EQAS Interpretation guidelines

Table of contents

LABQUALITY

1. Symbols

x_{pt}, x, $\overline{x}$	Assigned value, corrected mean
x_t	Transferred value in serum B and C scheme
X, X_{rob}	Assigned value, robust mean
x_i, Own	Measurement result from a participant
u	Standard uncertainty of the assigned value. SEM used as standard uncertainty with 3 SD calculation; 1.25* SEM used with $x_{Rob.}$
Median	Assigned value, median value
sd, SD, σ_{pt}	Standard deviation (shows the scattering of the results) of reported participant results. SD used also as standard uncertainty of the assigned value ($\overline{x}$) with 3 SD calculation.
s	Robust standard deviation
CV%	coefficient of variation (standard deviation divided by the mean in percent)
SEM	Standard error of the mean (standard deviation divided by the square root of the number of results). SEM used as standard uncertainty of the assigned value ($x_{pt.}$) with 3 SD calculation.
min	The lowest result of the method group accepted to calculation of the assigned value
max	The highest result of the method group accepted to calculation of the assigned value
Outliers	The number of outliers found by the calculation used
n	The number of accepted results in the method group
diff%	Difference between own result and assigned value in %
z, z-score	Score used for proficiency assessment

2. Determination of the assigned value and its uncertainty

Assigned value calculation, 3 SD method

The assigned value and other statistical parameters are calculated from the results that fall within the calculated limits for the group in question. The limits are obtained from the median value of the uncorrected results ± 3 * uncorrected SD.

Results deviating more than median + 3SD are not included into the assigned value calculations and they are remarked as outliers in reports. Please note that an outlier can be within the target area if the method group is homogeneous.

The standard uncertainty (u) of the assigned value is reported as SEM.

In case there are 2-11 results in a method group and the uncertainty of the assigned value (target value) is too large a remark is printed on the report: "The uncertainty of the assigned value is not negligible, and evaluations could be affected." The uncertainty of the assigned value is too large if the criteria - $u < 0.1$ * maximum allowable error - is not fulfilled. Maximum allowable error is calculated as: quality goal (%) * assigned value / 100.

In case the client's result is the only one in the method group, no assigned value will be calculated, no target area shown, and no statistics calculated.

Metrological traceability of assigned value is not possible to establish.

Assigned value calculation, robust analysis (applied to the method groups with more than 12 results (n >12)).

The assigned values are calculated according to the robust procedure described in the standard ISO 13528:2015 (Statistical methods for use in proficiency testing by interlaboratory comparisons, Annex C). Briefly, the robust mean and the robust standard deviation of each analyte and method group are obtained by iterative calculation i.e. updating the values of x and s several times using the modifications of grossed outliers. The iteration continues until the process converges so that no change in the third significant figure in the robust x and in the robust s is observed. The final values obtained are the assigned value (x_{Rob}) and the standard deviation (s) presented in the scheme reports. The standard uncertainty (u) of the assigned value is 1.25*SEM. Due to its iterative mode algorithm A adds the uncertainty of the assigned value and with this factor we want to adjust uncertainty accordingly.

Metrological traceability of assigned value is not possible to establish.

Assigned value, reference method value

Uncertainty of the assigned value and metrological traceability will be reported as given from a reference laboratory.

Assigned value from an expert laboratory

Uncertainty of the assigned value and metrological traceability will be reported as given from an expert laboratory.

Assigned value as a transferred value from expert laboratories

Uncertainty of the assigned values reported as SEM of expert laboratories' results, metrological traceability will be reported as given from an expert laboratory.

Assigned value, median of participant results

Uncertainty of the assigned values reported as standard deviation or SEM of results, metrological traceability is not possible to establish.

3. Evaluation of Performance

Scheme reports have two different ways (diff%, z-score) of assessing performance and thus their basics and interpretations are also different. Please see the explanations below (quality goals and Z-scores).

In most of the cases Diff% and z-score performance evaluation coincide. However, sometimes they can give a different message e.g. when the analyte concentration is low or otherwise in the area where analytics are not so precise. Diff% and z-score are calculated from the original results but in the reports the values are rounded with certain accuracy.

Performance criteria using quality goals

The Diff% assessment is based on the total error % set by expert groups. The total error% is maintained from one round to another and rarely changed. Quality goals are reviewed yearly and updated when necessary.

Participant's performance is described as a deviation of a result from the assigned value and expressed as diff%.

$$diff\% = 100(\frac{x_i - x_{pt}}{x_{pt}})$$

For the good performance Diff% should lie within the target area. Quality goals are expressed as total analytical error (%) taking into account imprecision and bias. The target area for a result is determined as the assigned value of the method group +/- quality goal %. The goals are set so that when the methods are correctly functioning, the result will be within the limits with 95% probability. The list of quality goals can be found in LabScala user instructions.

The criteria used for analytical quality goals are based on clinical needs, biological variation, state-of-arts, and reference intervals depending on the analyte concerned. Labquality´s quality goals are educational which means that the goals are strict if compared to the ones used for requirements of authorities or legislation.

Some of the EQA- reports are accompanied by an automatic report check, which helps clients to evaluate their performance. Performance is indicated by colored radio buttons and are seen in the LabScala View Reports section as follows:

blue radio button - results inside target area

red radio button - a result /results outside of target area

yellow radio button - a client has not returned results

no radio button - no automatic report checks have been run

If results outside target area are found the client will also be notified in a Report ready email.

Performance assessment using z-scores

Reported z scores are informative but can be used to evaluate the results. The standard deviation (sd) used for calculating the z-score is not predetermined target deviation but originates from the observed distribution of results of the EQA –round concerned. It variates from round to round because of different sample matrices, concentration range and analytical precision. The z-score is calculated by

$$z = \frac{x_i - x_{pt}}{\sigma_{pt}}$$

Assessment of z-scores is based on the following criteria:

-2.0 ≤ z ≤ 2.0 is regarded as satisfactory;

-3.0 < z < -2.0 or 2.0 < z < 3.0 is regarded as questionable ('warning signal');

z ≤ -3.0 or z ≥ 3.0 is regarded as unsatisfactory ('action signal').

