

LABORATORY ASSESSMENT REPORT  
TAJIKISTAN  
October 14 – 24, 2004

Marija Joncevska MD, PhD  
Regional Laboratory Specialist  
Project HOPE - CAR



Project HOPE is responsible for the information provided in this report, which does not necessarily reflect the opinion of USAID or the United States Government

## **Contents:**

	<b>page</b>
<b>List of abbreviations</b>	<b>3</b>
<b>Executive summary</b>	<b>4</b>
<b>1. Background</b>	<b>5</b>
<b>2. Laboratory assessment visit</b>	<b>5</b>
<b>2.1 Terms of Reference for the visit</b>	<b>5</b>
<b>2.2 Findings</b>	<b>6</b>
<b>2.2.1 Organizational structure of TB laboratory service</b>	<b>6</b>
<b>2.3 Accessibility and availability of laboratory services</b>	<b>6</b>
<b>2.4 Policies and methods for laboratory diagnosis</b>	<b>9</b>
<b>2.4.1 Smear microscopy</b>	<b>9</b>
<b>2.4.2 Culture</b>	<b>9</b>
<b>2.4.3 DST</b>	<b>9</b>
<b>2.5 Laboratory workload and staffing</b>	<b>9</b>
<b>2.6 Quality Assurance</b>	<b>10</b>
<b>2.7 Training</b>	<b>11</b>
<b>2.8 Recoding and reporting</b>	<b>11</b>
<b>2.9 Infection control and bio-safety</b>	<b>11</b>
<b>2.10 Monitoring and supervision</b>	<b>12</b>
<b>2.11 Equipment and supplies</b>	<b>12</b>
<b>3. Conclusions and recommendations</b>	<b>13</b>
<b>4. Annexes</b>	<b>18</b>
<b>Annex I List of persons met</b>	
<b>Annex II Data collection forms</b>	
<b>Annex III Needs of laboratory supplies and reagents for DOTS expansion plan</b>	

## **List of abbreviations**

CAR	Central Asian Republics
CCC	Country Coordination Committee
CDC	Centres for Disease Control and Prevention
DOTS	Directly Observed Treatment Short course
DST	Drug Susceptibility Testing
DRS	Drug Resistance Surveillance
EQA	External Quality Assessment
FIDELIS	Fund for Innovative DOTS Expansion through Local Initiatives to Stop TB
GBAO	Gorno-Badakhshan Oblast
GFATM	Global Fund against AIDS, Tuberculosis and Malaria
IEC	Information Education Communication
IUATLD	International Union against Tuberculosis and Lung Diseases
LJ	Löwenstein-Jensen
MDG	Millennium Development Goals
MDRTB	Multi Drug Resistant Tuberculosis
MERLIN	Medical Emergency Relief International
MoH	Ministry of Health
NGO	Non Governmental Organization
NRL	National Reference Laboratory
NTP	National Tuberculosis Programme
NTBC	National Tuberculosis Centre (Kazakhstan)
PHC	Primary Health Care
PSH	Pharmaciens Sans Frontieres
QA	Quality Assurance
SES	Sanitary Epidemiological Surveillance
SRL	Supranational Reference Laboratory
TB	Tuberculosis
ToR	Terms of Reference
UNDP	United Nations Development Program
WB	World Bank
WHO	World Health Organization

## Executive summary

The assessment visit to Tajikistan was conducted by Marija Joncevska, Project HOPE Regional laboratory specialist from October 14 till October 24. The information was collected during the site visits to TB Centres, Hospitals and polyclinics, as well as during the meetings with local and international partners involved in TB control activities. A total number of 15 TB laboratories were visited: four in Sugd Oblast, five in Dushanbe City and six laboratories in Khatlon Oblast.

Tajikistan adopted DOTS strategy and in February 2002 and introduced it through official executive order (Prikaz). The implementation started in two pilot regions, the capital Dushanbe and Rudaki Rayon, covering 13% of Tajikistan population. DOTS expansion plan for 2005, supported by GFATM is to cover 35% of population.

TB laboratory network in Tajikistan is still not established countrywide. A number of smear microscopy laboratories have been established in DOTS pilot sites, equipped and provided with reagents and supplies by different donors and NGOs.

Almost all laboratories had problems with water and electricity supply, which limits the use of microscopes to maximum one hour per day. The situation is even worse during the winter time, when during the working hours there is no electricity at all. The establishment of smear laboratories in DOTS pilot sites was done according to the WHO standard, one laboratory per 100 000 population, but the distribution of the workload and location of laboratories does not provide good access for the population. For example, three smear laboratories in Dushanbe are located in the same place and patients from the city, coming for smear examination prefer to have their examination at specialized TB laboratory at TB centre, rather than in Polyclinic lab. This resulted in overloading of TB laboratory and underutilization of PHC laboratories. All laboratory technicians from DOTS pilot sites received basic training in smear microscopy, but satisfactory quality of smear preparation and microscopy was observed only in a few laboratories. Initial activities for introducing EQA by blinded rechecking started recently in two sites. Taking into account the limited human resources and the increased workload with DOTS expansion, the sustainability of this program is uncertain.

Currently, there is only one functioning culture laboratory situated in TB Hospital in Sugd Oblast. The condition of the laboratory is very poor, work is not organised properly and working conditions are below any standard. In this situation, it would be better to stop with culture examination until basic safety requirements are provided. The quality of cultures was not satisfactory. The same laboratory is performing DST, but the results produced could not be considered as reliable due to the method used and poor quality of drug containing media. Pure substances of TB drugs are not available and media are prepared from crushed tablets.

Currently, the high turn over of laboratory staff is the most serious problem for the NTP. Young people are not motivated to work in TB laboratories, due to poor working conditions and very low salaries. Six out of thirteen laboratories at Rayon TB Dispensaries in Khatlon Oblast are not functioning because laboratory technicians left their job.

Taking into account the plan for further DOTS expansion it is very important to define the working structure of the DOTS program and ensure adequate staffing before new pilot sites are opened.

## Background

Tajikistan is landlocked, predominantly mountainous country, divided in four Oblasts: Sughd in the North; Central Oblast with the capital Dushanbe; Khatlon Oblast in the Southwest and the mountainous GBAO - Gorno-Badakhshan Oblast on West.

The total population is estimated to 7,011,556 (July 2004)

Tajikistan is the poorest country in CAR region, with the lowest per capita GDP among all former Soviet republics. According to UNDP Human Development Index ranking, Tajikistan is on the 117 position, out of 177 countries. It is estimated that more than 60% of population lives in abject poverty.

The break down of the Soviet Union and the Civil War (1992-1997) damaged already weak economic structure and seriously affected the existing Health Care System. The lack of drugs, lack of functioning equipment and the high turnover of qualified staff resulted in increase of morbidity especially in communicable diseases. The large hierarchically organized Soviet health system could not survive and provide adequate care. Recognizing this problem the Government of Tajikistan introduced Health Sector Reform (HSR) in order to strengthen Primary Health Care (PHC) and rationalize the highly specialized services and hospitals.

Tuberculosis is one of the major health problems in the country increasing rapidly from 32 cases per 100 000 in 1996 to 64 per 100 000 in 2002. Annually Tajikistan registers on average 2800 to 3500 new TB cases and these numbers tend to increase. In order to improve the epidemiological situation with TB the Government of Tajikistan adopted DOTS strategy and in February 2002 issued an official executive order (Prikaz) for DOTS implementation. The implementation started in two pilot regions, the capital, Dushanbe and Rudaki Rayon, covering 13% of Tajikistan's' population. With support of the GFATM the expansion of 35% is planned for 2005.

