RANDOX

EDUCATIONAL GUIDE

Why Choose RIQAS?

RIQAS

RANDOX INTERNATIONAL QUALITY ASSESSMENT SCHEME (RIQAS)

In today's fast-paced laboratory environment, ensuring accurate and reliable results is paramount.

External Quality Assessment (EQA) serves a crucial function in ensuring accurate patient testing, upholding high standards, offering an independent evaluation of performance and facilitating benchmarking against international peers.

RIQAS (Randox International Quality Assessment Scheme) is the world's largest EQA programme, offering comprehensive, flexible, and cost-efficient solutions designed to enhance laboratory quality assurance and ultimately, improve patient safety.

Why Choose RIQAS?

Consolidation

Optimise cost-efficiency and time management by utilising a comprehensive array of multi-parameter programmes.

Commutability

Human samples free from interfering preservatives, enhancing confidence that EQA performance accurately reflects the performance of patient samples.

World's Largest EQA Programme

RIQAS encompasses over 76,000 laboratory participants, increasing statistical validity while ensuring the availability of data across a diverse array of instruments and methodologies.

Accuracy

Frequent reporting facilitates the early detection of test system errors, enabling the prompt implementation of corrective actions with minimum disruption to laboratory operations.

User Friendly Reports

Simple, one page per parameter format, enables at-a-glance performance assessment, saving valuable time in the laboratory.

Flexibility

Tailored participation options are available to ensure compatibility with laboratories of all sizes and budgets.

Rapid Report Turnaround

Reports are sent within 72 hours of submission deadline, enabling the timely implementation of corrective actions, thereby minimising the risk of costly errors with patient results.

Clinically Relevant Samples

Samples spanning clinically relevant levels allow identification of concentration-related biases, helping to support the maintenance of accurate instrument performance at these critically important decision levels.

Consolidation

REDUCE COSTS AND SAVE TIME

RIQAS enables laboratories to consolidate EQA programmes, by reducing the need for multiple suppliers and individual programmes to cover their test menu. This means a reduction in administrative efforts and associated costs. By streamlining EQA participation under a single provider, laboratories benefit from:

- Cost savings on administration, procurement and individual programme subscriptions.
- Reduced time spent managing multiple EQA programmes and providers.
- A more efficient workflow, allowing resources to be redirected toward core lab functions.
- Reduced risk of human error due to reconstitution and sample mix-ups.

Case Study

22 Programmes with National Scheme
(133 SAMPLE TUBES)

9 Programmes with RIQAS
(16 SAMPLE TUBES)

Cost Savings in the region of £14,000 annually

Countless hours saved with reduction in samples to prepare

Reduced risk of sample mix up

RIQAS enables laboratories to register up to five instruments per programme at no additional cost, offering significant cost savings for laboratories with multiple instruments and simplifying the management of EQA programmes across multiple devices.

Individual reports are provided for each instrument along with a unique multi-instrument report. The multi-instrument report plots the performance of each individual instrument on a single, colour coded Levey-Jennings chart, ensuring instant identification of any discrepancies in instrument performance.

Commutability

HIGH QUALITY SAMPLES SPANNING CLINICALLY RELEVANT LEVELS

RIQAS provide high quality samples spanning clinically relevant concentrations, ensuring:

- Realistic and reliable proficiency testing that actually reflects clinical conditions.
- Accurate performance evaluation across the entire clinical range of concentrations.
- Increased confidence in patient test results and laboratory processes.

