoniazid therapy (IPT). So far 89 deaths among PLHIV have been registered, with TB responsible for 29 cases (32%). TB/HIV surveillance remains at a poor level as there is little if any information on trends, prevalence and forms of TB among PLHIV or reliable data on HIV prevalence among TB patients. IDUs accounted for 57.5% of cases, sexual transmission 23.7%, unknown 18% and mother-to-child transmission 0.8%. The majority of cases (453) were registered in Dushanbe.

Since 2006 universal access to ARV therapy has been available with through GFATM support, but only at the regional level. At the regional and district levels, voluntary counselling and testing (VCT) is provided in AIDS centres, but the quality needs to be improved. In 2005, the country coordination mechanism (CCM) was established, consisting of representatives from different ministries and agencies, national and international partners and PLHIV. There is also a technical working group on the management of TB/HIV coinfection under the CCM with technical support provided by UNAIDS, WHO, UNICEF, Project HOPE, Foundation Caritas Luxembourg, Project Capacity and AFEW.

TB surveillance is based on passive case finding by the PHC network and TB service according to a specific algorithm defined by the national TB programme (NTP) for the diagnosis of pulmonary TB in adults (see figures, Annex 2). General practitioners look for TB-specific clinical symptoms and laboratory results as a mandatory procedure for TB-suspected case management, using an NTP-defined algorithm for diagnosing pulmonary TB. Extra-pulmonary TB and TB in children are investigated by specialized phthisiopulmonologists, mostly based on x-rays, epidemiological background and clinical symptoms. General practitioners are poorly involved in the passive case finding. The NTP practices active case finding, based on MMR, in specific groups, screening 299 963 people and detecting 147 (0.05%) TB cases in 2007.

3. TB CASE FINDING

3.1 Case finding

Case finding in Tajikistan is passive and is provided by PHC services. Patient can go directly to TB service facilities if there are symptoms. Annual active case finding is done among migrants, pretrial detainees and patients with:

- chronic diseases
- HIV/AIDS
- diabetes mellitus
- chronic obstructive pulmonary diseases
- chronic alcoholism or drugs addiction
- many pregnancies
- cancer
- psychiatric diseases
- immunosuppressive therapy
- contact with infectious tuberculosis.

According to the NTP, the MMR examination is regularly conducted among children as an alternative method of TB diagnosis when x-ray examination is not available (Table 4).

Table 4. MMR examinations

Year	MMR	Children under 14	Contacts screened	TB cases detected	Children under 14	Youth 15–17
2003	233 567	16 677	2 441	321	71	18
2004	250 075	20 810	4 024	595	78	71
2005	216 946	16 454	7 170	241	50	9
2006	253 672	11 606	6 719	232	58	56
2007	299 963	15 950	10 999	147	52	22

According to national policy, PHC should be the main level for TB case finding. It is recommended that PHC doctors take three sputum samples prior to referral of a patient to a TB doctor. Culture and the drug susceptibility testing (DST) are not routinely practiced. If a sputum smear is negative for AFB, non-specific antibiotics are prescribed for two weeks, after which the patient is to be re-examined (see Annex No. 1. Flowchart for TB diagnosis).

The Sino Project has been integrating DOTS and PHC services in Tajikistan since late 2003, in close collaboration with the NTP Central Office and Project Hope, promoting integration of TB prevention, detection and treatment into the emerging family medicine delivery system in Dangara and Varzob. In Tursunzoda and Shahrinav the programme was introduced in the pre-family medicine PHC setting. Based on a review of the project in 2008, a bit more than half of all TB suspects (of the four districts) were referred by a PHC facility in 2006 and 2007. The referral rates have ranged from 99% in Varzob to only 27% in Tursunzoda (in 2006). It was also pointed out that confirmation rate by sputum smear was low in four pilot regions. It was assumed that one reason for the low percentage of new smear-positive cases could be travel costs for the patients (especially when they are not allowed to submit their sputum samples in the local health facility) and informal payments related to the examination, typically $0.50 *(15)*.

In the course of current TB programme assessment it was observed that in Dushanbe and Rudaki districts, the symptomatic patients were referred by PHC to the TB service, whereas in

Khatlon Region PHC doctors tend to start TB treatment without a proper diagnosis, with drugs bought by the patients in private pharmacies. Therefore patients applying to the TB services are often sputum smear-negative at the beginning of treatment and treatment is not based on the national guidelines (categories I, II, III). The public's fear of stigmatizing and low awareness are suspected contributing factors. The TB and the PHC services forward information on diagnosed infectious TB cases to the SES for contact tracing. According to NTP data, registration of severe TB forms, such as TB meningitis and miliary TB, is low and registration of TB meningitis is declining.

Table 5. TB meningitis and miliary TB

Year	TB meningitis			Miliary TB		
	Total	Under 14	Youth	Total	Under 14	Youth
2003	5	0	1	113	14	3
2004	4	0	1	66	7	1
2005	11	4	0	17	0	1
2006	6	0	0	6	2	0
2007	15	6	3	5	2	0
2008	8	0	0	3	0	0

Bacillus Calmette-Guérin (BCG) vaccination is mandatory on the fourth or fifth day after birth unless contraindicated. Coverage was 96.8% in 2007. Revaccination at age 6–7 and 11–12 stopped in 1992.

Table 6a. TB cases detected among migrants and contacts in Kulyab

		Total TB cases	Migrants	%	Contacts	%
1	Kulyab city	272	22	8	52	19.0
2	Kulyab district	257	20	7.8	32	12.4
3	Vose	276	7	2.5	15	5.4
4	Hamadoni	182	17	9.3	49	26.9
5	Farkhor	88	33	37.5	2	2.2
6	Muminobod	77	9	11.7	5	6.5
7	Shurobod	55	3	5.4	7	12.7
8	Temurmalik	89	1	1.1	24	26.9
9	Dangara	93	9	9.3	15	16.1
10	Baldjuvan	28	3	10.7	2	7.1
11	Hovaling	27	1	3.7	3	11.0
Total:		**1 444**	**125**	**8.6**	**206**	**14.2**

Table 6b. TB detection among migrants and contacts in Kurgan-Tyube

		TB cases	Migrants	%	Contacts	%
1	Kurgan-Tyube	78	4	10.0	2	5.0
2	Sarband	40	4	10.0	2	5.0
3	Vakhsh	125	2	8.7	1	4.3
4	Bokhtar	185	18	9.7	24	12.9
5	Yovon	122	49	40.1	2	1.6

		TB cases	Migrants	%	Contacts	%
6	Rumi	146	29	19.8	9	6.1
7	Khuroson	53	20	37.7	2	3.8
8	Jomi	112	25	22.3	21	18.7
9	Qabodiyon	86	31	34.8	8	9.0
10	Shahritus	67	9	13.4	25	37.3
11	Khusrav	10	0	0.0	0	0
12	Pyanj	95	27	28.4	1	1.0
13	Jilikul	93	7	7.5	2	2.1
14	Qumsangir	117	18	15.3	2	1.7
15	Norak	23	2	8.7	1	4.3
Total:		**1 352**	**245**	**18.2**	**102**	**7.5**

Table 6c. TB detection among migrants and contacts in GBAO

		TB cases	Migrants	%	Contacts	%
1	Khorug	39	13	33.3	9	22.5
2	Vanj	33	8	24.2	6	18.2
3	Ishkoshim	25	11	44.4	2	8.0
4	Darvoz	12	0	0.0	0	0,0
5	Murghob	15	1	6.7	3	20.0
6	Roshtkala	28	13	46.6	2	7.1
7	Rushon	48	5	10.4	11	22.9
8	Shuhnon	32	11	34.4	10	31.2
Total:		**232**	**62**	**26.4**	**43**	**18.3**

Table 6d. TB detection among migrants and contacts in Sugd

		TB cases	Migrants	%	Contacts	%
1	Khujand	87	11	12.6	8	9.2
2	Mastchoh	112	35	31.2	12	10.7
3	Konibodom	89	27	30.3	5	5.6
4	Penjikent	136	47	34.6	19	14.0
5	Isfara	81	17	20.5	5	6.0
6	Istaravshan	69	2	2.9	1	1.5
7	Spitamen	69	8	11.6	7	10.0
8	Ghafurov	111	19	17.1	15	13.5
9	Rasulov	85	31	36.5	4	4.7
10	Ghonchi	54	11	20.3	6	11.0
11	Qayroqum	25	3	12.0	4	16.0
12	Taboshahr	14	3	21.4	2	14.3
13	Chkalovsk	17	3	16.7	0	0
14	Asht	59	14	23.7	4	6.8
15	Ayni	19	4	20.0	0	0
16	Zafarobod	60	8	13.0	12	19.7
17	Shahriston	25	3	15.8	3	15.8
18	Kunstoni Mastchoh	5	0	0.0	0	0
Total:		**1 117**	**246**	**22.0**	**107**	**9.5**

Table 6e. TB detection among migrants and contacts in other regions

		TB cases	Migrants	%	Contacts	%
1	Rudaki	277	34	11.7	32	11.0
2	Varzob	51	8	15.7	2	3.9
3	Tursunzoda	120	25	20.8	8	6.6
4	Shahrinav	48	13	25.0	4	7.7
5	Hissar	202	53	26.2	12	5.9
6	Nurubod	59	23	37.7	2	3.3
7	Tavildara	6	0	0.0	2	33.2
8	Tojikobod	56	15	22.4	37	55.2
9	Jirgital	48	16	33.3	7	14.6
10	Vahdat	218	42	19.3	60	27.5
11	Faizobod	58	18	31.0	4	6.9
12	Rogun	20	0	0	1	5.0
13	Rasht	72	19	26.4	5	6.9
Total		**1 235**	**266**	**21.5**	**176**	**14.2**

Case detection of pulmonary TB officially follows a partially standardized algorithm: as soon as a PHC doctor suspects TB, sputum smear microscopy is ordered at the TB laboratory, which might be part of a policlinic, TB dispensary, TB DOTS centre or TB hospital. A nurse, doctor or the patient brings specimens to the laboratory. If the smear microscopy is positive, TB is diagnosed; if it is negative, the patient is treated for two weeks for unspecific pulmonary infection, then the smear microscopy is repeated. Again, TB is to be diagnosed if the smear microscopy is positive. If it remains negative and/or the patient improves due to unspecific antibiotic therapy, suspicion of TB is rejected and treatment of the unspecific infection is completed. If the patient does not improve, a team of TB doctors reviews the patient's history, laboratory results and chest x-rays, and decides whether TB is present or not. If so, the patient is to be treated following official DOTS guidelines.

Challenges

1. So far, all materials (even tissues) are used for diagnostic microscopy. However, tissues can only be microscoped after histological processing, i.e., embedding in paraffin and ultra-thin slicing. So far the facilities for this procedure do not exist in Tajik TB laboratories. The diagnostic limits (sensitivity, negative predictive value) of the TB microscopy of tissues, as well as of other paucibacillary materials such as urine, pleural fluids, cerebrospinal fluid, etc. are largely unknown. Negative results from such materials are possibly misleading.
2. Diagnostic culture is not included in the algorithm.
3. The algorithm was unknown by all laboratory specialists interviewed for the review of TB diagnostic indicators.
4. Specimens sent to the laboratory are frequently of poor quality. In Vose dispensary, 13 of 24 specimens were poor quality, i.e. the amount was too small (less than 3 ml), or saliva was sent instead of sputum.
5. The antibiotics of choice or to avoid for the unspecific treatment of cases with smear-negative microscopy were not identified.

Recommendations

1. Microscopy of tissues should be rejected and replaced by culture. For paucibacillary specimens, a diagnostic culture should supplement microscopy.
2. So far the diagnostic culture is not included in the algorithm of TB diagnostics. Culture is the most sensitive and specific diagnostic tool available for the detection of TB

bacteria. Diagnostic culture should be performed on each substance from which a low concentration of bacteria is expected (pleural fluid, cerebral-spinal fluid, ascites, menstruation blood, sperm, operation tissue, biopsies). Additionally, sputum cultures should be performed at each relapse, treatment failure and chronic case in order to perform subsequent DST for potential enrolment of the patient in the MDR treatment programme.

3. Regular meetings and training should intensify communication between clinicians and laboratory specialists. Lab specialists should learn more on the clinical background of the disease and diagnostic procedures in order to better understand the responsibility they bear to the patient and the NTP.
4. Unspecific treatment should be performed exceptionally with penicillins (e.g., ampicillin), cephalosporines (e.g., cephalotin, cefuroxim, ceftriaxon), or tetracyclines (e.g., doxicyclin). Chinolones (e.g. ofloxacin, ciprofloxacin, levofloxacin, moxifloxacin, gatifloxacin) should never be used for the unspecific treatment of smear-negative patients, for whom TB could be a potential differential diagnosis. Under chinolone treatment the symptoms will improve, even if the patient has TB. Thus, the diagnosis of TB could be missed. Moreover, chinolones are given in monotherapy, which leads to increased risk of developing chinolone-resistant MTB strains.

3.2 Diagnostics and follow-ups

Table 7a. Total microscopy laboratory examinations

Facility	Patients examined	SS+	%	Slides examined	SS+	%
Dushanbe PHC	2 889	269	9.3	7 169	611	8.5
RRS	6 638	830	12.5	16 770	1 829	10.9
Sugd	10 193	1 024	10.0	25 687	2 303	9.0
Kurgan-Tyube	8 762	1 094	12.5	22 188	2 586	11.7
Kulyab	9 383	803	8.6	23 231	2 216	9.5
GBAO	1 795	65	3.6	4 754	119	2.5
NTC & NRL	4 046	693	17.1	10 968	1 547	14.1
RTBH (Machiton & Children's Hospital)	2 079	780	37.5	4 692	1 525	32.5
Penal system	968	260	26.5	2 405	500	20.8
Military laboratory	165	14	8.5	338	35	10.4
TOTAL	**46 918**	**5 832**	**12.4**	**118 202**	**13 271**	**11.2**

Table 7b. Diagnostic analyses

Health facility	Patients examined	SS+	%	Slides examined	SS+	%
Dushanbe PHC	2 133	210	9.8	5 767	506	8.8
RRS	3 998	421	10.5	11 528	1 116	9.7
Sugd	7 382	667	9.0	20 411	1 642	8.0
Kurgan-Tyube	5 358	718	13.4	15 491	1 900	12.3
Kulyab	5 267	681	12.9	15 204	1 795	11.8

GBAO	1 257	60	4.8	3 673	110	3.0
NTC & NRL	3 572	585	16.4	10 044	1 368	13.6
RTBH (Machiton & Children's Hospital)	694	269	38.8	1 977	645	32.6
Penal system	560	124	22.1	1 607	271	16.9
Military laboratory	165	14	8.5	338	35	10.4
TOTAL	**30 386**	**3 749**	**12.3**	**86 040**	**9 388**	**10.9**

Microscopy examinations per patient (TB-04)

Table 8a. Diagnostics and follow-up

Facility	Slides per patients
Dushanbe PHC	2.53
RRS	2.52
Sugd	2.53
Kurgan-Tyube	2.48
Kulyab	2.65
GBAO	2.71
NTC & NRL	2.26
RTBH (Machiton & Children's Hospital)	2.48
Penal system	2.05
Military laboratory	2.52
TOTAL	2.53

Table 8b. Diagnostics

Facility	Slides per patients
Dushanbe PHC	2.70
RRS	2.88
Sugd	2.76
Kurgan-Tyube	2.89
Kulyab	2.89
GBAO	2.92
NTC & NRL	2.81
RTBH Machiton & Children's Hospital	2.85
Penal system	2.87
Military laboratory	2.05
TOTAL	2.83

The NTC laboratory prepared 877 mycobacterial cultures in 2008 as part of the drug resistance survey in Dushanbe and Rudaki district, financed by GFATM. In other aspects no diagnostic or follow-up culture practice was followed.

Recommendations

A general task force of phthisiatric and laboratory specialists should be set up with the aim of identifying clear diagnostic rules on how to integrate diagnostic culture into the algorithm for TB diagnostics.

Culture contamination

Overall contamination rate of cultures was determined as up to 9% (should be 1–5%) in the NTC laboratory, the only institution currently preparing cultures.

Recommendations

- Three potential reasons for the high contamination rate have been identified and should be corrected.
- Misreporting inflates the rate. Contamination should only be reported when most of the medium is overgrown by a contaminant. When single or few colonies are interpreted as contamination, the rate is a false high.
- Insufficient decontamination can be rectified by extending the period for the application of sodium hydroxide.

- Media become contaminated due to work procedures in poor laboratory conditions such as wooden benches that cannot be adequately disinfected, or defective sterilizing equipment. Although sterilizing equipped is supposed to be checked at least annually using biological test spores, these checks have been never carried out.

4. LABORATORIES

4.1 The network

The laboratory network is under development, strongly supported by Project HOPE through Round 3 of the GFATM. In March 2009, the programme was extended for six years, during which the laboratory network will consist of the NRL, which is actually located in the NTC and connected with the supranational reference lab (SRL) in Gauting, Germany, by a partnership registered by WHO in 2008. It functions as a level 3 laboratory, preparing cultures, performing DST and differentiating mycobacteria and TB bacteria. So far no culture laboratories (level 2) have been set up. The number of level 1 laboratories for sputum smear microscopy has been gradually increasing, from 11 in 2002 to 97 by the end of 2008.

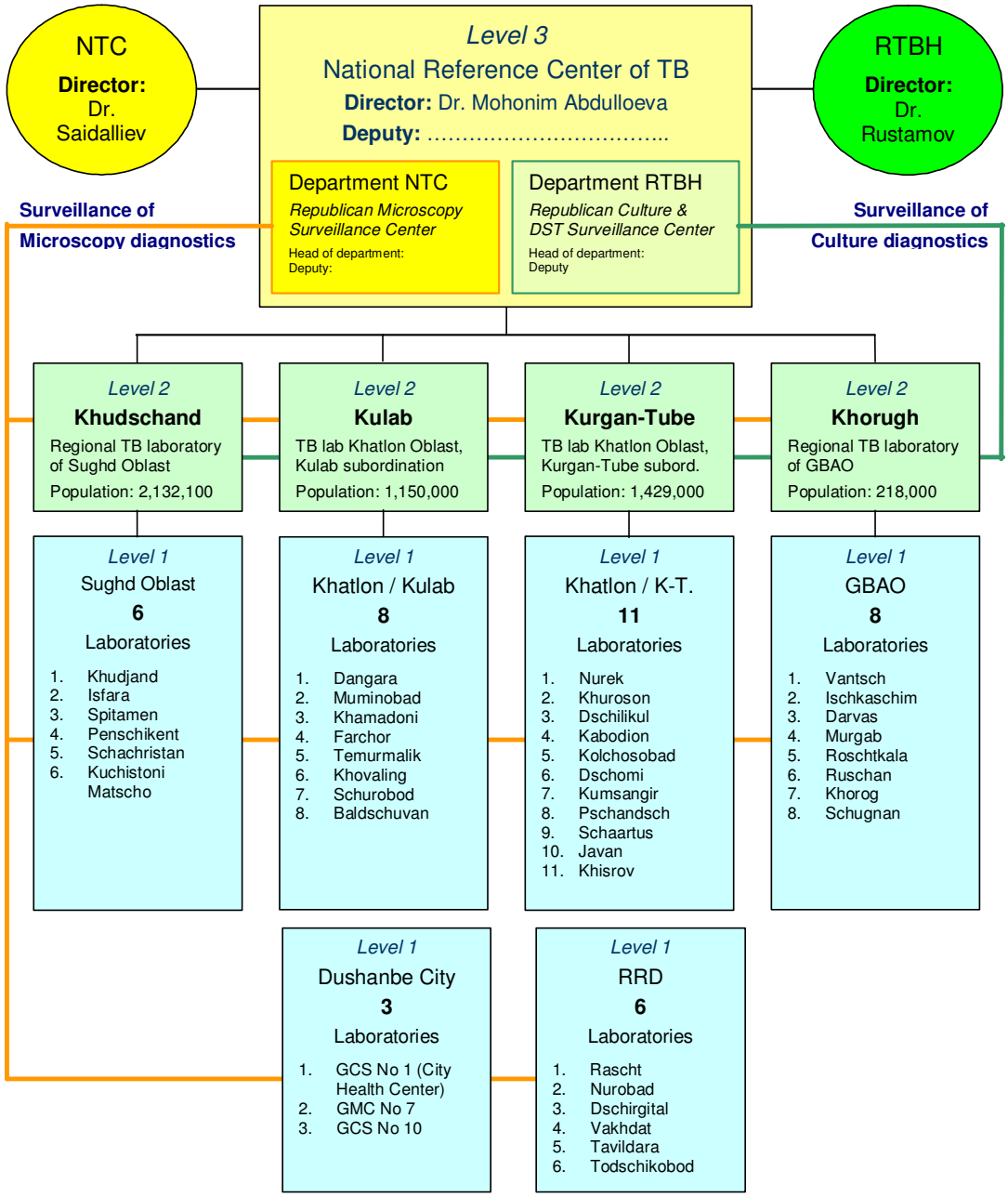
The NTC laboratory was re-equipped with GFATM support until March 2009. A site visit on 11 March 2009 revealed that the laboratory did not comply with the requirements for a biosaftey level 3 (BSL-3) laboratory, and could not even meet them after further refurbishment (see 4.2. for details). However, with some changes it was able to be used as the BSL-2 laboratory for culturing, including fluid cultures. A new BSL-3 laboratory is under construction at the Machiton Hospital, funded by the German Kreditanstalt für Wiederaufbau (KfW) within the framework of governmental cooperation. The laboratory will be extensive, fully equipped and compliant with all relevant standards, and is expected to resume functioning by April 2010.

In 2008 UNDP and external expert consultants drafted a laboratory network to be placed in the NRL for the GLC application. The Minister of Health decided that the Machiton Hospital TB laboratory should serve as future NRL of the network from 2010. However, human resource development could potentially become a difficult issue for the new laboratory. It will certainly not be possible to resume work at the Machiton laboratory along with all of the other NRL tasks, including microscopy monitoring, purchasing, preparing statistics and reports, etc.

Recommendations

Within the framework of this mission, alternative solutions were searched, taking into view decisions and expectations of all partners. Finally, a new structure for the laboratory network was elaborated (see below).

Fig. 6. Structure of the laboratory network



Level 3: Role of the TB laboratories in the NTC and the RTBH

The NTC and NTBH should comprise the National TB Reference Centre (NRC). Its tasks should be divided between the laboratories so that the NTC laboratory continues its prior work and will remain the Republican Centre for Microscopy Surveillance, Monitoring and Training. Its tasks should include The introduction of fluorescent microscopy, external quality control of all microscopy laboratories, monitoring of the microscopy laboratories by site visits and training of the lab experts. It should continue its diagnostic work since the only change is that DST will be transferred to the Machiton BSL-3 laboratory (Table 9).

The RTBH Machiton's tasks should include: providing the hospital and surrounding areas with diagnostic analyses; differentiating culture growths, identifying mycobacteria and DST for the whole country; molecular biological testing; external quality control and site monitoring of all culture and DST laboratories in the country; training lab experts; establishing

and implementing TB laboratory diagnostic standards; and developing – in collaboration with State Agency for Sanitary and Epidemiological Service and with technical support by the Gauting SRL – minimal standards for TB laboratory construction, furniture, equipment, work safety and hygiene.

The NRL director is the head of both laboratory centres, and will gather data from both laboratory centres and analyse them for consistency, completeness and potential indicators of deficits in quality. Processed data will be reported to the director of the National TB Centre, as before.