**Tab. 1. Case notification 2003**

Cases	Pulmonary TB			Extra pulmonary TB	Total
	Smear +	Smear –	Subtotal		
New cases	731	591	1322	490	1812
Retreatment cases	45	0	45	0	0
Total	786	591	1367	490	1867

## Organizational structure of TB control service

One of the main objectives of the National TB Program, issued in 2002 by the President of Tajikistan is integration of TB control activities in Primary Health Care (PHC). Coordination and implementation of TB control activities is responsibility of Country Coordination Committee (CCC), established by the Government of Tajikistan with participation of representatives from all ministries.

In order to facilitate the implementation of DOTS strategy, The Minister of Health appointed the Deputy Minister of Health as a National TB Coordinator.

Republican TB Centre in Dushanbe is the leading institution in implementation of DOTS strategy. The intermediate level is represented by Three Oblast TB Centres and

one City TB Centre. Rayon TB centres or TB cabinets are involved in case finding and treatment delivery on the peripheral level.

## **1. Laboratory assessment visit**

The assessment visit to Tajikistan took place from October 14 – October 24. The information was collected during the site visits to TB Centres, Hospitals and polyclinics, as well as during meetings with local and international partners involved in TB control activities. A total number of 15 TB laboratories were visited, four in Sughd Oblast, five in Dushanbe City, including two neighbouring Rayons and six laboratories in Khatlon Oblast.

### **1.1 ToR of the assessment visit**

1. To assess the current structure and functioning of the TB laboratory service in Tajikistan
2. To assess the need of expansion of laboratory network and upgrading the capacity for diagnosis of TB
3. To estimate the needs of laboratory supplies and reagents for expansion of DOTS strategy
4. To meet with other partners and organizations involved in support of laboratory component of TB control program and discuss coordination of laboratory strengthening activities

## **2.2 Findings**

### **2.2.1 Organizational Structure of TB laboratory service**

TB laboratory network in Tajikistan is still not established countrywide. A number of smear microscopy laboratories have been established in DOTS pilot sites, equipped and provided with reagents and supplies by different donors and NGOs.

MERLIN is supporting TB Laboratory service in Khatlon Oblast since 1998, by refurbishing smear microscopy labs, providing lab equipment and training. So far 7 labs have been fully equipped. Establishment of additional 15 labs is planned by November 2005, within the new FIDELIS grant. In order to improve accessibility for the population living in remote areas MERLIN is planning establishment of smear preparation points in each SVA and FAP (about 300). The plan is still under consideration and advantages and disadvantages of this strategy were discussed during the joined meeting with MERLIN technical team.

The NTP plans to establish a three level network of TB laboratories with National Reference Laboratory at central level, seven culture laboratories at intermediate level and smear microscopy centres in all Rayons.

The National Reference Laboratory was supported by Project HOPE during the previous USAID grant. The necessary equipment and supplies for culture and DST have been provided and it will be installed as soon as the refurbishment of the new laboratory building, supported by CDC and Project HOPE is completed. The NRL is

temporary situated in the basement of Republican TB Centre and performs only smear microscopy.

## **2.2.2 Accessibility and availability of lab services**

During the former Soviet Union TB laboratory services were provided through a large network of laboratories countrywide. During that time in Sughd Oblast alone, which has a population of 2 000000, there were 161 clinical labs performing smear microscopy. Due to the shortage of reagents for smear microscopy, almost all laboratories stopped the work and currently smear microscopy is available only in DOTS pilot sites supported by donors and NGOs. Smear microscopy is free of charge only for the patients, coming from DOTS Rayons. Officially, TB Hospital and DOTS Polyclinics do not charge socially disadvantage categories of patients for laboratory examinations, but unofficially it happens very often that patients have to pay to the lab technician if they want their laboratory analysis to be done properly.

The establishment of smear laboratories within DOTS pilot sites was done according to the WHO standard, one laboratory per 100 00 population, but the distribution of the workload and location of laboratories does not provide good access for all population covered. For example three smear laboratories in Dushanbe are located in the same place and patients from the city, coming for smear examination prefer to have their examination at specialized TB laboratory at TB centre, rather than in Polyclinic lab which is next door. This resulted in overloading of TB laboratory and under utilization of the Polyclinic laboratory.

There is only one functioning culture and DST laboratory, at TB Hospital in Sughd Oblast, performing culture and DST for hospitalized patients. The quality of tests is poor and it does not contribute much to diagnosis of TB and detection of drug resistance.

### **2.2.2.1 Use of smear microscopy for case finding**

Although it is too early to analyze the trends in case finding by smear microscopy, based only on data from 2003 and first three quarters of 2004, the decreasing number of smear examinations and smear positive cases found in pilot sites, should be noticed and carefully followed during the next period. If the same trend is still present, the reasons should be identified and remedial actions taken in order to ensure further success of DOTS implementation and expansion.

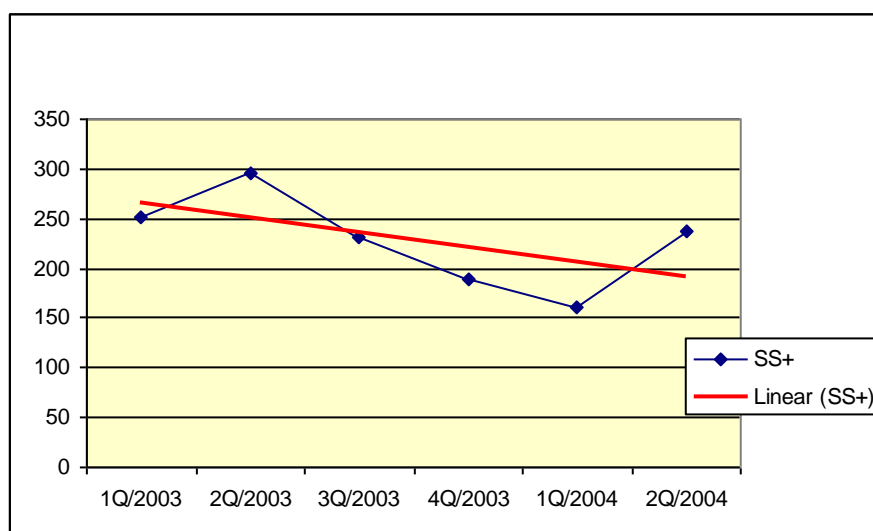
**Tab. 2: Use of smear microscopy for case finding in Dushanbe and Rudaki Rayon (comparison of first three quarters 2003 and 2004)**

Use of smear microscopy	2003	2004
Suspects examined	5811	3427
Smear positive cases found	779	397

**Fig.2. Smear examinations in Dushanbe 2003 – Q2/ 2004**



**Fig.3. Smear positive case detected in Dushanbe 2003- Q2/ 2004**



## 2.2.3 Policies and methods for laboratory diagnosis of TB

### 2.2.3.1 Smear microscopy:

All laboratory technicians from DOTS pilot sites received basic training in smear microscopy and were given Russian translation of WHO manuals for smear microscopy. However this did not appear to be sufficient for good quality of smear microscopy and smears with satisfactory quality were observed only in a few laboratories. There are technicians, especially among older generation, who do not accept WHO recommendations and still use the methods they are used to, smearing the sputum with two slides, instead of using loop.



Almost all laboratories had problems with water and electricity supply, which limits the use of microscopes to a maximum of one hour per day. The situation is even worse during the winter when there is no electricity at all during the working day. The quality of sputum collected from suspects was not good in many laboratories. All samples collected during one morning in TB Dispensary in Kulyab were checked and five out of eight were saliva. The nurse in charge of sputum collection did not take any action to obtain sputum samples with better quality.

