

Birmingham Quality

UK NEQAS Serum Indices (HIL) [Pilot]

Laboratory :

Distribution : **105**

Date : 12-Mar-2017

Page 1 of 11

Feedback

Quality Manager
Pathology Laboratory
Biochemistry Department
Hospital
Town
County
Postcode
Country

This Scheme is essentially web-based. We can alert you to information regarding the Scheme via email. The e-mail address (or addresses) we are currently using to contact your laboratory is shown below in red. If no e-mail address is displayed or the information shown is incorrect, please email us with an appropriate contact e-mail address as soon as possible, using the word 'feedback' in the title line.

Based on the date information you have provided, the transit time from specimen dispatch [] to receipt [] was day(s), and the subsequent time to analysis [] in your laboratory was day(s). (Missing values indicate dates not provided. "0 days" represents same day).

[Any comments you made to us are shown below and have been acted upon where necessary](#)

[Any specific comments applicable only to laboratory are shown below](#)

[Any general comments applicable to all laboratories are shown below](#)

Thank you to everyone who has taken part. Where a 'quantitative' result has been provided, results have been summarised using Birmingham Quality house-style histograms. Category results have been summarised in the commentary at the end of this report.

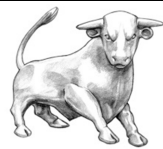
This is the first Distribution where we introduced Analyte 'X' — which for this distribution was Sodium. We asked you to measure the Specimens for Sodium alongside the Serum Indices, and then interpret whether you would report this to clinicians based on the Serum Indices that you obtained and your local protocols. We also asked you for information about your Serum Indices testing strategy for Sodium. Analyte 'X' and your interpretation are reported in the usual Birmingham Quality house-style. Please see the commentary for further information regarding the cut-off values used for reporting a Sodium for H, I and L for different methods.

We are working towards UKAS accreditation as soon as possible, so this will remain a pilot scheme until then.

Please contact us if you have any queries and we hope you will be pleased with the direction the Scheme is moving.

Report authorised on Wednesday 3rd May 2017 by:

Finlay MacKenzie, Director Birmingham Quality



Birmingham Quality

Distribution Summary

No rolling-time window scores or trend data will be calculated or appear on your report unless you have returned numerical results for at least 7 specimens during the 6-distribution time window.

	Specimen	Pool	Result	Target	Specimen %bias	B score	C score
Haemolysis Index (mg/dL)	105A	117	133	128.4	+3.5		
	105B	118	13				
	105C	119	14				
Icterus Index (mg/dL)	105A	117	1	0.9	+13.4		
	105B	118	21	19.3	+8.9		
	105C	119	1				
Lipaemia Index (mg/dL)	105A	117	53	50.6	+4.8	+1.7	4.0
	105B	118	271	284.3	-4.7		
	105C	119	258	260.3	-0.9		
Analyte 'X' ("units")	105A	117	140	140.1	-0.1		
	105B	118	140	139.4	+0.4		
	105C	119	139	138.9	0.0		
Analyte 'X' Interpretation	105A	117	Y				
	105B	118	Y				
	105C	119	Y				

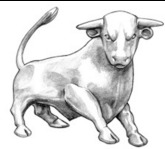
For Distribution 105 'Analyte X' is SODIUM.

Please note that for the time being we will not be issuing amended/late reports. You can still submit requests for late or amending non-analytical errors on the web under the usual Results button ensuring the correct Distribution number has been selected. You should include your name and a valid reason. Amending results is at the discretion of the Director and is not an automatic entitlement. This will be used for scoring purposes only.

We are not accepting any further requests to amend results or to change methods for Distribution 104.

Specimens for Distribution 106 were dispatched on Monday 27 March 2017 results were due back in Birmingham by, notionally, 23:59 on Sunday 9 April 2017.

Where your results appear as "XPL" , it is because you did not report a numerical value for that analyte, but you did provide an explanation as to why a result was not reported.



Birmingham Quality

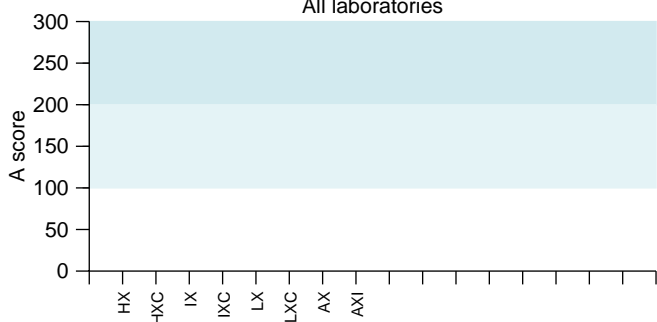
Method Summary

Our method update service is web-based and is accessed online via the 'edit' button on the 'Results and Reports page'. You can select from a dropdown of methods or select the default option from the major manufacturer's products*.

*If you are not using the system according to the manufacturer's instructions, please select the in-house category within your system's method principle.