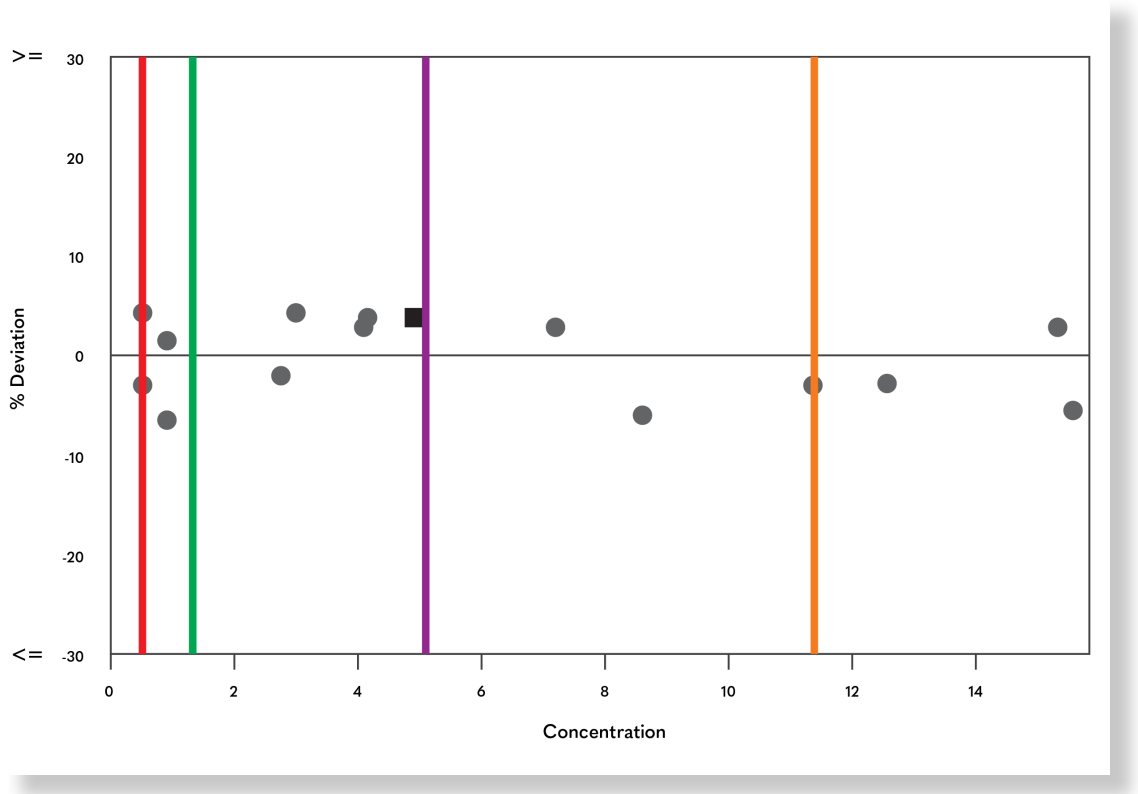
Case Study – Anti-Müllerian Hormone (AMH)

- <0.5ng/mL of AMH Ultra-Low Ovarian Reserve (Associated with IVF Cycle Cancellation) - Ultra Low Level Concentration
- <1ng/mL of AMH Low Ovarian Reserve – Low Level Concentration
- 1ng/mL – 10 ng/mL of AMH Normal Ovarian Reserve – Normal Level Concentration
- >10ng/mL of AMH PCOS (Polycystic Ovarian Syndrome) – High Level Concentration

A clinician reviewing a patient's AMH test result must be confident that the test system can accurately measure concentrations spanning the entire clinical range. With blind EQA samples, it is crucial that they are clinically relevant, ensuring precise performance evaluation across the entire clinical range.

AMH RIQAS % Deviation by Concentration Chart

RIQAS Sample Concentrations = 0.47 - 16.268 ng/ml – The full clinical range of concentrations is covered throughout each cycle.



World's Largest Peer Group

OVER 76,000 LABORATORY PARTICIPANTS

RIQAS is the largest global EQA programme, with more than 76,000 laboratory participants across more than 139 countries. This extensive reach guarantees:

- Extensive peer group comparisons, leading to more accurate and reliable assessments.
- Greater confidence in results through a reputable and globally trusted programme.
- Engagement in a global network of laboratories, strengthening credibility and providing enhanced benchmarking opportunities.

Haemoglobin, g/dl

	N	Mean	CV%	U_m	SDPA	Exc.
All Methods	8205	10.603	2.3	0.00	0.24	1075
Sysmex XN Series	1889	10.640	1.2	0.00	0.24	197

Method	N	Mean	CV%	U_m
Sysmex XN Series	1889	10.640	1.2	0.00
Sysmex XN-L Series	751	10.481	1.1	0.01
Mindray BC-6000/6200/6600/6800/6800Plus	552	10.651	1.2	0.01
Sysmex XP Series	363	10.610	2.0	0.01
Beckman Coulter DxH 600/800/900 Series	366	10.554	1.2	0.01
Abbott Cell-Dyn Ruby	360	10.706	1.7	0.01
Mindray BC 1000/2000/3000 series	256	10.507	3.0	0.02
Siemens/Bayer Advia 120/2120	212	10.847	1.7	0.02
NihonKohden Celltac a/a+ MEK1301/2/3/5	199	10.800	2.9	0.03
Calculated from HCT	190	9.477	3.0	0.03
Mindray BC 5100/5180/5300/5380/5390	186	10.610	1.6	0.02
Mindray BC 10/20/30	165	10.705	2.1	0.02
Mindray BC 5000/5150/5140/5130/5120	157	10.556	1.7	0.02
Beckman Coulter DxH 500 Series	152	9.707	2.2	0.02
Horiba Yumizen H500/ 550	119	10.504	1.5	0.02
Sysmex XS series	132	10.578	1.3	0.01
Mindray BC-700 series	137	10.607	1.5	0.02
Manual Methods	119	9.566	3.4	0.04
ABX Micros/Minos/ABC VET	114	10.485	2.7	0.03
Boule Medonic/ Swelab 3-part diff	99	10.754	2.3	0.03
Nihon Kohden Celltac E/Es	96	10.759	2.4	0.03

Case Study – RIQAS Haematology Programme

- 9,280 Results submitted in December 2024
- 8,205 contributing to the generation of means for comparison
- 2,086 on Sysmex XN Series Alone
- 1,889 contributing to the generation of means for comparison
- A further 20 Methods with large peer groups included

The most effective means of comparison is always at the instrument level, where participants are compared to their peers using the same instrument and reagent method, as different instruments and methods may exhibit varying biases and targets.