All laboratories have sufficient quantities of stains, with good quality, prepared and distributed by the Reference Laboratory in Dushanbe. Laboratory guidelines for smear microscopy, culture and DST have been prepared last year by Project HOPE team, in collaboration with National TB team. It was reviewed by CDC specialist and found as not appropriate for the current level of development of laboratory service in Tajikistan. This manual should be revised and after necessary changes and adaptations it could be included in the official policy documents for TB Control (Prikazes). The document should also include the structure of the national laboratory network, number of laboratories at each diagnostic level and minimum requirements for functioning of TB laboratory network.

#### **2.2.3.2 Culture:**

There is only one functioning culture laboratory situated in TB Hospital in Sughd Oblast. The condition of the laboratory was very poor, work was not organised properly, it was not clean with many pieces of old, non functioning equipment. Working conditions were below any standard. In such conditions it would be better to stop with culture until basic safety requirements are provided. The quality of cultures was not satisfactory. The LJ medium prepared in the laboratory looked good and typical growth of colonies of *M tuberculosis* could be observed in some cases after prolonged incubation, but the tests for identification are not used and the bacteriological diagnosis could not be confirmed.

#### **2.2.3.3 DST:**

The same laboratory performs DST, but the results produced could not be considered as reliable due to the method used and poor quality of drug containing media. Pure substances are not available and media are prepared from crushed tablets.

### **2.2.3 Laboratory workload and staffing**

High turn over of laboratory staff is the most serious problem for the NTP. Young people are not motivated to work in TB laboratories, due to the poor working condition of laboratories and very low salaries. An additional problem is the gender issue. Work in laboratories is considered as a female profession and majority of the students in Medical Colleges are female. After the graduation, many of them get married and do not work. The MoH recognised the problem and tries to find a solution by increasing the salary by 100%, which still might not be sufficient due to the fact that currently the salary of lab technician is about 3-5 \$ US per month. Six out of thirteen laboratories at Rayon TB Dispensaries in Khatlon Oblast do not have laboratory technician and are not functioning. Taking into account the plans for further DOTS expansion it is very important to define the working structure of the

DOTS program before new pilot sites are opened. Identification of laboratories, sputum collection points and laboratory staff available to be trained and work in smear microscopy should be agreed upon with local authorities (Hucumats) before laboratory equipment and supplies are provided.

The problem with trained staff is present at all levels. National Reference Laboratory has only three lab doctors and a very big responsibility to work on development of laboratory network, expansion of diagnostic activities, training, monitoring and implementation of Quality Assurance plan. In this regard, technical assistance from partners, Project HOPE and CDC will be very important element in the process of upgrading laboratory capacity

**Tab.5. Laboratory workload in smear microscopy at Republican TB Centre, Khatlon Oblast and Vose Rayon**

	Diagnosis	Follow-up	Total
National	6347	2666	9013
Oblast	5224	2504	7731
Rayon	2236	1142	3468

## 2.2.4 Quality Assurance

Establishment of smear microscopy laboratories in DOTS pilot sites was not followed by implementation of necessary measures for quality assurance. Laboratories have been monitored regularly, but the monitoring was mainly focused on rechecking positive slides and other aspects as: organization of laboratory work, layout, and regular supply with reagents. Recently CDC conducted training in EQA in order to train laboratory coordinators in blinded rechecking program. Initial activities for blinded rechecking started recently in two sites, but it is uncertain how sustainable this system will be, taking into account the problem with laboratory staff, and the increasing workload as a result of expansion of laboratory network in newly established DOTS sites.

In order to establish a sustainable program for quality assurance, the NRL will need technical support to develop protocols and guidelines for quality assurance with clear definition of the roles and responsibilities of each subject involved and taking into account the real capacity of TB laboratory service.

### 2.2.5 Training

**Tab. 6 Training needs for laboratory staff at different levels**

Qualification	Laboratory staff					
	National		Oblast		Rayon	
	Trained	Not trained	Trained	Not trained	Trained	Not trained
MD	5	5	5	10	7	33
Lab technicians	5	10	6	15	73	28
Total	10	15	11	25	80	61

Basic training in smear microscopy was provided for all staff in DOTS pilots. In 2003 the Reference laboratory, in collaboration with CDC and Project HOPE conducted five trainings for lab specialist. All participants were given Russian translation of WHO manual for smear microscopy. Training materials for smear microscopy are not available in Tajik language.

Training activities will continue for the needs of DOTS expansion, within the GFATM plan, in new sites as well as the refresher training for laboratory technicians in old pilot sites. Refresher courses should primarily be focused on proper sputum collection and smear preparation; those elements were recognized as the weakest points in many laboratories visited.

CDC will start with advanced training in smear microscopy for Oblast staff involved in QA procedures

### 2.2.6 Recording and reporting

Registers and forms as recommended by WHO are in use in Pilot sites and are filled in properly, with some minor exceptions. The most common problem is to get TB05 with all necessary information filled in by doctors who refer patients for smear examination. All laboratories have additional register where they record laboratory examinations for non DOTS patients which in most laboratories represent two thirds of all smear examinations.

Quarterly reports on laboratory examinations done and smear positive cases found are prepared by each laboratory in DOTS sites. However it is not possible to get accurate information on the contribution of laboratory service in case finding, since the information provided by laboratory service does not match with quarterly reports on case finding. The number of smear positive cases found by laboratory service is much higher due to the common practice to confirm smear positive result by several laboratories. Patients found smear positive at PHC are referred to TB laboratory at Dispensary and TB hospital and each laboratory reports the same case as a new smear positive case found.

Laboratory registers and forms for culture and DST are not prepared yet.

### 2.2.7 Infection control and bio – safety

Safety conditions in many smear laboratories were not satisfactory. Old and non functioning equipment and furniture could be found in many laboratories, limiting the working area to minimum and making impossible proper cleaning and decontamination. In addition to the deteriorating conditions in laboratories, basic laboratory hygiene requirements often are not met.

Sputum collection in terms of safety was done properly, either in sputum collection rooms or outdoors, but in terms of the quality of collected samples the quality was not always satisfactory.

Safety conditions in the culture laboratory in Sughd TB hospital are below any standard. Centrifugation and inoculation of sputum samples done in very dangerous conditions in terms of production of aerosol and possibilities of inhalation of contaminated droplets. The laboratory should stop inoculations as long as basic safety equipment and working conditions are not provided.

### **2.2.8 Monitoring and supervision**

Quarterly monitoring visits are conducted by regional lab coordinators and the standard monitoring reporting forms are filled in after each visit. Recommendations for improvement are included as well. However, the laboratory network is still not completely established and the collaboration with the NTP in terms of use of this information for planning further activities is lacking.

Officially, the Republican SES is in charge of conducting monitoring and supervisory visits to health facilities and they have already developed a plan for monitoring of malaria program. According to the director of SES, this institution has capacity to take over monitoring activities for TB program as well. He requested TB training for SES monitoring team and their involvement in monitoring plan for TB facilities.

### **2.2.9 Equipment and supplies**

Currently the functioning of the TB laboratory service is fully dependent on external financial support in terms of provision of laboratory equipment and supplies.

Microscopes and reagents have been provided by the international organizations implementing TB and other health projects and were distributed by the Reference laboratory. At the time of assessment visit the NRL staff reported shortage of all reagents for smear microscopy. It appeared, however, that the NRL did not have accurate records on reagents and supplies in stock and the rechecking revealed a certain amount of reagents and supplies that nobody at NRL was aware of.

The estimation of the needs of reagents and laboratory equipment for DOTS program and planned expansion for 2005 was calculated together with the country team and the new order adjusted according to the actual situation.

