



Summary of Results

External Quality Assessment of Water Microbiology Recreational and Surface Water Scheme

Distribution Number: S82

Sample Numbers: S82A, S82B

Distribution Date:	January 2018
Results Due:	02 March 2018
Report Date:	22 March 2018
Samples prepared and quality control tested by:	Angela Appea Richard Borrill Thomas Harper Zak Prior Judith Spellar Aneta Stranc Lili Tsegaye
Data analysed by:	Joanna Donn Nita Patel
Report compiled by:	Joanna Donn Nita Patel
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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>

Guide to Scoring and Statistics:

<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 Recreational and Surface Water Scheme is 0.35. 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 are investigated to establish the possible cause. As a general rule, PHE recommends that all questionable and unsatisfactory results are investigated.

FEPTU Quality Control: To demonstrate homogeneity of the sample, a minimum of 10 LENTICULE® discs, selected randomly from a batch, are tested in duplicate for parameters requiring enumeration.

To demonstrate stability of the sample, a minimum of nine LENTICULE® discs, selected randomly from a batch, are examined throughout the distribution period for enumeration parameters.

PHE uses methods stipulated in the Microbiology of Recreational and Environmental Waters (2000) and the DWI's series of documents: The Microbiology of Drinking Water (2002) - Methods for the Examination of Waters and Associated Materials.

The FEPTU results are used for guidance in the preliminary intended results notification, 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>

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

Participants who report unexpectedly high or low results for enumerations on single occasions only should not be unduly alarmed, although they should still assess the reason(s) for the outlying result.

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: foodeqa@phe.gov.uk
General comments and complaints	Nita Patel or Zak Prior	FEPTU's website
Scheme consultants	Julie E. Russell	
Scheme Co-ordinator	Nita Patel	

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



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Sample: S82A

Swimming pool water sample

Contents: *Enterobacter cloacae* (NCTC 10005), *Escherichia coli* (wild strain), *Enterococcus hirae* (NCTC 12367), *Pseudomonas aeruginosa* (wild strain), *Leifsonia aquatica* (NCIMB 9460)

Expected Results:

All counts are expressed as colony forming units (cfu) per 100mL except the colony count at 37°C/24h which is cfu per mL.

The fixed standard deviation value (σ_{pt} value) used for calculation of the z-scores is **0.35** for all parameters.

Parameter	Coagulase positive staphylococci	Coliform bacteria	<i>Escherichia coli</i>	Enterococci	<i>Pseudomonas aeruginosa</i>	Total staphylococci	Colony Count 37°C/24 h
FEPTU median	0	44	21	55	29	0	2
No. results returned	76	130	135	114	133	43	133
Assigned value (Participants median all results)	0	50	25	59	23	0	2
Uncertainty of assigned value*	N/A	0.03	0.03	0.01	0.03	N/A	0.05
Participants mean (all results)	0	46	24	58	22	0	3
Expected Range	N/A	16 - 158	3 - 79	19 - 187	7 - 23	N/A	0 - 20
Standard deviation**	N/A	0.25	0.24	0.23	0.23	N/A	0.4
No of outlying counts	N/A	10	13	3	10	N/A	11
False positives	3	N/A	N/A	N/A	N/A	12	N/A
False negatives	N/A	2	9	1	2	N/A	0
Your result							
Score for performance assessment							
Z-score							

* $U(X_{pt})$ is based on results transformed to a log₁₀ scale

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

Total sent samples	145
Not examined	4
Non returns	3
Late returns	0

Sample: S82B

Swimming pool water sample

Contents: *Staphylococcus aureus* (NCTC 8532), *Staphylococcus warneri* (NCTC 11044), *Escherichia coli* (wild strain), *Enterococcus faecalis* (NCTC 5957), *Pseudomonas aeruginosa* (wild strain), *Aerococcus viridans* (wild strain)

Expected Results:

All counts are expressed as colony forming units (cfu) per 100mL except the colony count at 37°C/24h which is cfu per mL.