A large peer group ensures the availability of accurate data across a broad range of instruments and methodologies, enhancing the reliability of comparisons.

World's Largest Peer Group

OVER 76,000 LABORATORY PARTICIPANTS

A large peer group increases the reliability and statistical significance of the target mean, leading to more accurate assessment of a laboratory's bias/accuracy. Ultimately providing staff with the confidence that the target mean is accurate and reliable.

POPULAR RIQAS PROGRAMMES

Haematology Programme – 9,280 Results in December 2024

Haemoglobin, g/dl

	N	Mean	CV%	U_m	SDPA	Exc.
All Methods	8205	10.603	2.3	0.00	0.24	1075
Sysmex XN Series	1889	10.640	1.2	0.00	0.24	197

Chemistry Progremme – 7,973 Results in December 2024

ALT (GPT), U/l @ 37°C

	N	Mean	CV%	U_m	SDPA	Exc.
All Methods	7477	40.064	8.8	0.05	3.29	496
Tris buffer without P5P	4084	39.249	8.4	0.06	3.22	270
Beckman AU instruments	116	41.687	4.4	0.21	3.42	7

Immunoassay Programme – 4,023 Results in December 2024

TSH, uU/ml

	N	Mean	CV%	U_m	SDPA	Exc.
All Methods	3639	34.223	11.4	0.08	2.23	384
Roche Cobas 4000/e411	470	35.922	4.7	0.10	2.34	44

Accuracy

FREQUENT REPORTING FOR EARLY ERROR DETECTION

RIQAS offers frequent reporting to help laboratories identify potential issues at an earlier stage. This proactive approach ensures:

- Timely corrective actions before issues escalate.
- Continuous monitoring to enhance quality assurance.
- Improved laboratory performance and reliability.
- Increased patient safety by minimising the risk of reporting inaccurate results.

Target Deviation for Performance Assessment (TDPA)

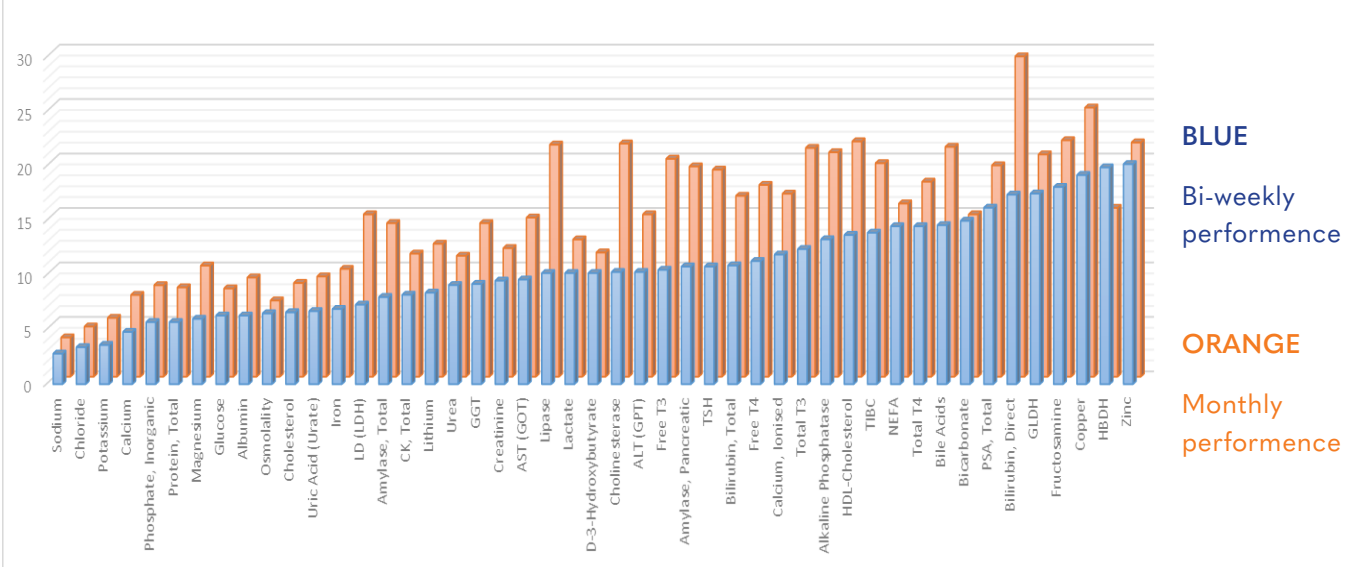
TDPA's are set to encourage participants to achieve and maintain acceptable performance. Target Deviations are assigned to be fit-for-purpose and take all possible sources of variation into account, including sample homogeneity and stability (taking guidance from ISO/IEC17043, ISO13528 and IUPAC). RIQAS review the Target Deviations for Performance Assessment annually, setting a performance limit for each parameter each year. The methods used to assign them have been agreed by the RIQAS Advisory Panel.