In case there are 2-4 results in a method group, no z-score is calculated, and a text is printed on the report: "Due to the small number of results, the z score is not calculated." In case there are 5-11 results, the z-score is calculated and the report has a text: "Z score is uncertain due to the small number of observations."

Please note that the change in the calculation of the z-score depending on the group size might cause a difference in reports that have a z-score history shown. Please note that the historical z-scores are also calculated following the above mentioned rules from 2018 and thus in reports printed before 2018 the z-score value might be different.

LABQUALITY

Please note!

1) If a method group has a few results it might be feasible to compare a laboratory's result also to the mean of all results or any other group relevant your own method.

4. Individual results, quantitative methods

The statistical parameters are calculated from the results that fall within the calculated limits for the group in question. The limits are obtained from the median value of the uncorrected results ± 3 * uncorrected SD. For some schemes the assigned value (x, target value) and the standard deviation (SD) are calculated according to the procedure described in the standard ISO 13528:2015 (1). This is always informed in the scheme documents. The histogram of the results is multi-coloured. The inner area shows the results of the own method group. The outer area relates to all results. Laboratory's result is shown with a symbol, like a black diamond or a coloured dot on the histogram and numerically below the histogram. If a result falls beyond the scale of the axis, it is shown on the outskirts of the histogram picture. The statistical values for the laboratory's own group and all groups are printed below the histogram as well as results from previous rounds.

Please see the graphical representations of histograms on the next pages. The client code is always on the right upper corner of the printout. Please see other details in the graphs.

Results for laboratory's own method group.
Method group is separated from all groups with a different colour.

All results
All results are shown with a separate colour

Laboratory's own result
Own result is shown with an orange dot on the histogram and numerically below the histogram. If the result falls beyond the scale of the axis it is shown on the outskirts.

Target area and limits
The graphical target area is shown with a yellow background behind the histogram picture. The area is shown if there are two or more results in a method group. The limits are presented numerically under the histogram.

Own group and all output groups
SD, SEM and CV are calculated if there are at least two results in a group. If there is only one, a dash appears. Own result should always be compared to results in own method group. Please note that if your method group is very small it might not represent the actual performance of your laboratory in the best possible way.

Summary of laboratory's last ten samples
(if participated)
Round: Year and number of round
Sample: Name of sample
X_{pt}: Mean value
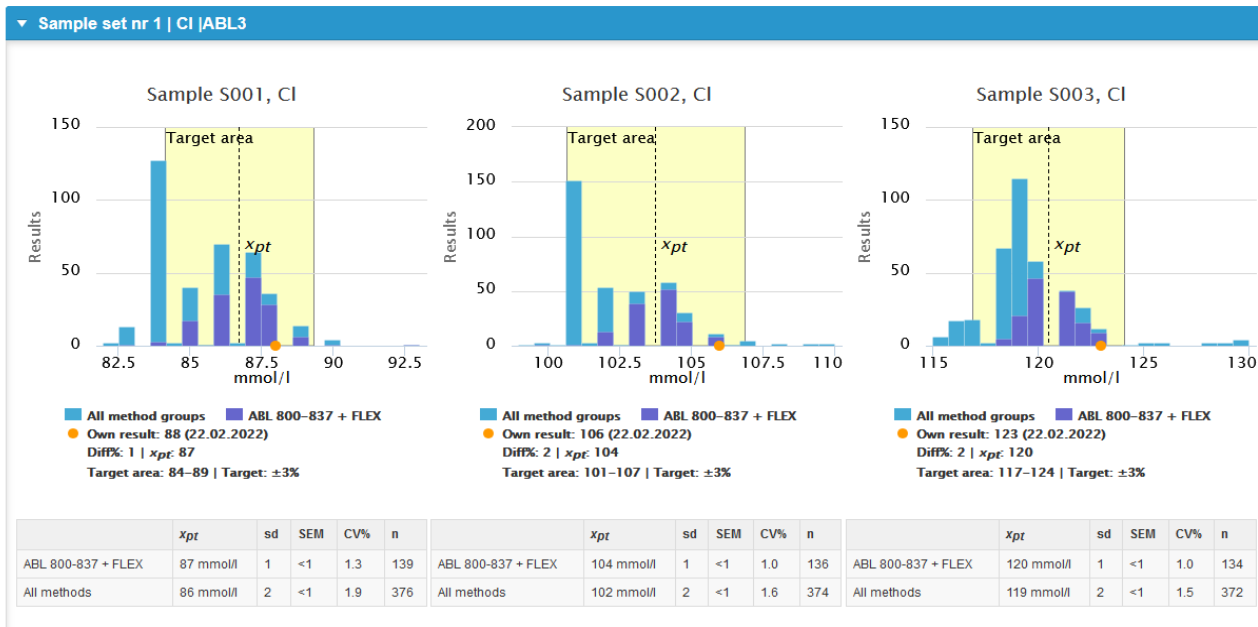Result: Laboratory's result
diff%: Difference between laboratory's result and its method group mean
z-score: Round specific z-scores.