The fixed standard deviation value (σ_{pt} value) used for calculation of the z-scores is **0.35** for all parameters.

Parameter	Coagulase positive staphylococci	Coliform bacteria	<i>Escherichia coli</i>	Enterococci	<i>Pseudomonas aeruginosa</i>	Total staphylococci	Colony Count 37°C/24 h
FEPTU median	35	21	21	20	21	66	31
No. results returned	76	130	135	114	133	43	133
Assigned value (Participants median all results)	38	30	30	22	18	62	25
Uncertainty of assigned value*	0.02	0.02	0.02	0.02	0.02	0.04	0.01
Participants mean (all results)	38	30	29	21	17	59	25
Expected Range	12 - 120	9 - 95	9 - 95	7 - 70	6 - 67	20 - 196	8 - 79
Standard deviation**	0.19	0.15	0.16	0.15	0.19	0.17	0.13
No of outlying counts	6	8	8	4	8	2	12
False positives	N/A	N/A	N/A	N/A	N/A	N/A	N/A
False negatives	5	5	1	2	2	0	4
Your result							
Score for performance assessment							
Z-score							

* $U(X_{pt})$ is based on results transformed to a log₁₀ scale

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

Total sent samples	145
Not examined	4
Non returns	3
Late returns	0

S82A: Coagulase-positive staphylococci

No data for graph

Method based presentation

S82A : Coagulase-positive staphylococci

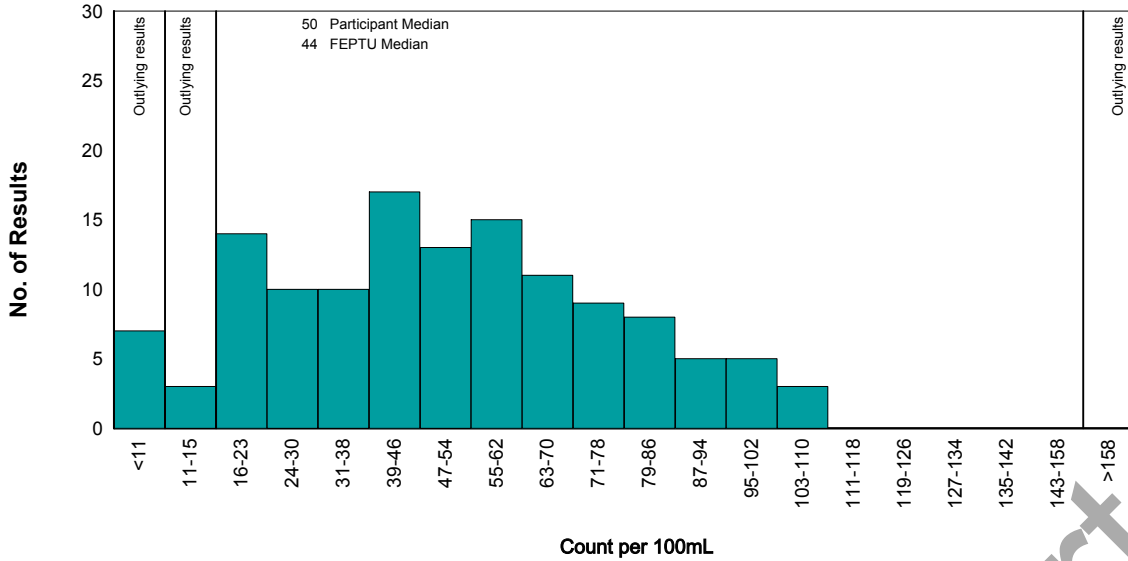
FEPTU Method: BPM

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
BPM	32	4	44	0	0.00	0 - 41
Mannitol Salt Agar	31	0	41	0	0.00	0 - 33
Other (Membrane filtration)	9	0	12			-

