QUALITY ASSURANCE IN SPUTUM SMEAR MICROSCOPY

DOCTORS' ORIENTATION

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Provincial Tuberculosis Control Programme Punjab
Provincial Reference Laboratory Punjab
Association for Social Development (ASD) Pakistan
Nuffield Institute for Health (NIH) UK

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Objectives of Training Session

At the end of this session the participants are expected to be able to:

1. Recognize the importance and understand the organizational arrangements for external quality assurance (EQA) in sputum smear microscopy.
2. Select a sample of slides for blinded reexamination by District Laboratory Supervisor (DLS)
3. Interpret the reexamination results and facilitate corrective measures to improve the quality of microscopy services at their respective facilities.

A. INTRODUCTION TO EQA

1. Quality of Sputum Smear Microscopy in TB Control

Early diagnosis and effective treatment is the key element of the DOTS strategy package. Failure to detect persons with TB can lead to continued spread of infection in the community. The WHO strategy for tuberculosis control (DOTS) relies on a network of laboratories that provide acid-fast bacilli (AFB) sputum smear microscopy. The AFB result determines the treatment and outcome of an individual TB patient. If the laboratory diagnosis is unreliable, all other activities of the TB control programme are affected. Therefore, quality assurance of laboratory services, including AFB sputum smear microscopy, is essential. The quality of sputum smear microscopy services can only be assured through staff commitment at facility, district, provincial and national levels.

2. External Quality Assurance (EQA)

The National Tuberculosis Programme (NTP) requires the AFB testing laboratories to be managed by a system of external quality assurance (EQA) and quality improvement that meets international standards.

2.1 Purpose of EQA

External quality assurance is an approach in which the performance of facility staff is assessed and supported on regular basis by expertise from outside the facility. The purpose of EQA at a diagnostic center is to improve the quality and the trust-worthiness of the smear results through:

- Availability and quality of laboratory inputs including reagents, supplies, print materials, and microscope.
- Continued skill and capacity enhancement for performing the laboratory related tasks e.g. smear preparation and examination, storage and disposal of slides, and recording and reporting of smear results.

The focus of EQA is on the identification of laboratories where there may be serious problems resulting in poor performance, not on the identification of individual slide errors

or the validation of individual patient diagnoses**.** It is also a very important tool for communication with and motivation of laboratory staff that may otherwise feel isolated in their work.

2.2 Methods Used in EQA

There are three methods that can be combined to evaluate laboratory performance:

On-Site Evaluation

The observation of laboratory arrangements and working under actual conditions include: quality and functioning of equipment; adequacy and quality of reagents and supplies; slide storage; record keeping; and laboratory safety. Documentation of the onsite evaluation process, on standardized formats, helps to monitor the changes in laboratory arrangements and practices over a period.

Blinded Rechecking

The DLS, during the monthly visit, would recheck a random sample of slides prepared and examined at the diagnostic center during the month under review. The method for selecting, rechecking, recording and cross validating the results is described in the respective sections of DLS Guidelines.

Panel Testing

In this method, the laboratory person is provided a set of stained and/ or unstained slides for reading, interpreting and reporting the results. This method tests the technician's ability to stain and/or read smears, and is not a useful mean to assess routine laboratory performance. In TB control programme, the provincial reference laboratory would periodically administer the panel testing to assess staff skills.

Participant Note:

- ☞ Discuss with the Facilitator to clarify points not understood in sections 1, 2.1 and 2.2.
- ☞ Wait for the Facilitator to proceed
- ☞ Read through the section 2.3

2.3 Organizational Arrangements for EQA

The EQA at a facility is implemented through collaborative efforts of facility, district and provincial level staff.

2.3.1 At Facility Level

Two main staff members involved in EQA are Medical Officer (MO) and laboratory staff.

M.O In-charge**:**

- Selects a sample of slides, as per programme guidelines, for reexamination by the DLS.
- Enters the facility results (from TB04) into EQA Form, and participate in comparing these with the DLS reexamination results.
- Discuss the EQA findings, and facilitate the process to address the gaps in laboratory arrangements and practices.

Laboratory staff**:**

- Maintains the laboratory register and stores all slides for re-checking.
- Shares the technical and logistic issues constraining his AFB testing work.
- Complies with the instructions of the District Laboratory Supervisor and M.O In-charge for improved quality of AFB testing.

2.3.2 At District Level

Two main district level staff members involved in EQA are District Laboratory Supervisor (DLS) and District TB Coordinator (DTC).