If there are several samples per scheme the histograms are aimed to be shown side by side. A nick name is given to the device, it is shown on the header of the report after the analyte or test (here "ABL3" is the nick name),

	x_{pt}	sd	SEM	CV%	n		x_{pt}	sd	SEM	CV%	n		x_{pt}	sd	SEM	CV%	n
ABL 800-837 + FLEX	87 mmol/l	1	<1	1.3	139	ABL 800-837 + FLEX	104 mmol/l	1	<1	1.0	136	ABL 800-837 + FLEX	120 mmol/l	1	<1	1.0	134
All methods	86 mmol/l	2	<1	1.9	376	All methods	102 mmol/l	2	<1	1.6	374	All methods	119 mmol/l	2	<1	1.5	372

Whenever possible the assigned value (target value) is shown with a symbol in the histograms. Xrob means that the assigned value has been calculated using ISO 13528 robust procedure (used for some schemes, information given in the report letter if this is used). Xt means that the assigned value is a transferred value that is traceable to reference method values (used for scheme 2050 serum B and C). Xref means that the value is a reference method value (used rarely, explained in detail in the report letter if used).
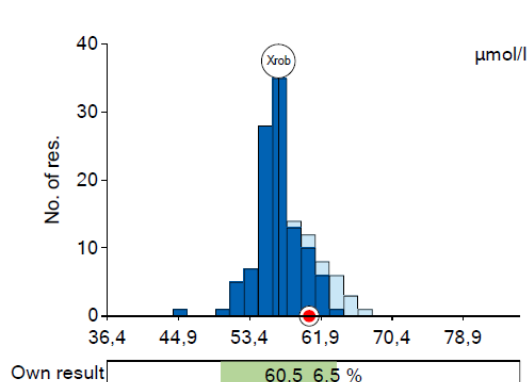
Sample 2 - Serum C
Assigned value (X): 56,8 µmol/l, Xrob
Target limits (X ± 12%): 50,0 - 63,7 µmol/l

	x	s	SEM	CV%	n
Own group	56,83	2,36	0,23	4,2	107
All	57,43	3,00	0,27	5,2	121
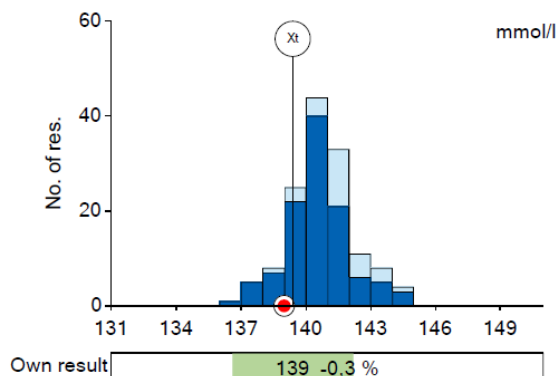
Sample 1 - Serum B
Assigned value (X): 139 mmol/l, Xt
Target limits (X ± 2%): 137 - 142 mmol/l

	x	s	SEM	CV%	n
Own group	140,2	1,3	0,1	0,9	109
All	140,4	1,4	0,1	1,0	138

Picture showing Xrob -marking   **Picture showing Xt -marking**

LABQUALITY

For some schemes we use a Youden plot to represent the performance for two samples. Results from laboratories are shown as pairs of specimen by analyte and method group. A red dot marks the laboratory's results. The dark blue dots represent pairs of results for the method group in question and light blue dots represent pairs of results for other method groups. The vertical lines represent the acceptance limits for sample 1 and the horizontal lines for sample 2, correspondingly. The square in the middle represents the target area for the method group. Results falling outside of the plot are seen on the edges.
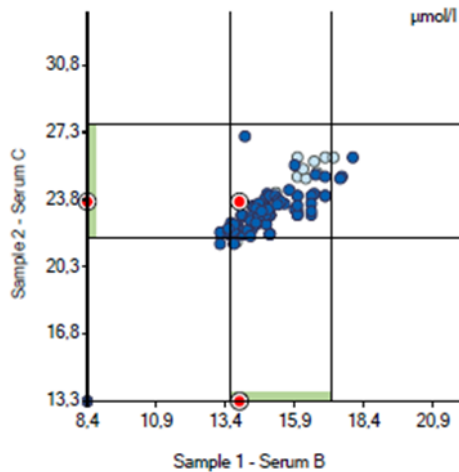
Conc./act. dependent performance
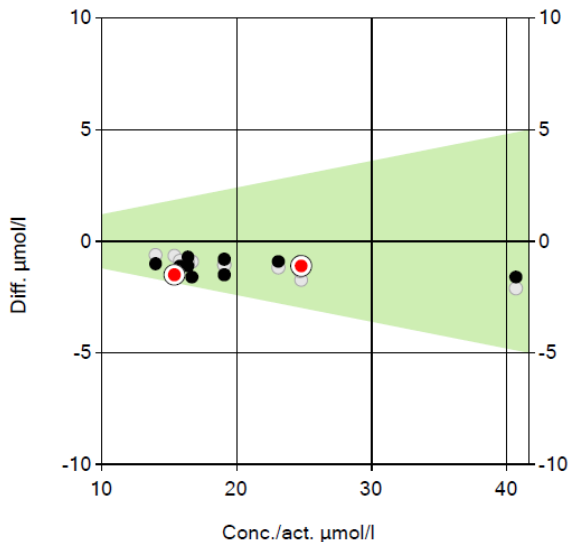
The graphical concentration or activity performance presentation shows differences between the result and the assigned value in terms of concentration. The shaded area forms the target area at the functional concentration level. The results from the present round are indicated with red dots and the previous results with black dots. The grey dots indicate the own method consensus values in those cases where the assigned value is e.g. a transferred value traceable back to reference method values. Results exceeding approximately ± 1.5 * target area are marked with a black x.

5. Numerical summary, quantitative methods

The statistical values in numerical summaries are calculated similarly to the values under the histogram. The numerical summary shows all results by method groups. CV, SD and SEM (standard error of mean) are calculated if there are at least two results in a method group. If there is only one, a dash (—) appears. The method specific histogram distributions can be seen in the reports inside LabScala.

The results that are outside median +/- 3SD are shown on all rows. The last row (All) is not a sum of the rows above but there the statistics are calculated freshly from all results in all method groups. Thus the numbers are completely independent and different than the numbers on the other rows.