S82A: Coagulase-positive staphylococci

No data for graph

S82A: Coliform bacteria



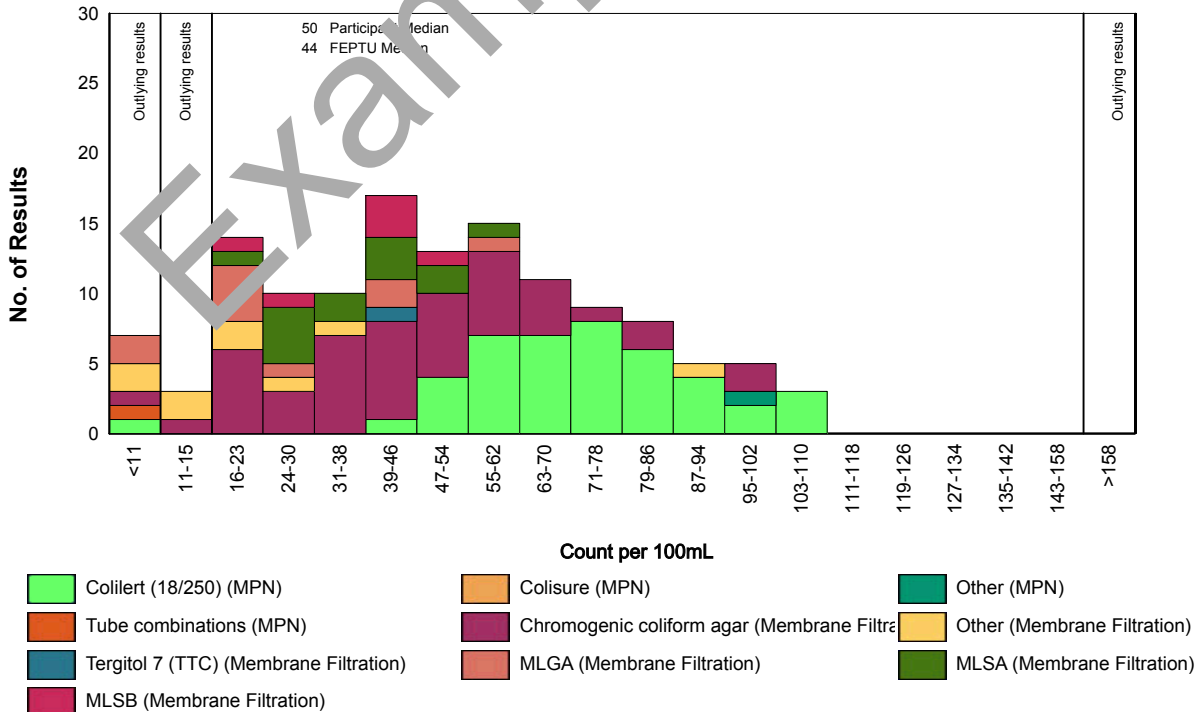
Method based presentation

S82A : Coliform bacteria

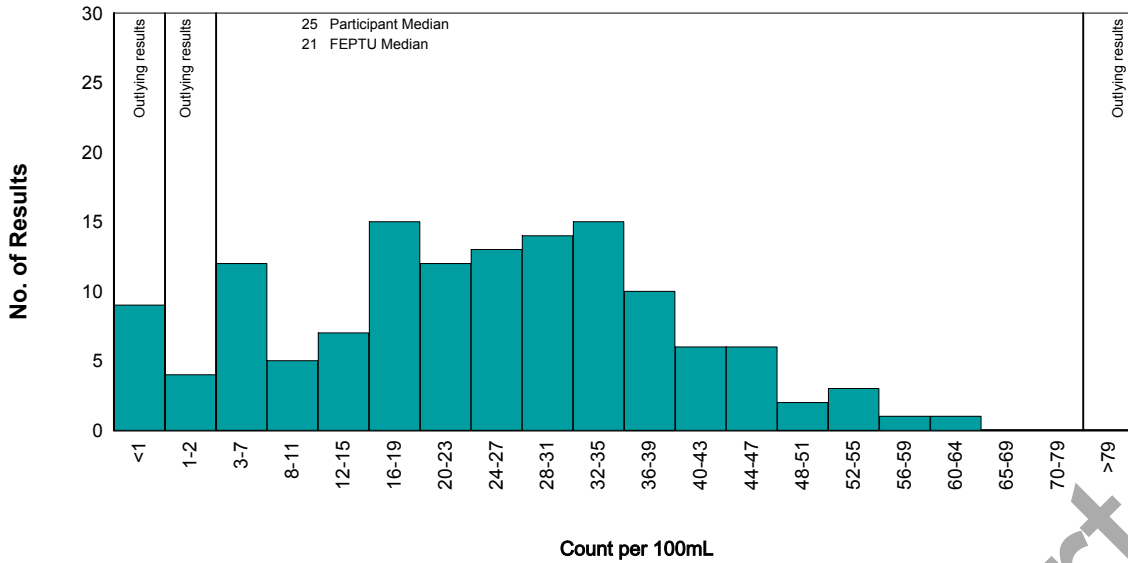
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	43	0	33	7	0.10	0 - 109
Colisure	0	0	0	-	-	-
Other (MPN)	1	0	0	-	-	-
Tube combinations	1	0	0	-	-	-
Chromogenic coliform agar	46	0	35	45	0.21	10 - 100
Other (Membrane filtration)	9	0	6	-	-	-
Tergitol 7 (TTC)	1	0	0	-	-	-
MLGA	10	0	7	23	0.31	5 - 56
MLSA	13	0	10	35	0.15	18 - 60
MLSB	6	0	4	-	-	-