DLS:

An enabled District Laboratory Supervisor (DLS) visits each TB diagnostic center, on monthly basis. During visit, the DLS performs EQA mainly through the onsite evaluation and blinded rechecking of a sample of TB slides. The assessment is followed by onsite interaction between the facility staff and the DLS for better understanding and action planning. The DLS is responsible to:

- Plan, conduct, document and report monthly supervisory visits to each diagnostic center in the district.
- Carry out and documenting the onsite evaluation and providing support to plan/address the material and ability gaps.
- Carry out and document the onsite blinded rechecking of sample slides, as per programme guidelines. This also includes providing feedback to health facility staff i.e. facility in-charge as well as laboratory staff.
- Maintain communication with the provincial reference laboratory (PRL) including sending them the discordant slides, facilitating their examining a sample of concordant slides (during supervisory visit of the district), and participating in quarterly interaction with them (i.e. PRL staff).

The operational details for DLS planning, carrying out, documenting and following-up the EQA activities in a district are described in DLS Guidelines.

District TB Coordinator

- Supervise (administrative) and support the DLS work in the district including approving and monitoring his visit plans, facilitating the availability of laboratory reagents and supplies.
- Contribute in the laboratory related discussions held during the facility review/planning meeting.
- Comment on the DLS performance presented in the quarterly intra-district meeting.
- Facilitate communication with provincial reference laboratory including:
    - Ensure the discordant slides are sent and feedback is received in-time;
    - DLS attends the quarterly meeting at PRL; and
    - PRL staff quarterly monitoring visit to the district is facilitated.

2.3.3 At Province Level

A strengthened provincial level laboratory setup provides the training and supervision support to the district laboratory supervisors. The responsibilities include:

- Design and conduct the training of District Laboratory Supervisors (DLS) from all districts in the province.
- Reexamine the discordant slides received from the districts, keep record and provide in-time feedback to the districts.
- Develop and conduct the interaction and build capacity of DLS, when they come for quarterly meeting at PRL.
- Plan and conduct quarterly supervisory visits to all the participating districts.
- Communicate with National Reference Laboratory for EQA work in province.

Participant Note:

- ☞ Discuss with the Facilitator to clarify points not understood in sections 2.3.
- ☞ Wait for the Facilitator to proceed.
- ☞ Read through the section 3.

3. MEDICAL OFFICER'S ROLE in EQA

During the health facility visit the DLS will cross examine a sample of slides, assess practices and assist the laboratory staff to address technical, operational and logistic issues.

The section below elaborates on three main responsibility areas of the M.O In-charge, related to EQA at their respective facilities.

3.1 Sampling

The recommended sampling technique and sample size are based on international standards of “Lot Quality Assurance System”. The recommended number of slides (i.e. 8 at RHC and 10 at district and sub-district hospitals) to be reexamined every month at health facility is based on multiple technical and programmatic considerations.

An essential requirement in the EQA is that reexamination is done without knowing the prior results i.e. cross-examiner is kept blind to the results recorded in TB04. The blinding ensures “unbiased” comparison of two results i.e. facility staff and the cross-examiner. The Medical Officer has been entrusted to achieve blinding in the EQA process. At each monthly visit of the DLS, the Medical Officer In-charge selects a sample of slides for the DLS to reexamine and report back. Medical Officer In-charge keeps the laboratory register with him, while the DLS does the reexamination of sample slides. This approach to blinding enables the District Laboratory Supervisor (DLS) to reexamine the slides on-site and provide immediate feedback to the facility staff.

The method for randomly selecting a sample of slides for reexamination is described below.

Sampling method:

- Check that all sputum slides are kept in sequence in the slide storage box (same sequence as in the laboratory register). This should include both new and follow-up sputum slides.
- Look in the laboratory register for the first and the last serial number of patients examined in the last completed calendar month. (For example, for the month of March 2007 at RHC Barakahu the first patient examined is serial number 201 and the last patient examined is serial number of 288).
- Count the total number of patients examined for the identified range of serial numbers i.e. 201 – 288 (88 patients examined for this range of serial numbers). The required sample size is 8 for rural health centers and 10 for hospitals.
- Divide the total number of patients examined by the required sample size, to get the sample number value “n”. For the above example, divide the number of patients (88) with the sample size for RHC (8). The result is n = 11. This means that a slide of every 11^{th} patient examined at RHC during the month of March is to be reexamined by the DLS.
- Choose randomly the first number to start sampling from. Out of the first “n” group (in this example, 11 patients with serial numbers 201 – 211), select one serial number randomly. In this example “203” is selected out of the first “n” group. Then from the remaining serial numbers, every n^{th} (in this example 11^{th}) serial number is systematically selected (i.e. 203+11=214, 214+11=225, etc.----). In this way the eight

selected serial numbers are identified from the RHC laboratory register (10 slides if a hospital).

