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GLOBAL PROVIDER OF QUALITY IN DIAGNOSTIC MEDICINE



EXTERNAL QUALITY ASSESSMENT



INTERNAL QUALITY CONTROL



REFERENCE MEASUREMENT SERVICES



EDUCATION & TRAINING

POCT Report and Interpretation

Samantha Jones & Nicola Blount



EQA – key elements in selecting EQA providers

- ✓ Design for clinical need
- ✓ Material & frequency
- ✓ Data analysis target value
- Analytical performance specification
- ✓ Reports
- ✓ Education element
- ✓ Troubleshooting support

Wegas POCT Programmes

Weqas

Cuesee

POCT Glucose & Ketones

POCT Urinalysis

Wegas Connect

POCT INR

POCT Lipids

POCT Bilirubin

POCT Blood Gas

POCT BNP

POCT Cardiac Markers

POCT Co-oximetry

POCT Creatinine

POCT CRP

POCT D-dimer

POCT Haemoglobin

POCT HbA1c

POCT HIV

POCT Influenza & RSV

Pre-term Labour Markers

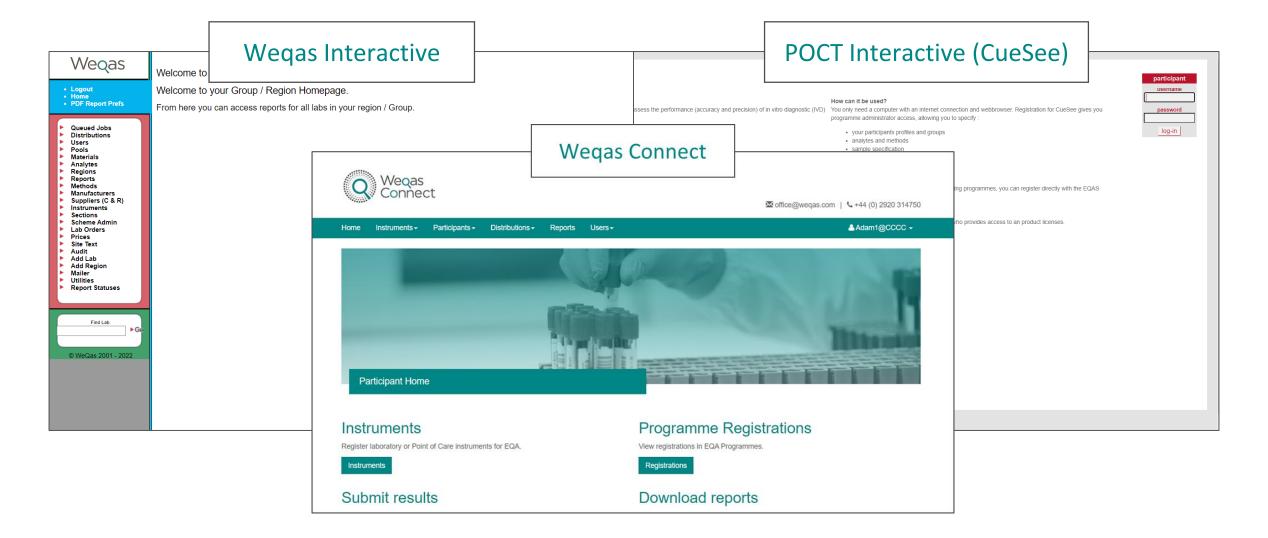
POCT Pregnancy Testing

Urine Drugs of Abuse

Viscoelastic Haemostasis



Current EQA Web Portals





Harmonised Performance Scoring

less than 1	Good - all points within ± 1 SD	
1-2	Acceptable	
greater than 2	Unacceptable	



6

Cuesee Target Value Assignment

Any gross outliers such as transcription, transposition or unit errors are minimised by using a minimum and maximum allowable value (in default unit) that can be entered for a particular sample via the website. This range spans approximately \pm 4 SD from the indicative target value calculated using laboratory methods. Participants will not be allowed to enter results outside this range and will be prompted to contact the Group Administrator for assistance.

For most POCT Programmes assessment is against a peer group target value

Methods are classified into categories based on:

```
the principle of the method e.g. Electrochemical
the device manufacturer e.g. Roche
the platform (meter) type e.g. inform II.
in some instances there is a further grouping based on the cartridge (strip) type.
```

Assessment against the higher order is preferred, however, where there are known differences between the different devices, the most appropriate peer group is selected.



Target value

Peer group Median – this is the default target value and is used in the majority of Programmes.

Peer group Mean – this is also calculated and can be selected as the target value.

For each analyte for each sample the peer group mean and standard deviation is calculated.

$$SD = \sqrt{\frac{\sum (x - \overline{x})^2}{(n-1)}}$$

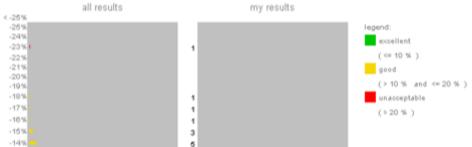
Where x = arithmetic mean.