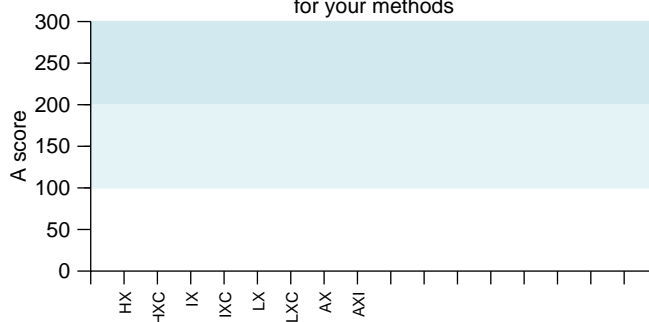
Method Principle	Your Method	Units
Haemolysis Index	Roche	mg/dL
Icterus Index	Roche	mg/dL
Lipaemia Index	Roche	mg/dL
Analyte 'X'	Roche	"units"
Analyte 'X' Interpretation		

Graphic Equalizer Plot of A scores All laboratories

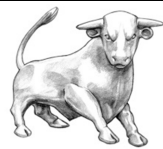


P:BWATSC02

Method Graphic Equalizer Plot of A scores for your methods



P:BWATSC02



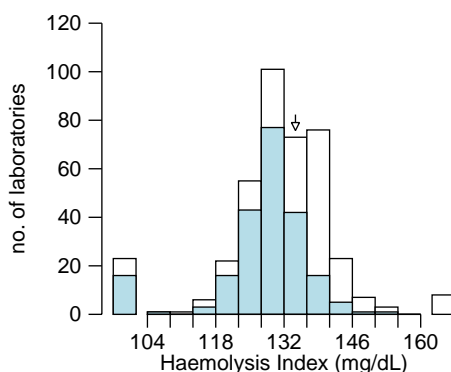
Birmingham Quality

Spec.	Pool	Pool description / Treatments / Additions
105A	117	Pooled human serum, positive for haemolysis
105B	118	Pooled human serum; 250 umol/L bilirubin & 1.8 g/L Intralipid
105C	119	Pooled human serum; 1.8 g/L Intralipid added

All methods
 Roche

Specimen : 105A

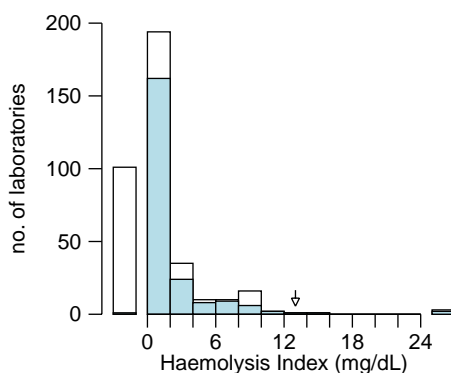
	n	Mean	SD	CV(%)
All methods [ALTM]	399	131.7	8.6	6.5
Abbott	142	135.5	6.0	4.4
J & J	15	135.4	13.9	10.3
Roche	221	128.4	8.1	6.3
Siemens	13	159.9	21.7	13.6



Your result	133
Target value (Roche)	128.4
Your specimen: %bias	+3.5
ALTM	131.7
Your method mean (Roche)	128.4

Specimen : 105B

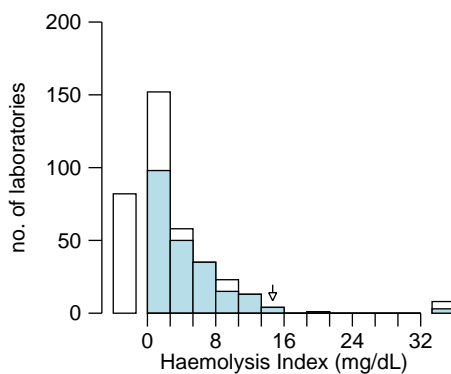
	n	Mean	SD	CV(%)
All methods [ALTM]	373	0.0	3.6	1294.3
Abbott	138	-2.0	4.5	-221.7
Roche	216	1.2	2.1	172.3
Siemens	13	-6.7	4.2	-62.1
non-numeric results	22			



Your result	13
Target value ()	
Your specimen: %bias	
ALTM	0.0
Your method mean (Roche)	1.2

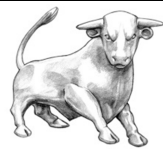
Specimen : 105C

	n	Mean	SD	CV(%)
All methods [ALTM]	376	2.0	4.7	235.0
Abbott	138	-1.0	3.6	-357.7
Roche	219	3.8	4.4	114.8
Siemens	13	-2.0	3.7	-183.1
non-numeric results	20			



Your result	14
Target value ()	
Your specimen: %bias	
ALTM	2.0
Your method mean (Roche)	3.8

We have excluded the Haemolysis results for Specimens 105B, and 105C from the rolling-time window scores (low concentration). Please ignore the %CV data. These are exaggerated high as the numerical results are low in value.



