# External QA program of Clinical Chemistry in 2013

# Clinical Chemistry Program

- Collaborate with RIQAS (by Randox Laboratories Ltd) from July 2012

- Total no. of participants: 45

  (39 labs with 6 labs submitting 2 sets of results)

## Program details:

- One sample per month
- 39 Analytes covered:

| | | |
|---|---|---|
| Albumin | AST | Calcium, Total |
| ALP | Bicarbonate | Calcium, Ionised |
| ALT | Bile acids | Chloride |
| Amylase, Total | Bilirubin, Direct | Cholesterol, Total |
| Amylase, Pancreatic | Bilirubin, Total | CK |

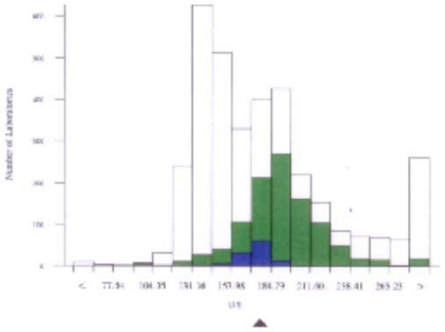
| | | |
|---|---|---|
| Creatinine | Osmolality | Total T3 |
| GGT | Magnesium | Free T4 |
| Glucose | Phosphate | Total T4 |
| HDL-Cholesterol | Potassium | TIBC |
| Iron | Protein, Total | Triglycerides |
| LD | PSA, Total | TSH |
| Lipase | Sodium | Urea |
| Lithium | Free T3 | Uric Acid |

# Alkaline Phosphatase, U/l @ 37°C

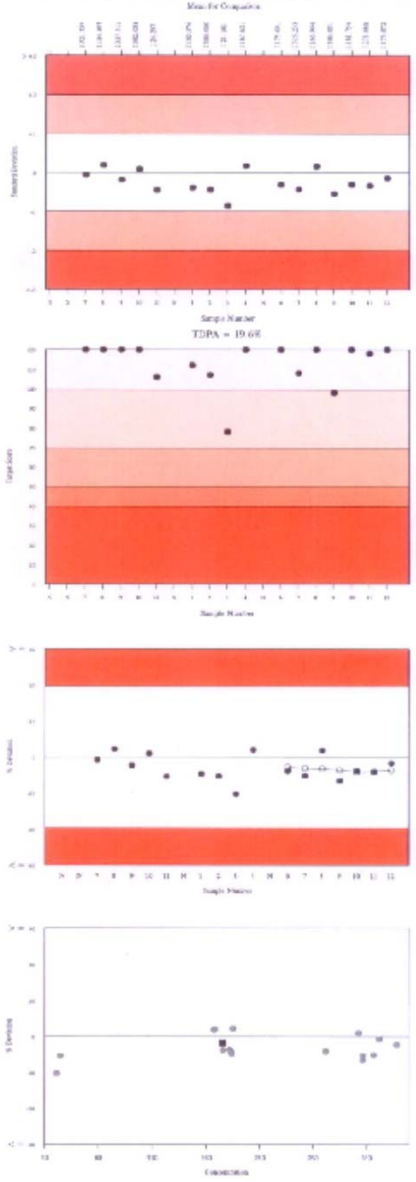
| | N | Mean | CV% | $U_{rv}$ | SDPA | Exc. |
|---|---|---|---|---|---|---|
| All Methods | 3227 | 171.388 | 20.9 | 0.79 | 20.42 | 288 |
| AMP, optimised to IFCC | 959 | 191.078 | 10.6 | 0.82 | 22.77 | 89 |
| Abbott Architect c systems | 99 | 175.072 | 3.9 | 0.87 | 20.86 | 15 |

| | | | |
|---|---|---|---|
| Your Result | 172.000 | SDI | -0.15 |
| | | RMSDI | -0.31 |
| Mean for Comparison | 175.072 | TS | 120 |
| | | RMTS | 110 |
| | | %DEV | -1.8 |
| | | RM%DEV | -3.7 |

