



Summary of Results

External Quality Assessment of Water Microbiology

Legionella Isolation from Water Samples

Distribution Number: G114

Sample Numbers: G114A, G114B

Distribution Date:	January 2019
Results Due:	08 March 2019
Report Date:	25 March 2019
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Data analysed by:	Nita Patel Manchari Rajkumar
Report compiled by:	Nita Patel Manchari Rajkumar
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For further information on the scheme please refer to:

Scheme Guide: <https://www.gov.uk/government/publications/food-and-water-proficiency-testing-schemes-scheme-guide>

Scoring Guide:

<https://www.gov.uk/government/publications/food-and-water-proficiency-testing-schemes-scoring-systems-and-statistics>

General guidance for z-scores:

Participants' enumeration results are converted into z-scores using the following formula:

$$Z = \frac{(X_i - X_{pt})}{\sigma_{pt}}$$

X_i = participants' result expressed (expressed as a log₁₀ value)
 X_{pt} = assigned value (participants' consensus median (expressed as a log₁₀ value))
 σ_{pt} = the fixed standard deviation for the examination (calculated by FEPTU)

The σ_{pt} -value expresses the acceptable difference between the individual participant's result and the participants' consensus median. The σ_{pt} -value used for calculating z-scores for all parameters in the Legionella Scheme is 0.55. A guide to interpreting z-scores follows, although laboratories must interpret their scores in the context of their own laboratory situation.

z = -1.99 to +1.99 **satisfactory**
z = -2 to -2.99 or +2 to +2.99 **questionable**
z = < -3.00 or > + 3.00 **unsatisfactory**

It is usually recommended that z-scores exceeding +/-2.0 are investigated to establish the possible cause. As a general rule, PHE recommends that all questionable and unsatisfactory results are investigated.

FEPTU Quality Control: A minimum of 10 LENTICULE discs, selected randomly from the batch, are examined for *Legionella* spp. at the dilutions indicated on the request/report forms. The FEPTU results are determined using a method based on ISO 11731: 1998 Detection and enumeration of *Legionella*, and are included in the 'intended results' letters which provide guidance for participants regarding the assigned values. Intended results letters are posted on the website immediately after every distribution; electronic notification of their availability is sent to all participants.

Refer to section 17.0 of the Scheme Guide if you have experienced difficulties with any of the examinations.

<https://www.gov.uk/government/publications/food-and-water-proficiency-testing-schemes-scheme-guide>

All participants are reminded that reporting incorrect or false negative results for water samples could have serious public health implications.

Identification of *Legionella* spp.

There are at least 50 species of *Legionella* of which at least 20 have been associated with human disease. The species that is most commonly isolated both from the environment and from infections is *L.pneumophila*; this species can be divided into at least 16 serogroups on the basis of surface antigens. *L.pneumophila* serogroup 1 is the most common cause of outbreaks of Legionnaire disease and, within serogroup 1, the strains most commonly associated with disease share a common epitope, as revealed by monoclonal subtyping. It is important, because of the risks to human health, to differentiate routinely between *L.pneumophila* and other *Legionella* species and to be able to distinguish serogroup 1 from the other serogroups of *L.pneumophila*. However, monoclonal subtyping is normally performed only by specialist reference laboratories. Participants who do not identify *Legionella* spp. other than *L.pneumophila* should where appropriate, report their results as '*Legionella* spp. not *L.pneumophila*' rather than '*Legionella* spp.'

Results as summarised in the performance assessment sheet included in this report, provide a more effective indication of on-going problems with Legionella examinations.

Please contact FEPTU staff for advice and information:

Repeat samples	Carmen Gomes or Kermin Daruwalla	Tel: +44 (0)20 8327 7119
Data Analysis	Manchari Rajkumar or Nita Patel	Fax: +44 (0)20 8200 8264
Microbiological advice	Nita Patel or Zak Prior	Email:
General comments and complaints	Nita Patel or Zak Prior	FEPTU's website
Scheme consultants	Dr John V Lee or Julie E. Russell	
Scheme Co-ordinator	Nita Patel	



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Accreditation: PHE Water EQA Scheme for *Legionella* Isolation is accredited by the United Kingdom Accreditation Service (UKAS) to ISO/IEC 17043:2010.