Level 2: Culture laboratories
Each region should have a fully equipped laboratory for culturing mycobacteria (Table 9). The following three laboratories should be refurbished and equipped as culture laboratories: Khujand, servicing the Sugd Region; Kulyab, servicing Kulyab administrative area; and Kurgan-Tyube, servicing the Kurgan-Tyube administrative area. After refurbishment they will meet bio-safety level 2 (BSL-2) requirements, allowing microscopy and culturing of bacteria of the *Mycobacterium tuberculosis* complex. BSL-2 standards for construction, furniture and equipment are given in the *World Health Organization Laboratory Biosafety Manual.* The Khorug laboratory should be considered a fourth culture laboratory. Its workload – with up to 3000 specimens per year – is relatively high (Table 11). It plays an important role for TB diagnostics in the GBAO. Khorug is connected with Dushanbe by airway, ensuring transportation of TB cultures to the NRC for differentiation and DST purposes.

If means were available for the refurbishment and equipment of an additional BSL-3 laboratory for DST, Kulyab would certainly be the best choice, as it is located in the centre of the Khatlon Region, covers over a third of the entire Tajik population and is logistically well-connected with other cities of the southern region. The requirements for BSL-3 laboratories are also listed in the *World Health Organization Laboratory Biosafety Manual*.

Table 9. Analyses performed at the level 2 and level 3 laboratories

Location	**Type of Test**					
	BF micros-copy	**FL micros-copy**	**LJ Culture**	**MGIT**	**DST**	**GT MTBDR**
Machiton RTBH	†	†	†	†	†	†
Dushanbe NTC	†	†	†	†		
Kulyab	†	†	†	†	†	†
Kurgan-Tyube	†	†	†			
Sugd Region	†	†	†			
GBAO	†		†			
Total	**6**	**5**	**6**	**3**	**2**	**1**

BF = Bright-Field; FL = Fluorescence microscopy; LJ culture = solid culture; MGIT = fluid culture; GT-MTBDR = Genotype

Level 1: Microscopy laboratories

Ninety-seven level 1 laboratories seems like too many for a country with Tajikistan's population. Procurement, maintenance, monitoring, external quality control, salaries and staff training demand too many resources for high quality to be maintained. This problem becomes particularly evident in laboratories where staff is limited to a single person. Most experts working in small microscopy laboratories are young women with frequent turnover. Therefore, wherever possible, two or more experts should work in laboratories, to ensure replacement and substitution.

Table 8 reflects the average work load per expert in the level 1 microscopy laboratories, which should range from 5–20 specimens. If it is lower, the work efficiency is generally low. If in excess of 20 specimens per day, Ziehl-Neelsen microscopy becomes too exhausting. In such cases the laboratory should switch to the fluorescence technique, which allows up to 40 specimens or more per day per technician. In Tajikistan the average workload is less than three specimens per technician per day, rather below the recommended average; measures should be taken to increase the average workload and output per laboratory and per technician.

Table 10. Average work load per microscopy centre

Location	Population (thousand)	slides, 2008	lab experts, 2008	Load/tech/week	Load/technician/ day
Machiton RTBH	-	4 692	4	23	4.6
Dushanbe NTC	-	8 178	7	22	4.4
Hospitals & polyclinics Dushanbe	800	7 169	19	7	1.5
RRS	1 606	16 770	19	2	0.4
Kulyab lab	1 150	23 231	17	26	4.8
Kurgan-tube lab	1 429	22 188	17	25	4.1
Sugd Region lab	2 132	25 687	32	15	3.0
GBAO lab	218	4 754	13	7	1.4
Prisons	10	2 400	4	12	2.4
Total	**7 000**	**118 202**	**127**	**mean 15**	**mean 2.9**

In 48 laboratories, there is only one trained expert (Table 11). These laboratories should be joined with others or terminated. The optimal number of level 1 laboratories would be fewer than 42. Reduction should occur stepwise, in order to reach this number by 2015. The list of redundant level 1 laboratories is given in Table 11. Resources freed by closing them should be reinvested in an effective logistics and transportation system for specimens, consumables, reports, etc.

Table 11. Level 1 laboratories with number of experts, workload and recommendations

(* redundant laboratories, recommended for closure in next five years)

	Trained lab techs	Recommendation	Slides/ year	Slides/ tech/yr	Slides/tech /month	Slides/tech/ week	Slides/tech/ day
Sugd							
Khujand	4	combine three labs in one	6 614	1 654	138	32	6
Chkalovsk*	1	close, send to Khujand	250	250	21	5	1
Mastchoh*	0	close, no lab expert, send to Khujand	2 111				
Ghafurov*	1	close, send to Khujand	1 804	1 804	150	35	7
Asht*	1	close, low work load, transfer to Khujand	455	455	38	9	2
Taboshahr*	1	close, low work load, transfer to Khujand	88	88	7	2	0
Qayroqum*	1	close, low work load	278	278	23	5	1
Spitamen	2		902	451	38	9	2
Zafarobod*	2	close, send to Spitamen	1 101	551	46	11	2
Rasulov*	1	close, send to Spitamen	1 328	1 328	111	26	5
Istaravshan*	1	close, send to Spitamen	1 133	1 133	94	22	4
Ghonchi*	1	close, send to Spitamen	815	815	68	16	3
Isfara	3	aggregate two labs in one	2 470	823	69	16	3
Konibodom*	1	close, send to Isfara	2 428	2 428	202	47	9
Penjikent	2		3 177	1 589	132	31	6
Ayni*	1	close, low work load, transfer to Penjikent	77	77	6	1	0
Kuhistoni Mastchoh	1		62	62	5	1	0
Shahriston	1		594	594	50	11	2
Dushanbe							
RTBC*/NTC	4		8 178	2 045	170	39	8
RTBH/Machiton	7		4 692	670	56	13	3
Dushanbe TBC	1	close, transfer to NTC	2 790	2790	233	54	11
Children TBH	2	close, transfer to NTC	0	0	0	0	0
Penal system	4	close, transfer to NTC	2 405	601	50	12	2
Military unit	2	close, transfer to NTC	338	169	14	3	1
RRS							
Varzob	1	close, transfer to NTC	285	285	24	5	1
Shahrinav	1	close, transfer to NTC	1 204	1 204	100	23	5
Tursunzoda	1	close 2 labs, transfer to NTC	2 154	2 154	180	41	8
Hissor (Gissar)	1	close, transfer to NTC	3 330	3 330	278	64	13
Faizobod	1	close, transfer to NTC	319	319	27	6	1
Rudaki	3	close 3 labs, transfer to Machiton	3 053	1 018	85	20	4
Roghun	0	close, no lab expert, transfer to Machiton	96				
Rasht	1		404	404	34	8	2
Jirgatol	1		520	520	43	10	2
Nurobod	1		754	754	63	15	3
Vahdat	2		3 996	1 998	167	38	8

	Trained lab techs	Recommendation	Slides/ year	Slides/ tech/yr	Slides/tech /month	Slides/tech/ week	Slides/tech/ day
Tavildara	1		44	44	4	1	0
Tojikobod	1		611	611	51	12	2
Kurgan-tyube							
Kurgan-Tyube	1		2 719	2 719	227	52	10
Bokhtar	2	close 2 labs, transfer to K-T	590	295	25	6	1
Sarband	1	close, low work load	655	655	55	13	3
Vakhsh	1	close 2 labs, transfer to K-T	1 392	1 392	116	27	5
Qumsangir	1		1 985	1 985	165	38	8
Rumi	?		4 757				
Jomi	1		2 250	2 250	188	43	9
Qabodiyon	1		982	982	82	19	4
Yovon	1		1 802	1 802	150	35	7
Jilikul	1		1 110	1 110	93	21	4
Khuroson	1		639	639	53	12	2
Pyanj	1		1 637	1 637	136	31	6
Shahritus	1		964	964	80	19	4
Nosiri Khusrav	0	close, no lab expert	25				
Norak	1		681	681	57	13	3
Kulyab							
Kulyab	4	combine two labs in one	9 439	2 360	197	45	9
Vose	3	close 2 labs, transfer to Kulyab	4 205	1 402	117	27	5
Farkhor	1		1 946	1 946	162	37	7
Hamadoni	2	combine two labs in one	2 384	1 192	99	23	5
Temurmalik	1		1 266	1 266	106	24	5
Muminobod	1		469	469	39	9	2
Dangara	1		1 754	1 754	146	34	7
Khovaling	1		991	991	83	19	4
Baldjuvan	1		307	307	26	6	1
Shurobod	1	close, low work load	470	470	39	9	2
GBAO							
Khorug	1		2 942	2942	245	57	11
Vanj	2		225	113	9	2	0
Ishkoshim	1		80	80	7	2	0
Darvoz	1		66	66	6	1	0
Murghob	1		290	290	24	6	1
Roshtkala	1		90	90	8	2	0
Rushon	1		658	658	55	13	3
Shughnon	2	combine two labs in one	403	202	17	4	1

4.2 Logistics

Currently, microscopy specimens are delivered to laboratories by nurses or doctors of the same institution or another institution or by patients themselves. The second and third approaches are rather laborious, and lead to the perception of laboratory diagnostics as burdensome. In order to bring the diagnostic service closer to the patient, specimen collection should be provided at every PHC facility. Transportation of specimens to the labs should be

standardized, reliable and free of charge. Establishment of such a system should be undertaken in three simultaneous steps:

1. The number of level 1 laboratories should be reduced, and laboratory diagnostics aggregated to few high-quality lab centres serving an area of 100 km or more in diameter.
2. Every centre should have one or more vehicles, dedicated to the laboratory transportation system, driving daily fixed routes to every policlinic, PHC facility, TB dispensary or hospital to deliver consumables, reports, etc. and to collect specimens to be brought to lab the same afternoon.
3. Each laboratory and health institution should have a fax machine or other means of electronic communication. As soon as the smear microscopy is completed, the results should be sent from the lab to the relevant institution.

Through these measures diagnostics become easier to organize, free of travel costs, and convenient for all parties concerned, especially the patient, certainly increasing compliance. Since patients do not need to travel to a lab centre, follow-ups will be more likely. Delivery of specimens and other materials would be combined, relieving nurses and technicians of the need to travel to obtain work materials.

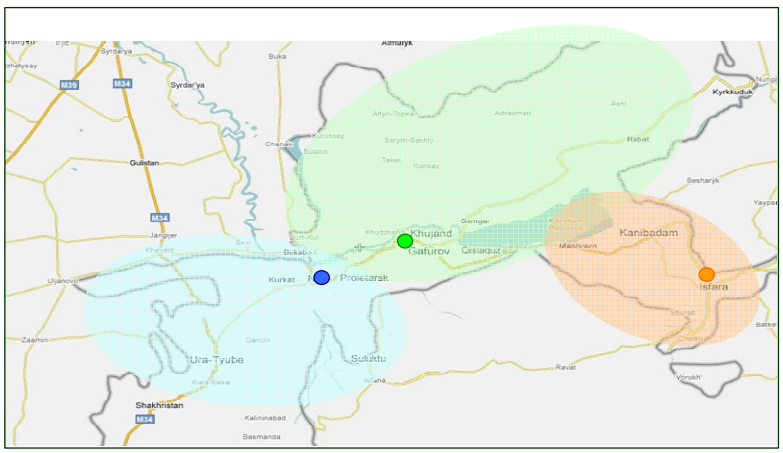
Figure 7 shows how to organize logistics in the north of Shakhristan in Sugd Region. Three laboratory centres should be set up in this region: Isfara, Khujand and Spitamen. In Isfara one car should drive a daily route to Charku, Lakkon, Kanibadam and Makhram, and four cars should be stationed at Khujand. One should have a daily route to Kyrkkuduk, stopping at the health facilities of Katta-Sarikamysh, Ashaba, Asht and Rabat; a second should go to Khujand, Choruk-Dayron, Kansay, Chakadam-Bulak, Adrasman, Altyn-Topkan, Sarym-Sakhly before returning to Khujand; and a third should go to Kuruksay and come back along the Uzbek border.

Logistic should be similarly organized for the city of Dushanbe and its surrounding districts (Varzob, Shahrinav, Tursunzoda, Hissor (Gissar), Faizobod, Rudaki and Rogun) for Kurgan-Tube, Kulyab and other large district lab centres. Planning should note that remote areas are difficult to reach in winter and need level 1 laboratories, even though they would not operate at full capacity.

Once weekly, a vehicle should collect cultures and other specimens from the level 2 laboratories at Kurgan-Tyube and Kulyab and bring them to the NRC laboratory at Machiton for identification and DST. Cultures and specimens from Khujand and Khorug would be brought to Dushanbe by airplane and picked up at the airport for the city-transportation system.

Many vehicles have been provided by UNDP/GFATM, including funds for fuel and maintenance. They could be utilized for the logistics of TB laboratory specimens.

Figure 7. Logistics for the Sugd Region



4.3 Laboratory capacity

Level 1 laboratories

The quality of the basic laboratory facilities varies widely, and could be considered adequate only at the Vahdat Rayon TB Centre, of the six laboratories visited. Others were mostly in poor condition, and did not meet minimal requirements for bio-safety level 1 laboratories: floors were not water-resistant, were slippery when wet, uneven and frequently made from easily inflammable materials. Doors did not have windows, opened inward and were not fireproof. None of the laboratories had a ventilation system. Windows stood mostly open. Electric lines were stripped. The Kulyab TB Centre lab walls were at risk of breaking down at any time. Furniture was easily inflammable, which comprises a great risk since work with open flames and combustible chemicals is routine.

The Vahdat TB Centre showed that it is possible to build a laboratory within an existing medical institution in compliance with most safety requirements. The lab was divided into two rooms, one for microscopy, documentation and administrative work, the other one for smear preparation and staining. The floor and walls of the latter were tiled. The window was closed. A separate room was available for drinking and eating outside the functional laboratory rooms. Inflammable materials were reduced to a minimum. Furniture was made from metal and steel. The only criticism was that the door was made from wood, had no window, and opened inward.

The technical equipment of the level 1 laboratories was similar at each site visited, and seemed to be in a reasonable shape. Laboratory techniques were in line with international standards, although standard operating procedures or manuals were not available at the most of sites visited.

Electricity was only available part-time in four of the six laboratories (all outside the capital, Dushanbe). When the electricity was off, microscopy was performed with indirect sunlight using mirrors, resulting in frequently poor lighting.

Biosafety knowledge, equipment and preventive measures were extremely poor. It was hardly possible to find basic knowledge on the right choice of disinfectants, their proper use and application period. Alcoholic disinfectants were only available in one of the laboratories. Hand disinfection was mostly performed with 0.5% chlorine solution, and surfaces were also disinfected with chlorine solutions. Chlorine requires application to surfaces at least every 30 minutes, which was not the case at any of the centres. In some centres used sputum containers were filled with aqueous disinfectants before incineration, possibly leading to inadequate combustion. Only two laboratories had functioning sinks and running water for hand washing or cleaning devices.

Level 3 laboratories

The NTC TB laboratory has recently been refurbished for culturing and DST, but the list of deficiencies is still long. Most criticism is similar to that for the level 1 laboratories. There is no observation room adjacent to the lab, the floor is not sealed, linoleum is curling and gapped, there is no ventilation system or emergency exit, windows are not sealed, there is wooden furniture in rooms with open flames, and electric lines are stripped. Equipment is mostly modern, and in rather a good shape, but it is at times installed inadequately, no maintenance plans are available and servicing has never been performed. The new bio-safety cabinet type/level 2 (BSC-2) has not been checked since it has been in use. No emergency plans are available for fire, bio, water, electrical or other hazards. There were no fire extinguishers. Hygienic knowledge and equipment were similarly inadequate to those in the level 1 laboratories.

The laboratory work was performed adequately. Techniques complied with international standards and basic knowledge of microbiological procedures was remarkable.

Recommendations
It should again be emphasized that number of laboratories needs to be reduced as much as possible. Most of the laboratories need fundamental refurbishment to keep operating: separating work with open specimens from desk work, tiling or covering the floors and walls, replacement of wooden furniture and doors, installation of adequate cleaning sinks and running water. Electricity for the microscopes should be available during the entire working day. New, good quality, energy-saving microscopes (Primostar iLED, Zeiss) with LED illumination allow fluorescence and bright field microscopy with simple accumulators for several hours (www.finddiagnostics.org). Equipping of the major laboratory centres with this new technique should be considered.

Once the new and modern Machiton BSL-3 laboratory comes back into operation, the NTC laboratory should be reduced to level 2 for purposes of microscopy, fluorescence microscopy, decontamination of specimens and culturing of mycobacteria in solid and fluid media. All deficiencies should be rectified (a preliminary snag list could be requested at the SRL). A maintenance plan should be implemented for all equipment. The BSC-2 should be reinstalled adequately and its functioning needs to be checked and recorded by the independent expert.

Disinfection rules for laboratories were defined several years ago by SES and NTC, and they urgently need actualization. A working group should be set up with representatives of SES and the NRC, to set new disinfection standards in mycobacterial laboratories. The SRL could serve as a consultant institution for unsettled issues. Standards for emergency action should be established, with appropriate training.

4.4 Standard operating procedures

Laboratory techniques are performed according to Akiko Fujiki's manual TB bacteriology examination to stop TB. Efforts have been made by NTC staff to standardize techniques throughout the country; no quality management system has been established at the NTC or other laboratories.

Recommendations
A comprehensive quality management system should be developed for the entire laboratory network, adapted to the individual conditions and requirements, to address: organization of the laboratory network, including tasks and responsibilities; management of documents within and without the laboratory network; construction, furniture, equipment and working conditions; human resources; transportation and logistics; ordering, delivery and storage of consumables, reagents and equipment; work safety and hygiene; pre-analytic, analytic and post-analytic procedures; internal and external quality assurance, auditing, monitoring and supervision; dynamic optimizing of quality management in the laboratory network. The quality management system should be developed with help of an experienced SRL.

4.5 Supervision and collaboration

Level 1 laboratories throughout the country are regularly monitored by members of the NTC laboratory in close collaboration with Project HOPE, via regular visits to check the quality of smears, stains and reading of smears, as well as the documentation and reporting of results. As soon as weaknesses are identified, training is provided in place and/or the technicians are invited to special training at the NTC. Fifty-six laboratories were monitored in 2008, with two having more than one serious fault, and special on-the-spot training was provided.

As mentioned, a partnership between the NRT and the SRL Gauting Institute of Microbiology and Laboratory Medicine (IML) was started in 2008. Monitoring of the level- 3 laboratory at the NTC by the SRL began with a first round of external quality assessment. Some

weaknesses were identified and addressed in special training provided by Project HOPE (Dr Marija Jonjevska), the SRL IML Gauting (Dr Harald Hoffmann) and the NRL of Uzbekistan (Dr Laziz Turayev). A second round assessment was sent to the NTC on 31 March 2009.

As soon as the Machiton BSL-3 laboratory is completed and fully equipped, Gauting IML will provide regular training comprising handling and maintenance of the new lab equipment, fluorescence microscopy, culturing and DST, including internal quality control measures, molecular biological techniques and the development of a quality management system. Training will be provided over a three-year period from 2010 to 2013.

5. TB TREATMENT

It is estimated that approximately 80% of patients receive internationally recommended Category I, II and III treatment regimens, and the rest receive individualized regimens. Non-DOTS patients are mainly chronics and patients with DR-TB and patients not included for various reasons (in some cases due to low standards of PHC or the out-of-pocket payments). Methods to determine the DOTS regimen are based on international recommendations, in three categories.

Category I is the regimen for new pulmonary smear-positives, smear-negatives with more than 10 cm^2 cover of lung tissue or more than one segment), new extra-pulmonary complicated TB forms (spondylitis, meningitis, pericarditis, gastrointestinal TB, TB in one or both kidneys, etc.) and double pleurisy or one-sided pleurisy with the fluid above the fourth rib. It is a four-drug combination of isoniazid (H), rifampicin (R), pyrazinamide (Z) and ethambutol (E) administered on a daily basis in the intensive phase. In cases of extensive disease, streptomycin (S) is added. The intensive phase lasts two months and is prolonged more for one month if smear conversion has not occurred. The continuation phase consists of daily or thrice-weekly RH for 4–7 months or daily for 6 months.

In Category II, streptomycin is added as a fifth drug in the intensive phase for two months in cases classified as retreatment, and treatment is prolonged for a total duration of about nine months. This applies to relapses, failures of categories I or III, after default in case of a sputum smear positive and patients treated for more than a month prior to registration and starting DOTS treatment.

Category III is used for new pulmonary smear-negative patients with limited process (within one segment), extra-pulmonary TB (with arthritis, peripheral lymphadenitis, mezoadenitis, one-sided pleurisy with a fluid level lower than the fourth rib, etc.) and adolescents and children with non-complicated and limited forms of TB. The following fixed-dose combinations (FDC) are used: HRZE (mainly), RH 150/75, RH 150/150. Also, loose tablets of E 400 mg, H 300 mg and Z 400 mg and injections of S 1 g are available.

Table 12. Treatment regimens

Regimens	Phase of treatment	
	Intensive phase	Continuation phase
I	2(3) HRZE(S) or 2(3) HRZE(S)/	4(7) HR or 4(7) H_3R_3 6 HE
II	3(4) HRZES$_2$ or 3(4) HRZES$_2$	5 HRE or 5 $H_3R_3E_3$
III	2(3) HRZE(S) or 2(3) HRZE(S).	4 HR or 4 H_3R_3 6 HE

Note: Numbers before the name of the drug indicate the therapy duration in months; subscript numbers after drug indicate the number of administrations per week (otherwise daily).

It was noted that doctors at the regional and central levels tend to add S to the category I and II regimens. Km is also often used instead of S. The intensive phase is often prolonged, based on subjective feeling of the doctor or extensive x-ray findings.

Intensive phase
According to TB programme policy, all sputum smear-positive patients should be hospitalized for the duration of the intensive phase. However, due to hospitals' technical insufficiency, approximately 50% of patients receive the full course of treatment as ambulatories. It was also

observed that where TB departments are in better condition all patients were hospitalized (including sputum smear-negative patients, for example in the Kulyab and Vose facilities). This was explained by the need to fill beds in order to get funding. As there are no infection control measures in place, only patients requiring hospitalization should be hospitalized to decrease the nosocomial infection. DOT is provided on a daily basis under hospitalization in only a few places. As the hospitals are poorly funded, patients mostly have to buy drugs to manage side effects and co-diseases, and they often have to pay for the testing for these as well.

Similar findings were documented by the Sino Project, which pointed out that findings from the four project districts were similar to the project-commissioned study on hospitalization, performed in ten TB centres (three in Dushanbe, one in Varzob, one in Tursunzoda and five in other five districts) in April 2007 *(16).* The study of 1495 adult pulmonary TB patients found a hospitalization prevalence of 58%, varying greatly among the centres. While for smear-positive patients the prevalence ranged from 34% to 83%, it varied from 27% to 67% for smear-negative patients.

Continuation phase
This is carried out by outpatient departments of TB services and in PHC (guided by a TB doctor according to national policy). All doses are assumed to be provided under direct observation (daily during the intensive phase and thrice weekly in the continuation phase). However, drugs are generally not received under direct observation in the continuation phase except in pilot regions, such as Vahdat, Tursunzoda and some areas in Dushanbe and Rudaki.

Since 2008, nurses in some districts have received 50 somoni for every treated patient, which will hopefully increase their motivation for providing DOT. The NTP has planned to employ ten home-care nurses to provide DOT during the outpatient phase for MDR-TB patients in Dushanbe and Rudaki District. The nurses' transportation costs will be reimbursed through the GFATM Round 6 (50 somoni per month), and vehicles will be available as needed (see also Chapter 6).