- Retrieve the slides with selected serial numbers from the storage boxes. In case of TB suspects with more than one slides examined, the morning slide (i.e. "b" of the same serial number) is taken for reexamination. If a slide is missing, use the next slide. If more than two slides are missing, check whether the slides are being destroyed by the peripheral laboratory technician and take the corrective action DLS receives the randomly selected sample of slides from the Medical Officer In-charge. DLS notes the serial numbers of the selected slides in the EQA-1 Form, before taking these slides for the reexamination.

Summary: The sample size of patients to have a slide cross examined is always 8 for RHCs (or 10 for hospitals). However, the sample number ("nth") will be different each time - depending on the number of patients examined in the last completed month. In our example this was 11 because there were serial number 201 – 288 = 88 patients examined in March. That is dividing by 8 (for an RHC) this gives a sample number of 11th patient in this example. (If in the month of April there is 72 patients in the laboratory register, then the sample number will be 9). Also, remember to start with a random number chosen from the first group of "n" patients; by chance patient serial number was chosen 203 in our example, and so the next was 203 + 11 = 214 and so on until all 8 (for this RHC) are sampled.

Participant Note:

☞ Discuss with the Facilitator to clarify points not understood in section 3.1.

☞ Do the following Exercise-1

Exercise-1

You are a Medical Officer at RHC. DLS has come to your RHC for EQA on his monthly visit.

i. You are required to do the sampling for him and record below. Identity the serial No. form the RHC Lab register attached at page no. 19-22.

ii. Retrieve the slide with selected serial no. from the slide storage box.

Sr. No.	Lab. Serial No.

Facilitator Note:

- Provide the TB04. (See page no. 19-22)
- Provide the slide box for selecting a sample.
- Explain the exercise
- Check the answers/ slides retrieved, discuss any variations and respond to any queries.

Step-1: Look in the laboratory register for the first and the last serial number of patients examined in the last completed calendar month

Step-2: Count the total number of patients examined for the identified range of serial numbers.

Step-3: Divide the total number of patients examined by the required sample size, to get the sample number value “n”.

Step-4: Choose randomly the first number to start sampling from. Out of the first “n” group, select one serial number randomly. Then from the remaining serial numbers, every n^{th} serial number is systematically selected.

Step-5: Retrieve the slides with selected serial numbers from the storage boxes.

3.2 Comparing two results

- After reexamination the DLS records the results in section-6 of EQA Form-1 in column; Reexamination Result, and takes this back to the Medical Officer In-charge.
- Medical Officer In-charge checks the results of the cross-examined slides from the Laboratory register, and records the results in section-6 of EQA Form-1 in column; Diagnostic Centre Result.
- Medical Officer In-charge and DLS jointly compares and records “by putting a tick mark” in one of the five columns under “Comparison” sub-section of Section-6.

3.3 Responding to deviated practices and differing results

- M.O discuss the findings and possible reasons for the gaps. The corrective actions depend mainly on the reasons of observed deviation and the circumstances influencing the feasibility of options.
- The reasons and potential response to deviated practices are:

Reasons	Possible Action
Materials not available or poor quality	Provide quality materials.
Microscope not available/ out of order	Repair or replace the microscope
Staff not available	Provide staff (temporary or permanent)
Available staff not skilled or over-worked	Staff training (onsite, refresher, retraining) Rationalize, through redistribution, the work load

Participant Note:

☞ Discuss with the Facilitator to clarify points not understood in section 3.2 and 3.3.

☞ Do the Exercise-2

Exercise-2

You are a Medical Officer at RHC. DLS has cross examined the slides which you have given to DLS (See the results cross examined recorded in EQA form-1 section-6 at page no. 16).

i. Write down the Diagnostic Center Results in EQA Form-1, Section-6 of the given sampled slides from TB04.

ii. Write down their results cross examined by DLS given in EQA Form-1, Section-6.

iii. You are required to record the comparison comments below.

iV. Record the Remarks.

Facilitator Note:

- Provide the TB04 (see page no. 19-22) and EQA Form-1(see page no. 15-16).
- Explain the exercise
- Check the answers, discuss any variations and respond to any queries.

Step-1: Write down the Diagnostic Center Results in EQA Form-1, Section-6 from TB04

Step-2: Record the comparison comments.

Step-3: Record the Remarks.