Sample: G114A

Contents:

- *Legionella pneumophila* serogroup 1 (4.4x10²) (wild strain)
- *Aerococcus viridans* (4.0x10²) (wild strain)
- *Brevundimonas vesicularis* (1.4x10⁴) (wild strain)

Expected Results:

	Expected Result	Your Result	PHE Score	Z-Score	Comments
Isolation of legionellae	Detected				
Identification	<i>L.pneumophila</i>				
Serogroup	1				
Enumeration	9.8x10 ¹ - 3.09x10 ³ cfu L ⁻¹				
Results Returned					
Total score out of N/A					

Background Flora:

Aerococcus viridans and *Brevundimonas vesicularis* did not form colonies on G-PC after processing.

Comments on Performance:

Total participants reporting results	143
Participants reporting detected	136 (95%)

Participants reporting <i>L.pneumophila</i>	126 (93%)
Participants reporting not examined	4 (3%)
Participants reporting <i>Legionella</i> spp.	2 (1%)
Participants reporting Other	2 (1%)
Participants reporting <i>Legionella</i> spp. not <i>L.pneumophila</i>	1 (1%)

Serogroups for <i>L.pneumophila</i>	
Participants reporting serogroup	126 (93%)
Participants reporting serogroup not examined	5 (4%)
Participants reporting no serogroup result	2 (1%)
Participants reporting serogroup not applicable	2 (1%)
Participants reporting serogroups 2 - 15	1 (1%)

Sample: G114A (cont)

Total participants enumerating legionellae	142
Participants reporting a low censored value	5

Assigned value (participants' median)	5.50×10^2 cfu L ⁻¹
Uncertainty of assigned value ($U(x_{pt}) = \log_{10}$ cfu L ⁻¹)	0.04
No. of outlying counts	17 (6 low / 11 high)
Participants' mean	5.87×10^2 cfu L ⁻¹
Standard deviation of participants' results *	0.4 log ₁₀ unit per cfu L ⁻¹

FEPTU median	4.40×10^2 cfu L ⁻¹
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Total sent sample	153
Non-returns	7
Not examined	3

The fixed standard deviation value (σ_{pt} value) used for calculation of the z-scores is **0.55** for all parameters.

* Robust S^* based on median absolute deviation about the participants' median (*MADe*).

Example Report

Sample: G114B

Contents:

- *Pseudomonas aeruginosa* (2.4x10³) (wild strain)
- *Roseomonas aestuarii* (3.2x10³) (wild strain)

Expected Results:

	Expected Result	Your Result	PHE Score	Z-Score	Comments
Isolation of legionellae	Not Detected				
Identification	Not Detected				
Serogroup	N/A				
Enumeration	<25 cfu L ⁻¹				
Results Returned					
Total score out of N/A					

Background Flora:

Comments on Performance:

Total participants reporting results	143
Participants reporting Not detected	137 (96%)

Example Report

Sample: G114B (cont)

Total participants enumerating legionellae	143
Participants reporting a low censored value	121
Participants reporting a high censored value	1
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Total sent sample	153
Non-returns	7
Not examined	3

The fixed standard deviation value (σ_{pt} value) used for calculation of the z-scores is **0.55** for all parameters.

- * Robust S^* based on median absolute deviation about the participants' median (*MADe*).