Supporting institutions and programmes
The World Food Programme (WFP) funded by the Global Fund Round 6 (and round 8 from 2010) and multilateral funds, is providing incentives to TB patients and the families in 32 districts in Khatlon, Sugd, RRS and GBAO with the technical support of the Project HOPE, Sino Project (4 districts) and the NTP. The WFP is providing additional food to the hospitals during the inpatient period. Social support (food packages once per month, each equal to $10, and similar support to two family members) is provided for all ambulatory patients. The main problem for the project is the low motivation of the Ministry of Health to deal with patients' social problems. The GFATM Round 8 with WFP and the partners have planned to evaluate the impact of activities on TB cure rates.

In 2005 Project HOPE conducted a study to evaluate the use of incentives (food packages) to improve TB treatment results. It found that a food supplement incentive programme can substantially increase treatment completion and the cure rate among poor and vulnerable patients. Approximately 78.5% of the patients were determined as to be vulnerable according to WFP standards. Some form of food support has been given to 1300 TB patients and 6700 family members. New sputum smear-positive patients who received the food supplements achieved a higher cure rate (88%) than those who did not (63%). The respective default rates were 1% vs.11% in the third quarter of 2003.

The Red Crescent Society of Tajikistan (RCST) has launched a pilot project in Vahdat district to strengthen DOTS implementation. RCST has been receiving funds from the Swedish Red Cross, Finnish Red Cross and Norwegian Red Cross through International Federation of Red Cross and Red Crescent Societies (IFRC).

RCST has built capacity of Ministry of Health staff (TB services and PHC), rehabilitated the TB Centre, provides DOT, links community infrastructure with PHC facilities, supports drug distribution, and provides health education to the communities. The project has also established the Village Development Committees, and trained volunteers on TB issues, as well as supporting their daily activities in increasing community awareness of TB. The District Coordination Council (RCC) with participation of all partners, including primary health care (PHC), was established for better coordination of TB activities in the area. Partially due to the achievements of this project the treatment success rate increased from 69% in 2005 to 78% in 2008. No one has conducted a comparative study in order to evaluate the impact of the project. However, the project faces some problems, such as high turnover of the trained health care personnel and community volunteers, no help is provided by the Ministry of Health in order to ensure sustainability of the project or expand the experience in the country.

The Sino Project also strengthens DOT provision in four *districts*, but no detailed analysis has been carried out. Cohort analysis was done in Varzob and Dangara for all four quarters and in Tursunzoda and Shahrinav for the 2006 cohort, which revealed very good treatment outcome. The collective treatment success rate in four districts was 94% (68/72) for new smear-negative cases, and 98% (103/105) for extra-pulmonary cases. Only 1.4% of new smear-negative cases (1/72) had failed treatment. However, it was found in the course of a 2008 review Sino Project review that treatment supervision needs to be improved and mechanisms that help the patient to take treatment more regularly need to be devised and implemented.

6. MDR TB

Based on the preliminary data from the ongoing Drug Resistance Survey (DRS) for 2008-2009 in Dushanbe and Rudaki district, MDR TB was found in 16.8% (16/95) of previously untreated patients, and 61.6% (53/86) previously treated patients. The prevailing pattern of resistance is to three and four first-line TB drugs (FLDs), 10.5% (10/95) and 38.4% (33/86) respectively, which is partially an indicator of erratic treatment regimens in the past, but is also particular to the prevalent *M. tuberculosis* strain. There is also resistance to second-line drugs (SLDs), reflecting their incorrect and uncontrolled use: ciprofloxacin among 24.7% (40/162), moxifloxacin 7.1% (12/168), kanamycin 22.6% (38/168), amikacin 13.7% (23/168), capreomycin 16.7% (28/168) and prothionamide 22.0% (37/168).

The Ministry of Health is concerned about the high rates of MDR-TB, and took action to strengthen the DOTS strategy in recently approved laws and regulations, and increased funding for TB control. Therefore, the NTP budget has increased annually by more than 30% since 2006. However, in 2008 according to the national estimates, less than 10% of required funds came from the national sources. The Ministry of Health with the counterparts have identified the gap in needs, and successfully applied to the GFATM Rounds 3, 6 and 8, as well as to the RCC Round 3. There are also several partners, such as Sino Project, Fondation Caritas Luxembourg, KfW, American Red Cross, WFP, GFATM/UNDP and WHO working to support the Ministry of Health /NTP in TB control.

Despite the measures taken to strengthen DOTS, it still remains weak. The focus on prevention of MDR-TB through a strong DOTS program has recently been shifted to management of drug resistant TB patients, which requires sophisticated equipment, more expensive drugs and therefore much more funding. A full course of treatment for a regular TB patient costs approximately $10–15, while an MDR-TB treatment costs around $4000, under concession prices through the GLC mechanism. In order to standardize management of the patients with M/XDR-TB according to international standards *(17)* and ensure access to SLDs, the Ministry of Health /NTP applied to the GLC for an MDR TB project in September 2008, approved for 50 patients in 2009. The project is planned only for civil services in Dushanbe and Rudaki district as the patients identified by ongoing DRS need to be treated.

A national plan for the management of MDR TB patients under the Stop TB strategy for the period 2010–2015 was presented by the Minister of Health at the Ministerial Meeting in Beijing on 1-3 April 2009. There are no comprehensive national guidelines for management of MDR TB. The guidelines were approved by the Deputy Minister of Health in 2008, recommending an empiric treatment regimen (E, Z, Km, Pt, fluoroquinlone), which is suboptimal in view of high resistance to FLDs and SLDs. The guidelines also contradict the regimen approved by the GLC, and should be revised on basis of latest international recommendations *(18)*.

Case finding and diagnosis

Under the current policy three sputum specimens are collected for diagnosis and a sputum smear is taken. Culture and DST are not practiced as a routine. In case of problems the patient is to be sent to the Machiton TB hospital, or RCTB, and culture and DST are done in the NRL. There is no national policy on case finding and diagnosis of M/XDR TB. Culture and DST for first-line TB drugs are done based on individual doctors' decisions. Within the ongoing Drug Resistance Survey (DRS), sputum for the culture and DST are taken for all smear-positive patients in Dushanbe and Rudaki district. The culture is taken in the NRL and sent to the SNRL for the DST for first and second-line drugs.

The policy for the M/XDR TB case finding and diagnosis is under revision, and it is expected to be introduced from 2010 for risk groups for MDR TB: retreated patients, people having had contact with M/XDR TB patients, migrant labourers, prisoners and HIV-positive patients.
Sputum will be taken for two cultures and one DST for FLDs at beginning of treatment or in case of category I, II or III failures or sputum smear-positives at the end of intensive phase. The aim is to be able to perform culture and DST among all registered patients at the beginning of treatment. The DST for SLDs will be probably be available from the end of 2010. The MDR TB patients will be tested for sensitivity to SLD.

Second-line TB drugs[3]
Municipalities are allowed to procure TB drugs through open tender, where the main criteria is price. Open tender should be followed if the cost of the product exceeds $1000, and is carried out by the Antimonopoly Committee. The quantities of SLDs procured in this way are small.
Drugs can be bought also with or without prescription by the patients in the pharmacies, which are mostly private. The quality of SLDs is unknown, as none are from WHO pre-qualified manufacturers. The price of SLDs is rather high for the patient; therefore, drugs are prescribed mainly for one to four months. The most often used drugs are prothionamide, kanamycin and fluoroquinolones. Treatment regimens thus composed are suboptimal. There has been no evaluation of treatment outcomes for MDR TB patients.

In the cohort approved by the GLC, the standard treatment regimen is composed of Cm, Cs, Pt, Of, PAS and/or Z. PAS is estimated to be used by about 50% of patients. In most cases it is included based on the history of previous drug use and extent of disease. Z will be not used, if there is documented resistance and will be replaced by PAS. The injectable drugs will be kept in the regimen until two consecutive negative cultures (taken at least a month apart), but not for less than six months. In case of extensive resistance, the injectables could be used throughout the full course of treatment.

There is a five-year plan for treatment of MDR TB patients, with 700 slated for treatment in 2009–2013. The estimated number of new MDR cases in 2006 was 2164 (16.0%), and previously treated cases were 1040 (42.4%). Therefore, the country should look for opportunities to ensure that an estimated 15 000 patients over the five-year period have access to MDR TB diagnosis and treatment. Thus, there are major equity, technological, humanitarian, financial and commitment gaps in the way of reaching the Millennium Development Goals.

Table 13- Planned treatment of DR TB patients, 2009–2013

Year	**2009**	**2010**	**2011**	**2012**	**2013**
Patients, R6	50	100	100	100	
Patients, R8	0	50	100	100	100
Total	50	150	200	200	100

Two facilities will be involved in the diagnosis and treatment of the drug-resistant patients under the pilot project, the RCTC and the Machiton National TB Hospital. There is also capacity to manage MDR TB patients in Vahdat district, as DOTS implementation is strong there. If the MDR TB cohort can be expanded, then Vahdat should be considered as a project site.

[3] Please see Annex 5 for SLDs available in the country.

that the plan is for MDR TB patients to stay in the hospital until bacteriological conversion.
Machiton Hospital has been a central TB hospital in the country; its previous capacity was approximately 700 beds. There are 12 departments: 4 for pulmonary TB (350 beds), 2 for surgery and 2 for bone and spine TB, one each for children, meningitis and other extra-pulmonary and a reanimation unit. There are clinical and biochemical labs, which are under-performing at present due to the lack of funds and personnel.

Renovation of the facility was started in April 2008 with KfW support, and the 50–80 bed MDR TB department was ready in May 2009. The rest of the hospital started renovations in 2009, again with KfW support. There will be in 400 beds in total. There are 20 doctors and 82 nurses currently on staff. Two people were trained in DR-TB management in Latvia in September 2008.

It was found that prescription practices of Machiton doctors are not in accord with international health care standards, which may be partly caused by inadequate training and lack of medicines. Funding of the hospital from the Ministry of Health is not sufficient, thus the patients have to buy drugs for side-effects management. The schedule for side-effects monitoring and treatment progress monitoring have been outlined in the application to the GLC, and the Ministry of Health/NTP has committed to ensure that all necessary tests will be free of charge for patients, via funding partly available from the GFATM Round 8.

Patients also need to buy additional food while saying in the hospital, which is a significant financial burden, as according to the *World Fact Book*, 60% of the population is living below the poverty line. A daily food ration costs only 0.60 somoni (approximately $1.6) per day. The World Food Programme (WFP) is providing around 45 kg per two months per patient additional food to the hospital, consisting mainly of carbohydrates: 87% wheat flour, 3% oil, 8.7% protein and 1% iodized salt. The hospital cannot devise a menu based on recommended nutritional composition (carbohydrates–55%, fat–30% and proteins–15%) due its lack of funds. Because SLDs are toxic and have a lot of side-effects, good nutrition has been shown to be crucial to good treatment results.

Human resources
The weakest part of the TB programme, including the DOTS-Plus Project, is in human resources. There is no comprehensive workforce management plan in the Ministry of Health. It was observed during the mission that health care personnel involved in TB, are poorly trained on the whole. Management capacity should be strengthened at all levels of TB control. Health care staff motivation is low, partly due to low salaries (nurse is receiving approximately $20 per month, and doctors $50). Low salaries contribute to high corruption and expectations of out-of-pocket payments on the part of staff. These factors are likely to affect the standards of TB treatment in general and MDR TB in particular.

Reporting and recording
Reporting and recording (R&R) forms, based on the World Health Organization's 2008 update of the *Guidelines for the programmatic management of drug-resistant tuberculosis*, have been developed but not formally approved by the Ministry of Health. R&R training has not been provided for the DOTS-Plus Project. R&R for MDR TB has not yet been incorporated into the TB programme routine. These were all planned for 2009 under the GFATM rounds 6 and 8. There is no electronic database for the DOTS-Plus Project.

Infection control measures

The former Sanitary Epidemiology Stations (SES) were reformed in 2009 into the State Sanitary Epidemiology Surveillance (SASES), under the Ministry of Health, with the head nominated directly by the president. It is responsible for surveillance and infection control in health care facilities, including TB facilities. It has central and regional levels, and authorities for monitoring IC measures, including for TB. Unfortunately, almost no funding is provided to the health care facilities for implementation of SASES-mandated IC measures. It was found that the IC measures required for an airborne disease like TB are not in line with international recommendations *(18)*. IC measures are not in place in TB facilities, nor were there any plans, isolation measures or triage according to level of infectiousness. The Machiton TB Hospital planned to have measures in effect after the renovation in 2009, with IC training scheduled for 2010.

There are plans and partial funding through GFATM Round 8 for renovation of one MDR TB department in every regional centre and the penal system (Round 6). It is estimated that the total capacity of those renovated departments at the regional level will reach 100 beds plus 100 beds in the prison hospital. However, as the NTP has no knowledge of TB IC, technical assistance is needed to ensure that adequate environmental IC measures are in place in future departments.

Strengths

- The National Five-Year Stop TB Plan was drafted and presented in Beijing.
- There is an MDR TB management guideline, approved by the Deputy Minister of Health in 2008.
- An application to the GLC for a MDR TB management project was submitted in September 2008, and approved for treatment of 50 patients on 5 February 2009.
- The NRL is quality-assured by the SNRL, and is able to perform good quality DST of FLDs in order to diagnose drug-resistant TB. Funding is available through the GFATM rounds 6 and 8.
- There is a plan for provision of directly observed treatment of MDR TB patients with support of PHC, GFATM rounds 6 and 8, WFP and in the future the RCST.
- SASES has been given responsibility for IC in the HC facilities.
- There is good experience of counterparts in provision of DOT to TB patients in Vahdat district.

Challenges

- The Ministry of Health's questionable prioritizing of MDR TB management over the basic DOTS.
- The guidelines approved by the Deputy Minister of Health in 2008 include a suboptimal empiric treatment regimen for MDR TB patients.
- There is no policy of MDR-TB case finding and diagnosis. Use of second-line drugs is unmanaged.
- The estimated number of patients with MDR TB is much higher than initially planned for.
- Treatment practices are unequal, but there are particular concerns over practices in the Machiton TB Hospital, which will be the pilot area for the DOTS-Plus Project. Doctors use individualized suboptimal regimens that do not comply with the international recommendations.
- The operating costs of Machiton MDR TB department are too high, particularly for inpatient food.
- Diagnostic tests and supplementary drugs for side-effects management are not free of charge to the patients.

- DOT is not routinely provided, and the Ministry of Health has low motivation to expand best practice from Vahdat district. Social support is only provided in 32 districts out of 66.
- Workforce management problems are likely to affect the standards of TB care in general and MDR TB in particular.
- There are no guidelines for TB IC based on the international recommendations.
- TB IC measures have not been implemented in TB facilities.

Recommendations:

- Ensure that the priority be given to prevention of MDR TB by strengthening DOTS;
- Revise the 2008 guidelines for MDR TB management according to the international recommendations and ensure that they physicians follow them.
- Ensure adequate use of SLDs.
- Develop a national MDR TB management plan to ensure diagnosis and treatment of all patients with MDR TB;
- Ensure that there is sufficient funding for the Machiton MDR TB department, particularly for food for inpatients, and that the management of the side effects of second- line TB drugs and comorbidities is free of charge.
- Ensure that all doses of MDR TB treatment are taken under direct supervision; consider inclusion of Vahdat district in the pilot DOTS-Plus Project due to good progress in DOTS implementation.
- Expand DOTS implementation in Vahdat district.
- Ensure that there are enough well-trained and motivated health care personnel involved in the DOTS-Plus Project.
- Revise the TB IC guidelines in line with the international recommendations and implement in cooperation with SASES and the NTP.

7. TB CONTROL IN PRISONS

7.1 Policy considerations

Regulatory acts managing the implementation of the National TB Control programme in the penal system include: Regulation 524 of 31 December 2002, "On the National TB Programme for 2003–2010" and Ministry of Justice Order 156 of 26 November 2007, "On opening of the DOTS programme in the penitentiary system of Sugd Region". In addition, official agreements between the Ministry of Justice and Ministry of Health for cooperation in TB services include Interagency Order 346/86 of 5 July 2007, and a trilateral memorandum of the Ministry of Justice, Ministry of Health and Fondation Caritas Luxembourg of 17 August 2008. From 2007 the head of the central prison committee medical unit was included on the TB Coordination Committee under the Ministry of Health. Standardized TB case recording and reporting forms have been implemented in all penitentiary facilities since 2009. The Republican TB Centre of the Ministry of Health provides consultative and methodical assistance to the Ministry of Justice Department of Correctional Affairs.

Although the interagency order mandates early TB diagnostic and treatment in the prison system, there is no clearly described mechanism for doing so. Consequently, visits to the prisons revealed the following.

- Approximately 42% of the general prison population were not screened for TB in 2008.
- In some cases TB treatment was started 6–8 weeks after detection. Reasons given included that transport of TB patients could be done only once a month from periphery prisons to the TB department of the prison hospital And that some prisons have no TB treatment in place.
- There are frequent transfers of TB patients between different prisons due to internal regulations, causing treatment disruptions and raising the risk of MDR TB.

There is no national guideline on TB in prisons, and NTP policies are not available for prison medical workers, especially on the periphery. The newly signed prison TB coordinator did not fulfil his duties due to lack of support from prison administration, an unclear job description and inadequate knowledge and skills for managing the TB programme.

Laboratory service includes six microscopy laboratories with low workload. The laboratories of the Central Prison TB Hospital and Prison Colony 4 perform 5–20 smear microscopy examinations per day. The workload in other prison laboratories is from 0–20 smear samples per month. A seventh prison laboratory is being built in the Khujand area for a population of 2400. It is about 70 km from the peripheral prison colony to the laboratory, while a civil TB laboratory is nearby (2 km).

There were 212 TB cases registered in 2008. Based on a current prison population of 9100, the estimated number of TB patients in prisons is approximately 500. Twenty-six of 212 prison TB patients were verified for TB drug sensibility (7 new SS+ and 19 retreatment cases) by the NRL in 2008. MDR TB was found among 42.9% of new TB cases, and 31.6% among retreatments. Nevertheless, there are not well-defined criteria for MDR diagnostics. Many mistaken categorizations resulted in unclear treatment regimens. Some TB patients were not recorded in the TB registry, and some were double-registered. There is no electronic TB database in the penal system. TB patients are registered in journal TB03 after a decision of the Central Medical Consultation Commission (CMCC) with participation of the NTP monitoring group. However, the NTP specialist's visit depends on donor funding. Therefore, TB patient registration and treatment may be postponed for several weeks.

There is no internal monitoring and supervision in the penal system. Monitoring is done by NTP specialists, but it is not sustainable as it depends on donor funding. Quarterly reporting

and cohort analysis of TB is done only by an NTP monitoring team; local medical staff are not motivated to do so.

Some of recommendations of the NTP M&E group do not meet NTP DOTS standards for prolongation of treatment for up to two months due to the large number of TB drugs with short shelf life and the addition of a fifth drug, streptomycin, under treatment category I.

Measures for improving IC in prisons are a low priority. There are no any preventive measures for the patients, health workers and visitors. Air direction in TB facilities is not appropriate; TB isolation wards are very relative. Measures such as coughing hygiene and wearing of surgical masks by infectious patients are not encouraged. There is no specific IC policy for prisons.

Penal system medical workers face low motivation and difficult working conditions. The total medical staff is around 60 people. It is estimated that 45–50% of positions in the medical departments are vacant, leaving prisoners to perform medical duties in several departments, with no training.

Presently there are around 400 TB beds in the penal system: 160 in prison hospitals in Dushanbe and Khujand, and about 25–30 in most other facilities. According to annual reports, 212 prison TB patients were registered in 2008, meaning that one TB bed must serve one TB patient for approximately 24 months. Meanwhile, a new 100-bed TB hospital is being constructed in Vahdat prison colony. At the time of the visit, only around 44% (71 of 160) of TB beds in prison hospitals were occupied: 46 out of 120 TB in the Central Prison Hospital in Vahdat, and 25 of 40 in the Khujand TB department. TB Beds in periphery colonies were half-used.

Among all released prisoners on TB treatment in 2008, 92% (23 out of 25) were followed up by civil TB facilities and continued treatment. However, it would be more sustainable if prison medical staff would be involved in the process. Presently the referral measures are performed by specialists of Fondation Caritas Luxembourg.

Lack of cooperation between the penal system and the health service, low status of medical staff, poor conditions and overcrowding (200 prisoners in a large room) were observed.

Recommendations to the ministries

- Revise and update existing policy regulations for TB in the penal system.
- Prepare a joint strategy document as the next step in strengthening TB control, including objectives, roles, expected results, tools and indicators. A detailed plan of action should describe the responsible agency and the place and terms of performance. Monitoring and evaluation of prison TB programme implementation every 6–12 months should be as essential measure of the strategy.
- Develop SOPs for early TB case finding and treatment.
- Change patient transport policy to enable earlier start treatment, especially with regard to confirmed infectious TB patients.
- Draft a guideline on TB control, based on national TB DOTS guidelines. It should outline steps to be taken by prison health and administrative staff and their local counterparts for all components of the TB programme.
- Adapt the NTP monitoring manual and tools and national standard MDR protocols on the basis of their use under prison programme conditions.

- Establish a TB infection control plan with a protocol for prompt recognition, separation, provision of services, investigation and referral of patients with suspected or confirmed TB.
- Improve access to quality laboratory diagnostics. Establish a laboratory network including the penal system.
- Work initially with a limited number of microscopy laboratories depending upon their workload, local need and capacity. A thematic working group should do the decision-making.
- Develop and institutionalize a referral system for TB patients released from prison to insure continuous care.
- Cooperate with the national and international NGOs in developing a sustainable policy and strategy to overcome overcrowding and consequent hygienic problems. Political commitment of the government and the concerned ministries is crucial.
- Improve access to laboratory TB diagnostics in collaboration with civil TB laboratories close to prison colonies. It is important to have the aforesaid policy document to facilitate collaboration between prison and civil TB laboratories in place. The NTP should define tasks and eventual lab services for the penal system. A complete list should be compiled by civil facilities providing lab diagnostics in the various regions. The Department of Correctional Affairs (DCA) medical unit should know the number of laboratories, locations and lab services that can be provided by the civil sector.
- The NTP should take action to address the root causes of health weaknesses, optimize appropriate financing, planning and rationalization of service delivery and protect essential TB-specific functions during the health sector reform process.

Recommendations to the penal system administration

- Strengthen TB programme management.
- Delegate powers of TB programme coordination to a prison TB coordinator whose precise job description should be specified in regulations.
- The prison TB coordinator should make a coordinating work plan with regular supervisory visits to prison facilities (monthly or bimonthly), training plans for medical and non-medical staff and prisoners and a list of existing resources and needs.
- Disseminate NTP policies to each prison medical department, including the periphery.
- Strengthen identification of TB cases jointly with strengthening monitoring and supervision of the programme activities.
- Enhance the R&R system of the TB programme. Train medical specialists in registration system and cohort analysis standards.
- Adopt electronic TB registration to ensure more comprehensive data entry, facilitate communication and transmission to the central medical unit and the NTP. Electronic TB data bases and computers should be placed in the Vahdat Central Prison Hospital, the Khujand TB department –and the medical unit of DCA. The central prison TB register in DCA should combine all data from the two prison regions.
- Decentralize registration of smear-positive TB cases. NTP monitoring team decisions are necessary to differentiate smear-negative cases.
- Conduct internal supervision of prison facilities by the prison TB coordinator on a regular basis. Supervisory visits should cover five main units: the laboratory facility, prison drug storage, the TB hospital wards, TB outpatient facilities, the offices and records storage. The monitoring and supervision activities should be included in local penal system budgets.
- Train prison medical specialists in R&R, cohort analysis and quarterly reports and analysis, assisted by the NTP monitoring team. The prison administration should demand TB reporting data from the medical unit.