EQA Form-1
Section - 6: Reexamination by DLS

S. No	Lab. Serial No.	Reexamine Result	Diagnostic Center Result	Comparison					Remarks
				AG	HFP	LFP	HFN	LFN	
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
Summary results									

Notes on Section-6 columns

- *Lab. Serial Number* as recorded on each selected slide. This is filled by DLS, when he receives the sample slides for reexamination.
- *Reexamine result* refers to the smear results of each selected slide, as reexamined by the first controller (DLS). This column is filled by DLS as he reexamines each of the sample slides.
- *Diagnostic center result* refers to the smear result of each selected slide, as recorded in TB04 of the diagnostic center. The Medical Officer In-charge fills this column once he receives the EQA-1 Form with DLS reexamine results.
- *The* results recorded in the two result columns are compared and accordingly recorded in the comparison part of the table. The DLS compares the results and records by putting a "tick " mark in the relevant column.
    - Agreement: refers to that smear positive or smear negative results (given by the diagnostic center), which were found concordant (same) on subsequent cross-examination by the first controller (DLS). In case of smear-positive results, even the grading difference is considered to be the agreed results (i.e. recorded under result agreement).
    - *False positive:* refers to that smear positive results (given by the diagnostic center), which were found smear negative on subsequent cross-examination by the first controller (DLS). More false positive means over-diagnosis of smear-positive cases of TB. False positives can either be high or low false positive.
        a. *High False Positive (HFP): refers to a negative smear misread as 1+ to 3+ (based on IUATLD/ WHO recommended grading of sputum smear microscopy results). This is a major error.*
        b. *Low False Positive (LFP): refers to negative smear that is misread as a scanty (1-9 AFB/100 fields) positive. It is a minor error.*
    - *False negative:* refers to that smear negative results (given by the diagnostic center), which were found smear positive on subsequent cross-examination by the first controller (DLS). More false negative means under-diagnosis of smear-positive cases of TB. False negatives can either be high or low false negatives.
        a. *High False Negative (HFN):* refers to 1+ to 3+ positive smear that is misread as negative. This is a major error.
        b. *Low False Negative (HFN):* refers to scanty (1-9 AFB / 100 fields) positive smear that is misread as negative. It is a minor error.
- *Summary results:* Gives the count of "tick marks" in each column.
- *Remarks:* DLS records the reasons for difference in results and agreed actions

Exercise-3:

You are a Medical Officer at RHC. DLS has done the detailed review of your health facility laboratory, EQA form-1 filled. He has come up with the findings. He wanted to discuss with you about the observed gaps, deviation from practices and enhancement of lab tech skills.

1. Write down the agreed actions / comments in Section-7: Review with Medical Officer

2. Record the implementation of previous agreed actions.

Facilitator Note:

- Provide the EQA Form-1(see page no. 15-16).
- Explain the exercise. (DLS told that Lab reagents are not filtered before use,TB04 recording is not complete as follow-up pt's are not given district Tb number, Slides are not stored in sequence order in slide box, specimen quality and thickness is not acceptable. In microscopy major error has also found. In my previous visit I pointed out these points but still all gaps persists.
- Check the answers, discuss any variations and respond to any queries.

Step-1: Write down the Agreed actions/Comments in EQA Form-1 Section-7 from EQA form-1 as observed and agreed in section-1 to Section-6.

Step-2: Record the mutually agreed comments.

Step-3: Record the implementation of previous agreed actions.

Section-7: Review with Medical Officer

Agreed actions/comments	
Implementation of previous agreed actions	
Signature:_____ **DLS**	**Signature: _____** **MO/Date**