Cuesee Reports – **Standard Report**

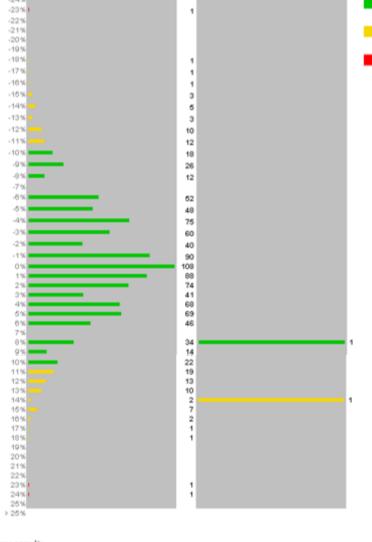
Report Settings	
sample	Weqas 0711
analyte	glu
reporting in	mmol/l
deviation	relative (resolution 1%)
reference method	median
reference value	9.30 mmol/l
comparison	all results and my results

All Results		
n	1079	
minimum	7.20	
maximum	11.50	
average	9.34	
median	9.30	
SD	0.50	
CV	5.9 %	

My Results		
n	2	
minimum	10.00	
maximum	10.60	
average	10.30	
median	10.30	
SD	0.40	
CV	4.1%	







my	resul	ts	
au I			I marks

#	instrument	instrument ID	result ID	result
1	Statstrip Glucose (Connectivity)	00002010137	0310270249	10.00
2	Statstrip Glucose (Connectivity)	140002310071	0310270249	10.60

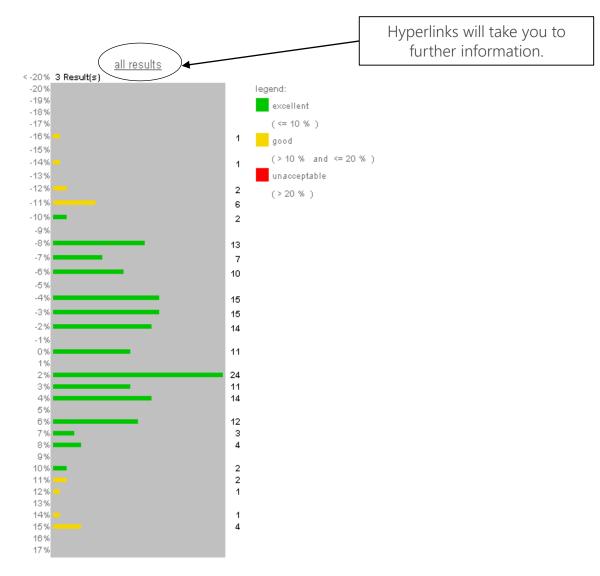
Cuesee Reports – Managers / Co-ordinators Report



all results - histogram

QUALITY LABORATORY -

report settings		all results	
sample	WEQAS 0110	n	182
analyte	glu	minimum	4.00
reporting in	mmol/l	maximum	11.60
deviation	relative (resolution 1%)	average	7.56
reference method	median	median	7.60
reference value	7.60 mmol/l	SD	0.70
calibration	standard	CV	9.2 %





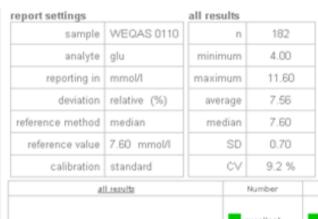
Tabular data behind hyperlink

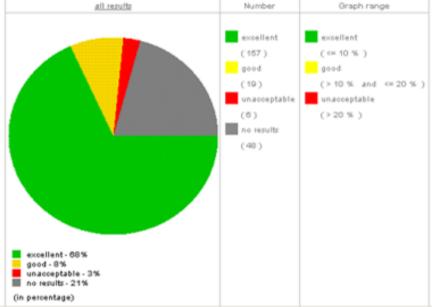
participant deviation from reference ranking instrument instrument result result ID ID contact value person Accu-Check 8548307546 0110 4.00 OPD Suite -48 % unacceptable 181.0 Advantage III Accu-Check 8547374420 4.80 Paeds Ward -37 % 180.0 0110 unacceptable Advantage III unacceptable Accu-Check 8548421221 **Endoscopy Unit** -36 % 179.0 0110 4.90 Advantage III Accu-Check 8541456251 0110 6.40 THEATRE 4 -16 % 175.0 good Advantage III Accu-Check 8542451290 6.60 A4 South -14 % 169.5 0110 good Advantage III Accu-Check 8547261406 0110 6.70 Teenage Cancer -12 % good 167.0 Advantage III Unit Accu-Check 8549087265 Ward 6 Nursing -12 % 167.0 0110 good Advantage III Staff Accu-Check 8542487205 THEATRE 0110 6.80 -11 % good 161.5 Advantage III Accu-Check 8546631983 6.80 WARD 0110 -11 % good 161.5 Advantage III

Poor Performing sites can be easily reviewed using this table.
Unacceptable sites will be shown in red text.



Cuesee Reports – Managers / Co-ordinators Report





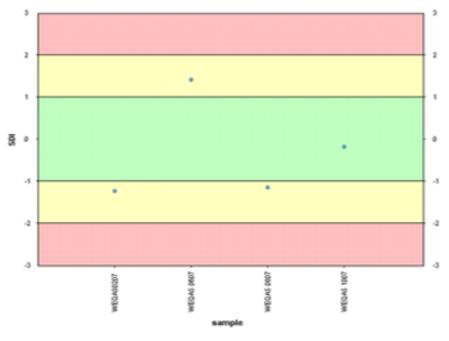


No Results Booked Summary (Non Compliance Report)