Case Study – Clinical Chemistry Bi-Weekly vs Monthly Performance

The graph below illustrates target deviation data for bi-weekly and monthly reporting within the RIQAS Clinical Chemistry Programme. This data is calculated based on the % deviation from their peer group in the previous cycle.

The %Dev. Limit (TDPA) for the monthly programme exceeds that of the bi-weekly chemistry programme, **indicating greater deviation away from the target mean among laboratory's registered for monthly samples. This suggests that the performance of laboratories in the bi-weekly programme was superior to that of laboratories in the monthly programme.**

Frequent EQA reviews are effective, as laboratories troubleshoot performance issues earlier and implement corrective actions more promptly. The graph below illustrates that performance of laboratories participating in the bi-weekly programmes is superior to those in the monthly prorgamme. This trend is also observed in Immunoassay and Haematology programmes, further supporting the value of more frequent performance evaluations.



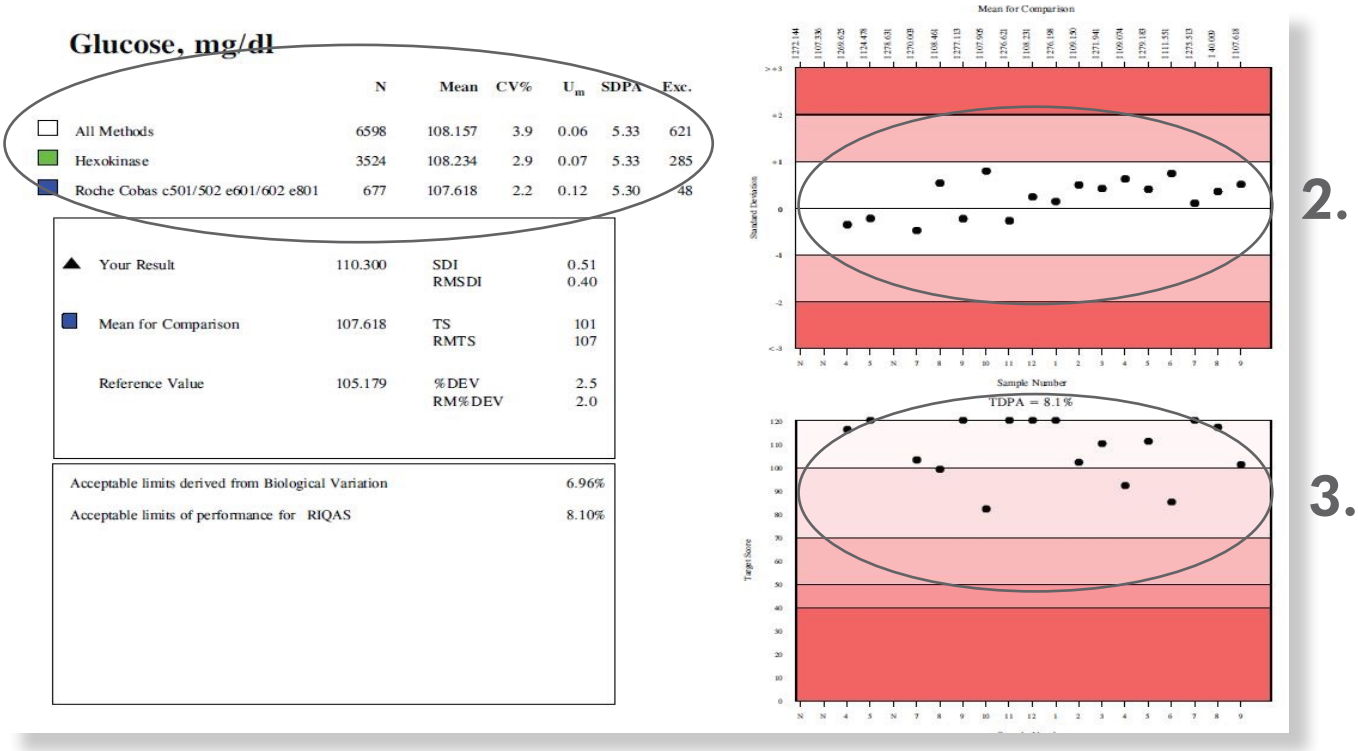
User Friendly Reports

FOR QUICK PERFORMANCE ASSESSMENT

RIQAS Reports are designed for ease of use, offering clear and concise performance assessments. Key features include:

- At-a-glance insights that allow for the quick identification of trends and potential issues.
- Detailed statistical analysis for a comprehensive performance review.
- Actionable insights that facilitate continuous improvement in quality control.