| | |
|---|---|
| Acceptable limits derived from Biological Variation | 11.7% |
| Acceptable limits of performance for RIQAS | 19.80% |




| Method | N | Mean | CV% | $U_{rv}$ |
|---|---|---|---|---|
| AMP, optimised to IFCC | 959 | 191.078 | 10.6 | 0.82 |
| Roche AMP buffer IFCC | 943 | 190.468 | 5.9 | 0.54 |
| Diethanolamine buffer, DEA | 399 | 219.167 | 12.8 | 2.26 |
| Dade Dimensions, AMP buffer | 258 | 145.186 | 13.4 | 1.82 |
| Ortho Vitros MicroSlide Systems | 228 | 183.818 | 5.8 | 0.75 |
| Other AMP kits | 187 | 183.943 | 6.5 | 1.10 |
| AMP, non-optimised | 144 | 183.318 | 6.4 | 1.22 |
| Tris/carbonate buffer, KA units | 99 | 240.496 | 12.3 | 4.80 |
| AMP, optimised to NVKC/SFBC | 19 | 200.594 | 15.4 | 8.89 |
| Vitros DT60/DT90 II/DTSC II | 13 | 139.760 | 35.5 | 16.85 |
| Tris/carbonate buffer | 10 | 185.330 | 18.2 | 13.35 |
| AMP, reduced interference | 7 | 182.018 | 4.4 | 3.80 |
| - select - | 7 | 181.857 | 8.4 | 7.23 |
| Other Dry Chemistry | 2 | 193.000 | 24.2 | 41.25 |