Most of the microscopes provided were with internal light source, and could not be used during the regular working time due to the irregular electricity supply.

Equipment and supplies for culture examinations have been provided by Project HOPE during the previous grant and are still kept in stock. The information about the quantities of each item was not available. The NRL staff expects problems with procurement of eggs for preparation of LJ medium, which for the local conditions are very expensive, especially during the winter months.

### 3. Conclusions and recommendations

<b>Organization and coverage</b>	<ol style="list-style-type: none"> <li>1. TB Laboratory network is still not established countrywide and laboratory services are available only for the population in DOTS pilot sites</li> <li>2. The plan for expansion of laboratory network and upgrading the level of laboratory service has not been developed yet</li> <li>3. The functioning of laboratory network is hindered by irregular electricity and water supply, lack of trained and motivated staff and very poor condition of health facilities</li> </ol> <p>Recommendations:</p> <ul style="list-style-type: none"> <li>• Provide technical support to the MoH and NTP to prepare sustainable laboratory development plan with budget, based on current situation analysis, funds available and priorities for implementation of DOTS strategy</li> <li>• Prior to making decision about opening and equipping new laboratories, identification of laboratories, sputum collection points and laboratory staff available to be trained and work in smear microscopy should be agreed upon with local authorities (Hucumats)</li> <li>• The Government should confirm the commitment to support DOTS implementation by providing better working conditions, refurbish laboratories and improve the situation with electricity and water supply.</li> </ul>
<b>Accessibility and availability</b>	<ol style="list-style-type: none"> <li>1. The establishment of smear laboratories within DOTS pilot sites was done according to the WHO standard, one laboratory per 100 000 population, but the distribution of the workload and location of laboratories does not provide good access for all population covered</li> <li>2. Diagnosis of TB is officially free of charge, but due to the extremely low salaries of health workers unofficial payment became a common practice.</li> <li>3. Smear microscopy is not sufficiently used for case finding and the number of suspects examined in the first three quarters in 2004 decreased by 50 %, compared with the same period in 2003.</li> <li>4. There is only one functioning culture and DST laboratory, at TB Hospital in Sughd Oblast, performing culture and DST for hospitalized patients. The quality of tests is poor and it does not contribute much to diagnosis of TB and</li> </ol>

	<p>detection of drug resistance.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> <li>• Support smear microscopy labs in Polyclinics, in order to improve accessibility and facilitate the integration of TB program within PHC</li> <li>• Organize IEC activities to increase the knowledge and awareness of TB among general population, and deliver the information that the diagnosis of TB is free of charge.</li> <li>• Although the priority for the TB Program is improvement of smear microscopy services, culture laboratories should be supported as well. Initial activities could be focused on supporting two culture laboratories, one in the North (Khudjand) and one covering the south of the country (NRL in Dushanbe). Culture examination should not start until the basic laboratory safety is provided.</li> </ul>
<b>Policies and technical methods</b>	<ol style="list-style-type: none"> <li>1. The quality of smear microscopy is not satisfactory and needs further improvement. Smears with satisfactory quality were observed only in a few laboratories.</li> <li>2. National guidelines for laboratory diagnosis are not prepared yet. Project HOPE lab specialist t, in collaboration with NRL team prepared the draft of the document, which could be revised and after necessary changes and adaptations could be included into a Prikaz.</li> <li>3. There is no national policy for use of culture and DST. The results produced in culture laboratory are not reliable due to the weaknesses in the methodology used.</li> </ol> <p>Recommendations:</p> <ul style="list-style-type: none"> <li>• Take action for improvement of quality of smear microscopy, by training and retraining laboratory staff, increasing motivation and introducing system for quality control</li> <li>• Finalize the work on laboratory guidelines by including information on the structure of national laboratory network, number of laboratories at each diagnostic level, functional responsibilities and minimum requirements for functioning.</li> <li>• Clearly define the policy for use of culture and DST for diagnosis and follow up, including the frequency and quantity of examinations, as well as, proper interpretation of results for case management</li> </ul>

<b>Laboratory workload and staffing</b>	<ol style="list-style-type: none"> <li>1. The laboratory workload in smear microscopy is not distributed equally and the majority of examinations are done in specialized TB laboratories</li> <li>2. Laboratories at PHC are underutilized. Low workload, and small number of positive smears will have impact on the lab technicians proficiency in smear microscopy</li> <li>3. The problem with the lack of trained staff is present on all levels. Young people are not motivated for work in TB laboratory, due to the poor working conditions in laboratories and very low salaries.</li> </ol> <p>Recommendations:</p> <ul style="list-style-type: none"> <li>• Review the plan of sputum collection points attached to each laboratory</li> <li>• Introduce reliable system for quality assurance in order to provide evidence about the quality of laboratory examinations performed at PHC laboratories.</li> <li>• Increase the motivation for work in TB laboratory service and explore possibilities for introducing incentive program for laboratory staff (additional salary, food packages, etc)</li> </ul>
<b>Training</b>	<ol style="list-style-type: none"> <li>1. Laboratory staff from DOTS pilots sites were trained in smear microscopy, but the quality of smear examination is not satisfactory and there is a need of refresher trainings.</li> <li>2. Culture and DST will be introduced as diagnostic methods in NRL after the renovation of the new building is completed and the equipment installed. It is necessary to provide training for laboratory staff before the start of the work.</li> <li>3. CDC started training in Quality Assurance and introduced blinded rechecking program for smear microscopy. The implementation of the Quality Assurance program would not be sustainable if written protocols and manuals are not prepared and distributed to all laboratories involved</li> </ol> <p>Recommendations:</p> <ul style="list-style-type: none"> <li>• Organize basic training courses in smear microscopy for laboratory staff in new DOTS sites and refresher trainings for old sites. Special attention should be played on sputum collection and smear preparation.</li> <li>• Discuss with CDC possibilities for training in culture and DST for the staff</li> </ul>

	<p>from NRL and TB Hospital laboratory in Sughd Oblast.</p> <ul style="list-style-type: none"> <li>• Provide technical support to NRL to preparing protocol and manual for Quality Assurance, describing methods, procedures, roles and responsibilities of all subjects involved.</li> </ul>
<b>Infection control</b>	<ol style="list-style-type: none"> <li>1. Most of the laboratories visited are situated in inadequate buildings, poorly maintained and not properly cleaned. There is a lack of knowledge on laboratory safety issues.</li> <li>2. Safety conditions in culture laboratory are below any standard</li> </ol> <p>Recommendations:</p> <ul style="list-style-type: none"> <li>• Address safety issues during the monitoring visits. Include laboratory bio-safety in the training program for lab technicians</li> <li>• The laboratory should stop inoculations as long as basic safety equipment and working conditions are not provided</li> </ul>
<b>Monitoring and supervision</b>	<ol style="list-style-type: none"> <li>1. Quarterly monitoring visits are conducted by regional laboratory coordinators. Due to the high turnover of trained staff the TB Program would not have capacity to expand monitoring activities, according to DOTS expansion plan.</li> <li>2. The monitoring team at Republican SES could take part in TB laboratory monitoring and support NTP in conducted monitoring visits on regular basis.</li> </ol> <p>Recommendation:</p> <ul style="list-style-type: none"> <li>• Organize training for laboratory monitoring teams and include in the training staff from Republican SES</li> </ul>
<b>Equipment and supplies</b>	<ol style="list-style-type: none"> <li>1. Central supply with reagents and consumables will be provided by GFATM. NRL should prepare plan for quarterly distribution according to the needs of laboratories.</li> <li>2. All laboratories in pilot sites were equipped with good microscopes with internal light source, which can not be used properly because of irregular electricity supply</li> <li>3. Equipment in culture laboratory is outdated, not functioning properly and unsafe. There is a high risk of infection for the staff working in culture and DST section</li> </ol> <p>Recommendations:</p> <ul style="list-style-type: none"> <li>• Technical partners (CDC, Project HOPE) should provide assistance in</li> </ul>