Standard Report - Performance Data Presented in a One Page Format with up to Seven Sub Reports

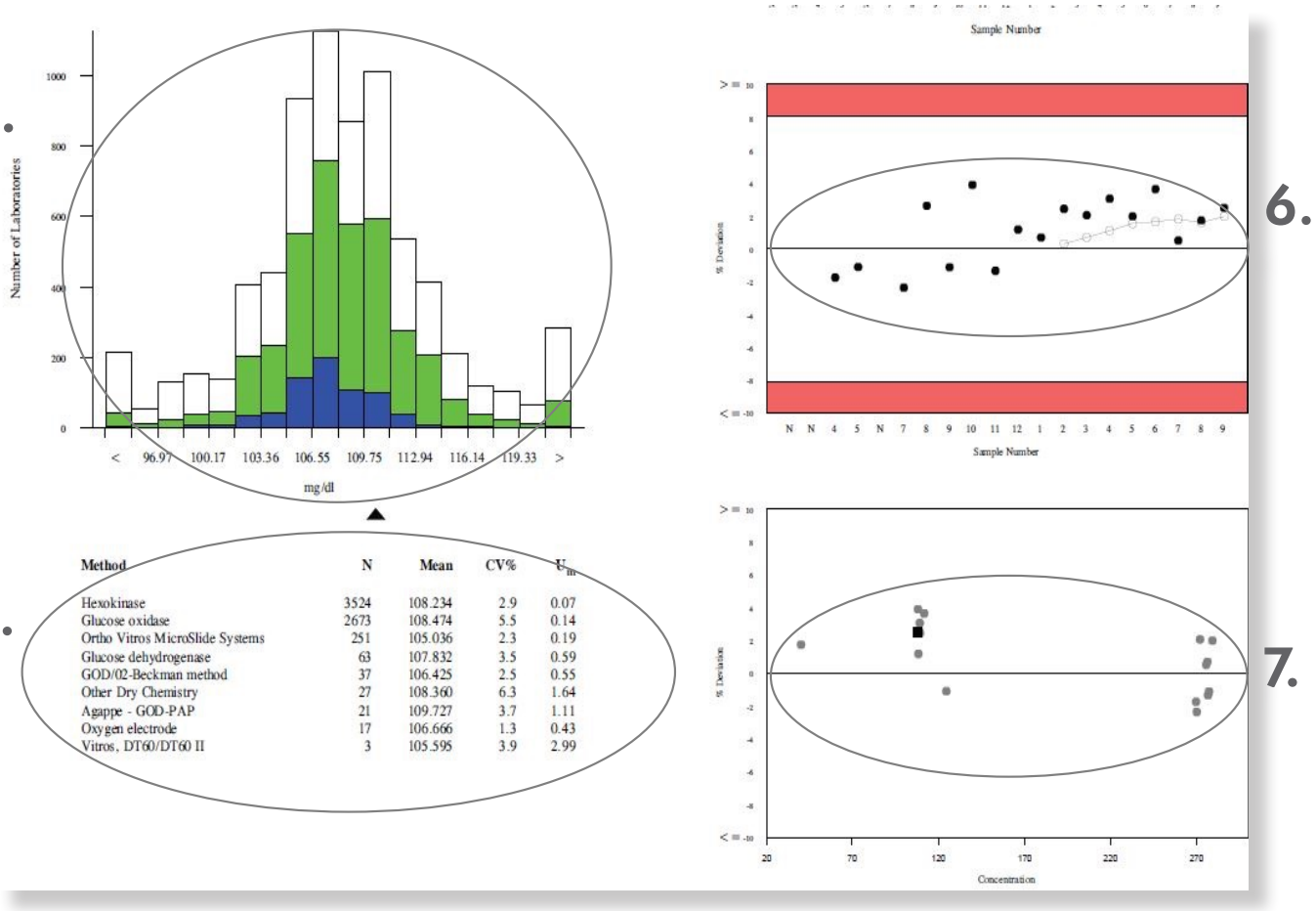


1. Text Section: Statistics for all methods, your method and instrument group (programme specific).

2. Levey-Jennings Chart: Detailed features of your laboratory's performance, with shading for at-quick review of performance.
- Lighter shaded areas represent acceptable, good or excellent performance.
- Heavy shading signifies poor performance.