Example Report

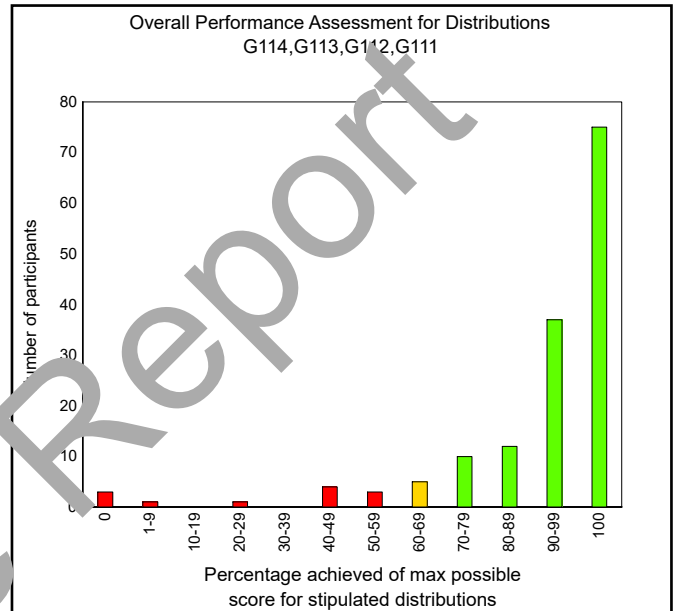
Performance Assessment Sheet

Participants are reminded that to take advantage of the performance assessment overtime tool provided in the reports they need to take part in more than one distribution a year.

Performance assessments are designed to identify laboratories with on-going problems with their examinations and are undertaken after every distribution. Scores are allocated to results reported for every sample to help assess participants' performance.

Cumulative scores are calculated for every participant, for all examination types, for the current and previous three distributions. Participants' cumulative scores for each of the examination types are compared with the maximum possible scores after every distribution.

Distribution	Sample	Your score	Your %
G114	G114A		
	G114B		
G113	G113A		
	G113B		
G112	G112A		
	G112B		
G111	G111A		
	G111B		



Performance Assessment Comment:

Laboratories that achieve less than 70% of the maximum possible score are likely to be experiencing significant problems with their examinations and are advised to

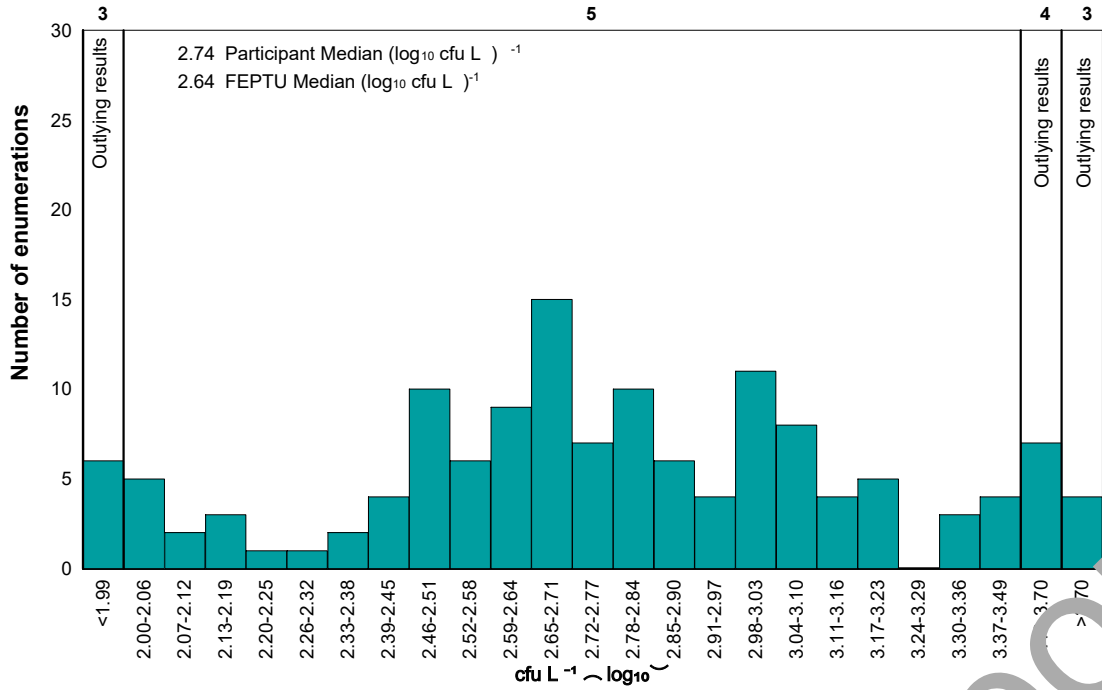
a) refer to the relevant sample reports for specific comments

b) refer to the website guidance documents:

<https://www.gov.uk/government/collections/external-quality-assessment-ega-and-proficiency-testing-pt-for-food-water-and-environmental-microbiology>

c) contact the organisers for advice.

Legionella counts reported by participants - Sample G114A



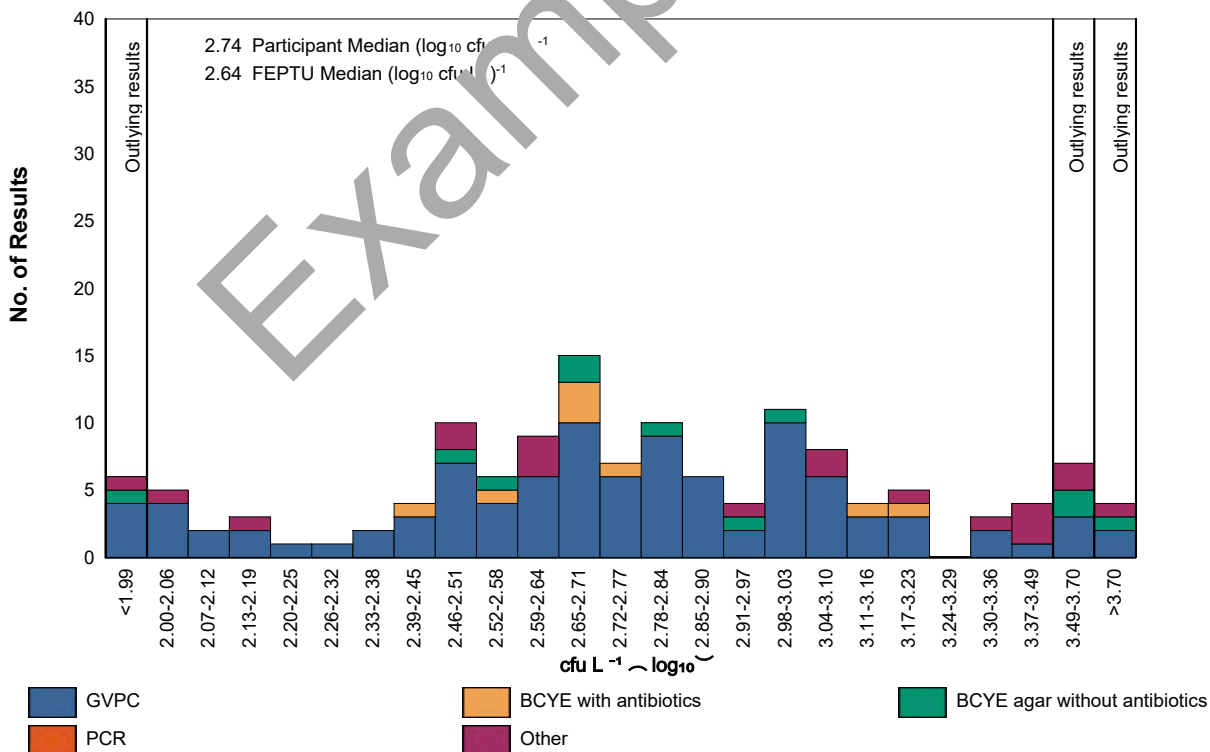
Culture based presentation

G114A

FEPTU Culture: GVPC

Culture	Number of Results	Excluded Results	Percentage of the total	Median	Robust S*	Range Reported
Log 10						
GVPC	99	1	72	2.74	0.38	0.60 - 4.30
BCYE with antibiotics	8	1	5			-
BCYE agar without antibiotics	11	1	8	2.78	0.40	1.90 - 4.06
PCR	0	1	0			-
Other	19	1	13	3.05	0.64	1.90 - 4.30