- Isolate retreatment sputum smear-positive patients. According to prison TB programmes of former Soviet countries including the Central Asian Region, the average rate of MDR TB among retreatment cases in prison is 60–80%. All new TB patients must be treated locally in TB units of periphery colonies. Patients who continue treatment have to be located in periphery units as well. All other smear-positive patients should be isolated in the TB department of the central hospital. The same scheme of TB patient isolation is also recommended for North Region.
- Consider the newly constructed TB hospital for MDR and smear-positive retreatment TB patients. In the meanwhile, the existing central hospital TB department can be used as an isolator/hospice for chronics unable to be treated with SLDs. In that case, the MDR department must be constructed in line with IC standards.
- Promote early diagnosis and effective treatment of all infectious TB cases to reduce the risk of transmission. Ensure that IC measures and equipment are implemented and in good operating order.
- give highest priority to administrative prevention measures, followed by environmental and personal respiratory measures (earlier TB diagnostic and treatment, strict isolation patients on infectious status and treatment categorization according to WHO standard recommendations).
- Institute environmental controls in every institution, including ventilation and ultraviolet light, as well as measures covering open windows, directional airflow, outdoor waiting areas, outdoor sputum collection where weather allows, sputum collection in areas with upper room UV germicidal irradiation in cold climates.
- Designate a medical specialist to oversee implementation of IC measures and provide training for medical and non-medical staff who risk TB exposure.

Recommendations to the NTP

- Give technical assistance to all TB programme components.
- Retrain the NTP monitoring group (conducted M&E for the penal system) and prison TB coordinator on DOTS and train for monitoring and supervision of programme performance.
- Train non-medical personnel in recognizing TB, educate prisoners on TB and patients on rules of behaviour.
- Distribute information on TB, TB/HIV, MDR TB to prison workers and prisoners.

Recommendations to counterparts

- Institute continuous care and support programmes for ex-prisoners for better integration into civil society.
- Assist in monitoring programme activities.
- Assist in TB awareness training for prison staff and prisoners.

Nonetheless, providing funds and technical assistance to the penal system are the main activities of TB programme performance, and should be delegating to the local staff to strengthening the programme's sustainability.

7.2 The TB control programme in prisons

The penal system (PS) comprises 19 institutions, including five pretrial detention centres (SIZOs) and three colonies. The total inmate population is approximately 9100, with 74% (6700) in the southern areas (Dushanbe) and 26% (2400) in the north (Khudjand). The medical department is responsible for health care in the penal system, including for personnel. The head of the Medical Department communicates with the head of the Penal System through the deputy head on urgent issues, which is often an obstacle to solving health care related

problems. The cost-of-living allowance per day per prisoner averages 3.85 somoni (about $1). Prison TB patients' allowance is nearly twice that (6–7 somoni), and includes donor humanitarian support.

DOTS implementation

A DOTS implementation pilot project in prison was started in 2005, supported by Fondation Caritas Luxembourg. At the beginning, it was extended to four prison colonies covering over 44% of the prison population. In 2008 DOTS was introduced in the penitentiary system nationwide.

The Ministry of Health has a supporting role in prison TB control, providing drugs and supplies under GDF guidelines, programme monitoring, external quality assessment for SS examination, microscopy, culture and DST services for prisoners (selectively) and clinical guidance for complicated diseases.

The introduction of TB control programme in prisons is going slowly due to lack of a strategic plan and weak management by the prison medical service.

Recommendations

1. A strategic plan for improvement of TB control in prison is very much needed, including:

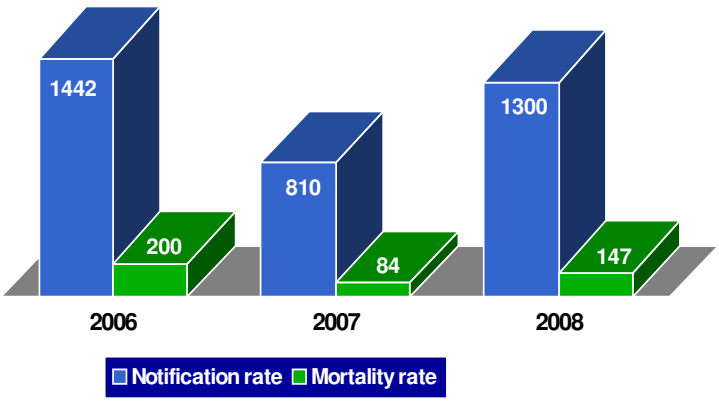
- SOPs for case finding, diagnostics and treatment of TB patients
- assessment of prison staff training needs
- a system for isolation of TB patients
- a TB drug management system
- a database and mechanisms for information flow on TB patients within the penal system and with civil TB services
- provisions for good collaboration between prison and civil TB services.

2. Strengthen coordination of TB activities at all levels (ministries, prison administrative, monitoring and supervision teams).

Case finding

The notification rate of new TB cases increased from 810 per 100 000 (77) in 2007 to 1 300 (127) in 2008, probably due to DOTS expansion. The following situation with high mortality rate can be resulted by inadequate treatment of TB before DOTS implementation in the system.

Figure 8. Case notification and case mortality in the prison population, 2006-2008 (per 100 000)



The decreasing TB data in 2007 was due to release under an act of amnesty. The confirmation rate was highest at 80% (79 out of 98) among new pulmonary cases, which is lower than previous two years (100% and 86%) and higher than in civil services (47.1%) in 2008. The high confirmation rate is related to laboratory diagnostics. In prison colonies, x-ray is done in case of a sputum smear negative. Mass screening still is not available for the general prison population due to lack of fluorography units. Fifty-eight percent (5300 out of 9100) prisoners were screened by (civil) fluorography at the end of 2008. Among them 3.7% (200) TB cases were selected with suspicion of TB, but still were not confirmed in the course of the mission. X-ray equipment is broken in most of the colonies. Cough-register journals are used in some colonies, but not regularly. Registration of prisoners with cough is widely available and prison worker journals intensify TB case finding. Case finding among contacts of infectious cases is not regularly done; infectious seats are not really investigated.

A mobile fluorography unit was provided by the GFATM in 2009, Fondation Caritas Luxembourg provides supplies and consumable for the laboratories and x-rays, and Carlux is building a laboratory in Khujand prison.

Recommendations

- Intensify TB case finding through various entry-screening, contact investigation, fluorography mass screening.
- Conduct active case finding at least every 12 months (ideally every 6 months).
- Provide training in recognizing TB to non-medical personnel.
- Provide TB education to the inmates.

Data management and cohort analysis

TB data analysis is not satisfactory in light of the lacking database. R&R forms based on the NTP format were introduced in 2009. Detected TB patients are registered in journal TB03 after a decision by the NTP monitoring group. Nevertheless, many mistakes on case definition and patient categorization were observed and over- and under diagnosis occurred. From 2006 the NTP team jointly with the Central Prison Hospital Medical Department to collect TB data from prison facilities. The penal system cohort group covered 212 cases over a year in 2008 (165 in 2007, 325 in 2006). The estimated pool is approximately 500 TB cases for the current prison population.

Table 14. Total registered TB cases in the penal system, 2006–2008

	New cases							Retreatment				
	New pulmonary SS+		New pulmonary SS-		Extra-pulmonary		Total	Relapse		Others		Total
2006	108	33.1%	22	6.8%	6	1.9%	136	-	-	189	58.2%	325
2007	60	36.4%	9	5.5%	8	4.8%	77	23	13.9%	65	39.4%	165
2008	79	37.2%	19	8.9%	29	13.7%	127	16	7.6%	69	32.6%	212

An imbalance is observed between registered new and previously treated cases in the cohorts, demonstrating poor detection of new TB cases.

Table 15. Treatment outcome of new SS+ pulmonary TB in the penal system, 2006–2007

	Total New SS+	Cured		Completed		Died		Failed		Defaulted		Transferred-out	
2006	108	59	54.6%	10	9.3%	6	5.6%	6	5.6%	2	1.9%	25	23.1%
2007	60	30	50.0%	0	0.0	4	6.7%	10	16.7%	0	0.0	16	26.7%

Treatment success (cured plus completed) in 2007 declined: 50% (30) compared to 63.8% (69) in 2006, mainly due to MDR-TB and treatment interruption within the system. The transfer rate is high; nevertheless, it is not possible to say, if cases were transferred within the system or to Ministry of Health, because in 2006–2007 all TB patients moved within the system, were also evaluated as transferred-out.

Three computers were provided by the GFATM in 2008. Fondation Caritas Luxembourg provided technical assistance in developing the R&R policy and plans to organize R&R training. Carlux technical specialists help with data collection.

Challenges include:

- miscategorization of patients
- poor information exchange due to the lack of an established system
- poor TB data management knowledge and skills of the local medical staff.

Recommendations

- Improve the database for an improved overview of the TB situation.
- Revise the definitions for case notification according to the latest recommendations.
- Design and implement an electronic TB recording and reporting system specific to the penal system.
- Train the specialists in TB data management.
- Improve monitoring and supervision of the TB information system.

Note: The NTP perspective plan is to launch a countrywide computerized database for TB patients. The penal system should be linked directly to the database, and prison TB data should be entered directly into the national database. Two regional penal system databases (Dushanbe and Khujand) will be able to enter their data in the central prison database. Quality control of the data should be maintained by the NTP. Regular monitoring and supervision should ensure the good performance of the system.

Treatment and treatment follow-up

Treatment regimens used in the TB department of CPH (Vahdat), of the branch in Khujand and TB units of periphery colonies comply with the international recommendations (according to NTP policies). However, due to the huge number of TB drugs with short shelf life, there is a recommendation to prolong the treatment course for all TB patients by up to two months, and to add the fifth drug, streptomycin, for patients in treatment category 1. DOT is not provided adequately. Many of patients keep TB drugs in their pockets. TB patients receive TB kits with drugs in hand.

Follow-up treatment after release was started by Fondation Caritas Luxembourg in 2006; 92% (23 out of 25) of TB patients were followed-up by the civil facilities in 2008. Each of the patients was escorted by Carlux specialists, without the recommended activities on the part of prison staff. There is no policy document/protocol with a description of the referral measures.

Three bureaus for drug users, HIV positives, released and ex-prisoners in need of social support were established with help of the AIDS Foundation East West, which also initiated a partners' network for social support in Sugd Region and Khujand. Different organizations including regional TB dispensaries are included in the social support network. AFEW also trained staff of social bureaus in providing social support and work with clients.

Recommendations

- Revise case management and treatment strategies in prisons.
- Strengthen monitoring of DOT; distribute DOT protocols to medical workers.

- Develop a referral plan for the patients released while under TB treatment.
- Strengthen collaboration of different partners to develop an integrated social support system.

Drug management

At the beginning of DOTS expansion in prison (2005), TB drugs were procured by the Ministry of Justice for non-DOTS treatment and by Fondation Caritas Luxembourg for four pilot DOTS colonies. In 2007 the TB kits were procured centrally by the NTP through the GFATM. At the moment an uninterrupted first-line TB drug supply in the penal system is ensured through the Ministry of Health with the support of GDF. There are no second-line TB drugs in the penal system.

Recommendation

Provide drug management training to penal system personnel.

Human resources

An NTP team has trained the medical specialists of the prison since 2006; but there are staff turnover problems in the system and more than half of the positions are vacant. Resource problems in the penal system reflect the general need for improvement in the overall health system.

Recommendations

- The NTP should initiate protection of essential TB-specific functions during health sector reforms.
- Conduct training needs assessment.
- Develop a training plan.
- Develop/adapt training programs for different target groups, including non-medical staff and inmates.

7.3 Site visits

Colony 13, Central Prison TB Hospital, Vahdat

The CPH in Vahdat is about 11 km from Dushanbe, and serves 13 colonies, including 3 pretrial institutions, 2 settlement colonies, 1 children's' colony and 1 for women. It has 2 departments, one for internal medicine (capacity 200 beds) and one for TB (capacity 120 beds with occupancy of 46). In the course of the visit only 21 of 46 TB patients received TB treatment. Another 25 prisoners/chronics did not receive drugs as they had been given two standard regimens unsuccessfully. Currently they are separated in two rooms. Within the department, patients of all types were mixed (new+, new-, retreatment cases including failures, MDR-confirmed, continuing phase and non-active).

There are 35 medical positions in the central hospital: 18 for doctors, including 3 TB specialists, and 17 for nurses, and they are only half-filled. In the sputum smear lab, one of two positions is filled. The lab specialist works for two laboratories (CPH and colony 2). According to the lab report 1007 examinations were conducted in 2008: 658 diagnostic (among them 23.6% smear-positive) and 349 treatment control (47.9% SS+).

Infection control measures are not related in the departments. The lack of TB and hygienic knowledge among patients was evident. Sputum containers were replaced by large jars (500 ml, 1 l) and were emptied into the toilet or in the yard.

Under the GFATM Round 6 plan, a new prison TB hospital is under construction.
(Recommendations below)

Colony 5. Khujand branch of the Central Prison TB Hospital

The branch hospital serves four colonies, including two SIZOs located in the northern part of Tajikistan. It has two departments, one for internal medicine (40 beds) and one for TB (40 beds). The TB department is situated in a separate two-floor building isolated from other premises of the institution. There is x-ray room, canteen for TB patients and ward for intensive care on the first floor. Regular TB wards are on the second floor: two for new SS- cases, one for SS- retreatment and three for SS+. At the time of the visit 25 TB beds were occupied.

There are ten medical positions in the TB department: one head, two TB doctors, one radiologist, one laboratory technician, one x-ray technician and two nurses. The same doctor works as a head of medical unit, head of TB unit and TB doctor. There are vacancies for one TB doctor, ½ laboratory technician, ½ radiologist and ½ x-ray technician. The TB doctor participated in Project HOPE DOTS training in 2007. Prisoners perform medical duties in the department due to lack of medical specialists. Some of the positions are filled by specialists of the Region TB dispensary as part-time work: ½ laboratory technician, ½ radiologist and ½ x-ray technician.

SS examinations are conducted by a Regional TB Dispensary laboratory technician (about 2–5 per week), because the branch of hospital does not have a laboratory for the purpose. With support of Carlux Foundation, a microscopy laboratory for the northern prison colonies is under construction. The needs and workload of a lab for the Khujand area prison population of 2400 remain to be decided, along with transport plans for periphery colonies lying some 70 km from the laboratory.

TB Diagnosis is confirmed by the Central Doctors Council of the Region TB Dispensary in Dengai. There is a ward for suspected smear-negatives, who are diagnosed in the TB department. Non-specific drugs are used in case of SS- for 2 weeks. A TB doctor together with the head of medical service of the prison administration visit all prisons in the region twice weekly to select patients for transfer to the branch hospital.

Standardized TB forms and registries are used in all facilities.

IC measures are moot because of a lack of premises for proper separation of TB patients according to infectious status, patient categories and phase of treatment. Wards for all TB patients are in the same corridor, with open doors. There was a UV lamp in the ward for SS+ TB patients. All TB patients are served in the same canteen in two shifts. Staff are not provided proper masks.

Recommendations to the hospitals

- Revise and separate retreatment smear-positive cases with from new cases in the prison TB department. All new cases (SS+ and SS-) should be treated locally at TB units of periphery colonies.
- Consider the new hospital in Vahdat for treatment of only MDR and retreatment smear-positives.
- Determine the new prison laboratory needs in Khujand prison.
- Provide TB training to medical and non-medical personnel and TB education to the inmates, according to training needs assessment.
- Provide respirators to the staff.

Colony 4

The medical unit includes two big rooms with 25 beds each, one for smear-positives and one for smear negatives. On the day of the visit there were 12 patients in the former and 17 in the latter. A medical technician trained in smear microscopy by the Carlux Project provides treatment and smear examinations. All TB cases are registered in TB03. Diagnosis was based on SS examinations. The information exchange mechanism was not in operation. TB07 and TB08 reports are usually developed by the NTP monitoring group.

Anti-TB drugs are dispensed under supervision of medical nurses. Some of patients had their TB drugs in hand. During the visit there were patients who had completed the treatment course in the same ward as infectious patients. In another was a severely sick patient, who had failed treatment regimen II, most probably due to resistance to the drugs. He was kept together with new cases and relapses, because there was no place to hold him separately.

The Carlux Project had provided respirators to staff, but some did not use them.

Recommendations

- Transfer all infectious retreatment patients including failures to the CPH. A special ward in the CPH should be reserved for treatment failures;
- Develop an epidemiological map in each barrack to improve work with contacts.
- Strengthen the screening questionnaires.
- Improve the quality of information collection and records in patient files and TB forms.
- The TB doctor should create reports and analyse TB data.
- Organize refresher training in DOTS for medical staff. TB data analysis should be one of the training topics.
- Strengthen health education for prison staff on the importance of appropriately using respirators and masks.

8. RECORDING AND REPORTING

8.1 Notification

SASES
Urgent notification is requested from a TB officer for each confirmed TB case by a district-level communicable disease epidemiologist. The individual data are recorded in the communicable disease logbook, and then aggregated monthly basis and reported on paper to the regional SASES office, which compiles regional data for forwarding to the national HQ. The SASES team in cooperation with the district TB officer is expected to visit the residence of each TB patient for contact tracing, health education, vaccination, preventive treatment and environmental disinfection. Therefore, according to many people interviewed by the mission, because of the poor human resources, the TB data flow through the SASES network is unclear and the actions listed above are not well-specified. Reporting and recording forms are not printed regularly, and all components of the health care system have had to use photocopies.

The NTP
The whole set of standard TB suspect/case management forms are found at the district level, and in generally follow DOTS strategy. However, the contents of the TB case management form and electronic and paper TB registries were inconsistent. It was also noted that reporting and recording forms are not printed regularly and staff have had to use photocopies. Documentation is poorly managed; therefore, it was difficult to find data for a simple cohort analysis and follow the management of data (Machiton, Vose). It should be noted that during the mission cases of mismanagement were found (Machiton, Vose, Tursunzoda), including false TB, misclassification and incorrect prescription of treatment regimen at registration, delay in treatment monitoring investigations and wrong assessment of treatment outcomes.

The core of notification system is an individual TB case management card with over 20 variables, TB-01, used by care providers to deliver and monitor the treatment. Among other information, the treatment regimen and monitoring are reflected on the form. The data are registered in a district-level logbook, TB-03, managed by the district TB coordinator. Aggregated data are processed at the national level on a quarterly basis according to cohort TB reporting forms for case registration, treatment monitoring after intensive phase of treatment and treatment outcomes of cases registered in the same quarter of last year. There was a DOTS standard logbook for suspected case management, managed by the district TB officer, including about 10 variables on personal identification and laboratory confirmation. Data are not analysed, and there is no data follow-up of suspected case management. TB logbooks are sent to the national level quarterly.

An electronic offline bidimensional database, operated in an EpiInfo 6.04D format, was developed and integrated into sustainable and user-friendly software, providing all the reports needed for a cohort analysis, as well many extra tables with aggregate data and lists for managing cases, validating data and maps. The open-source TB electronic surveillance and case management software (TBESCM), was provided by a USAID funded CDC/CAP Project. It was found in all visited facilities, but due to staff turnover and poor infrastructure it is inadequately used, and all data management is based on paper documentation.

8.2 Monitoring and evaluation and field supervision

The NTP has developed the M&E and field supervision system, with a team including the regional curator for technical areas and responsible field officers (see Annex 6) and tools

including a list of 12 specific indicators and 4 checklists and a quarterly field supervision schedule, as approved by the Ministry of Health.

The mission assessed practical results of the field suppression teams. Recommendations on the field mission reports sent to the regional TB control officer and his supervisor were not implemented (Vose, Kulyab, Tursunzoda) due to poor human and financial resources. Therefore the entire system is not sustainable and has little impact on the local TB burden.

On the other hand, there is a strong team at the national level, maintained by adequate financial and technical recourses. The national M&E and field supervision coordinator has successfully undertaken analysis and interpretation of the programme indicators.

Recommendations

Forms and registries

- Revise/add fields on the TB case management card for case type at registration and treatment outcomes.
- Design a referral/result form for HIV testing linked to the TB registry by a code (county code + TB registry number). Include the HIV test result only in the TB registry.
- Discontinue use of the old forms (according to the Evidence in Health Act), and ensure countrywide implementation of the new ones. Forms and registries should be printed centrally and distributed to the field.
- Maintain the paper reporting and recording documentation.
- Develop and implement reporting and recording documentation for MDR-TB case management under treatment category 4. XDR-TB case data management and individual treatment regimens should be considered in the long-term plans.
- Finalize implementation of TBESCM and provide retraining for all field TB registry managers.

M&E

- Nominate by Ministry of Health Order a TB surveillance country correspondent to the European TB Surveillance Network, to cooperate with all NTP technical area coordinators, penitentiary, SASES, HIV/AIDS control programmes, STD control programmes and other governmental and nongovernmental stakeholders as part of the NTP team, directly supervised by its manager.
- Add a national-level, part-time epidemiologist and IT expert.
- Enhance M&E skills of peripheral staff, especially in data analysis. Data should be primarily used for programme performance evaluation.
- Share the electronic TB database with the SASES central office, in order to integrate TB into overall national CD surveillance.
- Implement the electronic data collection system only in the facilities with more than 30 cases per year. Revise the system to increase data analysis flexibility by introducing script codes to automatically calculate programme performance indicators based on cohort analysis. The Ministry of Health should ensure the sustainability of the system.
- The TB M&E and field supervision coordinator should perform data analysis and interpretation based on cohort analysis methodology at the national level in close cooperation with the SASES CD epidemiologist, quarterly, using TB control programme performance indicators.
- Use surveillance data in the WHO-recommended framework for estimation and measurement of TB incidence to improve data reliability, evaluate epidemiological trends and impacts of TB control, and update estimates of the burden *(19).*

- Strengthen NTP and SASES officer TB surveillance skills through participation in international training. Pursue the matter with the WHO Regional Office for Europe.

9. DRUG MANAGEMENT

9.1 The drug supply

From the start of DOTS implementation, a continuous drug supply has been an NTP priority. Drug need calculations are made by the NTP, GFATM PIU and Project HOPE specialists in collaboration with GDF experts. Project HOPE and the UNDP PIU have assisted the NTP with custom clearance of drugs purchased through the GDF under GFATM Round 3. The Ministry of Health supports the NTP drug supply effort, actively taking part in all required formalities of registration, customs clearance, pharmacovigilance, etc. related to procurement of drugs and health products. The most recent regulation issued is Order 423: On forbidden use of TB drugs from other health institutions, of 01 August 2008, which regulates sale of TB drugs without prescription by a TB specialist.

Prisons receive drugs from the central NTP through Fondation Caritas Luxembourg. Coordination among the Ministry of Justice, the Ministry of Health, the NTP and Caritas was provided through TB thematic working groups.

All personnel, responsible for drug management (central and peripheral), have been trained with the support of Project HOPE. Logistics Management and Information System (LMIS) training was provided to 146 people from all district TB facilities. UNDP monitors the procurement according to the internationally accepted standards and in compliance with national legislation, ensuring the best value for money, transparency and competitiveness. A procurement and supply management plan for the project has been developed. The last GDF mission was in February 2009, and the report is available for the NTP and all programme stakeholders.

Drug registration

The State Drug Expertise Centre under the Ministry of Health is responsible for quality assurance and registration of drugs. The national essential drug list includes Z 400, H 100, H 300, E 100, E 400, R 150, R 300, S 1g, RH–150/75; 60/30, 60/60, 300/150, 150/150, RHZ–60/30/150; 150/75/400, 150/150/500, RHZE–150/75/400/275, HE 150/400, HRE–75/150/275. Second-line drugs are not included on the list.