3. Target Score: This unique chart provides a numerical index of performance, allowing at-a-glance performance assessment.

Standard Report - Performance Data Presented in a One Page Format with up to Seven Sub Reports



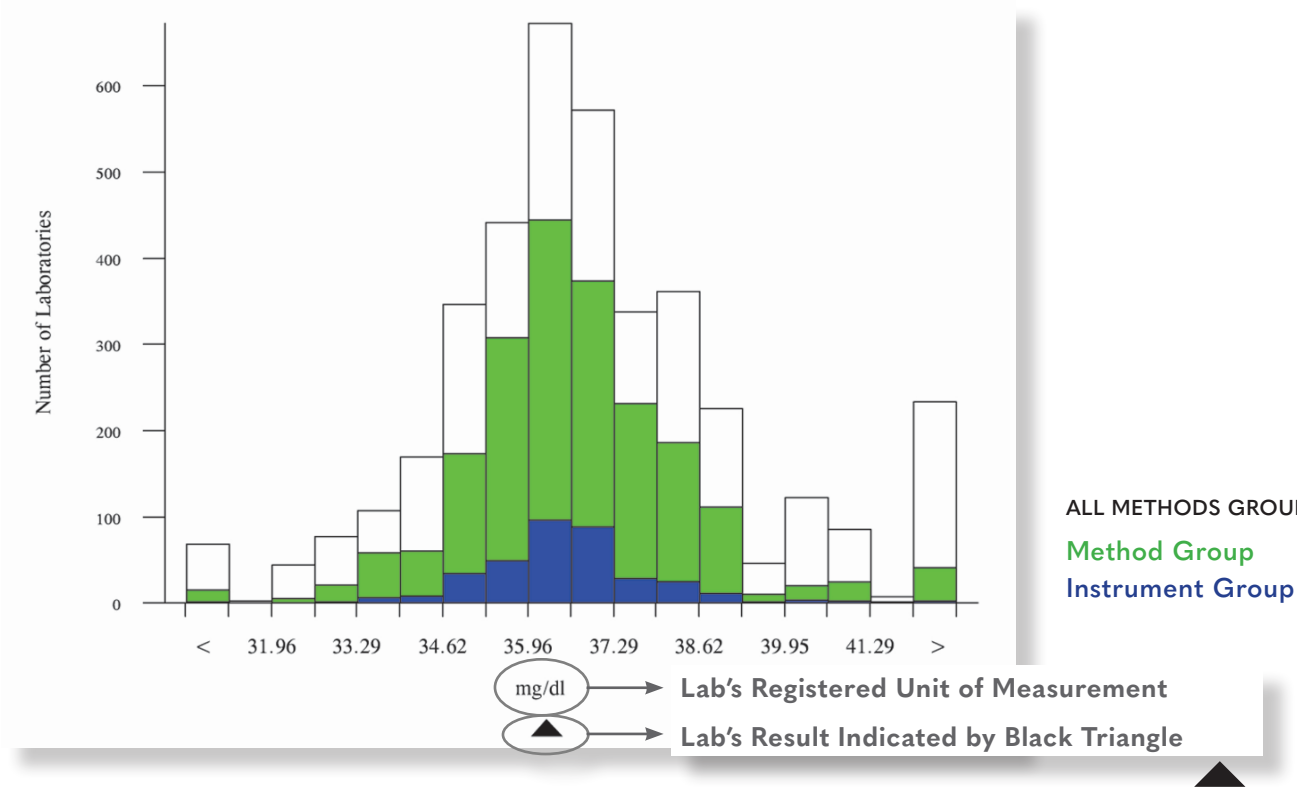
4. **Histogram Chart:** Quick visualisation of how your lab's results compare to the method mean, instrument mean and all method mean.

5. **Multi Method Stat Section Chart:** Enables assessment of performance for each method.