Methodics	x_{pt}	Median	sd	CV%	SEM	min	max	Outliers	n
ABX Micros	38	38	3	8.4	<1	30	42	-	20
AFIAS CRP	32	32	1	4.6	<1	31	34	-	3
Axis-Shield Afinion	34	34	2	5.5	<1	30	37	-	49
Boditech ichroma Reader	38	39	5	12.0	2	29	44	-	8
Eurolyser	43	44	4	9.1	2	38	47	-	4
Nal von Minden Colibri	33	34	2	7.2	<1	29	37	-	12
NycoCard Reader	37	38	6	15.3	1	27	49	-	15
Orion QuikRead	37	36	2	5.8	<1	29	43	1	116
Orion QuikRead GO	38	37	2	6.1	<1	32	44	8	494
Orion QuikRead wrCRP	36	36	1	2.8	<1	35	37	-	3
Radiometer AQT 90 FLEX	42	43	3	6.3	1	38	45	-	5
All	37	37	3	7.3	<1	29	45	7	729

6. Summary by methods, quantitative methods

There is additional information available for some schemes. The statistical values in summaries by methods are calculated similarly to the values under the histogram. The summary shows all results by methods used. CV and SD are calculated if there are at least two results in a method group. If there is only one, a dash (-) appears.

Methodics	Instrument	x_{pt}	sd	CV%	n
ABX Micros	ABX Micros CRP 200	35	3	8.6	7
	Microsemi CRP	39	2	5.8	13
AFIAS CRP	AFIAS-1	32	1	4.6	3
Axis-Shield Afinion	Afinion AS100	34	2	5.7	45
	Afinion 2	35	1	3.7	4
Boditech ichroma Reader	iChroma Reader	38	5	12.0	8
Eurolyser	Eurolyser CUBE	41	5	11.6	2
	Eurolyser smart 700/340	-	-	-	1
	Other	-	-	-	1
Nal von Minden Colibri	Colibri	33	3	7.6	11
	Other	-	-	-	1
NycoCard Reader	NycoCard READER	37	<1	1.9	2
	Nycocard Reader II	38	6	16.8	12
	Other	-	-	-	1
Orion QuikRead	Other	-	-	-	1
	QuikRead	37	2	4.7	5
	QuikRead 101	37	2	5.6	109
Orion QuikRead GO	Other	38	1	2.6	3
	QuikRead Go	38	2	6.1	483
Orion QuikRead wrCRP	QuikRead Go	36	1	2.8	3
Radiometer AQT 90 FLEX	AQT 90 FLEX	42	3	6.3	5

LABQUALITY

7. Individual results on qualitative schemes

The results are presented in a table for each specimen and method. The laboratory´s own result and own method is shown with a background colour or a symbol. The distribution can also be shown as graphs. The laboratory code (client code) is on the right upper corner of the printout. There is an example of hCG round results below.

Methodics name	Total	Positive	Negative
Alere hCG Cassette (U 25 IU/l)	11	11	0
Alere hCG Combo Cassette (S+U 25 IU/l)	15	15	0
Alere hCG Easy (25 IU/l)	15	15	0
Alere TestPack +Plus hCG Combo (25 IU/l)	2	2	0
Alere TestPack +Plus hCG with OBC (S+U 25 IU/l)	12	12	0
All Diag Mini test hCG (10 IU/l)	27	27	0
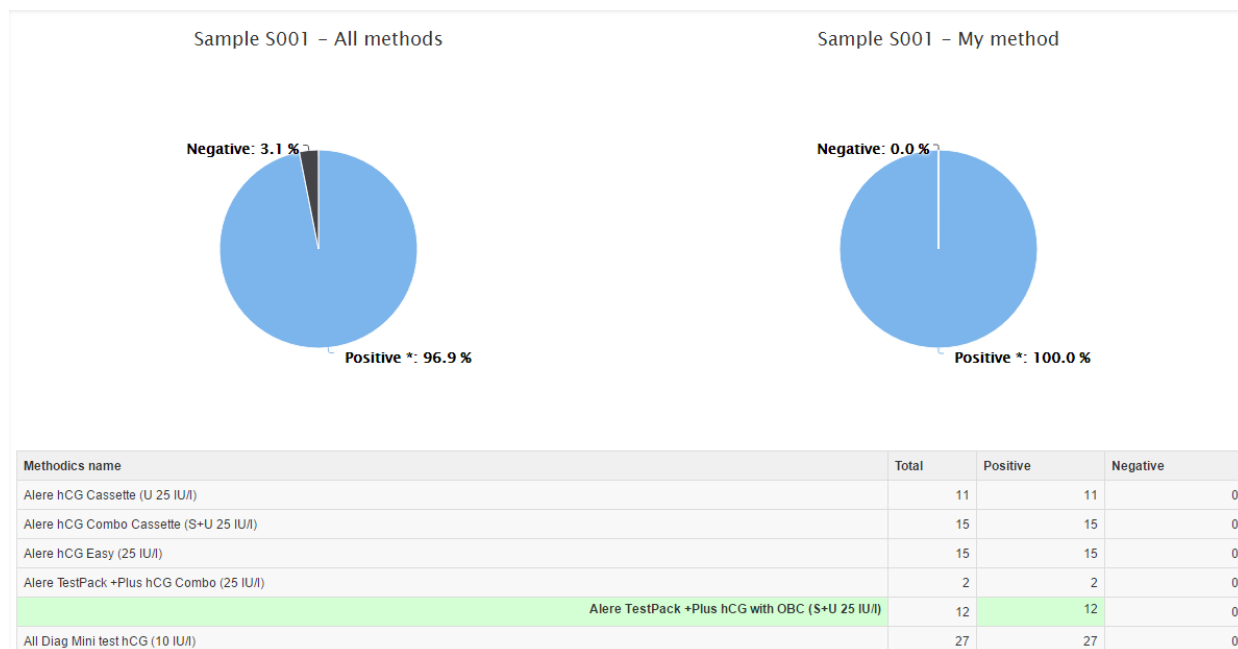
8. Urine strip test B reports