At present the following first-line TB drugs are used in the NTBP: RHZE 150/75/400/275 and RH 150/150 in STOP TB 1/3 kits (for treatment categories 1 and 3); RHZE 150/75/400/275, RH 75/150, E 400 and S 1g in STOP TB 2 kits (for treatment category 2); H 100 and H300 (for chemoprophylaxis) and Z 400, E 400, RH 150/150, RH 75/150 (for children and patients with adverse reactions). The registered GDF drugs are HRZE, RH 150/75, E 400mg, RH 150/150 and S 1.0g. Four more drugs are under consideration.

No TB drugs are produced in the country. Some first- and second-line drugs of potentially dubious quality imported from Belarus, Georgia, the Russian Federation and Ukraine are available in the open market and could be taken without medical prescription. The variety of drug forms and dosages has certainly contributed to the potential for confusion and suboptimal treatment regimens on the part of both health providers and patients.

For a few years FDC and TB kits have been available for the NTP. They are very well-accepted and used by the peripheral health facilities and PCH doctors, but there is some unexplained concern about them at the highest level (Ministry of Health, NTP). For the first time paediatric drugs (allowed in the country by special permission of the Ministry of Health) are being used for TB treatment, but they are not yet registered. Second-line drugs are planned to be procured through the Green Light Committee (GLC) mechanism.

Management and distribution

The RMPC provides storage and distribution services, including for TB drugs procured through existing GFATM grants, and undertakes all supply management functions, related to pharmaceuticals and other health commodities and supplies. It has enough space and adequate storage capacity. Currently the RMPC has three warehouse facilities, located in Dushanbe, Khatlon and Sugd regions.

The central storage is modern and updated, regional and district storages are adequate, but could be improved with adequate funding. Stock cards are updated. Upon arrival the shipments are inspected for condition, quantity, expiration date. The central has provision for controlling and recording temperature, but at the periphery there is none.

Based on the quarterly reports from the regions, the Republican TB Control Centre (RTBC) analyses quarterly TB drug use and expenditures in light of the registered TB cases by category. Distribution is according to a plan developed by the RTBC on basis of the quarterly reports from each region. Usually the order includes 100% buffer stock. In turn, regions provide data to the RTBC on TB drug balances at of the beginning and end of the quarter. According to the plan, the drugs are transported to the regions (Sugd, Khatlon and GBAO) from the RTBC. They are distributed with consideration of the buffer stock (regions have six months buffer stock, districts, three months). Usually drugs are delivered to regions semiannually and quarterly to districts.

Drugs storage and dispensing are carried out according to the first-in-first-out principle. The TB drug distribution system is not integrated into the general health logistics. The Republican Medicines and Medical Commodities Procurement Centre distributes TB drugs to the regional level, from there to districts and treatment centres collect drugs with their own means. Reporting documents approved by the Ministry of health enable tracing expenditures, receipts and balances for each individual drug at every facility where TB drugs are stored. There are drug management coordinators responsible for the rational use of drugs and control of expiry dates at the national, regional and district levels and nurses at the PHC level. Funding for drug storage comes from GFATM Round 6. In recent years, Project HOPE has provided technical assistance in drug management (LMSL) and WHO and the Strengthening Pharmaceutical Systems Centre for Pharmaceutical Management have held workshops in drug management for MDR TB.

Challenges

- There is inadequate preparation and attention to planning, ordering, distribution and stocking of drugs at all levels. Drug management is weak, and NTP staff are incapable of calculating drug needs.
- Weak management of drug calculation, planning, ordering, stocking and distribution mean common supply shortages.
- The NTP is moving away from standardization to a wider variety of regimens, drug formulations and two different patient kits.
- Due to high turnover, there are ongoing trained staff shortages and thus poor stock management capacity.
- There are poor stocking practices in some peripheral TB units.
- Information flow is inadequate, both vertically and horizontally, and there is a lack of central information on stocks.
- Stock management coordination is inadequate within and among regions and between regions and NTP.
- Some areas do not have adequate stocks on hand.
- Drug availability by category is uneven.

- Most of the loose drugs have short expiration dates.
- Stock depletion remains a threat.
- Laboratory capacity for drug quality assessment needs to be developed.
- There have been no stockouts during last few years. NTP and GFATM procurement of TB SLDs were not complete at the time of the mission; however, small quantities of SLDs were available at hospitals, procured with hospital/municipalities funds or by patients.
- Procurement, distribution and stock management of TB drugs are not undertaken together with other essential drugs management.

Recommendations

- Strengthen drug management training (calculation of needs, procurement, drafting the tender requirement, dealing with important problems, storage and distribution, LMIS). Continue training for medical staff in optimal use of patient kits at the periphery (including GPs).
- Make assured access to proven quality TB drugs, preferably in FDC form, and better drug management NTP priorities.
- Introduce a registry for recording adverse drug effects (for first- and second-line TB drugs). Update the adverse effects reporting forms (include batch number and manufacturer).
- Initiate discussion and undertake actions with the Ministry of Health, stakeholders and others for quality control of TB drugs available on the private market used in public sector.
- Strengthen the implement the new disaster management information system (DMIS) at all levels. DMIS should play an important role by helping to track drug stocks, monitor expiration dates and calculate drug needs).
- Improve conditions and organization of medicines stored at the periphery.
- Secure further technical assistance for drug management training.

9.2 Drug Financing

The country's plans for TB drug and diagnostics procurement in the coming years are based on funding from donors and grants. Funds for first- and second-line TB drugs will be continuously provided by GFATM (rounds 3, 6 and 8). Drug funding in the NTP comes through GDF (three years and one year, currently expired) and GFATM funds (direct procurement through GDF, ensured through 2013). The fund for first-line TB drugs for the next four years is between $311 740 (2010) and $337 365 (2014). The last shipment of TB drugs (for 5357 patients) ordered with GFATM Round 3 funds was at the end of March 2009.
A three-year paediatric grant was approved by the GDF from the end of 2008, and will supply paediatric formulations HR 60/60; 30/60; Z150 and E100). In addition to the drugs distributed by the NTP, some of the TB facilities have small budgets to procure quantities additional drugs, despite serious under-financing.

Monitoring
Drug management monitoring is conducted quarterly by NTP specialists and international organizations (Project HOPE, Sino Project, Red Cross), using check-lists. Project HOPE is one of the main stakeholders for TB drug management in the country, providing regular M&E mission and technical support. In 2008 M&E visits were conducted by NTP staff in 59 districts and 4 regional and district TB centres.

Monitoring statistics, indicating the proportion of districts:

- using all referral forms: 42% of districts; showing improvement: 88%
- having recording discrepancies: 85%
- having regular entries in four registries: 93%
- having no expired TB drugs: 93%
- having stock for less than one month on hand: 42%
- running risk of drug expiration: 18. 8%
- experiencing periods without TB drugs: 72%
- where needs calculation is done according to standards: 57%
- needing improvement in stocks: 25%.

The LMIS system was developed and implemented countrywide by Project HOPE with financial support from USAID, and it improved the drug management component of the DOTS programme.

Challenges
Government funding is not adequate for provision of TB drugs for all TB patients.

10. IMPROVING THE HEALTH CARE SYSTEM

10.1. Social determinants of TB

It is known that the risk of TB is influenced by factors related to socioeconomic status, and indirectly by broader processes of social and economic change. TB vulnerability can be influenced by programmes, health system strengthening and a wide range of social determinants beyond the health sector. Responding to a call by the Commission on Social Determinants of Health, the Ministry of Health acknowledges its role in helping to analyse the importance of TB risk factors, improving collaboration with other public health programmes, contributing to health system strengthening and providing additional backing for frameworks for action developed by the Commission. The Ministry realizes that the action on the social determinants of health must involve all the key sectors of society.

The review of the national TB programme came at a unique time when both the National Health Sector Strategy and the new National TB Plan 2010-2015 were being drafted. TB in Tajikistan is well recognized as a disease of poverty and TB prevalence often provides a good proxy for poverty levels in a country. Meanwhile, the NTP needs to improve its coverage and performances by effectively addressing the immediate risk factors of TB and their social determinants.

Recommendations

- Include the social determinants of health and TB in the National Health Sector Strategy and the National TB Plan 2010–2015.
- Take the lead in action on the social determinants in the interest of achieving health equity, thereby decreasing TB vulnerability.

10.2 Integration into primary health care

The Ministry of Health undertook a number of activities, including establishment of a coordinating council for GFATM grants, consisting of representatives from different ministries and international/local organizations, which is also helpful in framing the problems. Integration of TB services into PHC, particularly for DOT, is supported by USAID, Zdrav Plus, the Asian Development Bank, GFATM rounds 3 and 6 grants and the Swiss Cooperation and Development Agency (Sino Project). All TB interventions conducted by stakeholders within the project also address the health system as a whole.

The role of PHC doctors and nurses in DOT is central – by mandate they are responsible for administering TB medication and recording DOT therapy in its continuous phase. PHC doctors are also responsible for screening contacts and referring them for sputum examination. According the NTP, only 19% of TB cases are diagnosed in PHC. However, Sino Project pilots showed a bit more than half of all suspected cases in four districts were referred by PHC facilities in 2006 and 2007. Referral rates varied from 99% in Varzob to 27% in Tursunzoda (in 2006; the rate was higher in 2007). A good example of integration of TB services into PHC is found in the Vahdat district.

There is, as stated, a high turnover rate of medical staff in Tajikistan, but no need assessment of medical staff for the NTP. Table No. 16 shows the number of general practitioners doctors and other specialists available in the country, but not involved (or partially involved) in TB control. It is clear that rural or remote areas are not covered by adequate medical care in general.

Table 16. General practitioners and specialists in Tajikistan

Type of doctor	Total	Rural	PHC Facility	Administrative
GP	764	118	702	41
Lung	11	0	3	0
Thoracic surgery	27	1	1	4
Paediatrician	1 657	692	989	124
X-ray	165	29	60	10
TB	201	23	104	15
Infection	328	57	81	37
Total	**3 156**	**920**	**1 943**	**222**

Source: State Statistical Reporting. Report on Medical Personnel (Statistical Form #17). Ministry of Health, 2007.

Challenges

- TB is not fully integrated into PHC. There is no accurate way to found out how many cases are discovered, treated or followed up by PHC. The degree of integration varies among districts, and laboratory services for diagnosing TB are not integrated with general laboratory services.
- There is no comprehensive health sector strategy for improving response to the current challenges, including TB, HIV/AIDS and malaria.
- Coordination of different institutions and health care sectors, including TB, is weak.
- There is a lack of coordination among authorities and stakeholders at all levels.
- Lack of funding hinders integration of TB with PHC.

Recommendations

- The global economic crisis should be taken into account in planning health care sector reforms; it could accelerate integration of TB programmes into PCH.
- The link between NTP services and PHC should be strengthened in practices.
- A new NTP document should be drafted based on the Stop TB Partnership Strategy and actual needs assessment.
- All interventions to integrate TB into PHC should support the national TB programme to ensure equal access to services and bring services closer to rural areas and promote community-based DOTS.
- Areas of possible exploration for further improvement of the TB and health system in general are health information systems, health management systems and drug management systems.
- Action should be taken to transfer TB activities to the auspices of PHC if the health care sector has developed enough capacity for a high-priority public health intervention.
- Continuing training of PHC workers is important in light of high staff turnovers.
- The Vahdat district could be used as an example of integration of TB facilities with PHC, the role of volunteers and good local political support.

10.3 Training

National training seminars for regional coordinators are conducted at least annually on key issues of TB control, microbiological diagnostics and quality control. Basic training for doctors and laboratory workers are conducted via NTP training centres with financial support of partners.

Table 17. Personnel trained by Project Hope, Sino Project, ICRC and NTP, 2004–2008

1	General practitioners	1 289
2	TB doctors	136
3	PHC nurses	1 422
4	Laboratory technicians	361
5	Nurses, sputum collection	72
6	Electronic TB data surveillance personnel	14
7	Epidemiologists	26
8	Chief doctors	24
9	Journalists	32

Challenges

- There is no full-time person responsible for human resources development (HRD) at the NTP.
- There is no comprehensive strategic HRD plan.
- Training materials are outdated, from 1993. There is no plan for updating the curricula at medical facilities.
- Training is lacking for medical staff who could be involved in the Stop TB partnership.
- Training for TB control is included in the basic curriculum of doctors, but is not adequately covered for nurses and lab Technicians.
- There are inadequate staff at the national level, a rapid turnover of staff at all levels, untrained staff, staff not posted at the required stations and a lack of complete information on staff availability and training status.
- The NTP has no HRD plan to address maintaining a good level of proficiency in programme activities.

Recommendations

- Make HRD an NTP priority.
- Prepare a strategic plan for resource development according to actual need (NTP and stakeholders).
- Identify training and staff needs for all components of the Stop TB Strategy.
- Make job descriptions for NTP managers at all levels.
- Update the HR TB training curricula.
- Establish on-going training for staff at all levels of the health care system.
- Systematically supervise and monitor recruitment and training needs.
- Plan for, hire and train adequate numbers of staff at different levels of the health system with the necessary competences to implement and sustain TB control activities based on the DOTS strategy.
- A new NTP document should emphasize achieving the national targets in TB control.

10.4 The Practical Approach to Lung Health (PAL)

The Practical Approach to Lung health (PAL) Strategy has not been implemented in Tajikistan and though the Sino Project is attempting to implement PAL as a pilot. The NTP structure is too vertical and rigid to accept transformation according the international best practice and evidence-based medicine, gradual integration with PCH or PAL. A first attempt in this direction is planned for a GFATM Round 9 project.

Only four departments in Dushanbe specialize in respiratory patients, and there are no special services for them in the country. Only 12 lung specialists are registered in the country. The TB

and Lung Specialists Association was established in 2007, but in practice it does not meet regularly and has no any impact on health care reforms.

Challenges

- Health statistics for respiratory diseases are poor and there is no information exchange among the NTP, academia and epidemiology.
- PAL has not been introduced.
- There is no consistent approach to diagnosis and treatment of TB and other pulmonary diseases at different levels of health care system.
- Inefficient use of resources does not ensure the rational use of drugs and related health care provided at the most appropriate levels of the system.
- There is a lack of appropriate coordination among TB and other health services.

Recommendations

- Include PAL in health sector reform. The first step is needs assessment and development of an appropriate PAL strategy.
- Secure external technical assistance for PAL implementation.
- Conduct visits by local health experts to countries where PAL has been implemented, e.g., Finland or Estonia; valuable experience and possible practical support could be expected from Kyrgyzstan, where PAL was started in 2003.
- Develop a national PAL guideline according to international and national policies and available resources, followed by the gradual expansion of PAL countrywide along with implementation of the PAL model through M&E tools.
- Seek consultative meetings with PAL experts and regional focal points (the Association of Pulmonary and TB physicians, APTB); establish a national working group and assess PAL need.
- Obtain medical equipment to improve diagnostics and treatment of pulmonary diseases at the regional hospitals.
- Train medical staff from different levels in PAL.

10.5 Involvement of all care providers

Tajikistan has a rather large public health network. Unfortunately, the private sector is not well developed yet. A private medical care providers' policy was endorsed in 2003. Most patients are served by the established public health facilities. Because TB is a stigmatized disease in Tajikistan, subject to a low level of awareness, it is likely that TB patients seek medical care in the non-NTP facilities. Traditionally, many Tajik people use healers' services. There are number of well-respected traditional healers all around the country. Consequently, many patients are misdiagnosed and reach the NTP services rather late. One of the GFATM Round 8 objectives is to implement a public-private mix (PPM) in the country.

Recommendations

- Gradually involve private practitioners and non-NTP health providers in the TB control programme. The NTP should plan and promote collaboration with all current and potential TB providers.
- Explore the potential involvement of additional public/private sectors (Ministry of Health and partners).
- Use Dushanbe, where most of the private practitioners and non-NTP health facilities are located, as the pilot area.

- Set up a coordination mechanism for the public-private mix, with national meetings for situation analysis, strategy, guidelines development and monitoring, and produce guidelines, information, education and communication (IEC) materials and tools.
- PPM training for representatives of different sectors should be conducted annually.
- Implement a new, effective method to improve sputum collection and examination (e.g., payment per sample, patient, slide or coverage).

10.6 International Standards For Tuberculosis Care (ISTC)

ISTC, launched by WHO in 2006, have not been completely accepted by the NTP, whose staff are not adequately familiar with the subject, nor in medical school curricula.

Recommendations

- Adapt ISTC as a part of the NTP document. These standards should be accepted by Ministry of Health and endorsed by the NTP team.
- Make ISTC training part of the NTP educational programme for medical staff at different levels.
- Include ISTC in medical school curricula for doctors, nurses and laboratory staff.
- Ensure that all public and private health providers to ISTC.

10.7 Empowering People With TB

A yearly plan for advocacy, communication and social mobilization (ACSM) activities was agreed with partners and approved by the Ministry of Health.

Advocacy

ACSM activities have played a very important role in the NTP programme in Tajikistan. Initial activities focused primarily on health care providers in both TB services and PHC, and then on the general population, including training, development of a technical working group and national communication strategy, KAP surveys, health education and a small grant program. The working group has been very active, from developing the communication strategy through implementation of education and BCC activities. It was established to plan ACSM activities aimed at increasing community awareness and care seeking for TB symptoms, engaging local organizations and focusing activities on communities where treatment procedures have demonstrated their effectiveness.

A number of IEC initiatives have already been undertaken, mainly in information dissemination, public awareness-raising, advocacy and sensitizing of health care providers regarding standardized treatment regiments. All national and district TB coordinators were trained in IEC for strengthening TB information among the population. Forty-four specialist nurses were educated in consulting with TB patients. Specialists were also given journals expressly addressing TB consultation.

Communication

Starting in 2007, interpersonal communication training was conducted for nurses in Kulyab (18), Vose (23), Rudaki (23) and Dushanbe city (21). Participants founded a patient support group, providing TB-related information for patients and their families in order to strengthen treatment adherence and decrease “default” results. Media workers (58) from central radio stations, TV and newspapers have been trained in providing reliable TB information.

Through GFATM funding health education materials, including brochures, posters, booklets and a video, are available for World TB Day.

Table 18. Materials distributed, 2007–2008

	Material **For the public:**	**2007**	**2008**
1.	Booklet *For a world without TB*	47 000	60 000
2.	Brochures on TB and treatment	16 000	10 000
3.	Brochures on sputum collection	5 000	-
4.	Brochures for religious authorities	-	7 500
5.	Posters for TB patients on behaviour norms	850	-
6.	Calendars with TB symptoms	-	150
7.	Video	-	3
8.	Video *TB is curable*	-	1
9.	Video *Flower of hope*	-	1
10	Theatre piece	1	-
11.	Radio play	1	-
12.	Broadcasting	8	12
13.	Telecasting	8	10
14.	Banners with TB information	-	950
	For medical workers:		
15.	Diagnostic algorithm for PHC doctors	3 000	-
16.	Posters for lab specialists	100	-
17.	Journal for nurses on consultation of TB patients	-	3 000

In order to improve TB knowledge, special training has been given to 75 specialists of Region Healthy Life Style Centres, who passed it on to 610 volunteers. The Red Crescent Society has also trained 316 volunteers in TB education. A small grant programme was conducted for three years, working with 10 local NGOs in pilot regions, and Project HOPE provided technical assistance and IEC materials. Some of the activities included community initiatives, media outreach through public service announcements and radio broadcasts, theatre performances on TB, and railway outreach with migrant workers.

Treatment support groups (TSG) have been organized and trained to conduct patient outreach and DOT in pilot regions to support health care workers and patients, with good success and much enthusiasm from participants. Healthy Lifestyle Centre staff were given cascade training in TB education and provided with IEC materials. Community leaders were also trained.
Public and private collaboration is not a focus of the programme, due to the nature of the vertical TB system in Tajikistan, whereby TB can only be treated in the public health sector.

The project trained national partners in international standards for development, pre-testing of IEC materials. Such materials were printed and distributed throughout the country by Project HOPE and other partner organizations. Project HOPE developed counselling charts and trained medical staff of two TB hospitals on interpersonal communication and counselling skills.

Challenges:

- It is not clear whether ACSM activities are undertaken in support of NTP goals or whether they are being evaluated.
- The small grants programme showed its high effectiveness in involving local NGOs in work with risk groups and the general population, but it covered only pilot districts and only two rounds were conducted due to limited funds.
- More funds are needed for close work with media. The project conducted journalist training only in Dushanbe and Rudaki and developed three public service

announcements that were not broadcast in full due to limited funds. To create greater media involvement more activities should be supported.

Recommendations:

- Assess the impact of ACSM activities through surveys.
- Pursue and strengthen opportunities for community-based TB care.
- Build capacity for training volunteers, who play major role in increasing community awareness of TB risks, symptoms and prevention.
- Expand information regarding TB/HIV and MDR TB, and provide all the medical network organizations with the educational materials.
- Submit information on health educational activities related to TB, TB HIV, MDR TB and prevention measures to RTBC.
- Get local NGOs to take part in the ACSM activities among different target groups.
- Discussions/trainings on TB, TB HIV, and MDR TB take place with the prisoners and prison medical and non-medical staff according to agreed schedule;
- To define culturally sensitive tools for informing patients
- Stakeholders can set-up different models to improve adherence of TB patients to their treatment. One possible solution is combined interventions for information-motivation-behaviour model could be proposed for patients' education and changing their behaviour, which means strengthening the patients' capacity.

10.8 Community participation in TB care

Many social factors can influence patients' adherence to treatment. Social support for the patients and their families should provided by government and stakeholders. Collaboration between Project HOPE and the World Food Programme (WFP) provided food assistance for vulnerable patients, helping to ensure their timely and complete treatment for TB and decreasing the overall economic and social costs. The two DOTS pilot areas were also selected for a food incentive programme with the World Food Programme for vulnerable TB patients and their families, selected through a questionnaire. Food was distributed three times at two month intervals, providing daily rations of staples. The results were highly positive, raising the question of whether in the future to supply all impoverished TB patients and their families with food assistance. Among new smear-positive patients receiving food assistance, the proven cure rate was 86% compared to 60% for those not receiving it. For smear-negative cases, the rates were 92% versus 70%. Food distribution reached a total of 400 patients and their families. Collaboration with the WFP continued until March 2004. The programme then had to be drastically curtailed, because of uncertain funding.

Recommendation

Temporary food assistance is an important factor in adherence, family support and positive outcomes, and should be a part of TB care.

The Patients' Charter for TB Care

The Patients' Charter for Tuberculosis Care outlines the rights and responsibilities of TB patients. In Tajikistan there is lack of awareness of this document; patients, NTP managers and health personnel in general are not well-informed of patients' rights and responsibilities, and training is insufficient. The charter has not been translated into Tajik or Russian.

Recommendations

- Translate the charter into local languages.
- Train appropriate medical and non-medical staff in the charter.

- Inform patients and their families of their rights and responsibilities (PHC staff, non-medical staff, volunteers and stakeholders).
- Find the best way to use the charter (NTP and stakeholders).
- Incorporate the charter into the new NTP programme.

10.9 Research

The NTP has not recognized the importance of programme-based operational research (OR) in evaluating and scaling-up the various components of the Stop TB Strategy. Many problems related to DOTS implementation have been noted. This offers excellent opportunities for OR in different areas of the programme. During the last five years of DOTS implementation, some OR has been conducted.

Box 1. Operational research conducted by Project HOPE/ NTP

1. Knowledge, attitude and practice survey, 2005: A baseline data collection for TB knowledge, attitudes, practice in specified targeted groups for development of the national strategy, conducted in 14 districts. As a result, an advocacy and communication strategy was adopted.