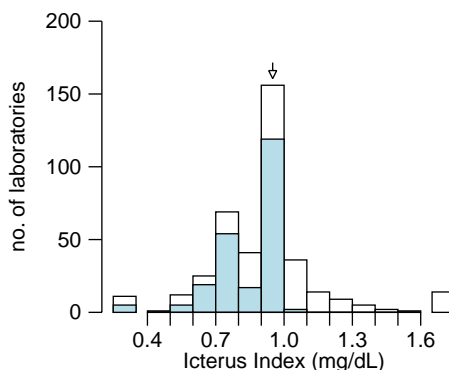
Birmingham Quality

Spec.	Pool	Pool description / Treatments / Additions
105A	117	Pooled human serum, positive for haemolysis
105B	118	Pooled human serum; 250 umol/L bilirubin & 1.8 g/L Intralipid
105C	119	Pooled human serum; 1.8 g/L Intralipid added

All methods
 Roche

Specimen : 105A

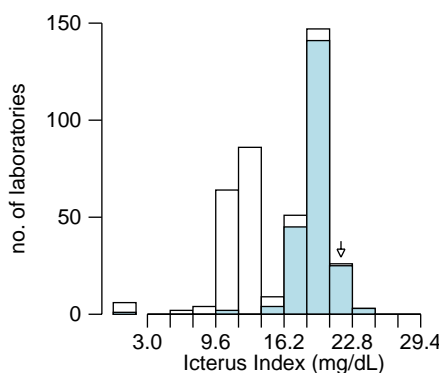
	n	Mean	SD	CV(%)
All methods [ALTM]	396	0.9	0.2	20.4
Abbott	142	1.0	0.2	19.1
J & J	10	2.4	0.7	27.6
Roche	221	0.9	0.2	18.3
Siemens	13	0.7	0.3	37.9
non-numeric results	3			



Your result	1
Target value (Roche)	0.9
Your specimen: %bias	+13.4
ALTM	0.9
Your method mean (Roche)	0.9

Specimen : 105B

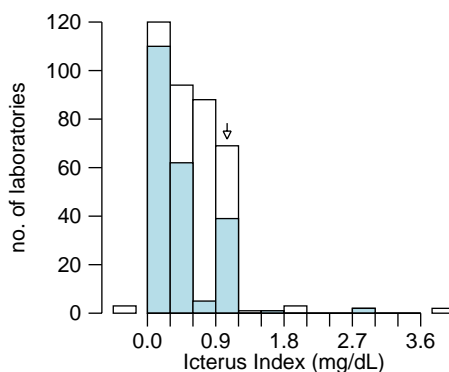
	n	Mean	SD	CV(%)
All methods [ALTM]	398	16.2	4.4	27.0
Abbott	141	12.0	0.9	7.3
J & J	12	9.9	1.0	9.8
Roche	221	19.3	1.2	6.3
Siemens	13	17.4	3.4	19.5



Your result	21
Target value (Roche)	19.3
Your specimen: %bias	+8.9
ALTM	16.2
Your method mean (Roche)	19.3

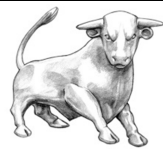
Specimen : 105C

	n	Mean	SD	CV(%)
All methods [ALTM]	383	0.5	0.4	84.2
Abbott	141	0.8	0.2	25.2
Roche	219	0.4	0.4	119.4
Siemens	13	0.5	0.4	71.1
non-numeric results	14			



Your result	1
Target value ()	
Your specimen: %bias	
ALTM	0.5
Your method mean (Roche)	0.4

We have excluded the Icterus results for Specimen 105C from the rolling-time window scores (low concentration).



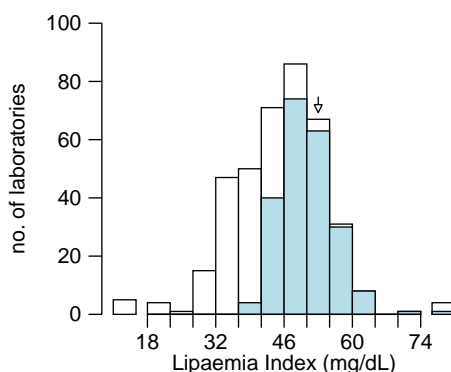
Birmingham Quality

Spec.	Pool	Pool description / Treatments / Additions
105A	117	Pooled human serum, positive for haemolysis
105B	118	Pooled human serum; 250 umol/L bilirubin & 1.8 g/L Intralipid
105C	119	Pooled human serum; 1.8 g/L Intralipid added