	Lipid Programme Dist WEQAS 1216			
	contact person	institute	instrument ID	instrument
1	Pharmacist in charge	Store 707	SN920967	BHR - Cardiochek Chol & Glucose
			SN920967	BHR - Cardiochek Chol, HDL & Glucose
2	Pharmacist in charge	Store 323	2014655	BHR - Cardiochek Chol & Glucose
			3019318	BHR - Cardiochek Chol & Glucose
			2014655	BHR - Cardiochek Chol, HDL & Glucose
			3019318	BHR - Cardiochek Chol, HDL & Glucose
3	Pharmacist in charge	Store 61	920503	BHR - Cardiochek Chol & Glucose
			920503	BHR - Cardiochek Chol, HDL & Glucose



Cumulative graph



report settings
sample date range 1/1/2007 - 1/1/2008
your instrument(s) all instruments
reference value median
instruments all instruments
principles all principles
families all families
countries all countries
groups all

	reference	your result	bias absolute	SD	SDI
	Momm	Momm	Nomm	mmol/l	
WEQAS0207	6.42	5.72	-0.700	0.586	-1.2
WEQAS 0607	3.20	3.60	0.400	0.284	1.4
WEQAS 0807	3.74	3.19	-0.550	0.479	-1.1
WEQAS 1007	4.95	4.81	-0.140	0.776	-0.2

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Design - Why multiple samples are important

- Identifies components of both Imprecision and Inaccuracy
- Identifies systematic errors
- Assesses method linearity required for ISO 15189
- Powerful error detection tool



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Wegas Interactive Target values used in Statistical Analysis

Hierarchy

Reference values – used for bias plot / PI calculation and σ score

Method mean – used for PI calc if no ref and n>8

Overall mean – used for PI calc and bias plot if no ref and n <8

Instrument mean – on report for information only



Harmonised Performance Scoring

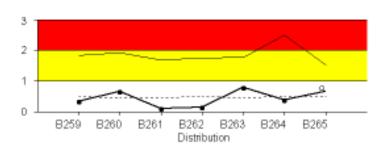
less than 1	Good - all points within ± 1 SD	
1-2	Acceptable	
greater than 2	Unacceptable	



Wegas Interactive Simplified Reports

Distribution Date: 4/01/16. Final. Report Issued: 25/01/16

This Distribution	
Overall Lab SDI: 0.65	
Median All Laboratory:	0.49
97.5th centile:	1.52



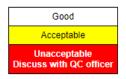
All S	All SDI Ranges		
< 1	< 1 Good		
1 - 2	Acceptable		
> 2	Poor		

Section SDI scores for this distribution

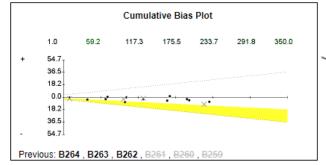
Section	Biochemistry Cobas
Overall	0.65
Total Bilirubin	0.65



Scheme: Bilirubin. Distribution Code: B265. Distribution Date: 4/01/16. Final. Report Issued: 25/01/16							
Total Bilirubin (µmol/L) Sample 1 Sample 2 Sample 3 Sample							
Reported Result	124.0	8.0	210.0	92.0			
Overall Mean	133.40	12.06	234.71	101.19			
Method Mean: Roche Diazo	125.67	10.33	220.74	95.04			
Instrument Mean: Cobas C Module	125.46	10.23	220.45	94.87			
Your results are compared against	125.67	10.33	220.74	95.04			







6 month time frame of bias plot across concentration range.

Colour coded graphical representation of Individual SDI scores over 6 month time frame

Cumulative Submitted results

_								
		B259	B260	B261	B262	B263	B264	B265
	Sample 1	148.0	168.0	39.0	70.0	158.0	64.0	124.0
	Sample 2	231.0	72.0	235.0	168.0	90.0	123.0	8.0
	Sample 3	48.0	261.0	11.0	99.0	35.0	10.0	210.0
	Sample 4	189.0	39.0	130.0	193.0	222.0	191.0	92.0

	Key				
?	Analyte enrolled but no results returned				
N/A	Not enrolled for this analyte				

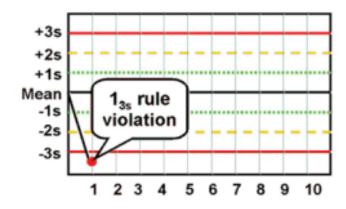
A Performance Alert

Your results show a consistent bias over an extended period. Please discuss your results with your EQA Officer.

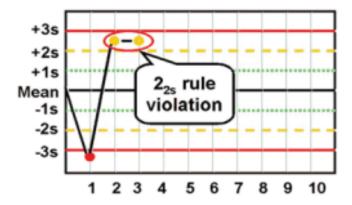
Performance alert based on Westgard rules



The following rules are used for the Performance alert.



At least 1 result with SDI > 3



At least 2 results with SDI > 2

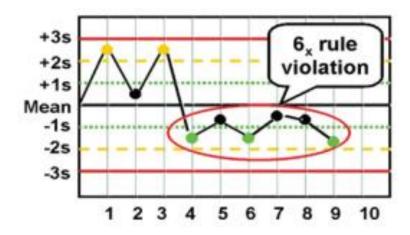
If number of samples in current distribution ≥ 2 then applies to this dist only.

If number of samples in current = 1 then applies to this and at least one in previous distribution.



Consistent Bias in one direction.

This is calculated over several distributions and will depend on the number of samples distributed per round e.g. if 3 samples are distributed per round, then the rule will be calculated over 2 distributions.