2. Rational use of TB drugs in Tajikistan, 2007, 2008: Data collection on drug use, side-effects, drug management.

3. Drug resistance survey, 2008-recently has finished (see results under chapter laboratory).

4. Knowledge, attitude and practice survey, 2008: Studying progress of TB knowledge, attitudes, practice in specified targeted groups as a result of ACSM activities, conducted in cooperation with the World Health Organization Tajikistan Country Office.

5. Food impact on treatment outcomes of TB patients in Tajikistan, 2008: Showed significant completion of treatment by participants in an incentive programme, compared to a group of patients who did not receive food support.

Two well-planned and executed Sino Project studies should be mentioned, even though they do not represent true operational research.

1. Review of DOTS and its integration into family medicine services in Sino project districts (March 2008): The Sino Project has TB-related activities in four districts. In close collaboration with the NTP and Project Hope, it has promoted the integration of DOTS into the emerging family medicine system. Many weaknesses and challenges were identified in the districts where the project activities were conducted, with concrete, rational and useful recommendations for the NTP, health care reforms and health care in general.

2. Survey among registered TB cases to investigate costs of illness at the household level: Gives very useful information on the degree of doubt of TB curability, costs of illness at the household level, influence of service choices on the cost of illness.

Another useful report, conducted by the American Red Cross, is the "Mid-term monitoring review report: lot quality assurance sampling methodology, Vahdat, Tajikistan", which covers the results of an assessment conducted among the general population, TB patients and TB and PHC doctors and nurses to measure progress of indicators.

OR was not a priority of the NTP plan and only three OR projects are planned through GFATM Round 8, for 2010–2014. The NTP is still not involved in clinical trials to develop new diagnostics, drugs or vaccines.

Challenges

- Programme-based OR is still not an integral component of DOTS implementation.
- The NTP managerial team and academia are insufficiently aware of OR significance or requirements.

- There is no collaboration among TB programme managers from national and regional levels, medical faculty, academia and research institutions.
- International partners conducted some OR; however, the results are not shared regularly among the other partners.

Recommendations

- Make programme-based OR an integral part of the Stop TB Partnership strategy.
- Use OR as a means of systematically gathering, analysing and interpreting relevant data.
- Involve NTP clinicians, the Institute for Healthy Life Style, students, NGOs, laboratory staff and statisticians and other local and international institutions in OR.
- Secure international technical support for OR planning and development.
- Use OR to address basic elements of DOTS components, collaborative TB/HIV activities, MDRTB/XDR-TB, PAL and social mobilization and community involvement.
- Develop and strengthen the capacity of national and regional managers for OR planning, methodology development, execution and analysis.
- Develop a relevant national research agenda jointly among the NTP, academia and international partners.
- Develop generic protocols for NTP-identified priority areas and send invitations for proposals to institutions and individuals of repute.
- Ensure collaboration of academic and medical university researchers and NTP managers at each step of OR management.
- Share OR results transparently among partners and stakeholders. Medical journals and publication, newsletters as well as the programme's web sites could be used for dissemination.
- Stage clinical trials to develop new diagnostics, drugs and vaccines.

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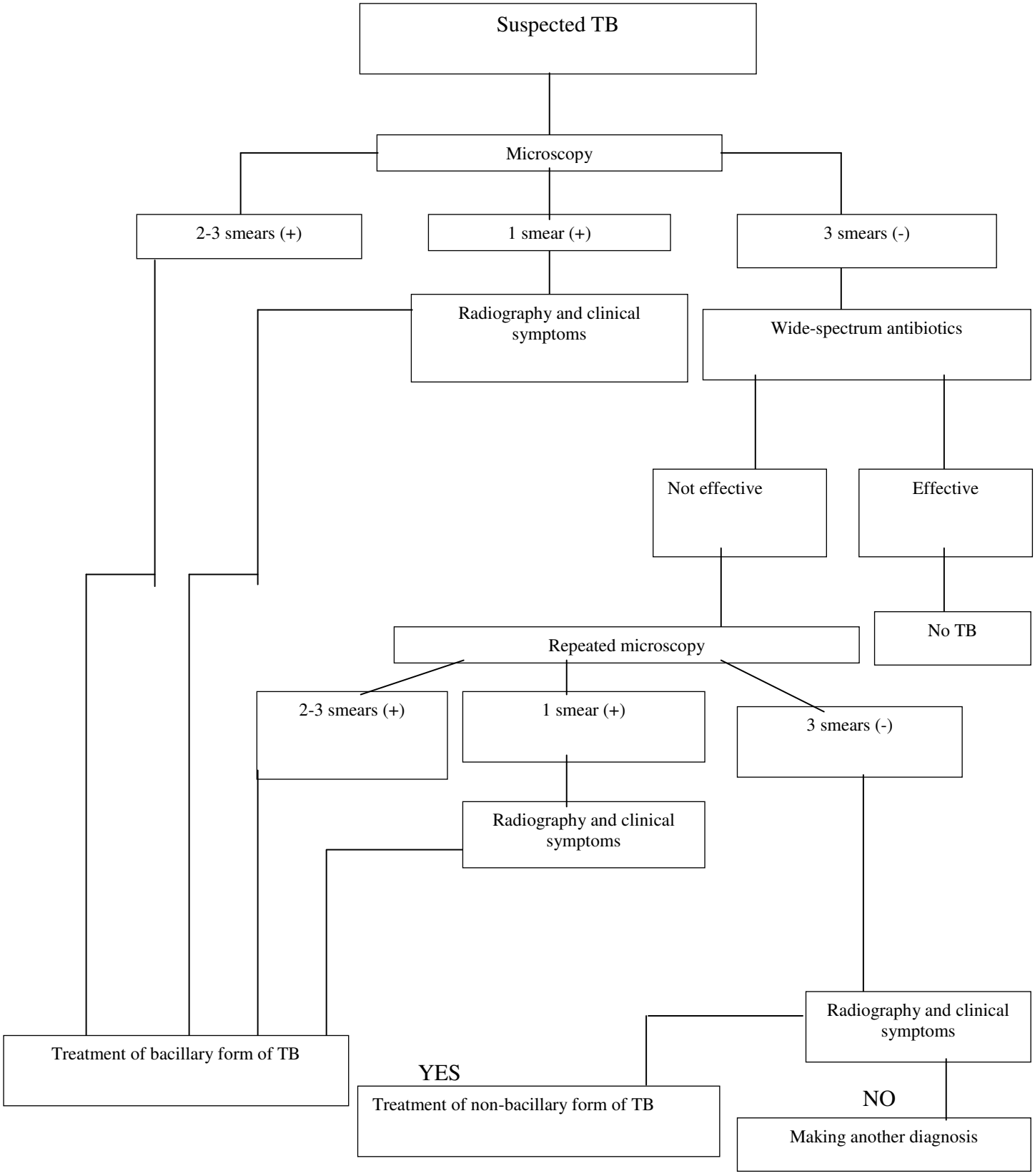
ANNEX 1. TB DIAGNOSIS FLOWCHART



ANNEX 2. TAJIKISTAN HEALTH PROFILE

Copied from the World Health Organization *Global health atlas.* Geneva, 2003-2007 (http://apps.who.int/globalatlas/predefinedReports/TB/PDF_Files/tjk.pdf, accessed 7 May 2010).

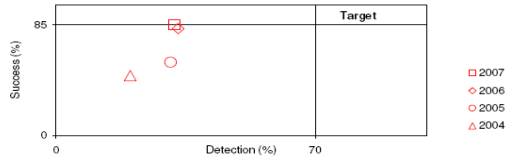
TB COUNTRY PROFILE

Tajikistan

Surveillance and epidemiology

Population (thousands)[a]	6 736	
Estimates of epidemiological burden, 2007[b]	All	In HIV+ people
Incidence		
All forms of TB (thousands of new cases per year)	16	0.6
All forms of TB (new cases per 100 000 pop/year)	231	9.1
Rate of change in incidence rate (%), 2006–2007	**9.1**	**25**
New ss+ cases (thousands of new cases per year)	6.9	0.2
New ss+ cases (per 100 000 pop/year)	103	3.2
HIV+ incident TB cases (% of all TB cases)	4.0	–
Prevalence		
All forms of TB (thousands of cases)	22	0.3
All forms of TB (cases per 100 000 pop)	**322**	4.6
2015 target for prevalence (cases per 100 000 pop)	**97**	–
Mortality		
All forms of TB (thousands of deaths per year)	3.1	0.2
All forms of TB (deaths per 100 000 pop/year)	**46**	3.1
2015 target for mortality (deaths per 100 000 pop/year)	**10**	–
Multidrug-resistant TB (MDR-TB)		
MDR-TB among all new TB cases (%)	16	–
MDR-TB among previously treated TB cases (%)	41	–

New ss+ case detection and treatment success

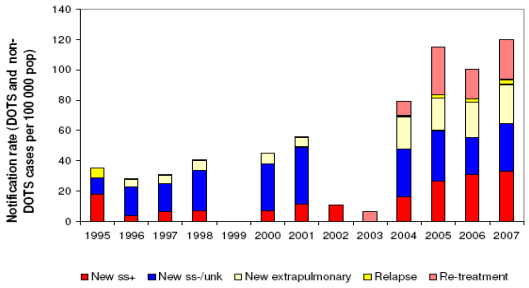


Note: case detection rate is for the year indicated. The associated treatment success rate is for one year prior.

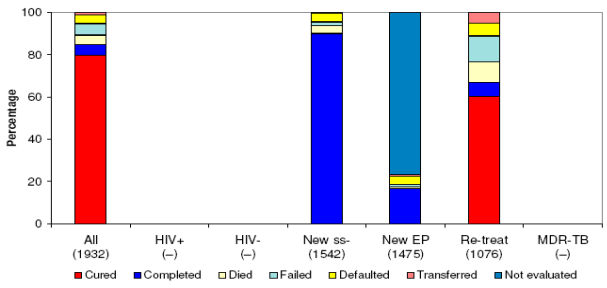
Total notifications, 2007

Notified new and relapse cases (thousands)	6.3
Notified new and relapse cases (per 100 000 pop/yr)	93
Notified new ss+ cases (thousands)	2.2
Notified new ss+ cases (per 100 000 pop/yr)	33
as % of new pulmonary cases	51
sex ratio (male/female)	1.3
DOTS case detection rate (% of estimated new ss+)	**30**
Notified new extrapulmonary cases (thousands)	1.7
as % of notified new cases	29
Notified new ss+ cases in children (<15yr) (thousands)	0.0
as % of notified new ss+ cases	1.5

Case notifications



Treatment outcomes, 2006 cohorts



Note: Numbers under the bars are the numbers of patients included in the cohort.

	2000	2001	2002	2003	2004	2005	2006	2007
DOTS coverage (%)	0.00	0.00	13	13	32	61	79	100
Notification rate (new & relapse cases/100 000 pop)	45	56	64	67	70	83	81	93
% notified new & relapse cases reported under DOTS	–	–	15	26	44	62	88	95
Notification rate (new ss+ cases/100 000 pop)	7.0	12	11	0.00	16	27	31	33
% notified new ss+ cases reported under DOTS	–	–	15	–	57	74	97	93
Case detection rate (all new cases, %)	38	41	7.1	–	38	42	37	39
Case detection rate (new ss+ cases, %)	13	19	16	0.00	20	31	33	32
Treatment success (new ss+ patients, %)	77	72	79	46	56	82	85	–
Re-treatment success (ss+ patients, %)	–	56	–	67	74	69	67	–

Note: notification, case detection and treatment success rates are for the whole country (i.e. DOTS and non-DOTS areas combined).

DOTS expansion and enhancement

Overview of services for diagnosis of TB and treatment of patients

Description of basic management unit	–	
Number of units (DOTS/total), 2007	71/ 71	
Location of NTP services		
Rural	–	
Urban	–	
NTP services part of general primary health-care network?		Yes
Location where TB diagnosed		
Rural	–	
Urban	–	
Diagnosis free of charge?	Yes (all suspects)	
Treatment supervised?	All patients in all units	
Intensive phase	Health-care worker	
Continuation phase	Health-care worker	
Category I regimen	–	
Treatment free of charge	All patients in all units	
External review missions	last: –	
	next: –	

Political commitment

National strategic plan?	Yes	(2003 – 2010)
Mechanism for national interagency coordination?	Yes	(established 2004)
National Stop TB Partnership?	No	(planned 2009)

Financial indicators, 2009 (see final page for detailed presentation)	%
Government contribution to NTP budget (incl loans)	–
Government contribution to total cost TB control (incl loans)	–
Government health spending used for TB control	–
NTP budget funded	–

Per capita health financial indicators, 2009	US$
NTP budget per capita	–
Total costs for TB control per capita	–
Funding gap per capita	–
Government health expenditure per capita (2005)	–
Total health expenditure per capita (2005)	–

Tajikistan profile, page 1

DOTS expansion and enhancement (continued)

Quality-assured bacteriology

National reference laboratory? Yes

All TB laboratories performing EQA of smear microscopy or DST under the supervision of the National Reference Laboratory

	Smear					Culture			DST					
	Number	per 100 000[a]	EQA	% adeq perf		Number	per 5 000 000[a]		Number	per 10 000 000[a]		EQA	% adeq perf	
2007	97	1.4	0	5.0	–	%	0	0	0	0	0	0	0	–	%
2008	102	1.5	0	102	–		2	1.5	0	2	2.9	0	2.0	–	

Note: for routine diagnosis, there should be at least one laboratory providing smear microscopy per 100 000 population. To provide culture for diagnosis of paediatric, extrapulmonary and ss-/HIV+ TB, as well as DST for re-treatment and failure cases, most countries will need one culture facility per 5 million population and one DST facility per 10 million population. EQA column shows number of labs for which EQA was done. Adeq perf: adequate performance for microscopy based on results of EQA.

System for managing drug supplies and laboratory equipment

	Central level			Peripheral level		
	2005	2006	2007	2005	2006	2007
Stock-outs of laboratory supplies?	–	No	No	–	Some units	No
Stock-outs of first-line anti-TB drugs?	Yes	No	No	No	No	No

Monitoring and evaluation system, and impact measurement

NTP publishes annual report?	Yes	(since 2003)	
% of BMUs reporting to next level in 2007			
Case-finding	84 %	Treatment outcomes	39 %

Burden and impact assessment		last	next
In-depth analysis of routine surveillance data	No	–	–
Prevalence of disease survey	Yes, national survey	2007	2008
Prevalence of infection survey	Yes, national survey	2007	2008
Drug resistance survey	–	–	–
Mortality survey	No	–	–
Analysis of vital registration data	Yes	2007	2008

Development of human resources, 2007

Number of TB posts 0 Percentage of TB posts filled 0 %

Note: percentage calculation restricted to categories of posts for which both the total number of posts and the number of posts filled reported.

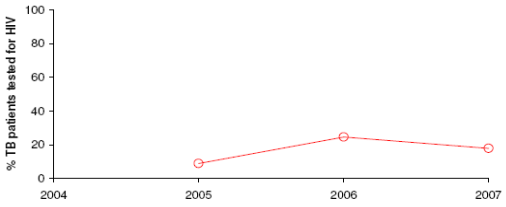
MDR-TB, TB/HIV and other challenges

	2005	2006	2007
Multidrug-resistant TB (MDR-TB)	number (% of estimated ss+ MDR-TB)		
Estimated incidence of ss+ MDR cases	2 664	2 970	3 286
Diagnosed and notified	– (–)%	0 (0)%	– (–)%
Registered for treatment	– (–)%	– (–)%	– (–)%
GLC	–	–	–
non-GLC	–	–	–

Detection and treatment of HIV in TB patients, 2007

TB patients for whom the HIV test result was known	1 443
as % of all notified TB patients	18
TB patients with positive HIV test	62
as % of all estimated HIV+ TB cases	10
HIV+ TB patients started or continued on CPT	0
as % of HIV+ TB patients notified	0
HIV+ TB patients started or continued on ART	0
as % of HIV+ TB patients notified	0

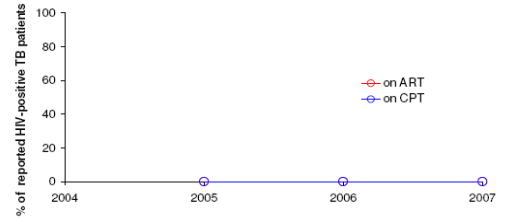
HIV testing for TB patients



Screening for TB in HIV-positive patients, 2007

HIV+ patients in HIV care or ART register	339
Screened for TB	28
as % of HIV+ patients in HIV care or ART register	8.3
Started on TB treatment	15
as % of HIV+ patients in HIV care or ART register	4.4
Started on IPT	75
as % of HIV+ patients without TB in HIV care or ART register	23

CPT and ART for HIV-positive TB patients



High-risk groups, 2007

Number of close contacts of ss+ TB patients screened	10 999
Number of TB cases identified among contacts	257
% of contacts with TB	2
Contacts started on IPT	5 452
% of contacts without TB on IPT	51

Contributing to health system strengthening

Practical Approach to Lung Health (PAL), 2007

Number and proportion of health facilities with PAL services

Number of health-care facilities providing PAL services 0 As % of total number of health-care facilities –

Engaging all care providers

Public-Public and Public-Private approaches (PPM), 2007

Number of Providers collaborating with the NTP[c]

	Number collaborating (total number of providers)		% total notified TB	
			Diagnosed	Treated
Public sector	1 732	(129)	4.0	13
Private sector	221	(72)	0.5	0.5

International Standards for Tuberculosis Care (ISTC)

ISTC endorsed by professional organizations? Yes

by which organizations:

0

ISTC included in medical curriculum? Yes

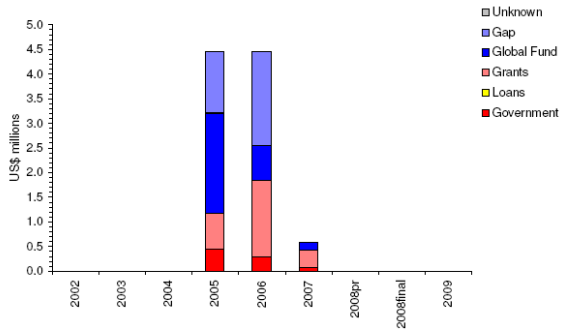
Enabling and promoting research

Programme-based operational research, 2007

Operational research budget (% of NTP budget) 11 %

Financing

NTP budget by source of funding

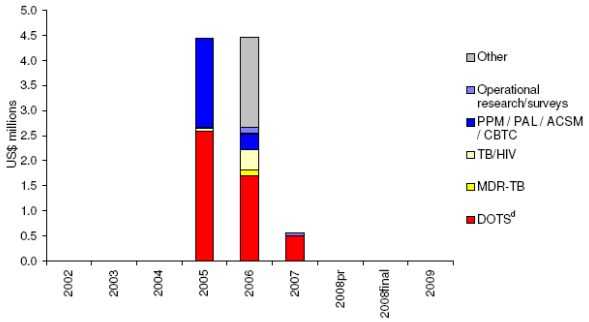


NTP budget line items in 2009

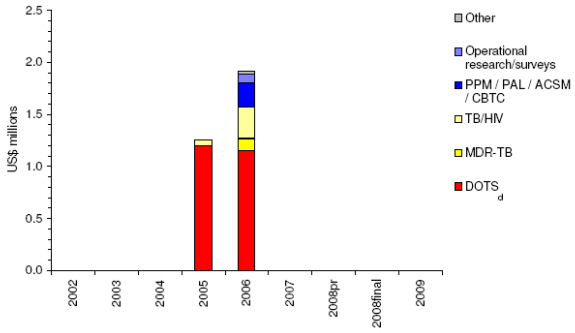
Data not reported

First-line drugs
NTP staff
Prog. management & supervision
Lab supplies & equipment
MDR-TB
TB/HIV
PPM/PAL
ACSM/CBTC
Operational research / surveys
Other

NTP budget by line item



NTP funding gap by line item



Footnotes

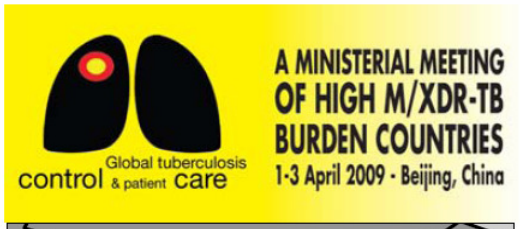
a World population prospects – the 2006 revision. New York, United Nations Population Division, 2007.

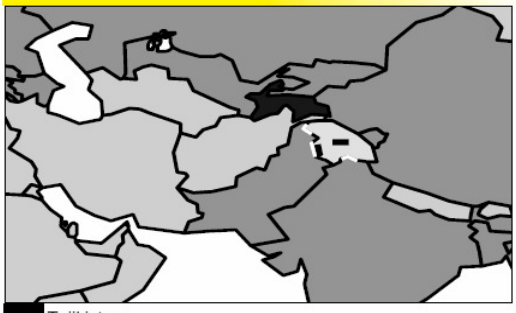
b For data sources and analytical methods, see annexes 2 and 3 of *Global tuberculosis control: epidemiology, strategy, financing: WHO report 2009*. Geneva, World Health Organization, 2009 (WHO/HTM/TB/2009.411). The report is also available on-line at www.who.int/tb/publications/global_report.

c For a definition of public and private sector and the categories of provider considered in each case, see Chapter 2 of the above-mentioned report and the 2008 WHO TB data collection form.

d DOTS includes the following components: first-line drugs, NTP staff, programme management and supervision, and laboratory supplies and equipment.

