

Training on EQA and National TB Laboratory Network

Module 6: Reporting of AFB Lab Performance

Date

Uganda Supranational Reference Laboratory

Content Outline

- Manual compilation, analysis and interpretation of rechecking results
- Computer reporting, analysis and interpretation of rechecking results

Computer Compilation of Data

- For use at national and (eventually) intermediate level
- Automatic additions quarterly/annually
- Automatic analysis of results by lab, by higher administrative level and by 1st controller if all data filled

Computer Compilation of Data

- Automatic correction for inaccuracies due to
 - Uniform sample size
 - Over-sampling of positives
- by converting FN rates to relative sensitivities

Workbook Sheets

1. Menu
2. Set up
3. Q1 to Q4
4. Q1P to Q4P
5. YR EQA
6. YR P
7. YR CONTR
8. Analysis Labs
9. Summary Labs
10. District totals



Menu

EVALUATION OF AFB-MICROSCOPY LABORATORIES

Menu for quarterly / annual data processing

First Step

Enter - Year, - Administrative levels, - Names of the laboratories and first controllers

Second Step

Enter Data on LABORATORY OUTPUT

<u>Quarter 1</u>
<u>Quarter 2</u>
<u>Quarter 3</u>
<u>Quarter 4</u>

Enter Data of RECHECKING RESULTS

<u>Quarter 1</u>
<u>Quarter 2</u>
<u>Quarter 3</u>
<u>Quarter 4</u>

Third Step

Analysis

Tables

<u>Summary Labs</u>
<u>Summary Districts</u>
<u>Analysis First Controllers</u>
<u>Analysis Labs</u>
<u>Annual Totals Rechecking</u>
<u>Annual Totals Output</u>

Set Up

EVALUATION OF AFB-MICROSCOPY LABORATORIES

Administrative Divisions covered by this report

Highest Administrative Division		Second Administrative Division
Designation	Fill here below the name	Designation
Region		District

Year covered by this report	Fill here below the year

Fill the names of the second administrative division for each controlled laboratory included in this report in the first column below

District	Fill here the names of the peripheral laboratories covered by this report; during the year, add any new names in the first empty line. DO NOT INSERT OR SORT.	Replace here the character codes by the names of the first controllers, leaving the remaining codes untouched
		A
		B
		C
		D
		E

Quarter 1 - Quarter 4

RE-CHECKING OF SPUTUM SMEARS FOR AFB

QUARTERLY COMPILATION SHEET

<u>Region</u>	<u>Second controller</u>
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Year	EQA coordinator
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Quarter 1

[illegible]

PERFORMANCE OF SPUTUM SMEAR LABORATORIES QUARTERLY COMPILATION SHEET

Quarter 1 Year

0

Year EQA

RE-CHECKING OF SPUTUM SMEARS FOR AFB ANNUAL COMPILATION SHEET

Region

Year

Second controller

EQA coordinator

		EVALUATION OF THE MICROSCOPY LABS							
Name of the District	Name of the controlled labs	Results reported for rechecked smears (#)			Errors detected in EQA (#)				
		Pos.	Scanty	Neg.	HFP	LFP	HFN	LFN	QE

Year P

PERFORMANCE OF SPUTUM SMEAR LABORATORIES ANNUAL COMPILATION SHEET

Region _____

Year _____

[illegible]

RE-CHECKING OF SPUTUM SMEARS FOR AFB FIRST CONTROLLERS EVALUATION

Year _____

EQA coordinator

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Analysis Labs

PERFORMANCE OF AFB-MICROSCOPY LABORATORIES ANNUAL ANALYSIS

Region _____

Second controller

Year _____

EQA coordinator _____

[illegible]

Legend

* Detection proportional to controllers: each laboratory's detection of true positives is compared with that of the controllers, and expressed as a number

"1.00" indicates exactly the same detection capacity

"0.50" indicates that only half of the positives detected by controllers were found

"1.05" indicates that the laboratory may even be slightly better than the controllers for detection of true positives

** Percent true positives / all positives: this percentage indicates how trustworthy is a positive result

Summary Labs

Summary results of rechecking

Region

Year

Number

Percentage

Number of operational laboratories

Number of those rechecked (%)