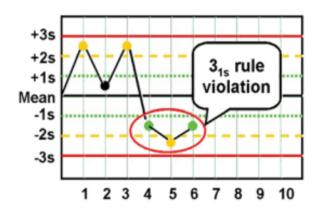


# samples in current with analyte	Number of samples overall to consider	trigger
1	6 samples 6 distributions	6 _x : 6 samples with SDI > 0.2 <i>or</i> 6 samples with SDI < -0.2
2	6 samples 3 distributions	6 _x : 6 samples with SDI > 0.2 <i>or</i> 6 samples with SDI < -0.2
3	6 samples 2 distributions	6 _x : 6 samples with SDI > 0.2 <i>or</i> 6 samples with SDI < -0.2
4	8 samples 2 distributions	8 _x : 8 samples with SDI > 0.2 <i>or</i> 8 samples with SDI < -0.2
5	10 samples 2 distributions	10 _x : 10 samples with SDI > 0.2 <i>or</i> 10 samples with SDI < -0.2
6	6 samples 1 distribution	6 _x : 6 samples with SDI > 0.2 <i>or</i> 6 samples with SDI < -0.2



At least 3 results > 1 SDI.

This is calculated over several distributions and will depend on the number of samples distributed per round e.g. if only 1 sample is distributed per round, then the rule will be calculated over 3 distributions.



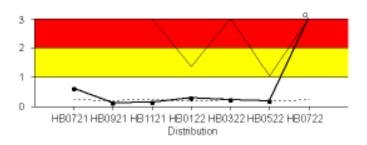
# samples in current with analyte	Number of samples overall to consider	trigger
1	3 samples 3 distributions	3 _{1s} : 3 samples with SDI > 1 <i>or</i> 3 samples with SDI < -1
2	4 samples 2 distributions	4 _{1s} : 4 samples with SDI > 1 <i>or</i> 4 samples with SDI < -1
3	3 samples 1 distributions	3 _{1s} : 3 samples with SDI > 1 <i>or</i> 3 samples with SDI < -1
4	4 samples 1 distributions	4 _{1s} : 4 samples with SDI > 1 <i>or</i> 4 samples with SDI < -1
5 or more	All in current 1 distribution	4 _{1s} : 4 samples with SDI > 1 <i>or</i> 4 samples with SDI < -1



Simplified Reports – poor performance example

Lab: Scheme: POCT Haemoglobin. Distribution Code: HB0722. Distribution Date: 5/07/22. Final. Report Issued: 29/07/22

This Distribution		
Overall Lab SDI:	7.06	
Median All Laboratory:	0.21	
97.5th centile:	7.06	



All S	All SDI Ranges				
< 1	Good				
1 - 2	Acceptable				
> 2	Poor				

.... Median — Lab SDI — 97.5th

Section SDI scores for this distribution

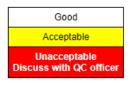
Section		
Overall	** 7.06	** 7.06
Haemoglobin	** 7.06	** 7.06

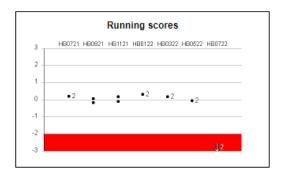
Lab Code: Section:

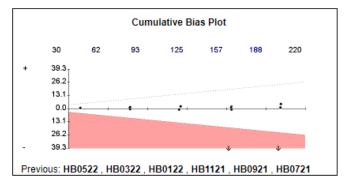
· Instrument: HemoCue 201+



Scheme: POCT Haemoglobin. Distribution Code: HB0722. Distribution Date: 5/07/22. Final. Report Issued: 29/07/22				
Haemoglobin (g/L)	Sample 1	Sample 2		
Reported Result	80	119		
Overall Mean	198.5	158.8		
Method Mean: HemoCue 201+ / DM	198.5	158.8		
Instrument Mean: HemoCue 201+	198.5	158.8		
Your results are compared against	198.5	158.8		







Cumulative Submitted results

	HB0721	HB0921	HB1121	HB0122	HB0322	HB0522	HB0722
Sample 1	81	201	40	122	163	79	80
Sample 2	162	79	160	205	40	118	119

Key								
?	Analyte enrolled but no results returned							
N/A	Not enrolled for this analyte							

A Performance Alert

At least 1 sample in the current distribution with a very poor score - |SDI| > 3

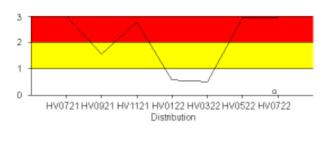
At least 2 samples in current/prior distribution with poor score - |SDI| > 2



Wegas Interactive Qualitative Reports

Distribution Date: 26/07/22. Final. Report Issued: 26/08/22

This Distribution					
Overall Lab SDI:	0.00				
Median All Laboratory:	0.00				
97.5th centile:	2.92				



All S	All SDI Ranges								
< 1	Good								
1 - 2	Acceptable								
> 2	Poor								

---- Median --- Lab SDI ---- 97.5th

Section SDI scores for this distribution

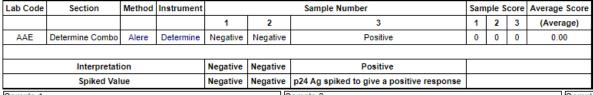
Section	Determine Combo
Overall	0.00
p24 Ag	0.00
HIV Ab	0.00