4. MEDICAL OFFICER'S ROLE in FACILITY REVIEW / PLANNING MEETING

- The Medical Officer In-charge (facility) facilitates the proceedings of the facility review/planning meeting. The meeting is attended by:
    a) Medical Officer In-charge, DOTS Facilitator and laboratory person from the host facility under review, and
    b) District TB Coordinator and District Laboratory Supervisor from the district.
- This meeting follows the cluster meeting, hosted in the facility. The participants from other facilities do not attend the facility review and planning meeting. Every three to four months (depending upon number of facilities in the cluster), a facility gets an opportunity to have this meeting held for their respective facility.
- Two main documents that inform the discussion and decision making in the meeting are: Facility monitoring forms and the EQA-1 forms for the last 3 - 4 months. These forms are available with the facility as well as the District TB Coordinator.
- The deliberations focus mainly on three interest areas i.e. the inputs, the case management practices, and the laboratory functioning.
    - The inputs availability is reviewed, as discussed earlier for the cluster meeting. The main reasons and the decisions to address the input gaps are recorded in the action note table (see Appendix-B).
    - The case management practices are reviewed, as described earlier for the cluster meeting. The main reasons and the decisions to address the case management practice gaps are recorded in the action note table (see Appendix-B).
    - The laboratory functioning, including EQA, is reviewed in light of DLS observations/feedback during the last 3 – 4 months. The main reasons and the decisions to address the laboratory performance gaps are recorded in the action note table (see Appendix-B).
- Two copies of Action Note Table are filled for the respective facility. Each filled copy is signed by the respective Medical Officer In-charge, and counter signed by the District TB Coordinator or his representative.
- The facility files the filled action note form in their respective file. District TB Coordinator also maintains a separate file for each diagnostic center, in which all the relevant documents (including action note) for the respective facility are filed.

FACILITY MONITORING TOOL

Name of Health Facility _____ **Catchment Population**_____

Month under reporting _____ **Visit/Meeting Date** _____

A. PRINT MATERIALS

Item	Minimal Stock Level	Stock available	Stock Replenishment		Comments/Required Action
			Supplied	To Arrange	
TB01	150				
TB02	150				
TB03	1 register				
TB04	1 register				
TB05	2 pads				
TB07, 08, & 09	1 register				
Treatment Support Card	150				
Request for Rx. Support	1 pad				
Hard to access cards	50				

B. DRUG

Drugs	Minimal Stock Level	Stock available	Stock Replenishment		Comments/ Required Action
			Supplied	To Arrange	
HRZE	2640				
HE	4320				
S	120				
RHE	1200				
Weighing Scale	1				

C. STAFF AVAILABILITY

Category	*Staff*		*Comments/ Required Action*
	#Available	#Trained	
DOTS Doctor			
DOTS Facilitator			
Lab. Person			

D. FACILITY FUNCTIONING (last month)

Outpatients	*Laboratory Functioning*		
Total OPD attendance	Interruption in laboratory functioning (# days)	Reasons	Required Action
D1	D2	D3	D4

Note: Data in "Grey cells" to be brought from the health facility, by the respective DOTS Facilitator.

Stock entries checked: **Signatures of SMO/ I/C:** _____

E. CASE MANAGEMENT PRACTICES Facility: _____ Month under review:_____

Lab. (TB 04)			Registration (TB 03)					*Case management (TB 03)*									
Number Examined			Number of patients registered					Pt who started their intensive phase during month under review			Pt who started their treatment same month previous quarter (i.e. 1st, 2nd or 3rd month of the previous quarter)					Absentee patients (TB01)	
Suspects		Patient	Smear Positive				Smear Negative	Smear Positive only			Conversion (NSS+)					#	Action taken
Tested last month	Found positive	Follow-up	New	Retrea-tment (CAT2)	Total (CAT 1 & 2)	Pre-reg default	New	# Correct Regimen (TB01)	# Correct Dosage (TB01)	Treat-ment support noted	# Total started	# Convert	# Default	# T. Out	# Correct Regimen (contin.)		
E1	E 2	E 3	E 4	E 5	E 6	E 7	E 8	E 9	E 10	E 11	E 12	E 13	E 14	E 15	E 16	E 17	E 18

F. INDICATORS/ ANALYSIS

Activity / Indicator	Formula (x100)	Situation		Reason for Variation	Proposed Actions
		Expected	Observed		
1. Proportion of OPD suspected for TB	**E.1 / D.1**	**2%**			
2. Proportion of suspects found new smear positive (NSS^+)	**E. 4 / E.1**	**10%**			
3. Proportion of S^+ not registered (i.e. pre-registration default)	**E. 7 / E. 2**	**0%**			
4. Proportion of S^+ registered as Cat II	**E. 5 / E. 6**	**> 10%**			
5. Proportion of NSS^+ among all new pulmonary TB patients	**E.4 / (E.4 + E.8)**	**> 40%**			
6. Proportion of NSS^+ found converted	**E. 13 / E. 12**	**> 85%**			
7. Proportion of NSS^+ found defaulted	**E. 14 / E. 12**	**< 5%**			
8. Proportion of NSS^+ transferred out	**E.15 / E.12**	**< 5%**			
9. Proportion of absentee retrieval action	**E.18 / E.17**	**100%**			

G. FIDELIS Specific Data

Updating of Coordinators TB03	Patient Access Data				NSS+ registered during same month last year
	# Hard		# Easy		