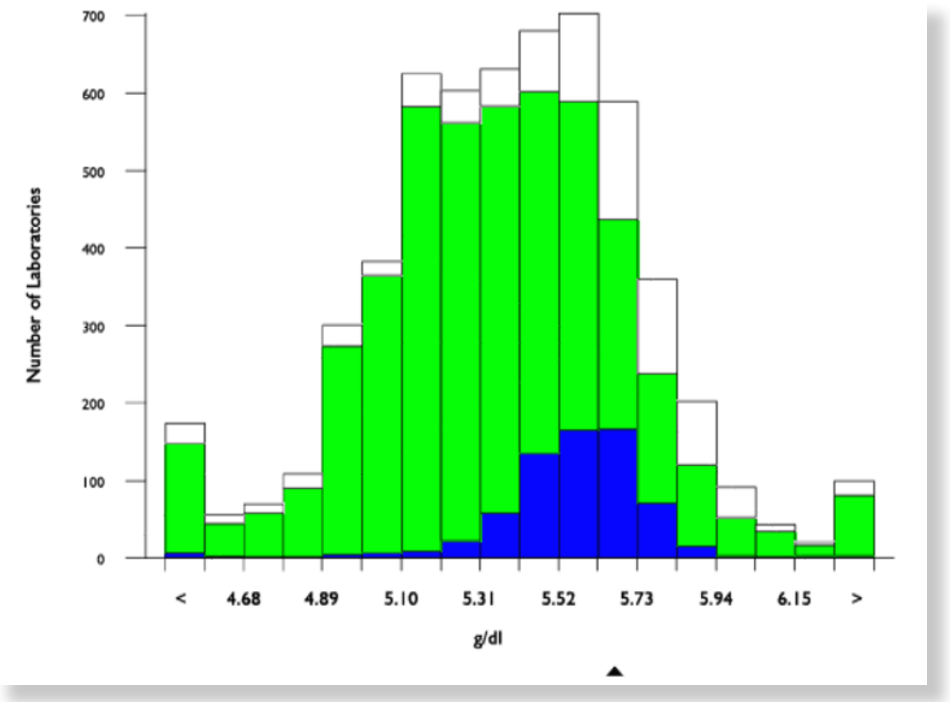
6. **%Deviation by Sample Chart:** Helps to identify trends and shifts in performance.

7. **%Deviation by Concentration Chart:** Rapid assessment of concentration related bias.

Histogram Chart - Quick visualisation of how your lab's results compare to the method mean, instrument mean and all method mean.



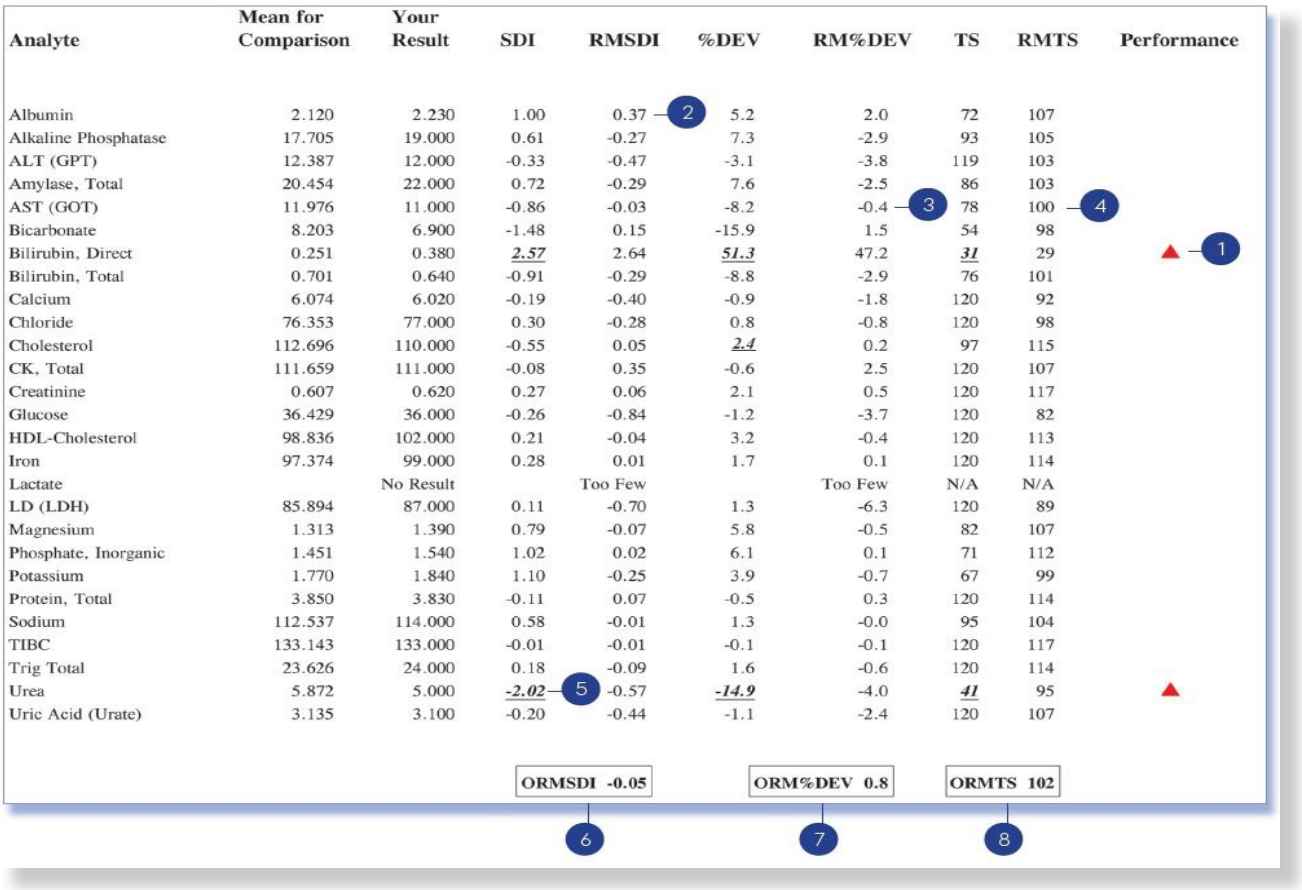
The histogram uniquely combines three charts into one, allowing for quick identification and easy visualisation of how the laboratory's results compare to the instrument mean, method mean as well as the all methods mean. Providing a quick **method** and **instrument comparison** and significant insights into any **instrument biases** present, as can be seen with an example below.