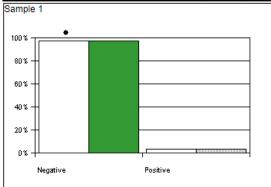


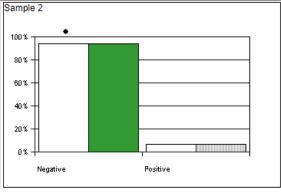
Qualitative Report

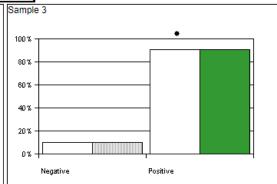
Distribution HV0722

p24 Ag Results









Le	gend
	Alere
	Al
	Correct Level (all)
*	Your result
Ш	
Ш	

N t D	Sample 1		Sample 2		Sample 3	
Number of Responses	Method	Overall	Method	Overall	Method	Overall
Negative	30	30	29	29	3	3
Positive	1	1	2	2	28	28
TOTAL	31	31	31	31	31	31

	uai Sampie Sco	
Score	Interpretation	
0	Good	
1	Acceptable	
2	Warning	
> 2	Unacceptable	

Wegas

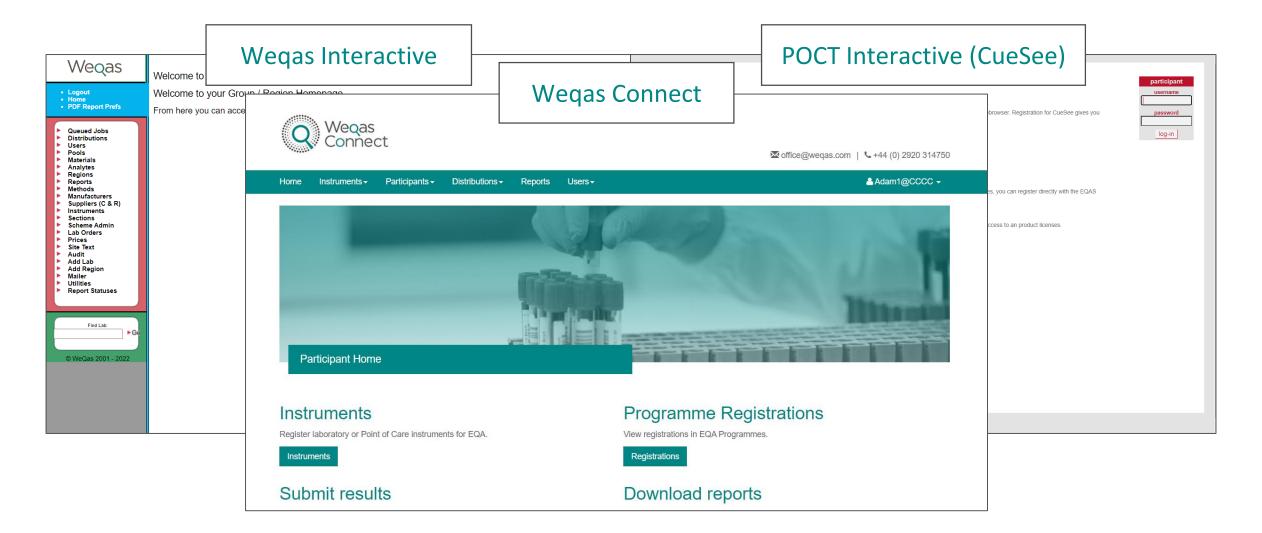
Summary data

Lab Code	Instrument	nstrument Sample Number				Sample Score		
		1	2	3	1	2	3	Score
AAE	Determine	Negative	Positive	Positive	0	0	0	0
ACN	Determine							\top
ACS	Determine							\top
AKT	Determine	Negative	Negative	Positive	0	4	0	2
AKT	Determine	Negative	Positive	Positive	0	0	0	0
AKT	Determine	Negative	Positive	Positive	0	0	0	0
AKT	Determine							\top
AY	Determine	Negative	Positive	Positive	0	0	0	0
AZK	Determine	Negative	Positive	Positive	0	0	0	0
BBE	Determine							
HP	Determine	Negative	Positive	Positive	0	0	0	0
HP	Determine	Negative	Positive	Positive	0	0	0	0
KT	Determine	Negative	Positive	Positive	0	0	0	0
MI	Determine	Negative	Positive	Positive	0	0	0	0
MI	Determine	Negative	Positive	Positive	0	0	0	0
MI	Determine	Negative	Positive	Positive	0	0	0	0
MO	Determine	Negative	Positive	Positive	0	0	0	0
MP	Determine	Negative	Positive	Positive	0	0	0	0
MP	Determine	Negative	Positive	Positive	0	0	0	0
MP	Determine	Negative	Positive	Positive	0	0	0	0
AGF	HIV Combo	Negative	Positive	Positive	0	0	0	0
AGF	HIV Combo	Negative	Positive	Positive	0	0	0	0
AGF	HIV Combo	Negative	Positive	Negative	0	0	4	2
AHX	HIV Combo				-	1		
AHX	HIV Combo							+-
AJD	HIV Combo	Negative	Positive	Positive	0	0	0	0
DJ	HIV Combo							+
FP	HIV Combo	Negative	Positive	Positive	0	0	0	0
GC	HIV Combo	Positive	Positive	Negative	3	0	4	2.33
ME	HIV Combo	Negative	Positive	Positive	0	0	0	0
ME	HIV Combo	Negative	Positive	Positive	0	0	0	0
ME	HIV Combo	Negative	Positive	Positive	0	0	0	0
MQ	HIV Combo				1	<u> </u>		+ -
MQ	HIV Combo							+-
MQ	HIV Combo							+-
MQ	HIV Combo					1		$\overline{}$
RJ	HIV Combo	Negative	Positive	Positive	0	0	0	0
RJ	HIV Combo	Negative	Positive	Positive	0	0	0	0
RJ	HIV Combo	Negative	Positive	Positive	0	0	0	0
TW	HIV Combo	Negative	Positive	Positive	0	0	0	0
TW	HIV Combo	Negative	Positive	Negative	0	0	4	2
YS	HIV Combo	Negative	Positive	Positive	0	0	0	0

Interpretation	Negative	Positive	Positive
Spiked Value	Negative	HIV-1 spiked to give a positive response	HIV-1 spiked to give a positive response



One portal for all programmes – Weqas Connect



Reports are very interactive.