Tajikistan





Tajikistan
Other high MDR-TB burden countries
Other countries

Population

	6 735 996

Estimates of epidemiological burden, 2007

	All	HIV+
Incidence, all forms of disease (per 100,000 pop/year)	231	9.1
Incidence, ss+ cases (per 100,000 pop/year)	103	3.2
Of incident TB cases, % HIV+	3.95	
Prevalence, all forms of disease (per 100,000 pop/year)	322	4.6
Prevalence, ss+ cases (per 100,000 pop/year)	147	1.6
Mortality (per 100,000 pop/year)	46	3.1

Drug-resistant TB

Estimates 2007	
Number of MDR-TB among all TB cases	4 688
MDR-TB among all new TB cases (%)[1]	16.2
MDR-TB among previously treated TB cases (%)[1]	41
Incident MDR-TB ss+ cases	3 286
Notification	
Diagnosed and notified	–
Registered for treatment	
GLC	–
non-GLC	–
Expected to be treated in 2008	–
Expected to be treated in 2009	–

TB/HIV

Estimated 2007 PLWHIV*	10 000
Number of PLWHIV screened for TB	28
Number of PLWHIV receiving IPT	75

Diagnostic capacity for DST

NRL	Yes
NRL EQA with SRL	Yes
Drug susceptibility testing for SLD	No
Year of last DRS	
Access to DST (per 10 million pop)	0.0

Political Commitment

MDR component in the country TB plan	Yes
National guidelines for the management of MDR-TB	Yes
National funding for MDR-TB	Yes
GF Grant for MDR-TB	Yes

Human resources

MDR-TB focal point at the NTP	No
Plan for training HR	Yes
Training material developed	No

Advocacy

ACSM included in TB national plan	Yes

Infection Control

National policy	Yes

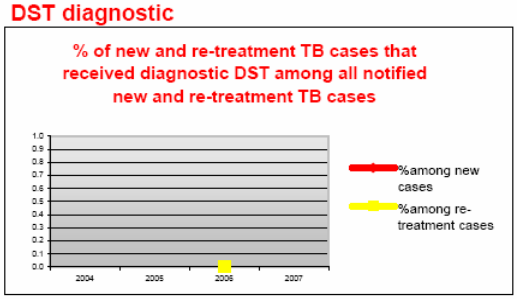
TB notifications, 2007

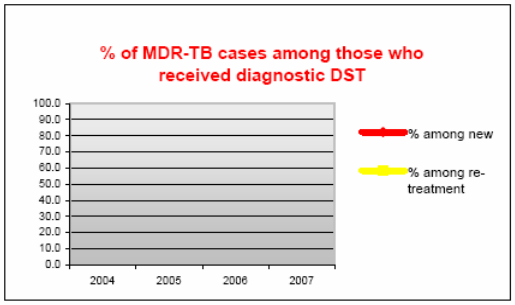
Notified new and relapse cases (per 100 000 pop/yr)	93
Notified new ss+ cases (per 100 000 pop/yr)	33
DOTS case detection rate (% of estimated new ss+)	30

XDR-TB

Cases reported	No
Rapid surveys or equivalent accomplished	No

DST diagnostic





Community involvement in MDR-TB control

Case finding	–
DOT provision	–
Advocacy	–
Social mobilization	–

Technical and financial support

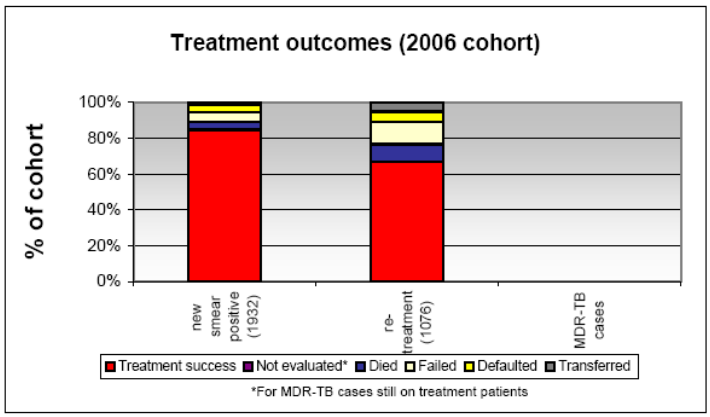
Main technical partners for MDR-TB	Project Hope, MSF, ICRC, Caritas (Luxembourg) GDF
Main funding agencies	USAID, KfW, GF

Treatment through the GLC

GLC approved projects	Yes

Drug management

GLC drug registration is limiting access	–
Availability of SLD outside GLC	All
FLD available over the counter without medical prescription	No
SLD available over the counter without medical prescription**	No



Engaging all care providers

MDR-TB manage by the providers outside NTP	No
Number of private health facilities collaborating with NTP	–
Number of public health facilities collaborating with NTP	–
Number of NGO health facilities collaborating with NTP	–

Abbreviations

– indicates no information available, ACSM advocacy, communication and social mobilization; CDC, Centers for Disease Control and Prevention; DOT, directly observed treatmnet; DRS, drug resistance survey; DST, drug susceptibility testing; EQA, external quality assurance; FIND, Foundation for Innovative New Diagnostics; FLD, first-line drugs; GDF, The Global Drug Facility; GF, the Global Fund to fight AIDS, Tuberculosis and Malaria; GLC, Green Light Committee; GTZ , German Technical Cooperation Agency; HIV, human immunodeficiency virus; HR, human resource; ICRC, International Committee of the Red Cross; IFRC, International Federation of Red Cross and Red Crescent Societies; IPT, isoniazid preventive therapy; KfW, Kreditanstalt für Wiederaufbau; KNCV, The Royal Netherlands Tuberculosis Association; LHL, Norwegian Heart and Lung Foundation; MDR-TB, multidrug-resistant tuberculosis; MSF, Médecins Sans Frontières; NRL, national reference laboratory; NTP, national tuberculosis control programme; PATH, Program for Appropriate Tecnology in Health; PEPFAR, The President's Emergency Plan For AIDS Relief; PIH, Partners inHealth; PLWHIV, people living with HIV; SIDA, Swedish International Development Cooperation Agency; SLD, second-line drugs; SRL, supranational reference laboratory; ss+, smear-positive; TB, tuberculosis; TBCAP, Tuberculosis Control Assistance Program; UNDP, United Nations Development Programme; the Union, International Union Against Tuberculosis and Lung Disease; WB, World Bank; XDR-TB, extensively drug-resistant tuberculosis; DFID, Department for International Development of the UK Government, CHC, Cambodian Health Committee.

Sources

Global tuberculosis control: surveillance, planning, financing: WHO report 2009. "WHO/HTM/TB/2009.411"

www.who.int/globalatlas/dataQuery

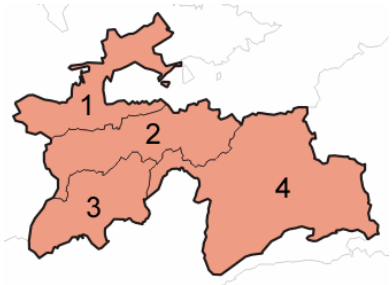
Anti-tuberculosis drug resistance in the world : fourth global report. "WHO/TB/2008.394" or 2008 Annual Notification Report

*Report on the global HIV/AIDS epidemic 2008. "UNAIDS/08.25R/JC151OR"

ANNEX 3. GENERAL INFORMATION ON TAJIKISTAN

Having gained its independence in 1991, Tajikistan faced not only economical difficulties, but also political and ethnic controversies, which led to a five-year civil war in 1992–1997, ending with the General Peace Agreement of 27 June 1997. In 1999, Tajiks marked the 1100th Anniversary of the Samanid Empire, which became a symbol of cohesion for public and political forces.

Geographically the country is situated in the southeastern corner of central Asia, and is bordered by Uzbekistan to the west, Kyrgyzstan to the north, China to the east and Afghanistan to the south. A narrow strip of Afghan territory separates Tajikistan from Pakistan. Tajikistan covers 143 100 km2 with a population density of 43.8 per square km, in spite of 93% of the territory being covered by mountains.
Tajikistan consists of 4 administrative divisions. These are regions of Sugd and Khatlon, Autonomous Gorno-Badakhshan Region (GBAR), and the Districts of Republican Subordination. Each region is divided into several districts, which in turn, are subdivided into village-level self-governing units (*jamoats*/townships). As of 2006, there were 58 districts and 367 townships.[4]



Division	Capital	Area sq km	Population 2007[5]
Sugd	Khujand	25.4	2 113 900
Region of Republican Subordination	Dushanbe	28.6	1 587 100
Khatlon	Kurgan-Tyube	24.8	2 549 500
Gorno-Badakhshan	Khorug	64.2	219.2

The country has little arable land (6%) due to the mountainous terrain. The northern region is industrial, and in the south agriculture dominates. In the east the terrain is mountainous and inaccessible.

The total population of the country was 7 139 800 in 2007, and is comprised of 80% Tajik, 15.3% Uzbek, 1.1% Russian and 3.6% other nationalities, such as Tatars, Kyrgyz and Koreans. Most (75%) of the population lives in rural areas, and 45% is under the age of 14.6

The country's official language is Tajik, a Farsi language. However, Russian is a lingua franca for most of the population, used in government and business. About 85% of people are Sunni Muslims, and 5% are Shi'a Muslims. There are a number of other religious groups in Tajikistan, including Orthodox Christians, as well as small number of Jews.

Tajikistan ranks 122 of 177 on the UNDP Human Development Index,7 and lowest among all the WHO Regional Office of Europe Member States. Even with a steady annual GDP since 1997, Tajikistan remains a low-income country (with GDP per capita $ 795).8 While

[4] Information from the State Statistical Committee of Tajikistan, Dushanbe, 2006.;
[5] Population health and health institutions performance in 2007. Ministry of Health, Centre of Medical Statistic and Information. Dushanbe 2008.
[6] National Human Development Report, 2001-2004.
[7] United Nations Development Programme. *Human Development Report 2006*. New York, 2006.
[8] International Monetary Fund. Retrieved on 22 April 2009.

Tajikistan has experienced steady economic growth since 1997, nearly two-thirds of the population continues to live in poverty.

Cotton is the most important crop. Mineral resources are limited, but include silver, gold, uranium and tungsten. Industry consists of only a large aluminium plant, hydropower facilities and small obsolete factories, mostly light industry and food processing. In 2001 about 28% of the workforce was employed by the government, or on collective farms. According to Ministry of Labour data, 2.5% of the workforce is unemployed.9 This figure excludes the thousands on "unpaid leave", and according to the Poverty Reduction Strategy Paper, the realistic unemployment rate is 33%. The unemployment rate is officially reported as 11.3%.
A growing numbers of workers have been forced to earn their livelihood abroad. According to the Ministry of Labour and Social Protection, the number of labour migrants is around 210 000. The International Organization for Migration (IOM) identified more than 620 000 Tajik citizens as labour migrants, with one in every four households reporting a member involved in labour migration. Of these, over 85% work in the Russian Federation; most are male (91%), and between 18–29 years old (62%).

Primary and secondary school education is compulsory, and the graduation rate exceeds 90 percent. The population is highly literate (99.5%). The portion of population 25 and older with post-secondary education is 11.7%, compared to the CIS average of 13.7, and EU average of 11.2.

Table 1. Country data

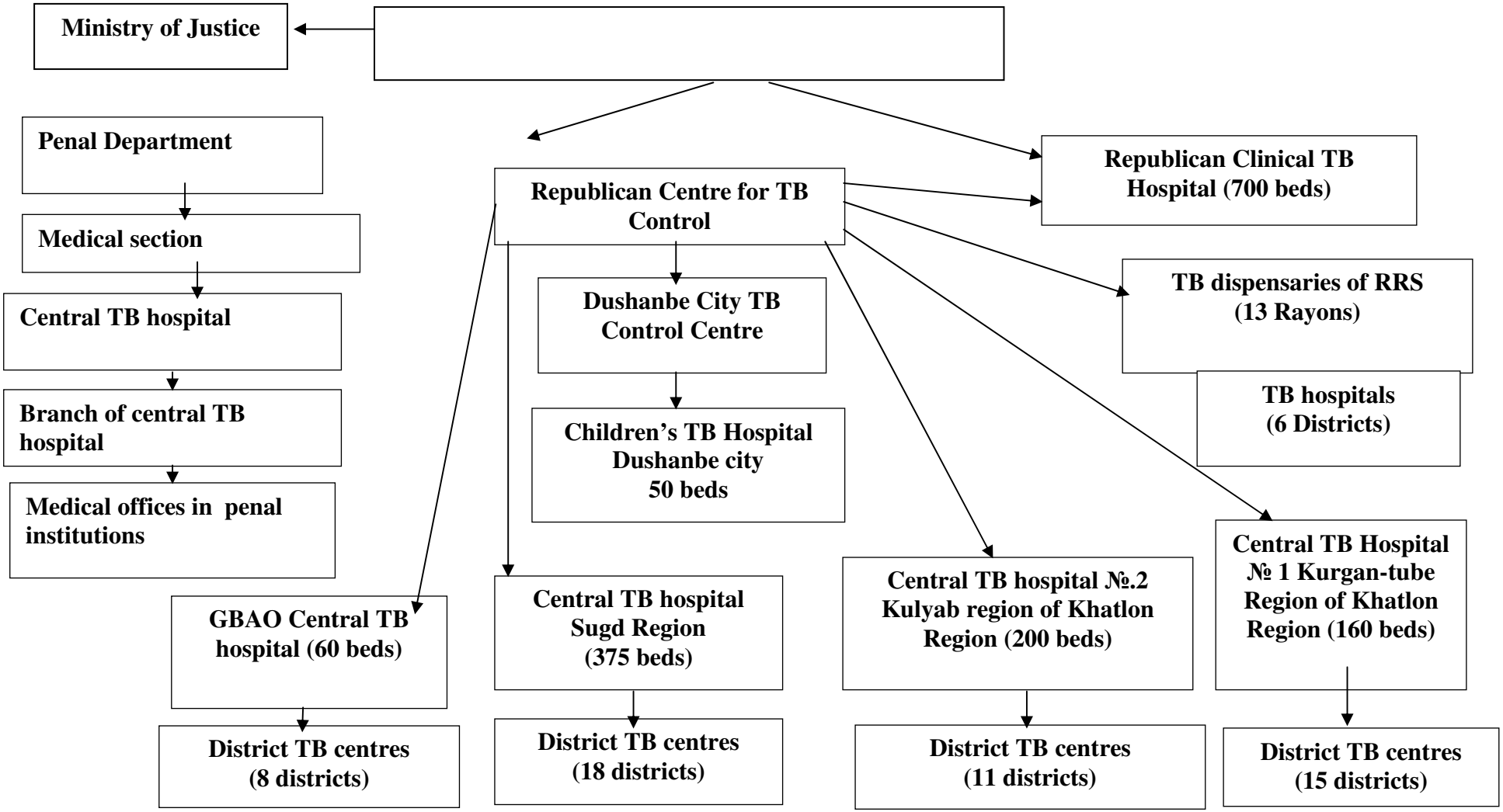
	200810
Population, total	7 211 884
Population growth rate	1.893%
Life expectancy at birth, female (years)	68.15
Life expectancy at birth, male (years)	61.95
Unemployment rate	2.4%
Administrative division	2 provinces and 11 autonomous areas
	200711
GDP per capita	$795
GDP real growth rate	7.8%
Population bellow poverty line	60%
Inflation, consumer prices	13.2%

As is noted in the Government's 2003 Millennium Development Goal (MDG) Report, Tajikistan is unlikely to meet its MDG targets. Progress towards MDG will require a sustained government commitment to policy reform and significant increase in financial resources. Although substantial external financing will be needed to facilitate social development, calls for additional funding must be balanced against a large foreign debt.

In order to improve the living standards of the population and deal with the socioeconomic problems, the government has developed a comprehensive national development strategy (NDS) for 2006–2015, based on the results of the MDG needs assessment report. In cooperation with the World Bank and other stakeholders, the government has also produced a revised poverty reduction strategy paper (PRSP2) for 2007–2009.

[9] United Nations Development Programme. *Human Development Report 2006*. New York, 2006.
[10] Central Intelligence Agency. *World Fact Book*. Washington, 2008 (https://www.cia.gov/library/publications/the-world-factbook/geos/ti.html, accessed 17 February 2009).
[11] World Bank statistics, assessed 17 February 2009;

ANNEX 4. STRUCTURE OF THE TB CONTROL PROGRAMME



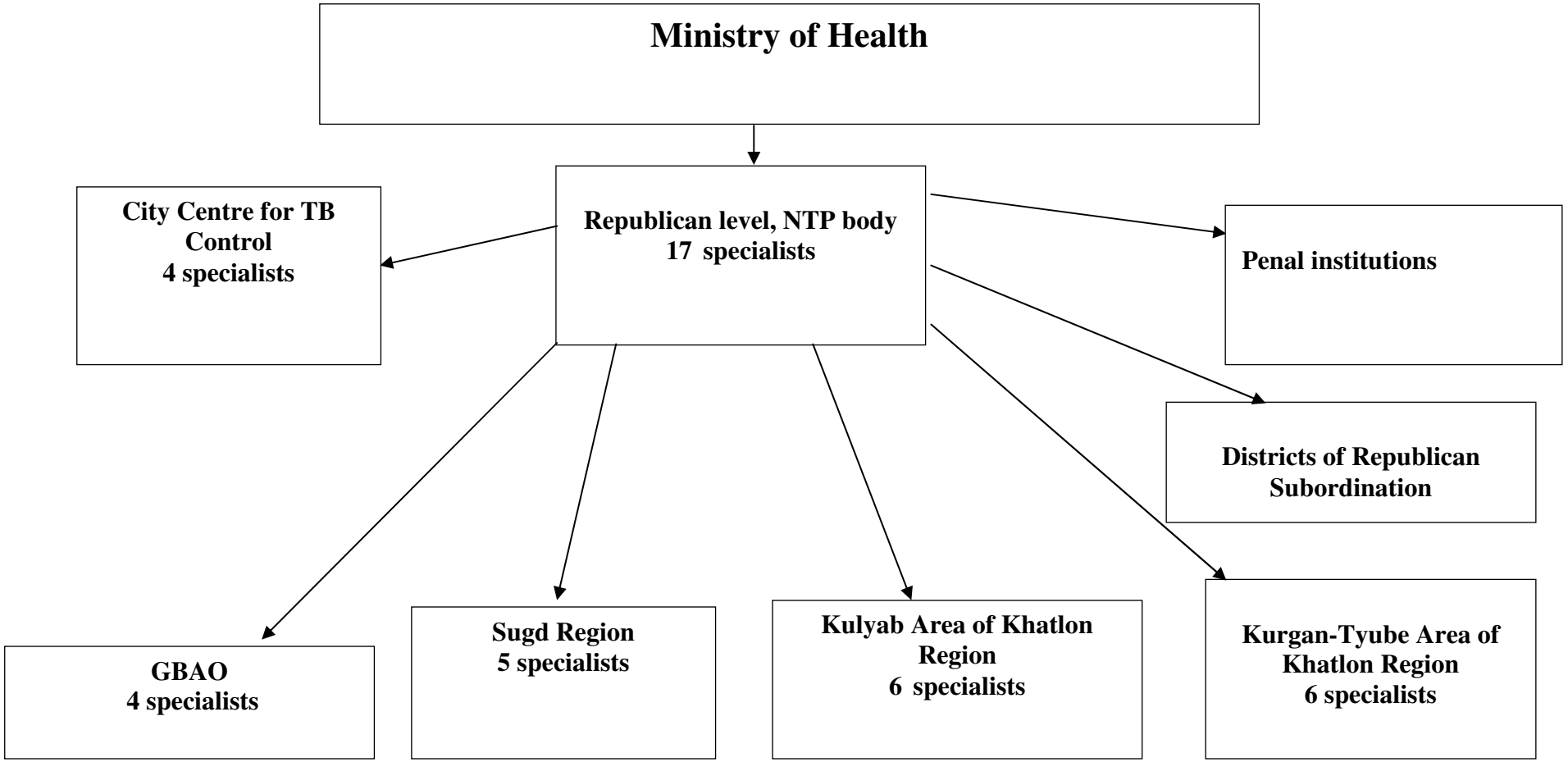
ANNEX 5. SECOND-LINE DRUGS IN TAJIKISTAN

	Brand name	Generic name	Form	Country	Manufacturer	Date of registration
1	Амикацина сульфат	Amikacin	Inf. Plv. Sol. 0.5 gr	Russian Federation	Synthesis, JSC	20.01.03[12]
2	Амикацина - КМП	Amikacin	Inf. Plv. Sol. 0.25 gr and 1.0 vials	Ukraine	KiyevMed Preparati, JSC	14.03.06
3	Канамицина Сульфат	Kanamicin	Inf. Plv. Sol. 1.0	Russian Federation	Biohimik, JSC	14.03.06
4	Канамицина Сульфат	Kanamicin	Inf. Plv. Sol. 1.0	Kazakhstan	Khimfarm, JSC	08.05.06
5	Канамицина сульфат	Kanamicin	Inf. Plv. Sol. 0.5 and 1.0	Russian Federation	Synthesis, JSC	20.01.03
6	Канамицина Сульфат	Kanamicin	Inf. Plv. Sol.	Georgia	Batpharma, LLS	04.07.07
7	Офлоксацин	Ofloxacin	Coated tablets 200mg №10	Russian Federation	Ozon, LLS	31.05.04
8	Офлоксацин - КМП	Ofloxacin	Tablets 200mg №10	Ukraine	KievMed Preparati, JSC	25.03.03
9	Офлоксацин	Ofloxacin	Infusion solution 0.002g/ml – 100ml	Ukraine	Yuri Firm, LLS	30.07.07
10	Тариферид (офлоксацин)	Ofloxacin	Tablets 200mg №10 and 20	Russian Federation	Brinsalov-A, JSC	25.11.05
11	Офлодекс	Ofloxacin injection	Solution 2mg/ml 100 ml in vials	India	Ultra Laboratories, Pvt.	09.07.07
12	Таривид	Ofloxacin	Tablets 200 mg №10	India	Aventis Pharma, Ltd.	07.11.07
13	Глева ТМ I.V. (левофлоксацин)	Levofloxacin	Infusion solution 50mg/100 ml in vials	India	Glenmark Pharmaceutical, Ltd.	12.11.07
14	Глева ТМ I.V. (левофлоксацин)	Levofloxacin	Tablets 250 and 500 mg	India	Glenmark Pharmaceutical Ltd.	12.11.07
15	Левоксин	Levofloxacin	Tablets 250 and 500 mg	Pakistan	Searl Pakistan, Ltd	12.10.06
16	Пасконат	Paraaminisalicilic acid	Infusion solution 400 ml	Ukraine	Yuri Firm, LLC	30.07.07

Source: The Government Registry and Health Products, Dushanbe, 2007.

[12] The expiration time is 15 days.