RIQAS

UKAS 0010

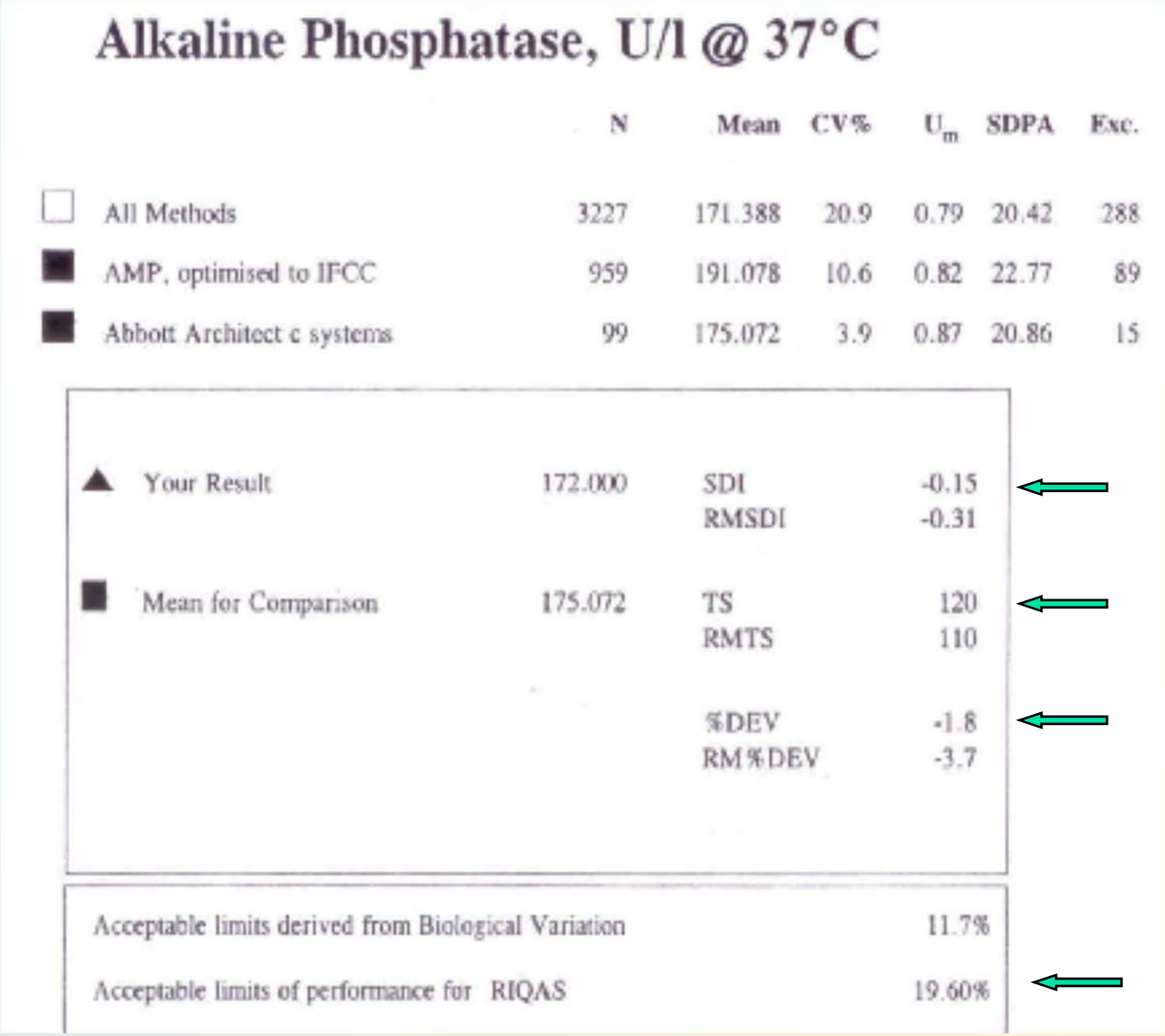
# RIQAS Evaluation of performance

Acceptable criteria:

- Target score greater than 50
- SDI less than ± 2SD from the mean for comparison
- % Deviation within the "acceptable limits" set by RIQAS

(From RIQAS: Evaluation of Performance 2012 eng.doc)

# Report text section



## Alkaline Phosphatase, U/l @ 37°C

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| | | %DEV | -1.8 |
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| | |
|---|---|
| Acceptable limits derived from Biological Variation | 11.7% |
| Acceptable limits of performance for RIQAS | 19.60% |

SDI

Target score

% deviation

Target deviation for performance assessment (TDPA)

# Criteria for selection of Mean for comparison

- Return results are compared to a mean for comparison
- The mean is generated by consensus (with outliers excluded)
- Minimum of 5 results to generate the instrument group mean
- <5 results, submitted result will be compared to method group mean

# Target score calculation

Calculate percent deviation (V)

$$V = \frac{(\text{Your result} - \text{Mean for Comparison})}{\text{Mean for Comparison}} \times 100$$

$$TS = \log10 \left( 3.16 \times \frac{TDPA}{|V|} \right) \times 100$$

TDPA=Target Deviation for Performance Assessment (%)

| Target Score | Performance |
|---|---|
| <40 | Unacceptable |
| 41 - 50 | Need for improvement |
| 51 - 70 | Acceptable |
| 71 - 100 | Good |
| 101 - 120 | Excellent |

# Standard Deviation Index Score

$$SDI = \frac{\text{participant's result} - \text{mean for comparison}}{SDPA}$$

## Standard Deviation Index Score

Calculate the standard deviation for Performance Assessment (SDPA) from CV for Performance Assessment (CVPA):

$$CVPA = \frac{TDPA}{\text{t-value}}$$

t-value ~1.645 (~10% labs have poor performance)

$$SDPA = \frac{CVPA \times Mean\ for\ comparison}{100}$$

$$SDI = \frac{participant's\ result - mean\ for\ comparison}{SDPA}$$

When Uncertainty (Um) >0.3 SDPA, the SDPA becomes SDPAadjusted

$$SDPA_{adjusted} = \sqrt{(Um^2 + SDPA^2)}$$

$$Um = \frac{1.25 \times SD}{\sqrt{n}}$$

SD=SD calculated when the mean for comparisons are generated

N =No. of results to calculate the SD

$$SDI = \frac{\text{participant's result} - \text{mean for comparison}}{SDPA_{adjusted}}$$