	<p>calculating needs and preparing plan for distribution of reagents and supplies to peripheral laboratories</p> <ul style="list-style-type: none"> <li>• Rechargeable batteries for microscopes should be provided for laboratories that have problem with regular electricity supply</li> <li>• Prepare list of equipment with technical specification for culture laboratories.</li> </ul>
--	---

## **4. Annexes**

### **Annex I**

#### **List of person met**

1. Dr Oktam Bobohadjaev, Head of Medical Services Department at the MoH Tajikistan
2. Dr. U. Sirojiddinova, Tajikistan NTP coordinator
3. Dr. S. Saidaliev, Director of the Republican TB Centre
4. Dr S. Aliev, Director of the Republican SES
5. Dr Bunafsha Mirzudovlyatova Head of NRL
6. Daliev Mahmud Ruzdi, Deputy of Khatlon Oblast Health Department and Oblast DOTS Coordinator
7. Dr Emomaliev Azizulo, Director of the Khatlon Oblast TB centre
8. Turueva Malika Huseinovna, Khatlon Oblast Laboratory coordinator
9. Dr. Eshonova Makhuba, Sughd Oblast TB Coordinator
10. Dr. Nail Sitdikov, Sughd Oblast Laboratory Coordinator
11. Fahriddin Ataev, First deputy of Sughd Oblast Health Department
12. Pascal Bernard, PSH, Head of the Mission
13. Tuya Altangerel, (MDG) Mission, focal point of MDG Needs Assessment
14. Dr. Marianna Nosa, MERLIN, Tajikistan Medical coordinator
15. Dr. Nadim Haider, MERLIN, Khatlon Program Coordinator

## Annex II

### Data collection forms

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Head of National Reference lab: Bunafsha Mirzudovlyatova Deputy: Dr L. Pashkova	
Date 18.10.2004	
Site Name: National Reference Lab at the Republican Centre for TB	
Number of staff and position: 2 doctors two technicians	
Population Served	
Condition of building	poor
Condition of Laboratory	Lab is temporary situated in the basement of Rep Centre building and for the time being performing only smear microscopy
Reliable electrical supply	Yes
Reliable water supply	Yes
Workload (diagnostic and follow up)	1643 (report)
Number of lab doctors	2
Number of Lab Technicians	2
Number of other staff	2
Total staff trained (where and when)	All have been trained, training activities started in 2001, WHO modules were used
Sputum collection procedure (containers, instructions, safety)	Sputum collected outside, delivered trough the window
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Not sufficient stocks of stains and reagents, soon will be out of stock. Disposable containers are reused
Small laboratory equipment *	Not enough
Laboratory glassware *	Has been procured but will be in use when they move to new lab
Number of binocular microscopes (condition and maintenance) *	1 maintained well

\* Fill in the list of necessary equipment and supplies

Quality of smears	Some smears are with good quality, a few too thick, to small surface about 1 cm wide
Slide storage	yes
Participates in Proficiency Testing? (WHO recommended)	Introduced blinded rechecking two weeks ago, results are still not analyzed. Before they did 10% negatives and all positive. City TB Centre lab was rechecking NLR slides and vice versa
Use of standard reporting scale	Yes (reporting results as doubtful)
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes
Biosafety measures in place?	Yes as much as possible, taking into consideration the condition of the building
Disinfectants used	Yes chloramine
Contaminated waste disposal	Kept in chloramines till the next day and then disposed in the drainage, boiled and reused.
Number of monitoring visits last 12 months	Quarterly
Feedback provided	No
Laboratory manual and guidelines present	Yes (WHO)
Remarks	The laboratory will move to a new separate building, refurbished by Project HOPE, and will perform culture and DST. CDC provided technical support in the organization of the new laboratory. . Separate sections for smear, culture, DST, media preparation, washing and decontamination, storage, training room and rooms for the staff

<b>Data collection form</b>	
<b>Culture lab</b>	
Laboratory at the Oblast TB Centre	
Present: Director of the Oblast TB Centre: Eshonova Makhuba Oblast Laboratory Coordinator: Sitdikov Nail Unusovich Chief laboratory doctor: Tursunov Nusratullo Tursunovich	
Date: 14.10. 2004	
Site Name: Khujand – Oblast TB Centre	
Number of staff and position: The laboratory consists of two separate departments: smear microscopy staffed with one doctor and 2 lab technicians and culture department staffed with one doctor and one lab technician	
Population Served	150 000
Condition of building	Poor
Condition of Laboratory	Very poor
Separate sections for: specimen reception; microscopy; media preparation; culture; decontamination; storage; administrative section	There are separate room, but with inappropriate layout an organization of workflow. Does not satisfy basic safety requirements
Reliable electrical supply	No, especially in winter. Beside that hospital does not have funds to pay electricity bill regularly
Reliable water supply	No
Organization of workflow	Not possible to organize in existing condition. There are no safety hoods, inoculation done in closed boxes, without ventilation.
Workload (diagnostic and follow up)	Smear: for DOTS patients, start recently: 24 June 2004, so far: 55 patients in the register, 14 positive For non DOTS since January 2004: 2067 smear examinations Culture: There is no proper registration, about 50 cultures per month.
Number of lab doctors	2
Number of Lab Technicians	3
Number of other staff	2
Total staff trained (where and when)	All technicians trained in smear microscopy by the Oblast Lab Coordinator at Polyclinic No 1. Duration of training 2-3 days.
Sputum collection procedure (containers, instructions, safety)	Done at sputum collection room, Well ventilated, big window which is opened during the working day.
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Received from National TB Centre – Dushanbe, powder is distributed to smear microscopy centers and they prepare staining solution. Quality

	satisfactory
Reagents and supplies for fluorescent microscopy (quality, quantity and source)	Not in use
Reagents and supplies for culture	
Laboratory equipment *	Complete equipment is outdated, except binocular microscope Zies
Media prepared in laboratory , how often?	Once in two weeks, about 100
Quality of media	good
Laboratory glassware *	
Quality of smears	satisfactory
Slide storage	Not done regularly, no sputum collection boxes
Participates in Proficiency Testing? (WHO recommended)	Rechecking of slides during the supervisory visit
Decontamination procedure	Petroff method with 4% NaOH
Media used for culture	LJ
Quality of culture	Satisfactory
Frequency of culture examinations	Culture examination is done for non DOTS patients, each sputum sample
Use of standard reporting scale	Smear: Only for DOTS patients  Culture: No
Request for Sputum Exam used and filled in properly	Smear:  Culture: No
Laboratory Register used and fill in properly	Smear: Yes  Culture: No
Biosafety measures in place?	No safety hoods, no safe centrifugation, some personal safety measures are in place, but not sufficient to provide basic safety
Disinfectants used	hypochlorite
Contaminated waste disposal	Keeping in disinfectant for two hours and than autoclaving
Number of monitoring visits last 12 months	Visits once a month or more frequent by Lab Coordinator
Feedback provided	On site, no written report
Laboratory guidelines and manuals	Smear: No  Culture: No
Preparation and distribution of reagents and supplies	Distributed by Lab Coordinator
Training activities carried out by lab	No
Research activities	No
Reporting (to whom and frequency)	To Director, quarterly
Remarks	In general the quality of professional work is