All methods
 Roche

Specimen : 105A

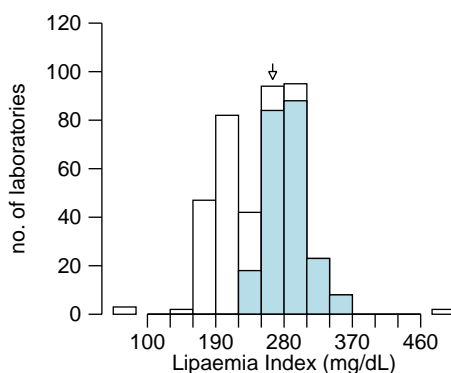
	n	Mean	SD	CV(%)
All methods [ALTM]	390	45.5	8.7	19.2
Abbott	142	37.6	4.8	12.8
J & J	6	22.5	2.8	12.6
Roche	221	50.6	5.0	9.8
Siemens	13	45.3	5.0	11.0
non-numeric results	9			



Your result: 53
 Target value (Roche): 50.6
 Your specimen: %bias: +4.8
 ALTM Your method mean (Roche): 45.5 / 50.6

Specimen : 105B

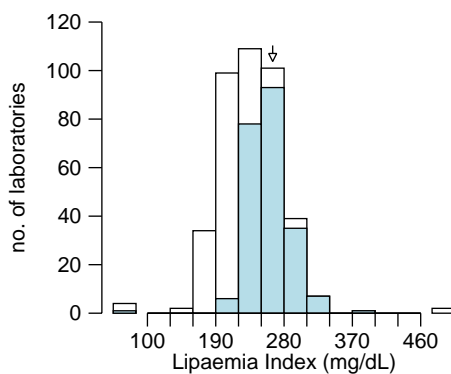
	n	Mean	SD	CV(%)
All methods [ALTM]	398	250.4	52.7	21.0
Abbott	141	199.9	19.9	9.9
J & J	15	192.3	7.9	4.1
Roche	221	284.3	23.8	8.4
Siemens	13	277.5	22.9	8.3



Your result: 271
 Target value (Roche): 284.3
 Your specimen: %bias: -4.7
 ALTM Your method mean (Roche): 250.4 / 284.3

Specimen : 105C

	n	Mean	SD	CV(%)
All methods [ALTM]	398	236.8	39.6	16.7
Abbott	141	203.7	17.6	8.6
J & J	15	178.3	10.9	6.1
Roche	221	260.3	24.4	9.4
Siemens	13	269.8	23.3	8.6



Your result: 258
 Target value (Roche): 260.3
 Your specimen: %bias: -0.9
 ALTM Your method mean (Roche): 236.8 / 260.3

Lipaemia Index Median and IQRs of B scores

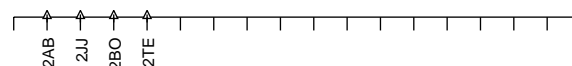
B score



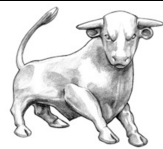
P-BWABCR

Lipaemia Index Median and IQRs of C scores

C score



P-BWABCR



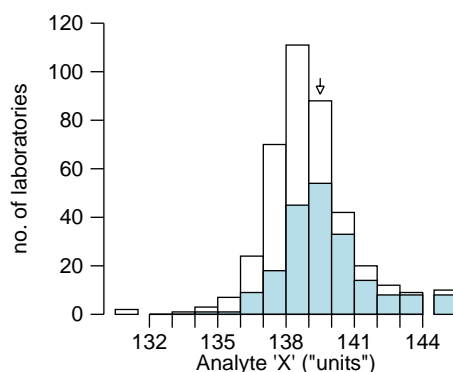
Birmingham Quality

Spec.	Pool	Pool description / Treatments / Additions
105A	117	Pooled human serum, positive for haemolysis
105B	118	Pooled human serum; 250 umol/L bilirubin & 1.8 g/L Intralipid
105C	119	Pooled human serum; 1.8 g/L Intralipid added

All methods
 Roche

Specimen : 105A

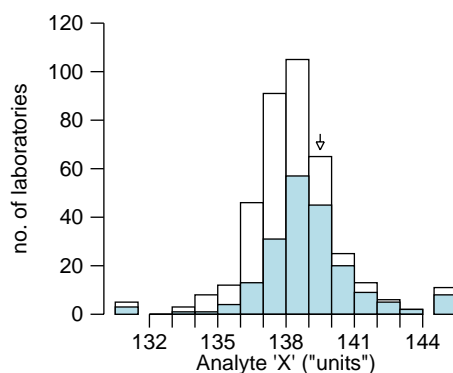
	n	Mean	SD	CV(%)
All methods [ALTM]	399	139.4	1.7	1.2
Abbott	112	138.5	1.0	0.7
Beckman Olympus	40	138.3	1.4	1.0
J & J	12	139.2	2.4	1.7
Roche	199	140.1	1.7	1.2
Siemens	27	140.4	1.5	1.1



Your result	140
Target value (Roche)	140.1
Your specimen: %bias	-0.1
ALTM	139.4
Your method mean (Roche)	140.1