Strip tests B results are arbitrary concentrations derived from ordinal scale categories. The method-specific targets are the median values and the method target ranges are 1/3 x Med – 3 x Med, except the pH target range, which is shown as median $\pm$ 0.5. Negative results are marked in summary tables and client specific histograms as follows: Erythrocytes and leukocytes are marked as value 1, glucose and ketone bodies as 0.1, nitrite and protein as 0.01. In the strip test reports the history data is not seen. Please see an example of the global report and client specific report below.
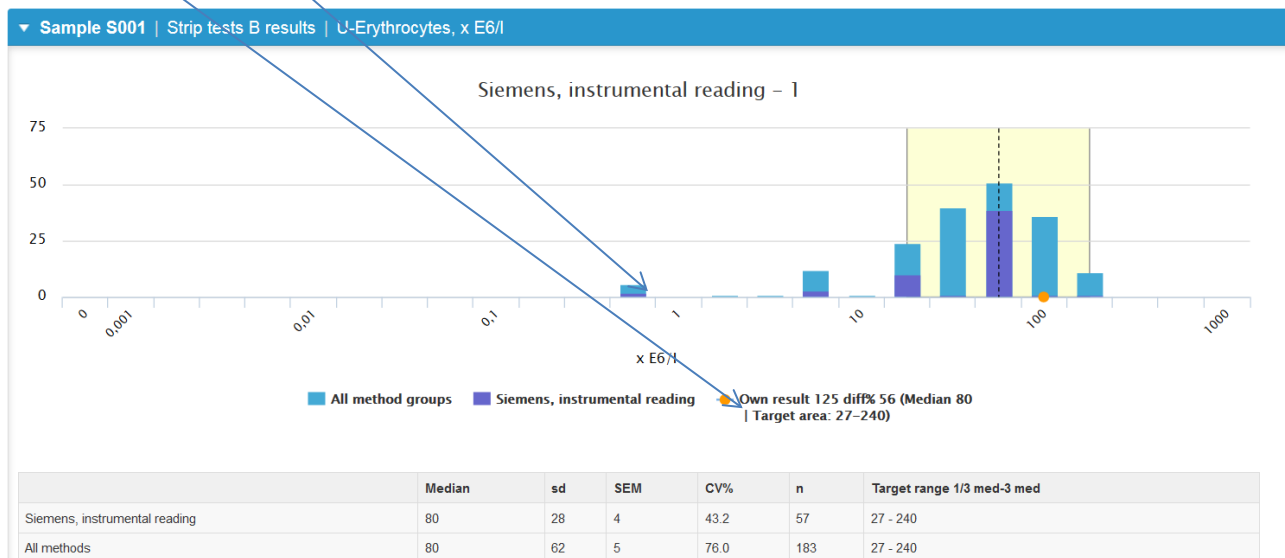
Global report

Sample S001 | Strip tests B results | U-Erythrocytes, x E6/l

Methodics	Median	sd	CV%	SEM	min	max	Outliers	n
Acon, instrumental reading	80	89	88.0	52	25	200	-	3
All. diag, instrumental reading	-	-	-	-	35	35	-	1
AMP diagnostics, instrumental reading	80	32	51.5	18	25	80	-	3
Analyticon, instrumental reading	50	-	-	-	50	50	-	2
Arkray, instrumental reading	19	3	16.3	2	18	25	-	4
Arkray visual reading	-	-	-	-	18	18	-	1
BioMaxima visual reading	45	49	110.0	35	10	80	-	2
Dirui, instrumental reading	80	15	20.7	8	50	80	-	4
Dirui visual reading	-	-	-	-	10	10	-	1
Iris Diagnostics, instrumental reading	23	17	72.5	4	9	70	-	16
Macherey-Nagel, instrumental reading	-	-	-	-	50	50	-	1
Macherey-Nagel visual reading	-	-	-	-	3	3	-	1
Other method	50	73	91.4	24	20	250	-	9
Roche, instrumental reading	150	45	27.7	7	50	250	-	43
Roche visual reading	150	141	94.3	100	50	250	-	2
Siemens, instrumental reading	80	28	43.2	4	1	125	1	57
Siemens visual reading	80	-	-	-	80	80	-	3
Yeongdong, instrumental reading	-	-	-	-	5	5	-	1
77 Elektronika, instrumental reading	50	17	36.6	3	1	80	-	28
77 Elektronika visual reading	-	-	-	-	1	1	-	1
All	**80**	**62**	**76.0**	**5**	**1**	**250**	**-**	**183**

Client specific report:

Negative results

Target area of own group (for the pH the target area is not shown.)

Sample S001 | Strip tests B results | U-Erythrocytes, x E6/l

Siemens, instrumental reading – 1

Own result 125 diff% 56 (Median 80 | Target area: 27–240)

	Median	sd	SEM	CV%	n	Target range 1/3 med-3 med
Siemens, instrumental reading	80	28	4	43.2	57	27 - 240
All methods	80	62	5	76.0	183	27 - 240

Outliers of the strip results are seen on the left end of the axis, regardless if the result is over or under the shown values.