Acceptable: SDI less than ± 2 SDPAs from the mean for comparison

# Percentage Deviation Score (%Dev)

$$\%\text{Deviation} = \frac{\text{participant's result} - \text{mean for comparison}}{\text{mean for comparison}} \times 100$$

Acceptable: %Deviation < target deviation for performance assessment

# Participation details

Total no. of participants in 2013:

Start of year 2013:  45

End of year 2013:  43

Start of year 2014: 45 (2 participants newly added )

# Participants distribution:

| | |
|---|---|
| Private laboratories: 28 | (62.2%) |
| Private hospitals: 9 | (20.0%) |
| Hospital Authority: 5 | (11.1%) |
| University: 2 | (4.4%) |
| Private laboratory (overseas): 1 | (2.2%) |

# Results submission:

- On-line submission: 35 nos. (77.8%)

  By fax: 10 nos. (22.2%)

- The due date can be deferred for 2 days if results are submitted on-line

- Submission rate:

  100% submission: 34 nos. (75.6%)

# Analytes distribution:

20 analytes with more than 40 participants:

Na, K, CL, Urea, Creatinine,
TP, Alb, T. Bili, ALP, ALT, AST, GGT
T. Cholesterol, Triglycerides, HDL-Cholesterol,
Calcium, Phosphate, Uric acid, CK,
Glucose

# Analytes distribution:

2 analytes with 35 - 40 participants:
Fe, LD

4 analytes with 31 - 34 participants:
TT4, TSH, Amylase, D. Bili

4 analytes with 20 - 30 participants:
Bicarbonate, TT3, TIBC, Mg

# Analytes distribution:

4 analytes with 5-10 participants:

Ionised calcium, Lipase, Lithium, Osmolality

5 analytes with 1-3 participants:

P. Amylase, Bile acids, Total PSA,

FT3, FT4

## Analysers used (in alphabetical order):

Architect C system
Beckman Coulter AU system
Beckman Coulter Dxc system
Biomerieux Vidas/mini Vidas/Vidas 3
Ortho Vitros system
Randox Rx series / Menar F360/560
Roche Cobas C501/C502, e601/e602, C111

Roche Cobas 4000/e411
Roche Hitachi 902/904/911/912/917
Roche Hitachi Modular D, Elesys
Siemens/Dade Dimension RxL/Max/Xpand
Siemens/Dade Dimension Vista

# Errors observed:

- Transcription error: 9 participants (20%)
- Incorrect units
- Swapped samples
- Incorrect method classifications
- ? Effectiveness of follow-up actions for unsatisfactory samples

HKIMLS QAP

# Clinical Chemistry Programme Year 2014
## RIQAS Cycle 11
## Please return survey data to
## http://riqasconnect.randox.com/riqas/login.asp or 2124 2798 (fax)

**NOTE: Analysed within two days of reconstitution**

| Sample Number | Deadline of submission to HKIMLSQAP | Sample Number | Deadline of submission to HKIMLSQAP |
|---|---|---|---|
| 1 | 20 January 2014 | 7 | 21 July 2014 |
| 2 | 17 February 2014 | 8 | 18 August 2014 |
| 3 | 24 March 2014 | 9 | 22 September 2014 |
| 4 | 22 April 2014 | 10 | 20 October 2014 |
| 5 | 19 May 2014 | 11 | 17 November 2014 |
| 6 | 16 June 2014 | 12 | 22 December 2014 |

For any questions concerning the RIQAS program, please contact

info@hkimlsqap.org

for clarification.

Fax no.: 2124 2789

# Thank you !