Specimen : 105B

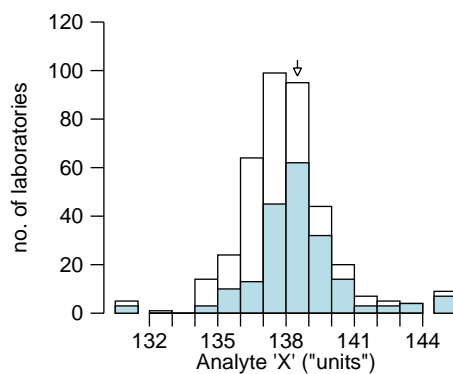
	n	Mean	SD	CV(%)
All methods [ALTM]	392	138.8	1.6	1.2
Abbott	107	137.9	1.0	0.7
Beckman Olympus	40	137.7	1.8	1.3
J & J	12	138.5	2.4	1.7
Roche	199	139.4	1.6	1.2
Siemens	27	139.5	1.3	0.9



Your result	140
Target value (Roche)	139.4
Your specimen: %bias	+0.4
ALTM	138.8
Your method mean (Roche)	139.4

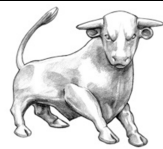
Specimen : 105C

	n	Mean	SD	CV(%)
All methods [ALTM]	391	138.3	1.7	1.2
Abbott	107	137.5	1.0	0.7
Beckman Olympus	40	137.5	2.0	1.5
J & J	12	137.9	2.2	1.6
Roche	199	138.9	1.6	1.2
Siemens	26	139.4	1.2	0.9



Your result	139
Target value (Roche)	138.9
Your specimen: %bias	0.0
ALTM	138.3
Your method mean (Roche)	138.9

For Distribution 105 'Analyte X' is SODIUM, and the units are mmol/L

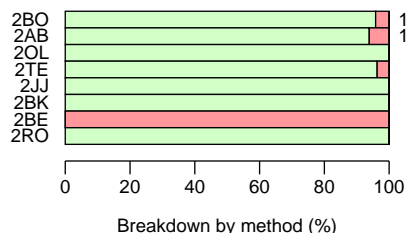
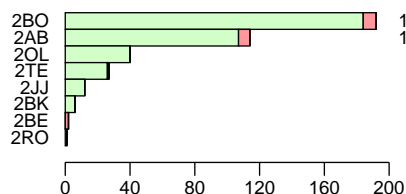
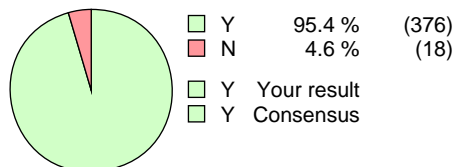


Birmingham Quality

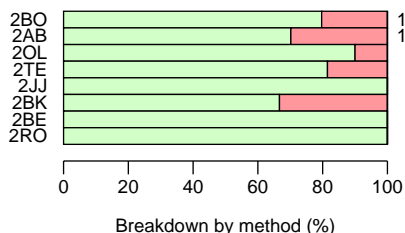
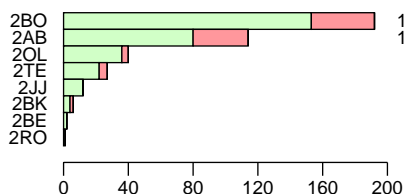
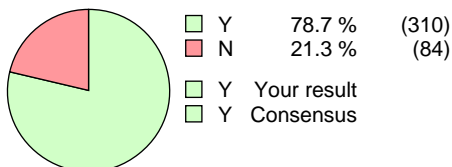
Spec.	Pool	Pool description / Treatments / Additions
105A	117	Pooled human serum, positive for haemolysis
105B	118	Pooled human serum; 250 umol/L bilirubin & 1.8 g/L Intralipid
105C	119	Pooled human serum; 1.8 g/L Intralipid added

Analyte X for Distribution 105 is SODIUM, the units are mmol/L
 Interpretation is based on whether the Analyte X result would be reported, based on the Serum Indices results.
 Y = Result would be reported
 N = Result would not be reported

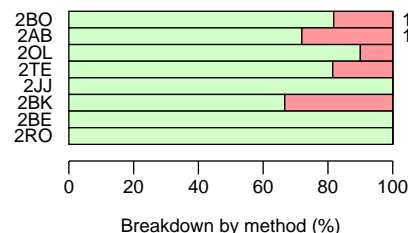
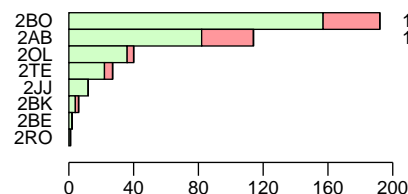
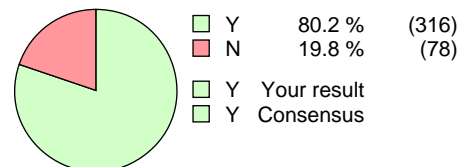
Specimen : 105A

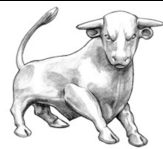


Specimen : 105B



Specimen : 105C





Birmingham Quality

Commentary Serum Indices Distribution 105

Thank you to everyone who has participated in Distribution 105 of the Serum Indices pilot.