Low result:

Sample S001 | Strip tests B results | U-Ketone bodies, mmol/l

Roche, instrumental reading – 1

Own result (5.0 (21.12.2021) | [Target area: 4.9–44.4 | Target: 1/3 Med–3 Med])

|	Median	sd	SEM	CV%	n	Target range 1/3 Med-3 Med
Roche, instrumental reading	14.8	0.2	<0.1	1.3	31	4.9 - 44.4
All methods	7.8	4.4	0.4	53.6	145	2.6 - 23.4

* outlier
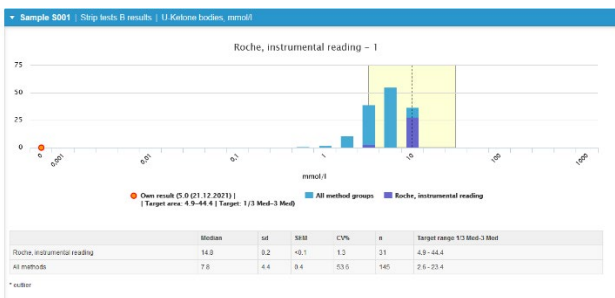
High result:
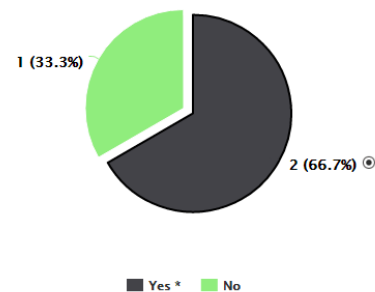

9. Preanalytical reports

On the preanalytical rounds the results are represented as bar and/or pie diagrams. The distribution of the results can be seen as the size of the bars. Laboratory's own result is marked with a radio button. In some schemes the results are grouped by respondents profession. Please see examples below.
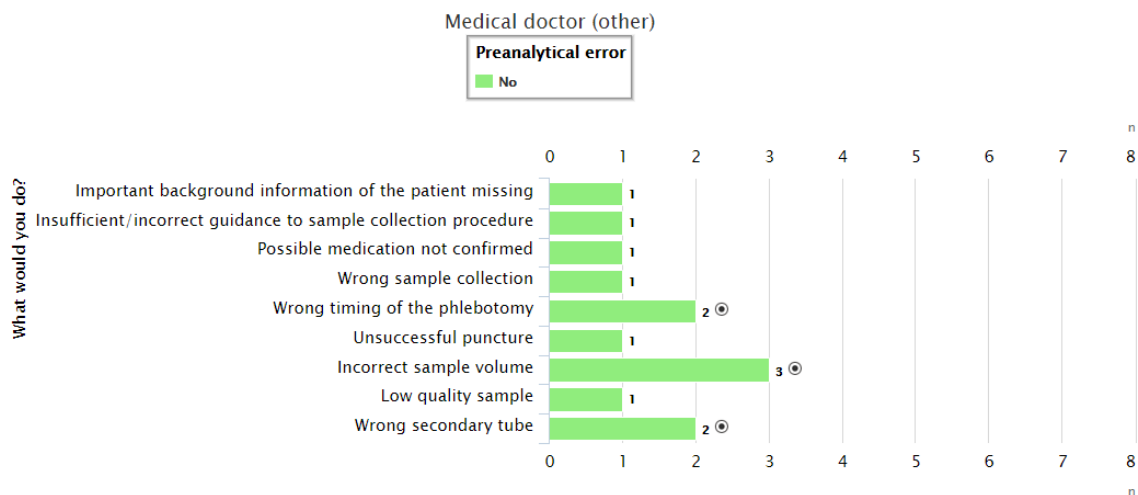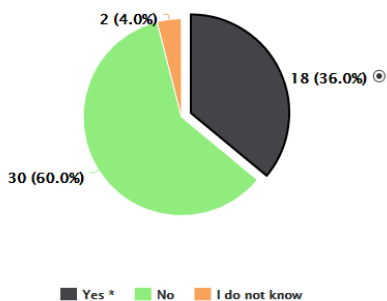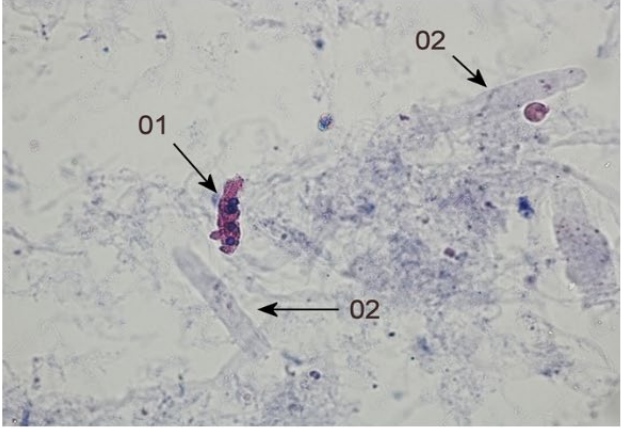
10.   Picture schemes, finding reports

The specimens are digital or virtual images. The expected findings are marked with a background colour and the laboratory´s own result is marked with a radio button. The report also includes the expert statement for each case and a miniature of the finding.

▼ Case S001 | Finding

Result	n
Artefact	3
Cast	38
Erythrocyte cast	9
Granular cast	⦿ 22
Granulocyte cast	25
Hyaline cast	1
Other than hyaline cast	11
Renal tubular cell cast	53
Renal tubular epithelial cell	2
Squamous epithelial cell	1
Transitional epithelial cell	1
Total	166

Finding 1601-01: The arrow 01 of the figure pointed at a renal tubular cell cast (E= expected report, 32% of participants) or at an "other than a hyaline cast" (E, 7% of reports) of the basic level. It was perhaps acceptable to report simply a "cast" (acceptable = A, 23% of reports). The cast was granular. It contained clearly matrix outside the cells and the cells had blue nuclei. Thus it was not a granular cast only (13% of reports), nor an artefact (2%). If the laboratory thought that the type of the cell was asked, rather than the type of the cast, renal tubular cell can be considered an acceptable answer as well (A, 2 reports). Renal tubular cells and granulocytes

LABQUALITY

11. General principles of microbiology reports

Scoring policy

Scoring is implemented for a sample/finding when 60% or more of the participants report the expected result and when at least three results are reported.