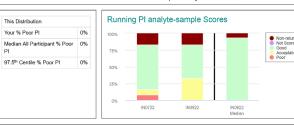
You can hover over various parts of any of the graphical displays within the reports to focus in on the element you wish to see.

Sign in - Wegas Connect

Participant Code: WQ000

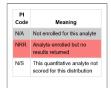
Weqas

Unit 6, Parc Ty Glas
Llanishen
Cardiff
United Kingdom
CF14 5DU
Tel: 02920 314750
Email: office@weqas.com
Programme Organiser: Mrs Annette Thomas





Location	Instrument Serial #	Instrument Name	INR	Overall % Poor PI	Overall % Non-Return
Anti-Coag Clinic	TZ1000001		Good	0%	0%
	TZ1000002		Acceptable	0%	0%
Day Surgery Unit	TZ1000003		Good	0%	0%
Endoscopy Unit	TZ1000004		Good	0%	0%
Ward 1	TZ1000005		Acceptable	0%	0%
Ward 2	UQ0000001		Acceptable	0%	0%
Pathology 1	UQ0000002		Good	0%	0%
Ward 3	TZ1000006		Good	0%	0%
Ward 4	TZ1000007		Acceptable	0%	0%
Ward 5	UQ0000003		NRR	0%	100%
West Building	TZ1000008		NRR	0%	100%
West Building Ward 1	U00000004		Good	0%	0%



***** Please note******

The NQAAP expects 100% compliance on EQA returns. If you are enrolled for an analyte and have not returned a result (denoted by NRR in your PI table), this will be treated as a poor performance score. Please let us know as soon as possible if you are no longer providing this analyte as part of your diagnostic service.

Distribution Specific Comment

There is no specific comment for this distribution.

Participant submitted comments				
Location	Instrument Name / Serial #	Distribution specific comment from the participant		
West Building	TZ1000008	ANALYSER NOT IN CLINICAL USE - AWAITING TRAINING FROM ROCHE		

Programme: POCT INR • Distribution Code: IN0922
Distribution Start: 13-Sep-2022 • Distribution End: 11-Oct-2022 • Report Issued: • Report Status: n/a

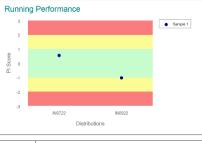
Participant Code: WQ00000 • Location: Anti-Coag Clinic • Analyser Name: n/a • Serial #: TZ1000002

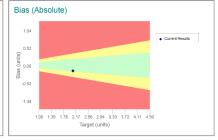
Date Samples received: n/a • Date of Analysis: n/a • Operator Details: n/a • Storage Conditions: 2 - 8 °C

Analyte: INR · Method: CoaguChek Pro II · Kit: na









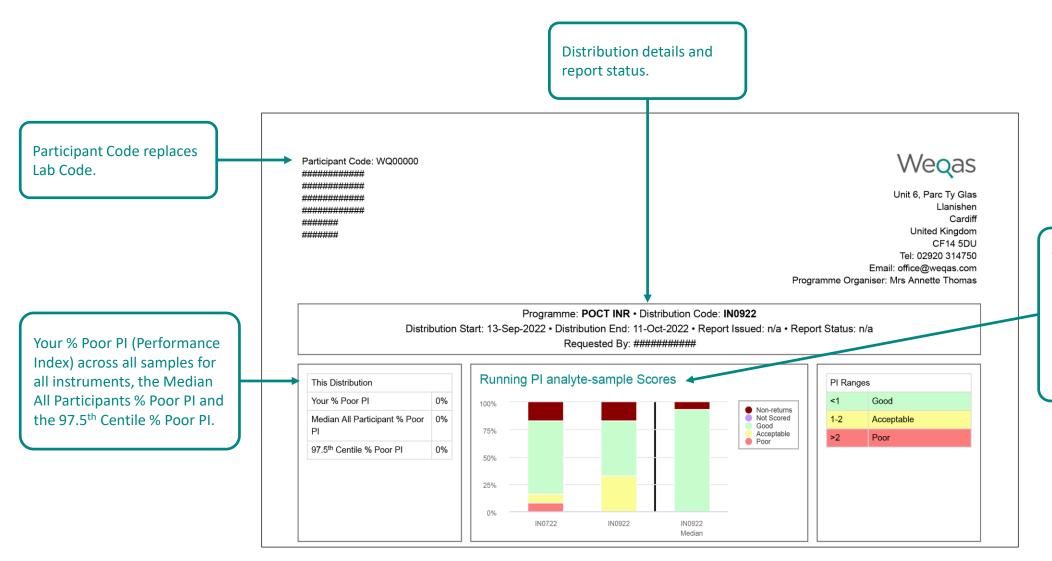


Your overall performance for this analyte is: Acceptable

• Your results for this distribution are acceptable

There are no Wegas or Participant supplied comments for INR for this distribution.