Prepared by: _____ ***Counter signed by:*** _____

Appendix-B

FACILITY DOTS REVIEW/PLAN MEETING: FACILITY: _____, Date: _____

ACTION NOTES (Facility Level)

Main Gaps	Agreed Action	Responsible	Dead line	Remarks
Inputs				
Case management				
Laboratory functioning				

Prepared by: _____ **Counter signed by: _____**

NTP
External Quality Assurance (EQA) Form-1

Name of Health Facility _____ Date of Visit _____

Section-1: Laboratory Functioning

No. of days Lab. Remained non functional	Reasons	Actions already taken	Actions required/agreed

Section-2: Laboratory Input Replenishment

Item	Minimal Stock Level	Stock available	Stock replenishment (Quantity)		Comments/Actions to be taken
			Supplied	To be arranged	
25% H_2SO_4	2 bottle				
1% Carbol fuchsin	2 bottle				
0.3% Methylene blue	2 bottle				
Immersion Oil	1 bottle				
Xylene or Toluene	1 bottle				
Methylated Spirit	1bottle				
Glass Slides	5 Packets				
Sputum Containers	200				
TB04	1				
Slide Storing Boxes	2 (100 slide capacity each)				
Wire Loop	1				
Diamond Pen	1				
Functioning Microscope	1				
Trained Lab. staff (1)					

Section-3: Recording & Reporting

Characteristic	Formula	Statistic	Comments
Specimens examined per TB suspect.	Total slides examined / Total suspects		
Proportion of suspects found smear positive on AFB testing. (Suspect positivity rate)	# SS^+ / # suspects examined		
Proportion of total slides found positive (Smear positivity rate)	# positive smears / Total smears examined		
TB04 (Lab. Register) Recording	Complete/Correct		

Section-4: Microscope maintenance, Slide storage and Waste disposal

Characteristic	Acceptable		Action/Comments
	Yes	No	
Microscope cleanliness			
Microscope functioning			
Slide Storage			
Disposal of used slides			
Disposal of used sputum containers			

Section-5: Smear Assessment of selected slides

Lab. Serial No.	Specimen Quality		Size		Thickness		Evenness		Labeling		Slide Staining		Smear cleanness	
	1		2		3		4		5		6		7	
	A*	NA**	A	NA	A	NA	A	NA	A	NA	A	NA	A	NA
Total														
Remarks***														

Key:
*A - Acceptable, **NA - Not Acceptable, *** Remarks – Gives overall performance of the characteristic under consideration. If for any characteristic, three or more slides are found not acceptable (NA) then overall performance on that characteristic is labeled as Not Acceptable (NA).

Section-6: Reexamination by DLS*

S.No	Lab. Serial No.	Reexamine Result	Diagnostic Center Result	Comparison					Remarks
				AG	HFP	LFP	HFN	LFN	
1.	244-a	NEG	NEG						
2.	250-a	NEG	1+						
3.	257-b	NEG	NEG						
4.	264-b	3+	1+						
5.	271-b	2+	2+						
6.	278-b	1+	1+						
7.	285-b	1+	NEG						
8.	292-b	NEG	NEG						
9.									
10.									
Summary results									

* Write grading of positive slides

Section-7: Review with Medical Officer

Agreed actions/comments	
Implementation of previous agreed actions	
Signature:_____ **DLS**	**Signature:** _____ **MO/Date**

External Quality Assurance (EQA) Form-2 (Page 1)

Name of District: _____ Month of Review: _____

Number of diagnostic centers in a district: _____

Name of DLS: _____

1. Summary EQA Activity – Smear Assessment

Name of Diagnostic Centers	# Slides reexamined	Number of Slides with Acceptable Smear:					
		Quality	Size	Thickness	Evenness	Staining	Cleanness

2. Comments by the PRL

External Quality Assurance (EQA) Form-2 (Page 2)

3. Discordant Slides

S. No	Name of Facility	Lab. Serial No.	Cross-exam Results	Health Facility Results	Reference Lab. Result	Error of: DC staff/DLS
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						