If less than 60% of the participants report an expected result the sample/finding might after consideration be scored if
- the finding is considered as such that, taking into consideration the performance level of the laboratories, it should be identified or reported correctly (e.g. most common pathogens)

and/or
- other reasons presented by the scheme expert.

Samples sent for educational and training purposes will not be scored.

If there is a reason to suspect, and/or has been shown any quality issues concerning the sample lot post-distribution (e.g. too scarce growth), the results will not be scored even if 60% of the participants would have reported the expected result.

Expected results

The expected result is defined by:
- data supplied by the sample material manufacturer
- data obtained in the pre-testing of the sample material
- results reported by participants of the actual round
- the scheme experts

Scoring reports

The principles regarding the scoring scale have been defined for all schemes and are presented in the report info on the last page of laboratory-specific reports and global reports. A client-specific scoring table will be included in the result reporting for each round. If a client has not reported any results the following note will appear in the report: "You have not responded in time, only global report is available."

Both individual tests results, and clinical interpretations may be scored. The final scores have been converted to percent form and a comparison between success rates of the participating clients is carried out by using these values.

The laboratory specific scoring summary presents the scores the laboratory has received within the specific round compared to the maximum score given for each sample/finding/test. The summary includes also cumulative data showing the sum of scores the laboratory has received in previous rounds.

The following general scoring rules are applied:
- Correct/expected clinical interpretation   4/4 points.
- Partly correct/expected clinical interpretation   1-3/4 points.
- False/deviating clinical interpretation   0/4 points.
- Correct/expected test result   2/2 points.
- False/deviating test result   0/2 points.

If exceptions to these scoring rules occur or if further actions are scored, the reasons are explained in the report letter.

LABQUALITY

In the scoring report **Summary** laboratory's own sample-specific scores and success rates, maximum scores and average (AVR) success rates (%) of all participants are presented. Difference between AVR success rate and the participant's own success rate is shown. Success rates are based on scores. Success rate history of previous rounds is shown by the bars and in the table.

|	No of participants	No of responded participants	Response percentage
Throat streptococcal culture, screening and identification, November, 4-2018	69	68	98.6 %

▼ Summary

Throat streptococcal culture, screening and identification (5140)

Summary	Own score	Max score	Own success rate	Difference	AVR success rate
Sample S001	4	4	100 %	9.6 %	90.4 %
Sample S002	4	4	100 %	0 %	100 %
Sample S003	4	4	100 %	1.5 %	98.5 %
Average:			100 %	3.7 %	96.3 %

History	Test nr.	Own success rate	Difference	AVR success rate
Round 2018-3	1	100 %	3 %	97 %
Round 2018-2	1	100 %	4 %	96 %

Sample specific interpretations are shown in **pie diagrams** as percentages and the total interpretation and method counts in the tables. By default, the distribution pies are closed in the scoring reports, but they can be opened by clicking the screen button at the right end of the result distribution row.

Sample S003 Clinical interpretation
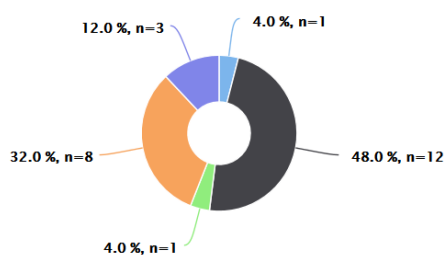
- ■ HTLVAb negative
- ■ Not yet reported, HTLVAb primary test reactive, re ...
- ■ HTLVAb positive, confirmed
- ■ HTLV-2 Ab positive, confirmed
- ■ HTLVAb reactive, reported without confirmation

LABQUALITY

12.   Scoring report for Microbiology, type I

Type I scoring reports include the majority of the antibody, antigen and nucleic acid detection schemes. Also, some of the bacteriology schemes are presented according to report type I.

Clinical interpretations and further actions reported by participants are presented in the table. The test results are divided into groups according to the method stated by the laboratory. Laboratory's own scores and success rates, as well as maximum scores and average (AVR) success rates (%) of all participants are presented. Expected results are marked with green color and laboratory's own result with a black radio button (⊙).

Clinical interpretation	Further action	Clinical interpretation count	Further action count	Own score	Max score	Own success rate	Difference	AVR success rate	Clinical interpretation score	Further action score
HTLVAb negative		1						0 %	0	
Not yet reported, HTLVAb primary test reactive, referred		12						100 %	4	
	New sample requested		1					-		-
	Would be referred to another laboratory for further examination		3					-		-
HTLVAb positive, confirmed		1						100 %	4	
⊙ HTLV-2 Ab positive, confirmed		8		4	4	100 %		100 %	4	
	New sample requested		2					-		-
	Would be referred to another laboratory for further examination		1					-		-
HTLVAb reactive, reported without confirmation		3						50 %	2	

HTLVAb Primary test	Interpretation	Testkit	Interpretation count	Testkit count	Own score	Max score	Own success rate	Difference	AVR success rate	Interpretation score
	Negative / non reactive		1						0 %	0
		HTLV- I/II Microelisa System (Avioq)		1						
	⊙ Positive / reactive		23		2	2	100 %		100 %	2
		ARCHITECT rHTLV-I/II (Abbott)		18						
		⊙ HTLV I/II Ab (ULTRA Version) (DIA. PRO Diagnostics Bioprobes s.r.l)		2	2	2	100 %			
		Liaison XM murex HTLV-I/II (Diasorin)		1						
		Murex HTLV I+II (Diasorin)		2						
	Total:		24		2	2	100 %	4.2 %	95.8 %	

LABQUALITY

13.   Scoring report for Microbiology, type II

Type II scoring reports include the majority of the culture schemes for bacteriology and mycology as well as the blood and faecal parasitology schemes.

Findings reported by participants are grouped into the Finding groups. Laboratory's own scores and success rates, as well as maximum scores and average (AVR) success rates (%) of all participants are presented in the table. Accepted results are marked with green color and laboratory's own result with a black radio button (⊙). Difference between AVR success rate and the participant's own success rate is shown.