The running table shows the current distribution PI scores, and ultimately the previous 5 distribution PI scores for all analytes, for your Participant Code, plus all-Participant Median performance.



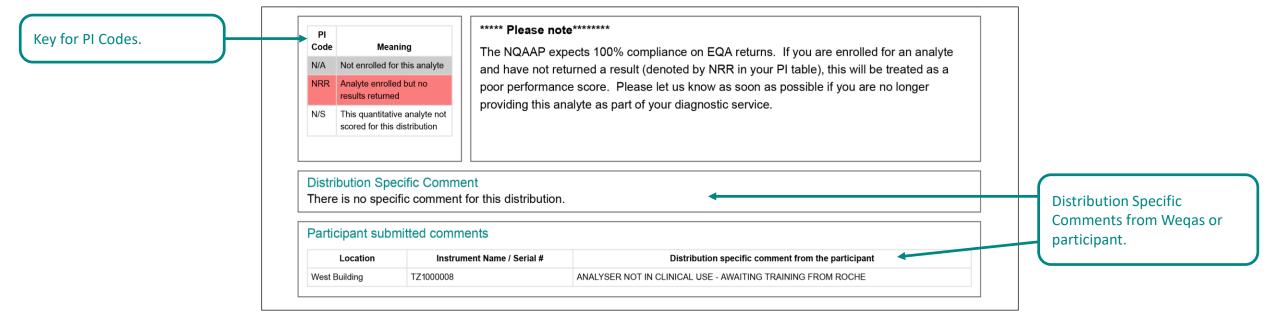
The PI Scores table shows performance for all analytes and all instruments.

PI Scores are converted into performance categories and colour coded.

Location	Instrument Serial #	Instrument Name	INR	Overall % Poor Pl	Overall % Non-Return
Anti-Coag Clinic	TZ1000001		Good	0%	0%
	TZ1000002		Acceptable	0%	0%
Day Surgery Unit	TZ1000003		Good	0%	0%
Endoscopy Unit	TZ1000004		Good	0%	0%
Ward 1	TZ1000005		Acceptable	0%	0%
Ward 2	UQ0000001		Acceptable	0%	0%
Pathology 1	UQ0000002		Good	0%	0%
Ward 3	TZ1000006		Good	0%	0%
Ward 4	TZ1000007		Acceptable	0%	0%
Ward 5	UQ0000003		NRR	0%	100%
West Building	TZ1000008		NRR	0%	100%
West Building Ward 1	U00000004		Good	0%	0%

Overall % Poor PI across all analytes for each instrument, and Overall % non return for each instrument.

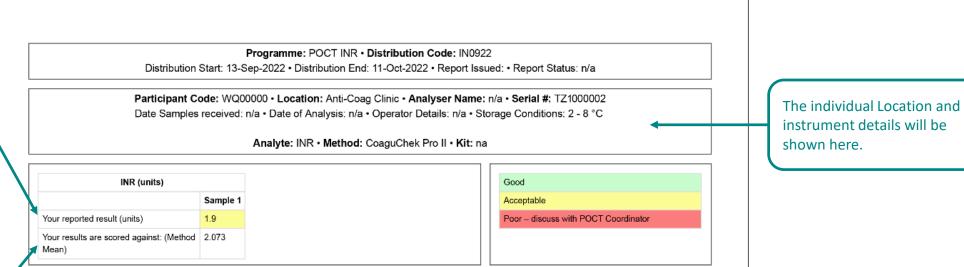






'Your reported result' will be shown in the units entered, in the Wegas standard units (if units entered are different from the Wegas standard units), and method corrected result (if appropriate for the analyte).

This will show whether you have been scored against Reference Value, Method Mean or Overall Mean and the actual target value will be shown here.

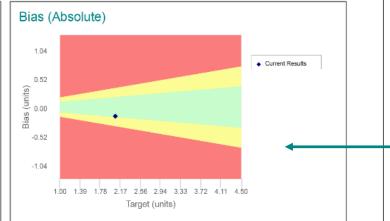


instrument details will be



Running Performance chart shows the PI (Performance Index) score for each sample for the current distribution and the last 5 distributions, with colour coding for each performance category.

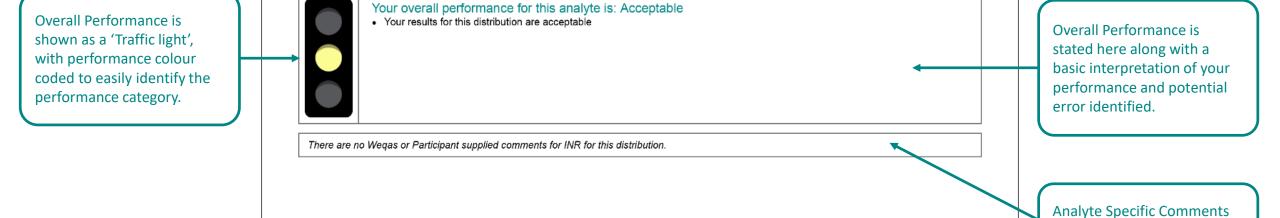




The Bias (Absolute) Plot shows absolute bias in Weqas standard units for each sample for the current distribution. The x-axis is the target value; if the target value is a Reference Value or the Overall Mean, your Method Means will be plotted.



from Wegas or participant.