Signature (DLS):_____	**Signature (DTC):** _____

3. Feedback to the District

Signature: _____

Manager PRL

National TB Control Programme

TUBERCULOSIS LABORATORY REGISTER

TB 04

Lab Serial No.	Date	Name (in full)	Address of patient	Sex M/F	Age	Facility from where patient referred	Reason for Examination		Results of specimen			Signature	Remarks
							Diagnosis	Follow up of chemotherapy (Record Dist. TB No.)	1	2	3		
241	2-5-07	Anwar S/o Sultan	Zura Abad colony	M	20	THQ	/		Neg	Neg		/	Only 2 sample
242	2-5-07	Tahir	Rana Tawan	M	30	BHU	/		Pos	Pos	Neg	/	
243	3-5-07	Ghulam Rasual S/o Ghulam muhammad	Nayee Abaddi	M	50	BHU	/		Neg	Neg	+2	/	
244	3-5-07	Amna bibi	Guli Number 10 H. No. 11 Maka colony	F	60	BHU		/	Neg			/	
245	3-5-07	Fatima W/o Hanif	Gali No. 4 H. No. 15 gulabad	F	65	THQ	/		2+		1+	/	
246	4-5-07	Shabbir	Street 10 H. No 1 Gung Bukash Tawn	M	20	THQ			Neg			/	Salina
247	4-5-07	Rehmat s/o Aslam	Samnaabad Lahore	M	15	THQ	/		Neg			/	
248	5-5-07	Rashida D/o Rasheed	Shadman Lahore	F	45	THQ	/		Neg	Pos	Pos	/	
249	5-5-07	Ilm Din s/o Ghulam	Gali No. 20 H.No. 30 Nishat colony	M	50	BHU	/		Neg	Neg	Neg	/	
250	5-5-07	Ruqia w/o Imran			55	BHU		107/33	1+			/	
251	5-5-07	M. Shanef S/o M. Jamil	H.No. 24 Thana Model Town	M	40	BHU	/		Neg	Neg	Neg	/	
252	5-5-07	M. Lateef	H.No. No. 20 GALI NO 11 Achirah Lahore	M	60	BHU	/		Neg	1+	Pos	/	
253	7-5-07	Gamay Khan s/o M. Ali			70	BHU	/		Neg	Neg	1+	/	
254	8-5-07	Shami Bibi W/o Allah Dita		F	75	BHU	/		Neg	Neg	Neg	/	

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TUBERCULOSIS LABORATORY REGISTER **TB 04**

Lab Serial No.	Date	Name (in full)	Address of patient	Sex M/F	Age	Facility from where patient referred	Reason for Examination		Results of specimen			Signature	Remarks
							Diagnosis	Follow up of chemotherapy (Record Dist. TB No.)	1	2	3		
255	9-5-07	Aziz Ahmed S/o M.Haneef	Zura Abad colony	M	20	THQ	/		Neg	Neg	Neg	/	
256	9-5-07	M.Irfan S/o M.Hashim	Rana Tawan	M	30	BHU	/		Pos	Pos	Neg	/	
257	10-5-07	Aziz S/o Barkat	Nayee Abaddi	M	50	BHU	/		Neg	Neg	+2	/	
258	11-5-07	Kalsoom w/o barkat	Guli Number 10 H. No. 11 Maka colony	F	60	BHU	/		Neg	Neg	Neg	/	
259	12-5-07	Shehnaz W/o Yousaf Khan	Gali No. 4 H. No. 15 gulabad	F	65	THQ	/		2+	1+	1+	/	
260	12-5-07	Muhammad Ashiq S/o Barkat	Street 10 H. No 1 Gung Bukash Tawn	M	20	THQ	/		Neg	Neg	Neg	/	
261	14-5-07	Paras S/o Umar din	Samnaabad Lahore	M	15	THQ	/		Neg	Neg	Neg	/	
262	15-5-07	Haneefa Bibi w/o Rasheed	Shadman Lahore	F	45	THQ	/		Neg	Pos	Pos	/	
263	16-5-07	Muhammad Buta s/o Qasim	Gali No. 20 H.No. 30 Nishat colony	M	50	BHU	/		Neg	Neg	Neg	/	
264	16-5-07	Rubina w/o Sajid		F	55	BHU	/		Neg	1+	Neg	/	
265	17-5-07	Royat Ali S/o Jalal din	H.No. 24 Thana Model Town	M	40	BHU	/		Neg	Neg	Neg	/	
266	17-5-07	M. Shareef S/o Nizam din	H.No. No. 20 GALI NO 11 Achirah Lahore	M	60	BHU	/		Neg	1+	Pos	/	
267	17-5-07	Sadiq s/o Mazhar		M	70	BHU	/		Neg	Neg	1+	/	
268	18-5-07	Maryam W/o Shabir		F	75	BHU	/		Neg	Neg	Neg	/	