The histogram on the left clearly shows that the instrument group has a positive bias when compared to the method group for this parameter.

This helps laboratories to understand that the accuracy issue is not just the laboratory's instrument, but it is a wider issue with the instrument supplier.

Located at the back of the RIQAS Report, the Summary Page collates the key information, allowing participants to review the performance of all parameters at-a-glance.



Analyte	Mean for Comparison	Your Result	SDI	RMSDI	%DEV	RM%DEV	TS	RMTS	Performance
Albumin	2.120	2.230	1.00	0.37	5.2	2.0	72	107	
Alkaline Phosphatase	17.705	19.000	0.61	-0.27	7.3	-2.9	93	105	
ALT (GPT)	12.387	12.000	-0.33	-0.47	-3.1	-3.8	119	103	
Amylase, Total	20.454	22.000	0.72	-0.29	7.6	-2.5	86	103	
AST (GOT)	11.976	11.000	-0.86	-0.03	-8.2	-0.4	78	100	
Bicarbonate	8.203	6.900	-1.48	0.15	-15.9	1.5	54	98	
Bilirubin, Direct	0.251	0.380	**2.57**	2.64	**51.3**	47.2	**31**	29	▲
Bilirubin, Total	0.701	0.640	-0.91	-0.29	-8.8	-2.9	76	101	
Calcium	6.074	6.020	-0.19	-0.40	-0.9	-1.8	120	92	
Chloride	76.353	77.000	0.30	-0.28	0.8	-0.8	120	98	
Cholesterol	112.696	110.000	-0.55	0.05	**2.4**	0.2	97	115	
CK, Total	111.659	111.000	-0.08	0.35	-0.6	2.5	120	107	
Creatinine	0.607	0.620	0.27	0.06	2.1	0.5	120	117	
Glucose	36.429	36.000	-0.26	-0.84	-1.2	-3.7	120	82	
HDL-Cholesterol	98.836	102.000	0.21	-0.04	3.2	-0.4	120	113	
Iron	97.374	99.000	0.28	0.01	1.7	0.1	120	114	
Lactate		No Result		Too Few		Too Few	N/A	N/A	
LD (LDH)	85.894	87.000	0.11	-0.70	1.3	-6.3	120	89	
Magnesium	1.313	1.390	0.79	-0.07	5.8	-0.5	82	107	
Phosphate, Inorganic	1.451	1.540	1.02	0.02	6.1	0.1	71	112	
Potassium	1.770	1.840	1.10	-0.25	3.9	-0.7	67	99	
Protein, Total	3.850	3.830	-0.11	0.07	-0.5	0.3	120	114	
Sodium	112.537	114.000	0.58	-0.01	1.3	-0.0	95	104	
TIBC	133.143	133.000	-0.01	-0.01	-0.1	-0.1	120	117	
Trig Total	23.626	24.000	0.18	-0.09	1.6	-0.6	120	114	
Urea	5.872	5.000	**-2.02**	-0.57	**-14.9**	-4.0	**41**	95	▲
Uric Acid (Urate)	3.135	3.100	-0.20	-0.44	-1.1	-2.4	120	107	

ORMSDI -0.05 | ORM%DEV 0.8 | ORMTS 102

1. Red Traingle appears when all performance indicators (SDI, %DEV and TS) exceed acceptable performance, ie: when
   - SDI>=2
   - TS < 50
   - %DEV > acceptable limits set
2. RMSDI – is the Running Mean of the previous SDIs (if fewer than 10 results on file, "Too Few" is printed).
3. RM%DEV – Average of the last 10%DEV for this parameter.
4. RMTS – Average of the last 10 Target Scores for this parameter.
5. All poor performance is highlighted in bold and underlined.
6. Overall RMSDI = average RMSDI for this sample distribution.
7. Overall RM%DEV = average RM%DEV for this sample distribution.
8. Overall RMTS = average RMTS for this sample distribution.

RANDOX
QUALITY CONTROL

MD 686778