This is the first Distribution where we introduced Analyte 'X' — for this Distribution Analyte 'X' was Sodium, further information is given on the next page.

Once again, we have reviewed your results and made an educated guess where discrepancies occurred regarding the 'units' that the absorbance units on your analyser correspond to. We have started to remove either the index field or category field based on the results that you are reporting, which will allow easier data processing in the future.

The same base material was used which was pooled human serum, which was not visually haemolysed, icteric or lipaemic. This was either manipulated to be haemolysed (Specimen 105A), icteric, 250 umol/L bilirubin added (Specimen 105B) or lipaemic, 1.8 g/L Intralipid added (Specimens 105B and 105C).

Where a numerical (non-category) result has been reported, your data is displayed using histograms in the normal Birmingham Quality house-style. We have used a method (instrument) mean as target and have also reported back an ALTM. Our aim is to design a report format suitable for the 'category' results but at present the 'category' results have simply been summarised in the tables on the right, with a summary of all data below in Scheme units. Please note that there is no known conversion factor for agreement between manufacturers for categories.

Summary Table of 'non-category' results

Haemolysis (g/L)

Method Name	105A		105B		105C	
	n	Mean	n	Mean	n	Mean
Abbott	142	1.35	138	0.00	138	0.00
J & J	15	1.35	0		0	
Roche	221	1.28	216	0.01	219	0.04
Siemens	13	1.60	13	0.00	13	0.00
Non-numeric	0		22		20	

Icterus (umol/L)

Method Name	105A		105B		105C	
	n	Mean	n	n	Mean	n
Abbott	142	17.0	141	205.7	141	12.9
J & J	10	40.6	12	169.3	0	
Roche	221	15.1	221	329.9	219	6.1
Siemens	13	12.5	13	297.5	13	9.0
Non-numeric	3		0		14	

Lipaemia (mmol/L)

Method Name	105A		105B		105C	
	n	Mean	n	n	Mean	n
Abbott	142	0.42	141	2.26	141	2.30
J&J	6	0.25	15	2.17	15	2.01
Roche	221	0.57	221	3.21	221	2.94
Siemens	13	0.51	13	3.13	13	3.05
Non-numeric	9		0		0	

Summary of Category Results

Haemolysis

105A						
Method Name	n	0	1	2	3	4
Ab Pic8	1	0	0	1	0	0
Beckman	9	0	0	4	0	5
Beckman Olympus	49	0	0	49	0	0
Roche	2	0	0	2	0	0
Siemens	31	0	3	28	0	0
Siemens Dade	6	0	0	1	5	0
Unknown	1	0	0	1	0	0

105B						
Method Name	n	0	1	2	3	4
Ab Pic8	1	0	1	0	0	0
Beckman	8	6	2	0	0	0
Beckman Olympus	47	46	1	0	0	0
Roche	2	2	0	0	0	0
Siemens	31	31	0	0	0	0
Siemens Dade	6	1	5	0	0	0

105C						
Method Name	n	0	1	2	3	4
Ab Pic8	1	1	0	0	0	0
Beckman	6	6	0	0	0	0
Beckman Olympus	47	46	1	0	0	0
Roche	2	2	0	0	0	0
Siemens	31	31	0	0	0	0
Siemens Dade	6	1	5	0	0	0
Unknown	1	1	0	0	0	0

Icterus

105A										
Method Name	n	0	1	2	3	4	5	6	>6	
Ab Pic8	1	0	0	1	0	0	0	0	0	
Beckman	6	4	0	2	0	0	0	0	0	
Beckman Olympus	46	45	0	1	0	0	0	0	0	
Roche	2	2	0	0	0	0	0	0	0	
Siemens	31	31	0	0	0	0	0	0	0	
Siemens Dade	6	1	5	0	0	0	0	0	0	

105B										
Method Name	n	0	1	2	3	4	5	6	>6	
Ab Pic8	1	0	0	1	0	0	0	0	0	
Beckman	6	0	0	0	4	0	0	0	2	
Beckman Olympus	48	0	0	0	48	0	0	0	0	
Roche	2	0	0	0	2	0	0	0	0	
Siemens	31	0	0	5	26	0	0	0	0	
Siemens Dade	6	0	0	0	1	5	0	0	0	

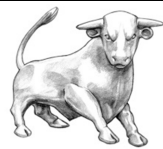
105C										
Method Name	n	0	1	2	3	4	5	6	>6	
Ab Pic8	1	1	0	0	0	0	0	0	0	
Beckman	6	4	0	2	0	0	0	0	0	
Beckman Olympus	46	45	1	0	0	0	0	0	0	
Roche	2	2	0	0	0	0	0	0	0	
Siemens	31	27	0	4	0	0	0	0	0	
Siemens Dade	6	1	5	0	0	0	0	0	0	