\* Fill in the list of necessary equipment and supplies

	satisfactory, but impossible to continue in such a poor condition. No basic condition for culture examination
--	---

### **Additional information for laboratory performing DST**

Method for DST used	LJ Absolute concentration
Pure substances available	No, patients bring drugs they use for treatment and the lab doctor prepares media with them
Indication for DST	Positive culture
Additional training	No
Proficiency testing	No
Link with SRL	No
Information on previous treatment	No
DST Register patient/specimen based	Specimen based
Annual reports on DST	Only limited information: number of strains tested and the number of drugs the strains are resistant to
Available DST results (period and resistance patterns) Drugs tested: Streptomycin, Rifampicin, Isoniazid, Ethambutol, Kanamycin  Results from 2003: Total No of tested strains: 116 Sensitive to all drugs: 76 Sensitive to 4 drugs: 21 Sensitive to 3 drugs: 11 Sensitive to 2 drugs: 5 Sensitive to 1 drug: 3	

<b>Data collection form</b>
<b>Microscopy lab</b>
Present: Head doctor of the Oblast TB Centre: Eshonova Makhuba Head of the laboratory: Dr Nail Sitdikov, laboratory technician and laboratory assistant
Date 15.10.2004
Site Name: Polyclinic No1

Number of staff and position: Head of laboratory, one lab technician and one lab assistant	
Population Served	About 50 000
Condition of building	Poor, refurbishment is ongoing
Condition of Laboratory	The laboratory is under construction and temporary situated in two inadequate rooms
Reliable electrical supply	yes
Reliable water supply	yes
Workload (diagnostic and follow up)	94 patients from March 2004, 16 positive
Number of lab doctors	1
Number of Lab Technicians	1
Number of other staff	1
Total staff trained (where and when)	All trained in smear microscopy, on job training. Head of laboratory received 5 day training in March 2004 in Dushanbe and two weeks training in EQA in Tashkent
Sputum collection procedure (containers, instructions, safety)	Sputum collection room with instructions, disposable containers.
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Reagents received from National TB Centre Dushanbe, (powder), the distributed to other DOTS laboratories, quality is good
Small laboratory equipment *	Not present
Laboratory glassware *	Not sufficient
Number of binocular microscopes (condition and maintenance) *	One binocular microscope, Leika, maintained well, received form National DOTS program
Quality of smears	Good
Slide storage	yes
Participates in Proficiency Testing? (WHO recommended)	No
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes
Biosafety measures in place?	yes
Disinfectants used	chloramine

---

\* Fill in the list of necessary equipment and supplies



Contaminated waste disposal	Disposed after disinfection with chloramine
Number of monitoring visits last 12 months	One
Feedback provided	No
Laboratory manual and guidelines present	No
Remarks	Laboratory serves as a training centre for smear microscopy. Head of laboratory is Oblast laboratory coordinator

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present:       :       , Laboratory doctor at Polyclinic No 1 Saidnabaeva Mumina,	
Date 15.10.2004	
Site Name: Polyclinic No 5	
Number of staff and position: One laboratory doctor, lab assistant	
Population Served	About 50 000
Condition of building	Good
Condition of Laboratory	Good
Reliable electrical supply	yes
Reliable water supply	yes
Workload (diagnostic and follow up)	110 patients from April 2004, 12 positive
Number of lab doctors	1
Number of Lab Technicians	-
Number of other staff	1
Total staff trained (where and when)	Doctor trained in smear microscopy, on job training
Sputum collection procedure (containers, instructions, safety)	Well organized, ventilated, instructions for patients placed on the wall
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Sufficient, powder received from Polyclinic No 1
Small laboratory equipment *	Partly present
Laboratory glassware *	Not sufficient
Number of binocular microscopes (condition and maintenance) *	One, good condition Laica
Quality of smears	good
Slide storage	yes
Participates in Proficiency Testing? (WHO recommended)	Rechecking during monitoring visit by Lab Coordinator

---

\* Fill in the list of necessary equipment and supplies

Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes
Biosafety measures in place?	yes
Disinfectants used	yes
Contaminated waste disposal	Disposal after disinfection
Number of monitoring visits last 12 months	Once a month
Feedback provided	On site, no written report
Laboratory manual and guidelines present	no
Remarks	This was the best organized and performing laboratory in Hudjand

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Head doctor of the Oblast TB Centre: Eshonova Makhuba; Oblast Lab Coordinator Dr Nail Sitdikov The laboratory technician was not present, there was no electricity and she went home. Laboratory was opened by the doctor who was on duty.	
Date 15.10.2004	
Site Name: Macho Rayon	
Number the staff and position: one lab technician	
Population Served	
Condition of building	Laboratory situated in the separate, recently refurbished building
Condition of Laboratory	Not maintained well, not clean, inappropriate arrangement
Reliable electrical supply	No, There is no electricity from 8:30 till 5 PM
Reliable water supply	No water supply
Workload (diagnostic and follow up)	137 patients from Augyst 2004, 8 positive
Number of lab doctors	-
Number of Lab Technicians	1
Number of other staff	-
Total staff trained (where and when)	One, on job training
Sputum collection procedure (containers, instructions, safety)	Sputum collection room, not cleaned properly
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Yes, solution prepared in the laboratory, powder received from Polyclinic 1
Small laboratory equipment *	Not sufficient
Laboratory glassware *	Not sufficient
Number of binocular microscopes (condition and maintenance) *	One binocular Laica. Completely new, looks like it has never been used. One monocular Lomo, most likely in use.
Quality of smears	poor
Slide storage	Some slides kept on the table, not cleaned

---

\* Fill in the list of necessary equipment and supplies

	from immersion oil.
Participates in Proficiency Testing? (WHO recommended)	On site checking
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	The laboratory number is not correct. Each month starting new number
Biosafety measures in place?	Most likely no, laboratory technician was not present
Disinfectants used	No information
Contaminated waste disposal	No information
Number of monitoring visits last 12 months	Visit every month
Feedback provided	On site
Laboratory manual and guidelines present	No
Remarks	General impression very poor.

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Date 18.10.2004	
Laboratory at the City TB Centre	
Present:	
Population Served	
Condition of building	Ground floor building , poor condition
Condition of Laboratory	Laboratory situated in the second half of the building
Reliable electrical supply	Yes, restriction no more than an hour during the day
Reliable water supply	yes
Workload (diagnostic and follow up)	This year 1008 so far
Number of lab doctors	1
Number of Lab Technicians	1
Number of other staff	Clinical lab staff
Total staff trained (where and when)	Trained in at NRL
Sputum collection procedure (containers, instructions, safety)	Collected outdoors, delivered trough the separate door, patients instructed by the nurses
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Receive from NRL
Small laboratory equipment *	Yes
Laboratory glassware *	Not completed (some old bottles, household glassware)
Number of binocular microscopes (condition and maintenance) *	One binocular Leica, one monocular that was on table in use. Explanation: binocular is used only for sputum examination
Quality of smears	Not all slides with standard quality, some too tick, some prepared with two slides instead of loop.
Slide storage	Yes
Participates in Proficiency Testing? (WHO recommended)	Yes

---

\* Fill in the list of necessary equipment and supplies

Use of standard reporting scale	Same as NRL
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes
Biosafety measures in place?	Too many pieces of old equipment.
Disinfectants used	yes
Contaminated waste disposal	Same as NRL
Number of monitoring visits last 12 months	Quarterly
Feedback provided	On site
Laboratory manual and guidelines present	WHO manuals were provided at the training
Remarks	According to the NTP plan, this laboratory should not provide lab services, patients should be diagnosed at Central polyclinic which is next door, or at other polyclinics.