Number of positive slides rechecked

Number of negative slides rechecked

Overall percentage positives in the laboratories' routine

Overall percentage high false positives

Overall percentage false negatives

Overall percentage true positives / all positives

Overall detection proportional to the controllers

Number (%) of laboratories with more than 1 HFP

Number (%) of laboratories with 100% true positives

Number (%) of laboratories with 95-99% true positives

Number (%) of laboratories with 90-94% true positives

Number (%) of laboratories with 85-89% true positives

Number (%) of laboratories with <85% true positives

Number of laboratories with insufficient data to calculate this parameter

Number (%) of laboratories with more than 1 FN

Number (%) of laboratories as good as controllers at detecting positives (≥ 0.95)

Number (%) of laboratories almost as good as controllers at detecting positives (0.85-0.94)

Number (%) of laboratories moderately good at detecting positives (0.75-0.84)

Number (%) of laboratories doing poorly at detecting positives (0.50-0.74)

Number (%) of laboratories doing very poorly at detecting positives (< 0.50)

Number of laboratories with insufficient data to calculate this parameter

District Totals

RE-CHECKING OF SPUTUM SMEARS FOR AFB

Summary Report by District

Region

<u>Year</u>	Number of people in the world	Percentage of the world's population who are poor
1980	4.6 billion	47%
1990	5.3 billion	53%
2000	6.1 billion	59%
2010	6.9 billion	65%
2020	7.9 billion	72%

Second controller

EQA coordinator

[illegible]

Analysis

- The analysis includes
 - Total workload
 - Prevalence of positives among diagnostic and follow-up smears
 - Total prevalence of positive and scanty positive smears
- The analysis takes into account
 - Differences in prevalence of positives between labs
 - Differences in prevalence of positives between samples presented to 1st controller and the routine slides

Interpretation (1)

- Conversion of error rates to performance indicators
 - Check on performance of controllers: percentage true positives detected by controllers or relative sensitivity of first controllers
 - Quality of work of each lab compared to controller: detection by labs proportional to the controllers or ratio of relative sensitivity of the labs versus controllers
 - Accuracy of a positive result: percentage of true positives out of all positive results or positive predictive value of the labs

Interpretation (2)

- Percent true positives detected by first controllers:
 - Controllers' true positive / (True positive + False negative) x 100%
 - Should be around 95%

Interpretation (3)

- Detection by centres proportional to the controllers
 - same percent detection calculation per lab, then divided by average first controllers (ratio)
 - 1.00= equal good work by centre and controller
 - >1.00= better work by centre than controller
 - The lower the worse the performance of the centre
 - If e.g 0.65= centre detects 65% of + slides compared to controller

Interpretation (4)

- Percent true positives out of all positives
 - $((\text{True positive} / (\text{True positive} + \text{False positive})), \times 100\%$
 - 100% = a positive result is fully reliable
 - The lower, the worse the performance of the lab, but with few positives rechecked this indicator may be misleading

Unsatisfactory Performance Criteria

- To be defined by NTP management
- Recommended
 - Annual analysis
 - < 0.75 detection proportional to controller
 - < 95% true positives
 - Quarterly analysis
 - Centres with (almost) all 1+ to 3+ FP
 - < 0.60 detection proportional to controller

SUMMARY

- Reporting and analysis of rechecking results can be done either manually or by means of the computerized tool (MS Excel based Workbook)
- The Workbook is intended for use at the national and, eventually, also at the intermediate level
- Properly filled in laboratory performance and rechecking reports (quarter / annual) provide a basis for the comprehensive analysis and evaluation of laboratory performance

Assessment

- What are the advantages of using the Workbook compared to the manual reporting and analysis system?
- At which level of laboratory services is the Workbook used?
- Name the different parts of the Workbook and their purpose.

References

- WHO/GLI Tools.
- John, R. (1999). External Quality Assessment for AFB Smear Microscopy. *Public Health Practice Program Office Centers for Disease Control and Prevention, Rosemary Humes. Association of Public Health Laboratories, 17.*
- GLI Training package on EQA overview & Planning

Acknowledgments