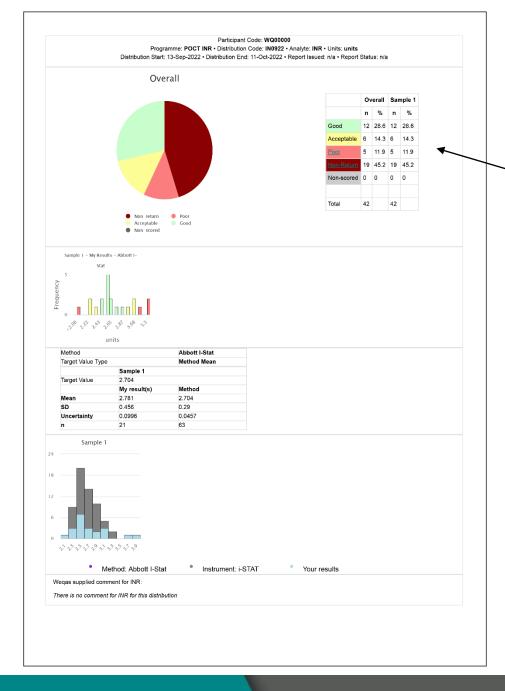


POCT Co-ordinators Report

Reports are very interactive.

You can hover over various parts of any of the graphical displays within the reports to focus in on the element you wish to see.

Sign in - Wegas Connect



Weqas

Hyperlinks on 'Poor' and 'Non Returns' to take you to further information.



Participant Code: WQ00

Programme: POCT INR • Distribution Code: IN0922 • Analyte: INR • Units: units

Distribution Start: 13-Sep-2022 • Distribution End: 11-Oct-2022 • Report Issued: 26-Oct-2022 • Report Status: Final

Location	Serial #	Name	Sample 1 result	Sample 1 score	Overall performance
	338	n/a	3.3	2.76	Poor
	338	n/a	3.2	2.29	Poor
	338	n/a	3.3	2.76	Poor
	34	n/a	3.2	2.29	Poor

Request PDF of Simplified Analyte reports for all poor performing instruments for this analyte

Request PDF

PDF will be created only for the sites that have poor performance to allow full review of the individual reports.



Non-Returns Report

Participant: WQ00001

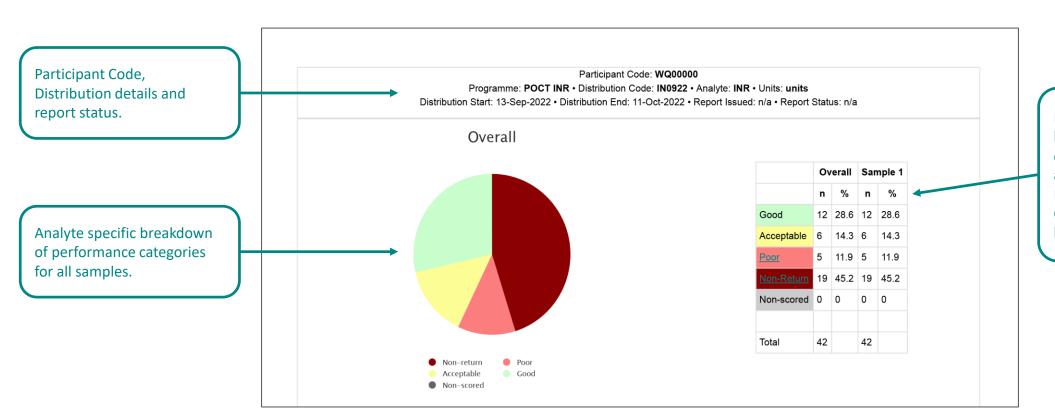
Programme: POCT INR • Distribution Code: IN0922 • Analyte: INR

Distribution start: 13-Sep-2022 • Distribution End: 11-Oct-2022 • Report Issued: 26-Oct-2022 • Report Status: n/a

Participant Code	Location	Serial #	Name
WQ00001	POCT Lab		n/a
WQ00001	POCT Lab		n/a

POCT Co-ordinators Report





Numerical analyte specific breakdown of performance categories for each sample and overall for your Participant, Group or Super Group dependent on access level and report chosen.

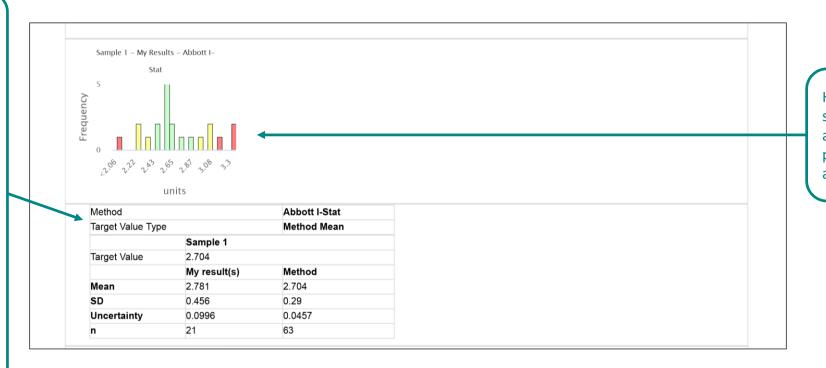
POCT Co-ordinators Report



Method specific data table showing:

- Target Value to which the submitted result is compared against and Target Value type e.g. Method Mean.
- Mean and SD of your submitted results for this method / instrument.
- Method data (all participants within this method) is also supplied in the right-hand column.

If you have more than one meter type, this data will be shown in a separate table.



Histogram showing the spread of your results. Bars are colour coded to show performance categories across the range.

POCT Co-ordinators Report