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Date 18.10.2004	
Laboratory at the Central TB Policlinics	
Number of staff and the position: General clinical laboratory, staff for smear microscopy: one doctor and one lab technician	
Population Served	
Condition of building	Good
Condition of Laboratory	Situated on the second floor, good
Reliable electrical supply	Yes
Reliable water supply	Yes
Workload (diagnostic and follow up)	Low workload, 1 – 5 smears per day
Number of lab doctors	1
Number of Lab Technicians	1
Number of other staff	Staff, doing clinical lab tests
Total staff trained (where and when)	2, trained in 2002, Training conducted at NRL, WHO lab manuals used as a training material
Sputum collection procedure (containers, instructions, safety)	Done outside the building
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Receive prepared from NRL, enough at the moment, quality satisfactory,
Small laboratory equipment *	Yes
Laboratory glassware *	Yes
Number of binocular microscopes (condition and maintenance) *	1 maintained well
Quality of smears	Needs improvement
Slide storage	yes
Participates in Proficiency Testing? (WHO recommended)	yes
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes

---

\* Fill in the list of necessary equipment and supplies



Biosafety measures in place?	yes
Disinfectants used	yes
Contaminated waste disposal	Kept in chloramine and disposed in drainage
Number of monitoring visits last 12 months	Quarterly visits
Feedback provided	On site
Laboratory manual and guidelines present	No
Remarks	The working conditions better then in other two labs, but the workload is the lowest. The patients still prefer to have smear examination at City TB Centre, because they think that the skills of lab technicians at TB centre are better.

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Rashimova Hanifa Achmyanovna, laboratory specialist	
Date 18.10.2004	
Laboratory at the Rudaki Central Rayon Hospital	
Number of staff and the position: Laboratory doctor and the laboratory assistant	
Population Served	90 000
Condition of building	good
Condition of Laboratory	Situate in separate building, very good condition, clean, smear done in one room, very well organized work
Reliable electrical supply	Only in the morning
Reliable water supply	yes
Workload (diagnostic and follow up)	664 patients examined so far
Number of lab doctors	1
Number of Lab Technicians	2
Number of other staff	1
Total staff trained (where and when)	Both technicians trained. One technician trained in 2002, other in 2003. Lab specialist trained in Bishkek 1998, in Dushanbe 2002 and in Tashkent on EQA for smear microscopy
Sputum collection procedure (containers, instructions, safety)	Sputum is collected in sputum collection room, delivered to laboratory by the nurse in charge of sputum collection. The nurse trained patients as well.
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Sufficient quantities, received regularly on monthly basis from Republican Centre
Small laboratory equipment *	Present
Laboratory glassware *	Present
Number of binocular microscopes (condition and maintenance) *	One microscope, a few months ago a white smear appear in one ocular from the internal side (possible colonization with yeasts)

---

\* Fill in the list of necessary equipment and supplies

Quality of smears	good
Slide storage	Yes, in sputum collection boxes
Participates in Proficiency Testing? (WHO recommended)	Yes, Panel testing (20 slides) performed by CDC. The laboratory specialist is included in EQA by blinded rechecking process, introduced two weeks ago
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes
Biosafety measures in place?	yes
Disinfectants used	chloramine
Contaminated waste disposal	Chemical decontamination and then burning
Number of monitoring visits last 12 months	quarterly
Feedback provided	Oral on site
Laboratory manual and guidelines present	Yes
Remarks	This was the best organized laboratory, out of all visited in the country. It should be included in the training as a model of well functioning smear microscopy centre.

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Date 19.10.2004	
Macheton Republican TB Hospital – TB laboratory	
Number of staff and the position: One lab Doctor and one cleaner	
Population Served	Hospital patients and surrounding
Condition of building	Poor
Condition of Laboratory	Very poor some renovation has started
Reliable electrical supply	yes
Reliable water supply	yes
Workload (diagnostic and follow up)	10-15
Number of lab doctors	1
Number of Lab Technicians	-
Number of other staff	1
Total staff trained (where and when)	1 in Dushanbe 2002
Sputum collection procedure (containers, instructions, safety)	Disposable containers, sputum collected in the hospital, nurses trained.
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	yes
Small laboratory equipment *	yes
Laboratory glassware *	no
Number of binocular microscopes (condition and maintenance) *	1 Zeiss, not maintained well, not clean, cover was missing (eaten by mice)
Quality of smears	Needs improvement
Slide storage	yes
Participates in Proficiency Testing? (WHO recommended)	Yes, tested two weeks ago by blinded rechecking
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes

---

\* Fill in the list of necessary equipment and supplies

Biosafety measures in place?	No, laboratory was not maintained well, lab doctor did not wear lab coat, a lot of old equipment everywhere
Disinfectants used	yes
Contaminated waste disposal	By chemical decontamination and boiling
Number of monitoring visits last 12 months	quarterly
Feedback provided	oral
Laboratory manual and guidelines present	Not present in the lab. Lab doctor has been given during the training, but she keeps it at home
Remarks	Very poor hygiene and maintenance, very poor condition of the building

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Oblast lab coordinator Kurgan tube	
Date 20.10.2004	
Lab Kurgan Tube lab – Regional TB Centre	
Number of staff and the position: 1 lab techn	
Population Served	About 100 000
Condition of building	New building built by Merlin very good condition
Condition of Laboratory	Good
Reliable electrical supply	Recently yes, before no
Reliable water supply	yes
Workload (diagnostic and follow up)	10-20
Number of lab doctors	1
Number of Lab Technicians	-
Number of other staff	
Total staff trained (where and when)	1 trained by Merlin in 2003
Sputum collection procedure (containers, instructions, safety)	Sputum collected outside, no special instructions, most of diagnostic patients with only one sample. Do not have disposable containers any more, now use old reusable
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Have stock, from August, difficult to figure out the expiry date, crystals present in carbol fuchsin
Small laboratory equipment *	yes
Laboratory glassware *	yes
Number of binocular microscopes (condition and maintenance) *	1 Poor maintenance, Zeiss, not clean, mechanical stage did not work
Quality of smears	Slides reusable with scratches, quality needs

---

\* Fill in the list of necessary equipment and supplies

	improvement
Slide storage	Only positive
Participates in Proficiency Testing? (WHO recommended)	No
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	Yes, quarterly reporting to the director
Biosafety measures in place?	No disinfectant, clean only with household detergents
Disinfectants used	No
Contaminated waste disposal	Boiling with detergent for 2 hours and then washed
Number of monitoring visits last 12 months	2
Feedback provided	oral
Laboratory manual and guidelines present	Yes
Remarks	Laboratory should be monitored on regular basis, participate in QA and regularly supplied with reagents of good quality. That will improve the quality of work.