G114A: Legionella counts reported by participants - Sample G114A



No Data For Graph

Culture based presentation

G114B

FEPTU Culture: GVPC

Culture	Number of Results	Excluded Results	Percentage of the total	Median	Robust S*	Range Reported	
						Log 10	
GVPC	13	87	61	0.00	0.00	0.00 - 3.67	
BCYE with antibiotics	2	7	9			-	
BCYE agar without antibiotics	0	12	0			-	
PCR	0	1	0			-	
Other	6	5	28			-	

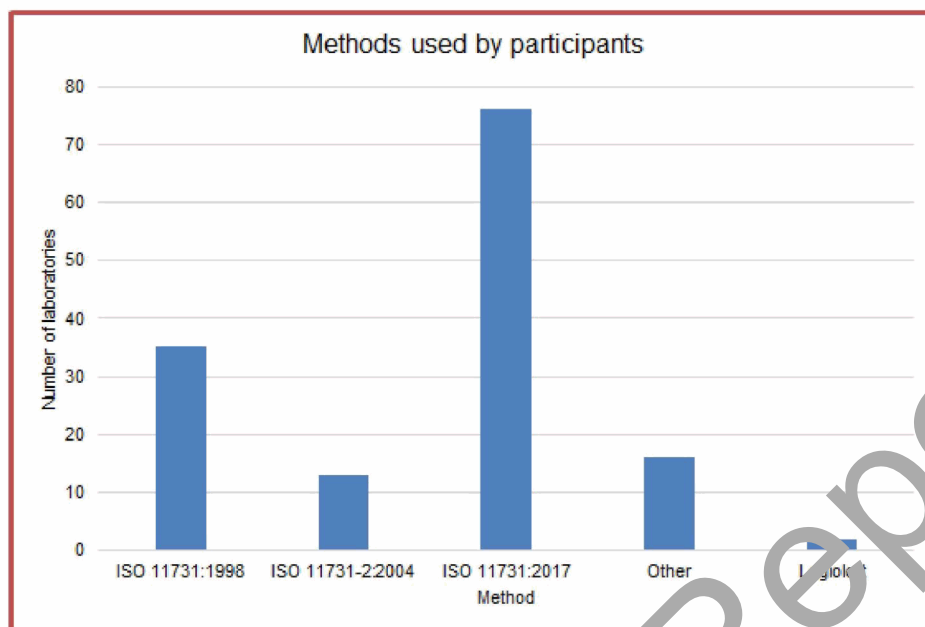
G114B: *Legionella* counts reported by participants - Sample G114B

No data for graph

ISO 11731:2017

Participants are asked to note that an updated ISO 11731:2017 Water quality - Enumeration of *Legionella* has now been published.

The methods used by participants for this distribution are shown in the table below.



Participants are asked to note that sample details will be included on the request form along with the dilutions for examination from the next distribution onwards. This will help laboratories to determine the testing regime against annex J of ISO 11731: 2017. Eventually as laboratories transfer to the new version of ISO, dilutions for examination will not be provided. This change will be communicated to our participants when this happens.

Culture based presentation of results:

Participants are advised that if less than 10 laboratories report a result for a method no data is shown for the Median, Robust S and the Range Reported in the 'Culture based presentation' tables. Numbers shown in the 'Excluded Results' column are laboratories that reported a censored value.

General comment:

If you do not return a result for a distribution, you will not be able to view all the participants' results data in your individualised report. To access this missing data contact us on foodsa@phe.gov.uk.

Trend analysis:

Plotting your PT results over a period of time can help to identify potential problems. Download the updated trend analysis spreadsheet one week after this report has been issued: <https://www.gov.uk/government/publications/legionella-scheme-trend-analysis>
End of report

Example Report