- The **blue title bar** indicates the expected finding for each sample.
- The **result distribution pies** are closed in the reports. You can open the distribution pies by clicking the screen button at the right end of the result distribution row.
- For each sample **a laboratory-specific scoring table** where the own result and the scores given is shown. The success rates have been calculated from the scores.
- The **"Report to the clinician"** table shows expected findings marked with green color and laboratory's own result with a black radio button (⊙).

▼ Sample S001 | Streptococcus sp., group G

Throat streptococcal culture, screening and identification (5140)

RESULT DISTRIBUTION

LABORATORY SPECIFIC SCORING TABLE

Finding group	Finding	Clinical significance	Own score	Max score	Own success rate	Difference	AVR success rate
Streptococcus sp., group G	ß-haemolytic streptococcus, Group G	Clinically significant	4	4	100 %	9.6 %	90.4 %
Total:			4	4	100 %	9.6 %	90.4 %

REPORT TO THE CLINICIAN

Finding group	Finding	Finding count	Significant	Non significant	AVR success rate
Streptococcus sp., group G		**68**			**90.4 %**
	⊙ ß-haemolytic streptococcus, Group G	52	⊙ 52		
	Streptococcus dysgalactiae ssp. equisimilis	4	4		
	ß-haemolytic streptococcus, Group C/G	2	2		
	Streptococcus dysgalactiae ssp. dysgalactiae	2	2		
	Streptococcus dysgalactiae	2	2		
	ß-haemolytic streptococcus, Group C	1	1		
	ß-haemolytic streptococcus, sent for referal	1	1		
	ß-haemolytic streptococcus, Group A	1	1		
	Negative / normal flora	3		3	
Total:		68			90.4 %

- In the Scoring summary table scores for different findings are shown.

SCORING SUMMARY

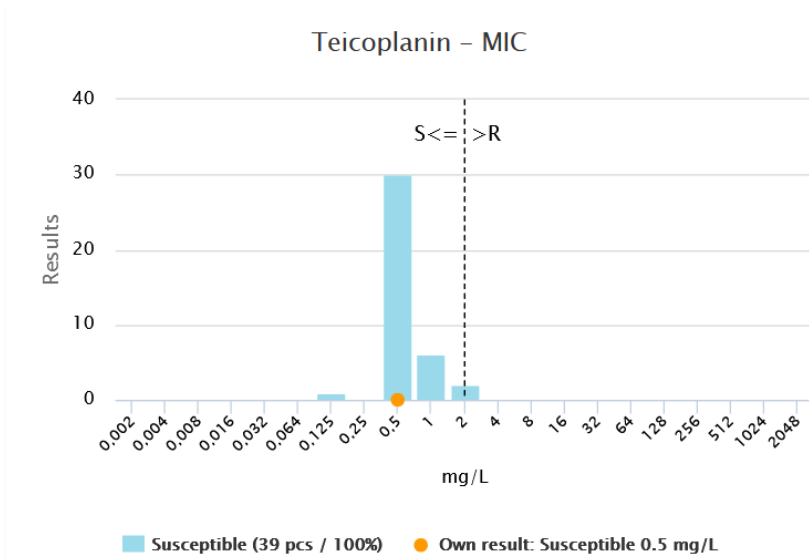| Finding group	Finding	Finding score	Significant	Max score
Streptococcus sp., group G				4
	ß-haemolytic streptococcus, Group G	3	1	4
	Streptococcus dysgalactiae ssp. equisimilis	3	1	4
	ß-haemolytic streptococcus, Group C/G	3	1	4
	Streptococcus dysgalactiae ssp. dysgalactiae	2	1	4
	Streptococcus dysgalactiae	2	1	4
	ß-haemolytic streptococcus, Group C	0	1	4
	ß-haemolytic streptococcus, sent for referal	0	1	4
	ß-haemolytic streptococcus, Group A	0		4
	Negative / normal flora	0		4
Total:				4

Schemes may contain also other tables and summaries. Their interpretation principles are the same as shown above.

14. Antimicrobial Susceptibility testing (AST) reports in microbiology

The antimicrobial susceptibility testing results are shown in laboratory specific summary tables and histograms. Histograms are drawn for each antimicrobial agent if the laboratory's result is included in a group of at least three results. By "group" is meant results which are obtained and interpreted according to the same standard (EUCAST, CLSI or CA-SFM). Laboratory's own results are indicated with a black radio button (⊙) in the table and an orange dot in the histograms. Average (x) is used as a reference value for disk results and mode (Mo) is used for MIC results. According to the experts' assessment some antimicrobials may be excluded from the final summary tables, e.g., antimicrobial agents to which the microbe is intrinsically resistant or to which only one result has been reported. Clinical breakpoints defined by the standards may be indicated with a dashed line and target ranges of international quality control strains may be shown with a yellow background in the histograms.

Antimicrobial agent	Standard	DISK						
		Own result (mm)	x (mm)	sd (mm)	S	I	R	n
Cefoxitin	CLSI	-	25	-	1 (100%)	0 (0%)	0 (0%)	1
	CA-SFM	-	17	1	0 (0%)	0 (0%)	5 (100%)	5
	EUCAST	16 ⊙	16	1	0 (0%)	0 (0%)	26 (100%) ⊙	26
All					1 (3%)	0 (0%)	31 (97%)	32

LABQUALITY

Teicoplanin – MIC

S<= | >R

Susceptible (39 pcs / 100%) ● Own result: Susceptible 0.5 mg/L

	Mo	min	max	n
Teicoplanin	0.5	0.125	2	39

15.   References

1. ISO 13528:2015 Statistical methods for use in proficiency testing by interlaboratory comparison
2. ISO 17043:2010 Conformity assessment — General requirements for proficiency testing
3. Further questions please contact info@labquality.fi