Lipaemia

105A										
Method Name	n	0	1	2	3	4	5	6	7	
Ab Pic8	1	0	1	0	0	0	0	0	0	
Beckman	9	4	5	0	0	0	0	0	0	
Beckman Olympus	47	46	1	0	0	0	0	0	0	
Roche	2	2	0	0	0	0	0	0	0	
Siemens	31	31	0	0	0	0	0	0	0	
Siemens Dade	6	1	4	1	0	0	0	0	0	
Unknown	0	0	0	0	0	0	0	0	0	

105B										
Method Name	n	0	1	2	3	4	5	6	7	
Ab Pic8	1	0	0	0	1	0	0	0	0	
Beckman	9	0	0	0	4	1	4	0	0	
Beckman Olympus	49	1	0	4	44	0	0	0	0	
Roche	2	0	0	0	2	0	0	0	0	
Siemens	31	0	3	24	4	0	0	0	0	
Siemens Dade	6	0	0	1	5	0	0	0	0	
Unknown	1	0	0	0	1	0	0	0	0	

105C										
Method Name	n	0	1	2	3	4	5	6	7	
Ab Pic8	1	0	0	0	1	0	0	0	0	
Beckman	9	0	0	0	4	0	5	0	0	
Beckman Olympus	49	1	0	8	40	0	0	0	0	
Roche	2	0	0	0	2	0	0	0	0	
Siemens	31	4	2	25	0	0	0	0	0	
Siemens Dade	6	0	0	1	5	0	0	0	0	
Unknown	1	0	0	0	1	0	0	0	0	



Birmingham Quality

Analyte X — SODIUM

This is the first distribution where we introduced Analyte 'X' — which is the analyte that we are focusing on in any given distribution. For this distribution it was Sodium. We asked you to measure the specimens for Sodium alongside the Serum Indices, and then interpret whether you would report this to clinicians based on the Serum Indices that you obtained and your local protocols. We also asked you for information about your Serum Indices testing strategy for Sodium.

Web Questions & Answers

- 1) Please could you inform us of the cut-off used for reporting a SODIUM result based on Haemolysis (H) value e.g. H <1000 mg/dL.
- 2) Please could you inform us of the cut-off used for reporting a SODIUM result based on Icterus (I) value e.g. I <500 umol/L.
- 3) Please could you inform us of the cut-off used for reporting a SODIUM result based on Lipaemia (L) value e.g. L <2 g/L

Thank you to all those that replied.

A summary has been included here so that you can see the variation within your method and between different methods. The results have been reported in Scheme Units to allow for easier comparison as well as a category interpretation below. At present it has not been possible to combine the two — unless, the equivalent quantitative numerical value had also been included with the category.

Where 'no cut-off' has been reported, this is represented on the graphs by a line that covers all the horizontal axis. For example, for haemolysis, 30 g/L does not represent a cut-off of 30 g/L but no cut-off stated.

Haemolysis

Specimen 105A (Pool 117) was designed to be positive for haemolysis, with an ALTM of 1.32 g/L. Specimens 105B and 105C were not manipulated to be haemolysed.

Icterus

Specimen 105B (Pool 118) was designed to be icteric and lipaemic, with an ALTM for Icterus of 277 umol/L. Specimens 105A and 105C were not manipulated to be icteric.

Lipaemia

Specimens 105B (Pool 118) and 1C (Pool 119) were both designed to be lipaemic, with 1.8 g/L added Intralipid. The ALTM for these pools were 2.83 mmol/L and 2.67 mmol/L respectively.