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Lab Serial No.	Date	Name (in full)	Address of patient	Sex M/F	Age	Facility from where patient referred	Reason for Examination		Results of specimen			Signature	Remarks
							Diagnosis	Follow up of chemotherapy (Record Dist. TB No.)	1	2	3		
269	19-5-07	Muhammad Sarwar S/o Lal Din	Zura Abad colony	M	20	THQ	/		Neg	Neg		/	
270	19-5-07	Abdul Majeed S/o Ashraf	Rana Tawan	M	30	BHU	/		Pos	Pos	Neg	/	
271	19-5-07	Shahid Sarwar S/o Muhammad Sarwar	Nayee Abaddi	M	50	BHU	/		Neg	2+	2+	/	
272	21-5-07	Najma bibi w/o Qadir baksh	Guli Number 10 H. No. 11 Maka colony	F	60	BHU	/		Neg	Neg	Neg	/	
273	21-5-07	Kalsoom W/o Mushtaq	Gali No. 4 H. No. 15 gulabad	F	65	THQ	/		2+	1+	1+	/	
274	22-5-07	Shaukat Ali S/o Ishaq	Street 10 H. No 1 Gung Bukash Tawn	M	20	THQ	/		Neg	Neg		/	
275	23-5-07	Hakim Ali s/o Ilim din	Samnaabad Lahore	M	15	THQ	/		Neg	Neg		/	
276	23-5-07	Rahat w/o Ishaq	Shadman Lahore	F	45	THQ	/		Neg	Pos	Pos	/	
277	23-5-07	Hakim Ali s/o Farzand Ali	Gali No. 20 H.No. 30 Nishat colony	M	50	BHU	/		Neg	Neg	Neg	/	
278	24-5-07	Zainab w/o Faqeer Muhammad		F	45	BHU	/		Neg	1+		/	
279	24-5-07	M. yaqoob S/o M. Ishaq	H.No. 24 Thana Model Town	M	40	BHU	/		Neg	Neg	Neg	/	
280	24-5-07	Karim Ali S/o M.Sharif	H.No. No. 20 GALI NO 11 Achirah Lahore	M	60	BHU	/		Neg	1+	Pos	/	
281	24-5-07	Maqbool Baluch s/o hashim			70	BHU	/		Neg	Neg	1+	/	
282	25-5-07	Qamar W/o Jamshed		F	75	BHU	/		Neg	Neg	Neg	/	

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TUBERCULOSIS LABORATORY REGISTER **TB 04**

Lab Serial No.	Date	Name (in full)	Address of patient	Sex M/F	Age	Facility from where patient referred	Reason for Examination		Results of specimen			Signature	Remarks
							Diagnosis	Follow up of chemotherapy (Record Dist. TB No.)	1	2	3		
283	26-5-07	Mukhtar S/o shabir	Zura Abad colony	M	20	THQ	/		Neg	Neg		/	
284	26-5-07	Fayaz S/O Nawaz	Rana Tawan	M	30	BHU	/		Pos	Pos	Neg	/	
285	26-5-07	Ijaz S/o Nawaz	Nayee Abaddi	M	50	BHU	/		Neg	Neg	+2	/	
286	26-5-07	Anbreen w/o junaid	Guli Number 10 H. No. 11 Maka colony	F	60	BHU	/		Neg	Neg		/	
287	28-5-07	Nazia W/o Aslam	Gali No. 4 H. No. 15 gulabad	F	65	THQ	/		2+	1+	1+	/	
288	28-5-07	Tariq Mashee S/o Phatoo	Street 10 H. No 1 Gung Bukash Tawn	M	20	THQ	/		Neg			/	
289	28-5-07	Asif Mashee s/o Haq Nawaz	Samnaabad Lahore	M	15	THQ	/		Neg			/	
290	29-5-07	Sabika D/o Haroon	Shadman Lahore	F	18	THQ	/		Neg	Pos	Pos	/	
291	29-5-07	Parvez s/o Akbar	Gali No. 20 H.No. 30 Nishat colony	M	50	BHU	/		Neg	Neg	Neg	/	
292	30-5-07	Zulaikha w/o Abdul Razaq		F	55	BHU	/		1+	Neg	Neg	/	
293	31-5-07	Mudassar S/o Zafar	H.No. 24 Thana Model Town	M	40	BHU	/		Neg	Neg	Neg	/	
294	31-5-07	Abbas S/o Ghulam Muhammad	H.No. No. 20 GALI NO 11 Achirah Lahore	M	60	BHU	/		Neg	1+	Pos	/	
295	31-5-07	M,Ashraf s/o Imam Din		M	70	BHU	/		Neg	Neg	1+	/	
296	31-5-07	Fatima W/o Hameed		F	75	BHU	/		Neg	Neg	Neg	/	