ANNEX 6. TB M&E AND FIELD SUPERVISION STRUCTURE



ANNEX 7. AGENDA OF THE WHO/UNDP MISSION ON REVIEW OF TB CONTROL

Name	Title	Organization
Richard Zaleskis (RZ)	Regional Adviser, Communicable Diseases Unit	WHO Regional Office for Europe
Gombogaram Tsogt (GT)	Medical Officer	WHO Regional Office for Europe
Andrei Dadu (AD)	Technical Officer	WHO Regional Office for Europe
Stefan Talevski (ST)	Manager	NTP of the former Yugoslav Republic of Macedonia
Kai Blondal (KB)	WHO consultant	WHO Regional Office for Europe
Harald Hoffmann (HH)	Head	The Supranational Laboratory, Gauting, Germany
Maria Idrissova (MI)	TB Programme Advisor	KNCV Representative Office in Central Asia

Time	Activity	Partici-pants
	Monday 9 March, Dushanbe	
14:00–15:00	**Briefing**	All
15:15–17:30	**National TB Centre (NTC)** **Meeting with National counterparts on TB control:** Oktam Bobokhodjaev, Head of Department, Organization of Medical Services, (TB service curator) Sadulo Saidaliev, Director, NTC Abdullo Mahmadov, Monitoring and Evaluation Dept., NTC Firuza Sharipova, Organizational Methodology Dept., NTC Khushvakht Ismonov, MDR Coordinator, NTC Kurbongul Akramova, HIV/TB Coordinator, NTC Mohonim Abdullaeva, Reference Laboratory, NTC Asliddin Rajabov, Drug Management, NTC Firusa Saidova, Coordinator on Communication NTC, Umrinisso Sirojidinova, Training Coordinator, NTC Muhabbat Safarov, Food Distribution Coordinator, NTC	All
	Tuesday 10 March, Dushanbe/Vahdat District	
9:00–9:15	**Meeting with WHO/UNDP** Santino Severoni, Head of the WHO Country Office Saleban Omar, GFATM Grant Manager, UNDP Nazira Artykova, Liaison officer, WHO Country Office Zumrad Maksumova, GFATM TB Grant Manager, UNDP Sayohat Hasanova, STI/HIV/AIDS and TB Officer	All

9:30–10:30	**Ministry of Health** Nusratullo Salimov, Minister of Health Sohibnazar Rakhmonov, Deputy Minister, Curator of TB Service, Head of TB Coordination Committee	All
11:00–11:30	**Republican TB Hospital (Machiton),** Saidahtam Rustamov, Head of the Hospital	All
11:30–13:00	**Republican TB Hospital (Machiton)** • Pulmonary department • Treatment • Drug management	GT, ST
	• Laboratory (Microscopy and bacteriology)	HH, KB
	• Reporting/recording	AD
	• New MDR Department (under renovation) Khushvakht Ismonov, MDR Coordinator, NTC	HH, KB
13:20–14:45	**Lunch**	
15:00–17:00	**State Committee of Sanitary and Epidemiological Surveillance** Dr Samariddin Aliev, State Chief Sanitary Physician Dr Gures Azimov, Head, Ministry of Health Epidemiological Control Dept. Dr Navruz Jafarov, Head, State Committee of Sanitary and Epidemiological Surveillance Statistics Unit; responsible for viral and bacteriological laboratories	GT, AD, MI, ST, KB
15:00–16:45	**Republican TB Hospital (Machiton)** • Laboratory (Microscopy and bacteriology) • New MDR department	HH
17:15–18:15	**Findings**	
	Wednesday 11 March, Dushanbe	
9:00–9:15	**Morning briefing**	All
9:30–10:00	**Dushanbe City Health Department** Abumuslim Temurov, Head	All
10:15–12:45	**National TB Centre** • Reference laboratory, microscopy and bacteriology in TB diagnosis and monitoring:	HH, KB

	• Recording & reporting documentation: Firuza Sharipova, Head, Organizational and Methodological Dept. Abdullo Mahmadov, Head, Monitoring and Evaluation Dept.	AD
	• Primary Health Care structure, integration in TB control • Vaccination, revaccination, TB among children and adolescents • IEC activities: Firuza Saidova, Communication Officer • Monitoring and Evaluation Karomat Imomnazarova, Head of Monitoring and Evaluation Dept. • Training: Umrinisso Sirojidinova, Coordinator on trainings • Food distribution: Muhabbat Safarov, Parviz Tabarov, Food Distribution Coordinator • TB and HIV/AIDS: Zakirova Kurbongul, TB/HIV Focal Point • Drug stocks: Aslidin Rajabov, Drug Management Coordinator	GT, ST
13:00–14:30	Lunch	
14:30–15:00	**Dushanbe TB Centre/Dispensary** Lola Pulatova, Head	All
15:00–16:30	Recording & reporting documentation, TB patients register: Karomat Imomnazarova	AD
	• Microscopy and bacteriology in TB diagnosis and monitoring: Mohbibi Mirzodavlatova, Head of Laboratory	HH, KB
	• Primary health care structure and integration in TB Control • Vaccination, revaccination, TB among children and adolescents • TB and HIV/AIDS • Drug stocks Nazarova Mekhri	GT, ST
16:45–17:45	**Meeting with UNDP/GFATM/PIU** Saleban Omar, Grant Manager, UNDP Zumrad Maksumova – TB Grant Manager Aziza Hamidova **–** HIV/AIDS Grant Manager Mahmadlatif Karimov, TB Specialist, UNDP	**All**
	Thursday 12 March, Dushanbe and Vahdat	
8:30 – 8:45	**Morning briefing**	
9:00 – 10:00	**TB in prisons. Meeting at the Ministry of Justice** Bahrom Abdulhakov, Deputy Head, Ministry of Justice Department of Correctional Affairs Rustam Nurov, Head of Medical Unit, Ministry of Justice Department of Correctional Affairs Abdurakhmon Shokarimov, TB Coordinator, Medical Unit, Ministry of Justice Department of Correctional Affairs	All
10:30–12:30	**Visit Vahdat Prison Hospital**	All
13:00–14:30	Lunch	
14:45–17:00	**Visit Dushanbe Prison, 7th colony**	All
17:20–17:45	**Findings (at WHO Office)**	

	Friday 13 March, Khatlon Region	
7:00–10:00	Departure from Dushanbe/Arrival in Kulyab Region of Khatlon Region	
10:00–11:00	**Visit Kulyab TB Hospital** Alisher Kabirov, Head of Kulyab Regional Health Dept. Azizullo Emomaliev, Head of Khatlon Region TB Centre Rahmatullo Jumaev, Head of Kulyab Regional TB Centre	All
11:15–12:30	**Kulyab Regional TB Hospital**	
	• Treatment departments: Jurakhon Ismoilov, Dept. Head for Treatment Issues • Recording & reporting documentation, TB patients registry: Ahmahkhon Olimov and Jahongir Ismoilov • Microscopy and bacteriology in TB diagnosis and monitoring: Uronbi Sultanova • TB and HIV/AIDS: Jurakhon Ismoilov • Drug Stocks: Abdurazok Azimov	Team divided into the groups
12:45–13:45	**Lunch**	
14:15–14:40	**Visit Central District Hospital** Head of the Vose Health Department Shamsiddin Jumaev, Head of the Dispensary	All
14:40–16:30	**Visit to Vose TB dispensary** • Recording & reporting documentation, TB patients registry: Rahmon Asoev • Microscopy and bacteriology in TB diagnosis and monitoring: Tolib • TB and HIV/AIDS: Nazri Saidov • Drug Stocks: Asliddin Rajabov • Treatment: A. Astanaev	Team divided into the groups
16:30–19:30	Departure from Vose /arrival in Dushanbe	
	Saturday 14 March, Vahdat and Tursunzoda Districts	
9:00–9:15	**Morning briefing**	
9:15–9:45	**Departure from Dushanbe/Arrival in Vahdat**	
9:45–10:45	**Vahdat Central District Hospital (CDH)** Mirzotillo Umurzokov, Head Alisher Islomov, Chief Physician, District TB Centre	All
10:45–12:45	**TB Dispensary** • IEC work: Saidjon Nazrullo • DOTS: Alisher Islomov • Treatment Dept. Bakhtier Ikromov • Reporting & recording: Alisher Islomov • Laboratory: Khudoer Usupov	Team divided into the groups
13.15–14.15	Lunch	

14:15–15:15	Departure from Vahdat/Arrival in Tursunzoda	
15:15–15:45	**Tursunzoda Central District Hospital** Meeting with Dilbar Burakova, CDH Head Meeting with Shukur Kuliev, Chief Physician of RTBD	
15:45–17:30	**TB Dispensary** • Recording & reporting documentation, TB patient registry: Shukur Kuliev • Microscopy and bacteriology in TB diagnosis and monitoring:– Khuriyat Juraeva • TB and HIV/AIDS: Nasiba Nurkhanova • Primary health care structure and integration in TB control: Ravshan Turaev • Vaccination, revaccination among children and adolescents: Khabiba Istamova • Community work: Khaidarov	All Team will be divided into the groups
17:30–18:15	Departure from Tursunzoda/Arrival in Dushanbe	
18:15–18:30	**Findings**	
	Sunday 15 March	
	Preparing report	
	Monday 16 March, Dushanbe	
09:00–09:15	**Morning briefing**	RZ, GT, AD, KB
9:20–12:45	**Meeting with international organizations** USAID, ZdravPlus, KfW,Sino Project, AKDN, Mercycorps, PSF, IFRC, Red Crescent Society of Tajikistan, WFP, Fondation Caritas Luxembourg, Hope Project, AFEW	RZ, GT, AD, KB
12:45–14:00	Lunch	
14:20–15:20	**Project HOPE** Alexei Korobitsyn, Head of Project HOPE and his team	RZ, GT, AD, KB
15:40–16:40	**AIDS Foundation East-West** (3, N.Makhsumi str.,228 98 57) Ikrom Ibragimov, Representative Dilshod Pulatov, Project Manager	RZ, GT, AD, KB
17:00–17:30	Findings	RZ, GT, AD, KB

	Tuesday 17 March	
9:00–9:15	**Morning briefing**	
9:45–12:45	**National HIV/AIDS Centre** Murodali Ruziev, Director • HIV Testing: Zuhra Nurlaminova, HIV Counselling and Testing • Treatment, Dispensary: Mansur Dodarbekov, Head of Dept. • National Reference Laboratory: Rezida, Head • Reporting/recording of patients with coinfections: Alijon Soliev	All Team divided into groups
13:00–14:30	Lunch	
14:45–15:30	**National Centre of Medical Statistic and Information** Lola Rajabova, Head Integration of TB reporting into general health information system	AD
	Ministry of Health Human Resources Development Department Dr Salomiding Isupov, Head • training • staff motivation	ST, GT, RZ
16:00–17:00	**STI Centre** Azizullo Kosimov, Director Collaborative surveillance	AD
14:45–17:30	Discussion of the outcomes of the programme review and recommendations to be presented to the Minister of Health on 18 March	All
	Wednesday 18 March, Dushanbe	
8:30–8:45	**Morning briefing**	
9:00–10:00	**Meeting with** Santino Severoni, Head of WHO Country Office Saleban Omar, GFATM Grant Manager	All
10:20–11:20	**Ministry of Health** Nusratullo Salimov, Minister of Health, Sohibnazar Rahmonov, Deputy Minister,	All
12:00–13:30	**Lunch**	
14:00–15:30	Debriefing with national and international TB stakeholders National TB Team Authorities from institutions visited: Kulyab Region, Vose, Vahdat, Tursunzoda Representatives of Ministry of Justice and TB prisons visited International TB stakeholders and donors	All

ANNEX 8 LIST OF PEOPLE VISITED/MET WITH

1. International agencies:
Mr Santino Severoni, WHO Country Office for Tajikistan, WHO Representative
Ms Nazira Artykova, WHO Country Office for Tajikistan, Liaison Officer
Ms Sayohat Hasanova, WHO Country Office for Tajikistan, NPO HIV/AIDS and TB
Mr Saleban Omar, UNDP, GFATM Grant Manager
Ms Zumrad Maksumova, UNDP, GFATM TB Grant Manager
Mr Mahmadlatif Karimov, UNDP, TB Specialist
Mr Gafur Khodjimuratov, KfW
Mr Farukh Kasymov, KFW, Local Consultant
Mr Alexei Korobitsyn, Project HOPE, TB Programme Manager
Ms Malika Makhkambaeva, USAID
Mr Ikrom Ibragimov, AFEW, Representative
Mr Dilshod Pulatov, AFEW, Project Manager
Mr Valiev Pirmahmad, Fondation Caritas Luxembourg, TB Coordinator
Mr Dilshod Fatoev, Fondation Caritas Luxembourg, Manager
Mr Philip Wegner, Mercycorps, Health Project Manager
Ms Bahriniso Isoeva, Mercycorps, Deputy Health Manager
Ms Patricia Ascani, PSF, Project Coordinator & Pharmacist
Ms Lola Nazarova, IFRC, Project Manager
Ms Mukharam Halilova, Red Crescent Society of Tajikistan, TB Coordinator
Mr Zlatan Milisic, WFP, Representative/Country Director
Ms Malohat Shabanova, WFP, Senior Programme Assistant
Ms Ruhkshona Kurbanova, IOM, Programme Assistant

2. National partners:

Ministry of Health, Administration

Mr Nusratullo Salimov, Minister of Health of the Republic of Tajikistan;
Mr Sohibnazar Rakhmonov, Deputy Minister of Health; TB Service Curator, TB Coordination Committee Head
Mr Samaridin Aliev, State Agency on Sanitary and Epidemiological Surveillance, Head
Mr Oktam Bobokhodjaev, Ministry of Health Department of Medical Services Organization, TB Service Curator, Head

National TB Centre
Mr Sadulo Saidaliev, National TB Centre, Director
Mr Abdullo Mahmadov, National TB Centre, Monitoring and Evaluation Department
Ms Firuza Sharipova, National TB Centre, Organizational Methodological Department
Mr Khushvakht Ismonov, National TB Centre, MDR Coordinator
Ms Kurbongul Akramova, National TB Centre, HIV/TB Coordinator
Ms Mohonim Abdullaeva, National TB Centre, Reference Laboratory
Mr Asliddin Rajabov, National TB Centre, Drug Management
Ms Firusa Saidova, National TB Centre, Communication Coordinator
Ms Umrinisso Sirojidinova, National TB Centre, Training Coordinator
Mr Muhabbat Safarov, National TB Centre, Food Distribution Coordinator

Khatlon Region
Mr Azizullo Emomaliev, Khatlon Regional TB Centre, Head

Mr Rahmatullo Jumaev, Kulyab Regional TB Centre, Head;
Vose Health Department, Head
Mr Shamsiddin Jumaev, Dispensary Head

RRP: Vahdat district
Mirzotillo Umurzokov, Central District Hospital, Head;
Heath Department of Khukumat, Vahdat District, Deputy Head
Mr Alisher Islomov, District TB Centre, Chief Physician
Mr Saidon Nazrullo, District TB Centre, IEC
Mr Alisher Islomov, District TB Centre
Mr Bakhtier Ikromov, District TB Centre
Mr Alisher Islomov, District TB Centre
Mr Khudoer Usupov, District TB Centre

RRP, Tursunzoda district
Mr Shukur Kuliev, District TB Centre, Chief Physician
Ms Khuriyat Juraeva, District TB Centre, Chief Physician
Ms Nasiba Nurkhanova, District TB Centre, Chief Physician
Mr Ravshan Turaev, District TB Centre, Chief Physician
Ms Khabiba Istamova, District TB Centre, Chief Physician
Ms Khuriyat Juraeva, District TB Centre, Chief Physician

Other Ministry of Health Agencies
Mr Firuz Davlatov, State Agency of Sanitary and Epidemiological Surveillance, Deputy Head
Ms Zuhra Nurlaminova, National HIV/AIDS Centre, HIV Counseling and Testing Unit
Mr Mansur Dodarbekov - National HIV/AIDS Centre, Dispensary Department
Ms Lola Rajabova, National Centre of Medical Statistics and Information, Head
Mr Ibodullo Sharipov, National Centre of Medical Statistics and Information, Deputy Head
Mr Saidahtam Rustamov, Machiton TB Hospital, Head
Mr Abumuslim Temurov, Dushanbe City Health Department, Head
Ms Lola Pulatova, Dushanbe City TB Centre , Head
Ms Karomat Imomnazarova, Dushanbe City TB Centre, Deputy Head

Ministry of Justice
Mr Bahrom Abdulhakov, Department of Correctional Affairs, Deputy Head
Mr Rustam Nurov, Department of Correctional Affairs Medical Unit, Head
Mr Abdurakhmon Shokarimov, Department of Correctional Affairs Medical Unit, TB Coordinator

ANNEX 9 INTERNATIONAL TB STAKEHOLDERS

Agency	Focal Point	Position
UNDP	Saleban Omar	Manager GFATM/PMU
	Zumrad Maksumova	GFATM PIU, TB Grant Manager
	Aziza Khamidova	GFATM PIU, HIV/AIDS Grant Manager
USAID	Ms Carolyn Brayan	Head of office
	Ms Malika Makhkambaeva	
Project HOPE	Alexei Korobitsyn	TB Programme Manager
Zdrav Plus		Country Director
	Alisher Mahmudov	PHC Coordinator
KfW	Khodjimuratov Gafur	
	Farukh Kasymov	Local Consultant
AIDS Foundation East-West	Ikrom Ibragimov	Representative
	Dilshod Pulatov	Project Manager
Fondation Caritas Luxembourg	Dilshod Fatoev	Manager
	Valiev Pirmahmad	TB Coordinator
	Mahmud Majidov	Medical Specialist for TB Programmes
Sino Project	Nick Bottone	Head of Office
	Asliddin Rajabov	TB Specialist
	Gulzira Karimova	Health Service Liaison Coordinator
AKDN	Lailo Kubonmamadova	Health Programme Officer
Mercycorps	Brandy Westerman	Country Director
	Philip Wegner	Health Project Manager
	Bahriniso Isoeva	Deputy Health Manager
	Saadi Izatov	Programme Manager
PSF	Patricia Ascani	Project Coordinator & pharmacist
IFRC	Shavkat Ismailov	Acting Head of Delegation
	Lola Nazarova	Programme Manager
Red Crescent Society of Tajikistan	Halilova Mukharam	TB Coordinator
WFP	AnneMarie van den Berg	Deputy Country Director
	Shabanova Malohat	Senior Programme Assistant
	Usmonova Gulchehra	Field Monitor Assistant
German Embassy	Echo Tardek	Temporarily Acting Consular
IOM	Zeinal Hajiyiv	Chief of Mission
	Ruhkshona Kurbanova	Programme Assistant

ANNEX 10. TB INSTITUTIONS VISITED BY THE MISSION

Machiton National TB Hospital

Machiton currently has 22 doctors and 150 nurses; two people were sent for DRTB management training in Finland in 2008. The hospital's capacity was once as high as 700 patients. There are 12 departments, 4 of them for pulmonary TB (350 beds), 2 for surgery and 2 for bone and spinal TB, 1 for children, 1 for meningitis, 1 for other extrapulmonary and an intensive care unit. There are clinical and biochemical labs, but the latter is not working due to lack of funds and personnel. The facility is run down. There are three well-trained and knowledgeable employees in the sputum smear laboratory and a cleaning staff of one. The microscope is of good quality. QA is done regularly and concordance is excellent. The workload was 1034 slides, of which 31.3% (324) were positive during the first quarter of 2008.

The Machiton MDR TB Department, after renovation (funded by the KfW), started treating patients in autumn of 2009 and is able to accommodate around 80 patients. The rooms have two beds and a proper ventilation system.

Infrastructure indicators, four districts, 2008

Indicators	Kulyab and Kulyab district	Vose	Vahdat	Tursunzoda
Population	173 965	167 900	265 780	236 770
District health centre	1	1	1	1
Regional hospital	1	0	0	0
Central district hospital	1	1	1	1
VHC	10	29	24	27
Health housed	34	22	76	50
Rural hospital units	1	6	7	4
Somatic beds	1 408	316	687	850
Doctors	303	109	313	196
Nurses	1 167	437	958	439
GPs	8	4	3	26
DOTS centres	1	1		1
Children's TB sanatoria	1 to 50 beds	0	0	0
TB doctors	12	3	3	3
TB beds	200	50	No	30
Microscopic network	2	2	1	2

Kulyab and Kulyab district is situated in the south of the country, 200 km from the capital, and has a population of 173 965. DOTS strategy was started at the end of 2004. An implementation plan has been drafted, and on a step-by-step preparation has been undertaken, with training for the TB Service, laboratory and PHC staff. The main part of the population is employed in cotton growing. The town TB service consists of a DOTS centre, microscopic laboratory, drug stock, a 200-bed inpatient ward and a 50-bed children's TB sanatorium.

Vose district is situated in the south of the country, 190 km far from the capital. The main part of the population is occupied with cotton growing. There are two unfortunate TB facilities – Sartez and Sino – in the district. DOTS strategy started in the second quarter of 2004. The TB service staff, laboratory and PHC workers have had training.

TB service consists of a DOTS centre, two microscopic laboratories, TB drug storage and two inpatient wards in the centre of the district with 30 beds, and inter-village branch for Pakhtakor, with 20 beds.

Vahdat is situated 20 minutes from Dushanbe and is a pilot district of the Red Crescent Society of Tajikistan. The main part of the population is occupied with agriculture, and 20% is employed in industry. DOTS strategy started in January 2007 after rehabilitation and equipping of the DOTS centre. The project trained 81% of doctors and 61% of nurses, and there was later training for 30 doctors and 33 nurses. There is no TB inpatient ward, as the Republican TB Clinical Hospital is located in the Vahdat district. The TB service consists of the DOTS centre, a microscopic laboratory, room for specimen collecting and drug storage.

Tursunzoda is situated 55 km from the capital, bordering Uzbekistan. It is the pilot district of the SINO project on reforming health and family medicine support. There is an aluminium plant and a porcelain factory. The main part of the population is engaged in agriculture, and a majority of men are migrant labourers outside of the country.

DOTS strategy started in October 2005. The project rehabilitated the DOTS centre and the inpatient ward. Training was provided for 69% of doctors and 46% of nurses, including the TB service staff. Later, 30% of medical staff was trained as well. The district TB service consists of the DOTS centre, two microscopic laboratories, a treatment room, a room for collecting specimens, drug storage and inpatient ward with 30 beds.

Involvement of PHC in TB control

The Ministry of Health assists in the integration of TB service in PHC. The staff of the PHC ambulatory service were given relevant training. Within the framework of health care reform, PHC has been separated from hospital service and has a separate budget. A TB grant financed by the GFATM Round 6 was applicable to PHC workers.

The World Bank has assisted in bed rationalization. In the tuberculosis programme the beds have been reduced to some 600 beds in the whole country. The bed fund is decentralized, with each district having 10–15 beds on average, and the regional TB inpatient ward has 200 beds for specialized care, such as non-pulmonary surgery and children's TB.

TB Epidemiology

Table 1. Tuberculosis morbidity indicator, four districts

District		2005	2006	2007
Kulyab	Morbidity (NTP data)	130	183	279
	Morbidity (WHO data)	198	204	204
	Absolute number of NC	220	314	486
Vose	Morbidity (NTP data)	147	133	119
	Morbidity (WHO data)	198	204	204
	Absolute number of NC	232	217	200
Vahdat	Morbidity (NTP data)	34	60	115
	Morbidity (WHO data)	198	204	204

Note: The morbidity percentage of the districts (except Tursunzoda) is higher than the average national data (in 2005 – 74.3%, in 2006 – 74.7%, in 2007- 85.1%).

Table 2. Registered TB cases in 4 districts

Rayons	Kulyab		Vose		Vahdat		Tursunzoda	
2005	**Cases**	**%**	**Cases**	**%**	**Cases**	**%**	**Cases**	**%**
New ss+	69	31.4	79	34.1	0	0	9	37.7
New ss-	90	40.9	97	41.8	0	0	10	41.6
Non-pulmonary	61	27.7	56	24.1	0	0	5	20.7
Total	**220**	**100**	**232**	**100**	**0**	**0**	**24**	**100**
2006			**2006**				**2006**	
New ss+	141	45	101	46.5	0	0	63	47.7
New ss-	83	26.4	57	26.2	0	0	31	23.4
Non-pulmonary	90	28.6	59	27.3	0	0	38	28.9
total	**314**	**100**	**217**	**100**	**0**	**0**	**132**	**100**
2007			**2007**		**2007**		**2007**	
New ss+	167	34.4	80	40.0	91	30.0	45	32.2
New ss-	210	43.2	56	28.0	93	30.7	45	32.2
Non-pulmonary	109	22.4	64	32.0	119	39.3	50	37.6
Total	**486**	**100**	**200**	**100**	**303**	**100**	**140**	**100**

Cohort of new positive cases in 4 districts, 2007

Table 3. Smear conversion, 2007

District	New SS+			Relapsed			Other +		
	registered	**conversion**	**%**	**registered**	**conversion**	**%**	**registered**	**conversion**	**%**
Kulyab	167	161	96.4	18	17	96.4	46	42	91.3
Vose	80	77	96.3	6	4	66.7	45	41	91.1
Vahdat	91	76	83.5	1	1	100	74	44	59.5
Tursunzoda	45	38	84.4	4	4	100	18	12	66.7
Total	**383**	**352**	**92.0**	**29**	**26**	**89.6**	**183**	**139**	**75.9**

Table 4. Treatment results, 2007

Districts	Cases	Cured		Completed		Died		Failed		Default		Transfer
		Ab/#	%	Ab/#	%	Ab/#	%	Ab/#	%	Ab/#	%	Ab/#
Kulyab	167	161	96.4	0	0	2	1.2	2	1.2	2	1.2	0
Vose	80	71	88.7	0	0	3	3.8	4	5.0	2	2.5	0
Vahdat	91	68	74.7	1	1.1	1	1.1	10	11.0	7	7.7	4- 4.4%
Tursunzoda	45	32	71.2	2	4.4	3	6.7	6	13.3	2	4.4	0
Total	**383**	**332**	**86.6**	**3**	**0.8**	**9**	**2.3**	**22**	**5.7**	**13**	**3.3**	**4-1.0%**

Note: The high level of treatment failure in Tursunzoda and Vahdat district is troubling; a possible explanation could be late identification of cases, and the existence of resistant TB forms.

Problems in the districts include:

- insufficient NTP planning capacity and infrastructure
- lack of integration of TB in PHC
- lack of programme organization
- improper use of funds, starting at the regional level
- infrastructure issues (electricity, water supply, heating) make creation of an electronic data base and laboratory work difficult
- lack of human resources.