Sodium

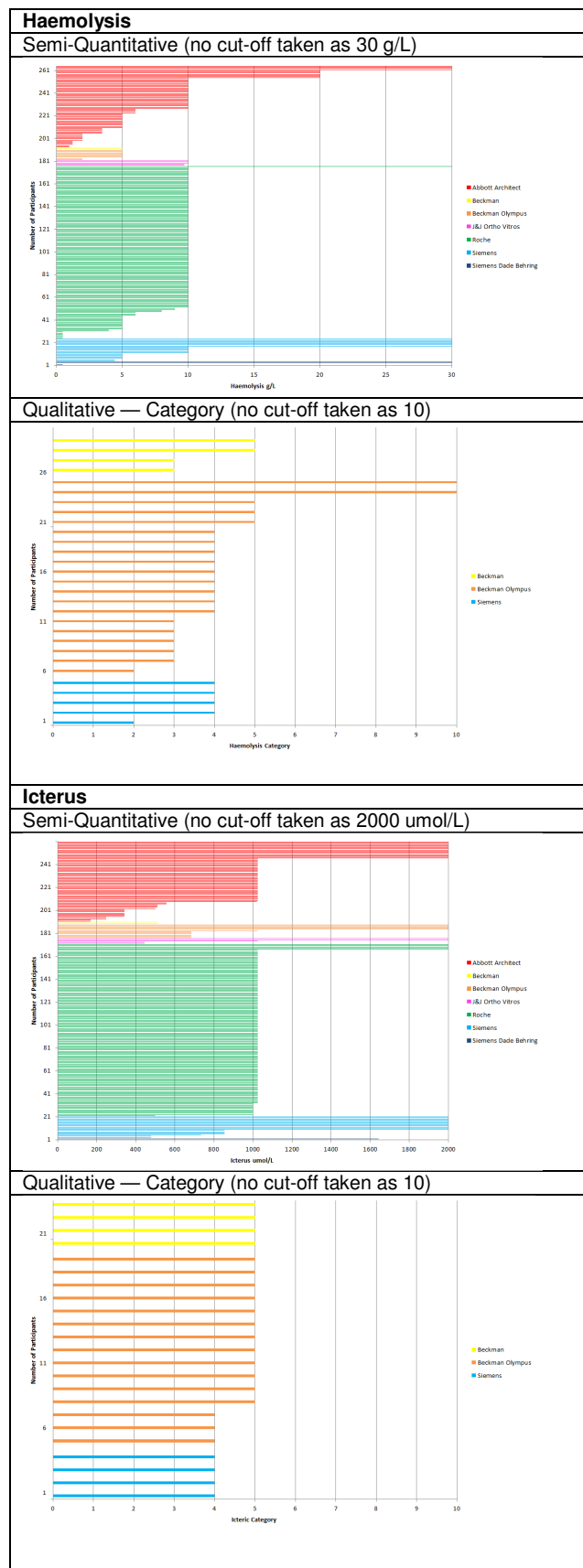
Review of the results for the three specimens shows that there is approximately 1 mmol/L difference between the three specimens for all methods, which would not be deemed clinically significant. Therefore the serum indices would not have affected the sodium result that was reported. However, interestingly approximately 20% of laboratories would not have reported the Sodium result for Specimens 105B and 105C.

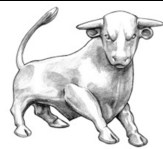
A wide variation in cut-offs used by laboratories for the H, I and L indices for Sodium was observed, as shown below. At this stage it is not known if these are manufacturer, or locally derived. The question has to be asked, as to why there is such a variation in cut-offs used within the same manufacturer, which obviously impacts on whether a result is reported or not, and whether a patient may require being re-bled.

There were a few comments that the cut-off used, would trigger either measurement of Triglycerides and/or Sodium by Direct ISE, prior to reporting the Sodium result. Out of interest, how many laboratories EQA their Direct ISE analyser independently, or make clinicians aware that a Sodium result has been reported by a different method than the routine that they may be used to?

Cut-Off used for H, I and L reporting a Sodium result

We know from the Clinical Chemistry EQA Scheme that the method principals used are Indirect and Direct ISE, and Dry Slide Technology.

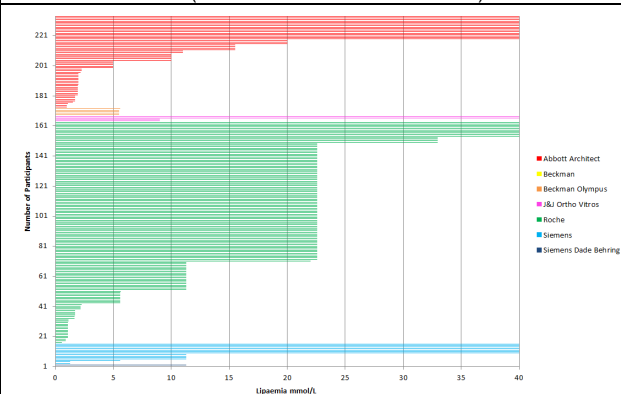




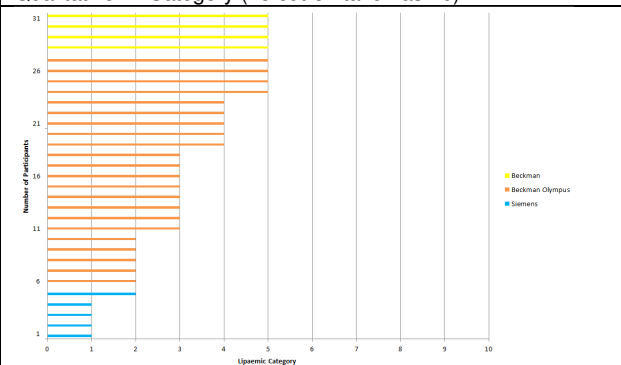
Birmingham Quality

Lipaeimia

Semi-Quantitative (no cut-off taken as 40 mmol/L)



Qualitative — Category (no cut-off taken as 10)



We hope that you have found this addition to the Serum Indices EQA Scheme useful and informative.

We would welcome and comments that you may have for future development.

Rachel Marrington, May 2017