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Sultonora Urnobi, lab technician, replacing Lab specialist on the position of Regional Lab coordinator Head of the NRL HOPE Monitoring specialist HOPE Project Manager Hope Regional Lab specialist	
Date 21.10.2004	
Laboratory at the regional TB Hospital Kulyab	
Number of staff and the position: 2 lab technicians, lab specialist on maternal leave	
Population Served	200 000
Condition of building	Good, clean
Condition of Laboratory	Good, clean, renovated and equipped by Merlin in July 2003
Reliable electrical supply	yes
Reliable water supply	yes
Workload (diagnostic and follow up)	20-30 slides per day 1358 patients examined so far
Number of lab doctors	1
Number of Lab Technicians	2
Number of other staff	1
Total staff trained (where and when)	Lab technicians trained once on 6 day training in Vose in 2003
Sputum collection procedure (containers, instructions, safety)	Sputum is collected outside; a nurse is trained to instruct patients. However majority of samples are saliva. That particular morning out of 7 samples collected 5 were saliva. Negative slides are reused 3 times.
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Reagents received from NRL, distributed prepared and ready to use, the quality was satisfactory
Small laboratory equipment *	yes
Laboratory glassware *	yes
Number of binocular microscopes (condition and maintenance) *	Binocular microscope received from Merlin in 2004 (Zeiss). Well maintained

\* Fill in the list of necessary equipment and supplies



Quality of smears	Crystals from Carbol fuschin present on the slides, majority of slides prepared from saliva and washed out during the staining.
Slide storage	Positive slides kept 6 months, negative 3 months
Participates in Proficiency Testing? (WHO recommended)	No
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	Yes
Biosafety measures in place?	yes
Disinfectants used	Chlorine 10%
Contaminated waste disposal	Chemical decontamination and disposal
Number of monitoring visits last 12 months	quarterly
Feedback provided	oral
Laboratory manual and guidelines present	Yes
Remarks	Sputum collection and smear preparation should improve; retraining of lab staff is needed.

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Laboratory was locked, It was possible to have a look on the lay out of the lab, hygiene and lab register and lab forms through the window.	
Date 21.10.2004	
Lab at Vose TB Centre	
Number of staff and the position:	
Population Served	150 000
Condition of building	good
Condition of Laboratory	good
Reliable electrical supply	-
Reliable water supply	-
Workload (diagnostic and follow up)	436 patients examined this year so far
Number of lab doctors	
Number of Lab Technicians	
Number of other staff	
Total staff trained (where and when)	
Sputum collection procedure (containers, instructions, safety)	-
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Distributed from NRL
Small laboratory equipment	yes
Laboratory glassware	-
Number of binocular microscopes (condition and maintenance)	One, maintained well
Quality of smears	
Slide storage	yes
Participates in Proficiency Testing? (WHO recommended)	no
Use of standard reporting scale	yes
Request for Sputum Exam used and	yes

filled in properly	
Laboratory Register used and fill in properly	yes
Biosafety measures in place?	-
Disinfectants used	-
Contaminated waste disposal	-
Number of monitoring visits last 12 months	quarterly
Feedback provided	oral
Laboratory manual and guidelines present	-
Remarks	Information on this laboratory recorded even though the laboratory was not visited and the lab personnel was not present. The number of smear examinations done shows that this laboratory has not been utilized adequately, taking into account the population coverage

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Safarova Tufa, lab technician	
Date 21.10.2004	
Laboratory at the Regional General hospital - Kulyab	
Number of staff and the position: One lab specialist and two lab technicians	
Population Served	About 100 000
Condition of building	Very poor
Condition of Laboratory	Very poor, there is enough space , three rooms connected, but all of them full with old equipment, old furniture and other staff which are not in use
Reliable electrical supply	Not in winter
Reliable water supply	yes
Workload (diagnostic and follow up)	4 patients examined in October. Laboratory started in July, so far 9 patients examined, no positive found
Number of lab doctors	1
Number of Lab Technicians	2
Number of other staff	1
Total staff trained (where and when)	The staff attended lab training in Kulyab in 2003
Sputum collection procedure (containers, instructions, safety)	Sputum collected outside
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	Do not have regular supply with reagents and consumables
Small laboratory equipment *	no
Laboratory glassware *	no
Number of binocular microscopes (condition and maintenance) *	One, received from ADB last year, but the lab technician was not trained how to use it. She removed one eyepiece and use it as

---

\* Fill in the list of necessary equipment and supplies

	monocular
Quality of smears	poor
Slide storage	no
Participates in Proficiency Testing? (WHO recommended)	no
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	Yes, most of patients examined only by one smear
Biosafety measures in place?	no
Disinfectants used	Chlorine 10%
Contaminated waste disposal	Chlorine disinfection
Number of monitoring visits last 12 months	Quarterly from NRL
Feedback provided	oral
Laboratory manual and guidelines present	no
Remarks	Poor performance of the laboratory, poor working conditions and maintenance, too few slides examined.

<b>Data collection form</b>	
<b>Microscopy lab</b>	
Present: Shaira Mohamedovna – lab specialist all	
Date 21.10.2004	
Dangara TB Hospital – laboratory	
Number of staff and the position: only one – lab specialist	
Population Served	40 000
Condition of building	Very good, refurbished and equipped by Merlin
Condition of Laboratory	Very good
Reliable electrical supply	Sometimes only two hours a day
Reliable water supply	Yes
Workload (diagnostic and follow up)	Laboratory started the work in March, so far 65 patients examined, 14 found positive.
Number of lab doctors	1
Number of Lab Technicians	-
Number of other staff	-
Total staff trained (where and when)	Lab specialist trained on basic training two years ago in Dushanbe
Sputum collection procedure (containers, instructions, safety)	Done outside, not always done properly, disposable containers in use
Reagents and supplies for Ziehl Neelsen (quality, quantity and source)	From NRL, good quality
Small laboratory equipment *	yes
Laboratory glassware *	yes
Number of binocular microscopes (condition and maintenance) *	One Leica, good, well maintained, received from KfW
Quality of smears	Needs improvement
Slide storage	yes
Participates in Proficiency Testing?	no

---

\* Fill in the list of necessary equipment and supplies

(WHO recommended)	
Use of standard reporting scale	yes
Request for Sputum Exam used and filled in properly	yes
Laboratory Register used and fill in properly	yes
Biosafety measures in place?	yes
Disinfectants used	10% chlorine
Contaminated waste disposal	Disinfected before disposal
Number of monitoring visits last 12 months	Each month
Feedback provided	oral
Laboratory manual and guidelines present	yes
Remarks	

### Annex III

#### List of laboratory equipment and supplies needs for DOTS expansion

Laboratory Reagents						
N	Population (2003)	50% of population	Morbidity rate per 100 000	Number of new cases	Number of smear positive cases (50% from number of new cases)	Total number of examinations N*37,6
	6640000	3,320,000	150	4980	2490	93624

		unit	needs for 1 examination	number of smear examination	needs	buffer stock	in the stock	total needs g/ml	per unit	amount of units
1.	Specimen slides	1	1	93624	93624	187248	0	187248	100	1873 pack
2.	glass containers for sputum	1	1	93624	93624	187248	0	187248	48	3901 pack
3.	Methylene blue, 100g	1g	0.015	93624	1404	2809	0	2809	100	28.1
4.	Carbon Fuchsin, 25 g	1g	0.015	93624	1404	2809	0	2809	100	28.1
5.	Immersion oil 480mlx8	1 ml	0.1	93624	9362	18725	0	18725	3840	4.9
6.	Sulphuric acid	1ml	1.25	93624	117030	234060	0	234060	1000	58.5



7.	Phenol	1g	0.25	93624	23406	46812	0	46812	500	93.6
8.	Xylol	1ml	1	93624	93624	187248	0	187248	1000	187
9.	Ethanol	1ml	0.5	93624	46812	93624	0	93624	1000	93.6
10.	Blotting paper	1 box	0.00007	93624	7	13	0	13	100	0.13

#### Small laboratory equipment and supplies

			unit per lab	number of lab	total amount
11.	Drapes for cleaning lenses		4	42	168
12.	box for slide storage	1 box	3	42	126
13.	staining bottles	1	2	42	84
14.	spirit lamp	1	1	42	42
15.	slide transport box	1	2	42	84
16.	timer	1	1	42	42
17.	loop holder	1	2	42	84
18.	sodium hypochlorite	5 l	1	42	42
19.	inoculation loop 3mm	12 per pack	1	42	42