S82A: Coliform bacteria



S82A: *Escherichia coli*



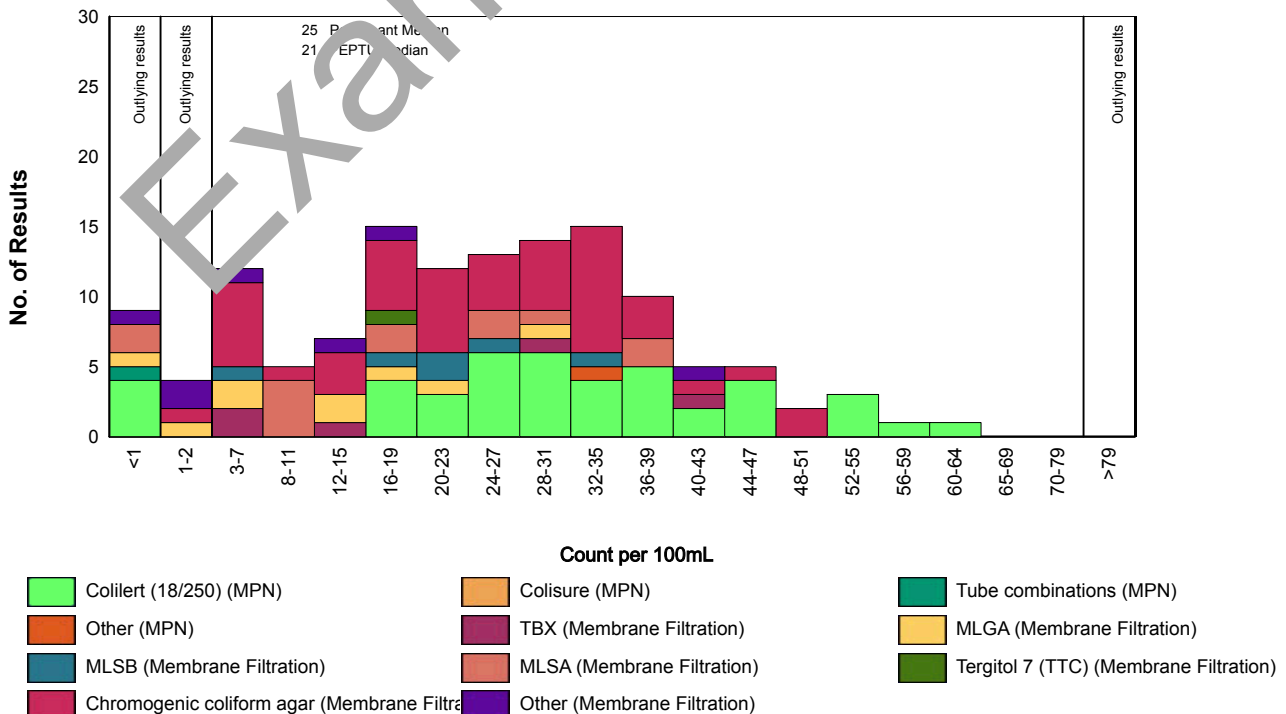
Method based presentation

S82A : *Escherichia coli*

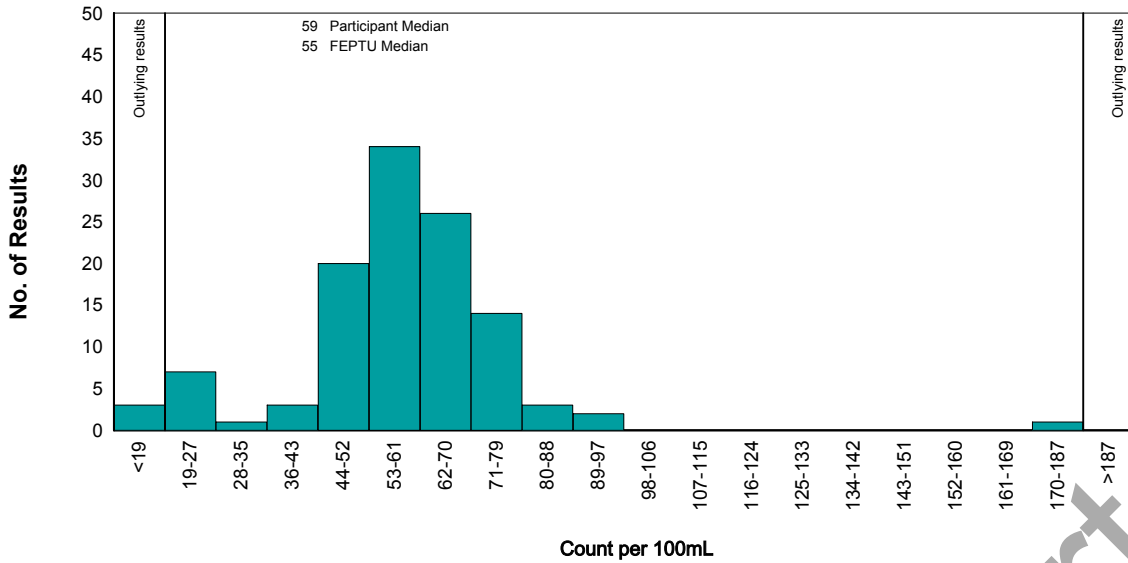
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	43	0	32	2	0.15	0 - 60
Colisure	0	0	0	-	-	-
Tube combinations	1	0	0	-	-	-
Other (MPN)	1	0	0	-	-	-
TBX	5	0	3	-	-	-
MLGA	9	0	6	-	-	-
MLSB	6	0	4	-	-	-
MLSA	13	0	9	16	0.27	0 - 38
Tergitol 7 (TTC)	1	0	0	-	-	-
Chromogenic coliform agar	47	0	35	25	0.21	2 - 49
Other (Membrane filtration)	7	0	5	-	-	-

S82A: *Escherichia coli*



S82A: Enterococci



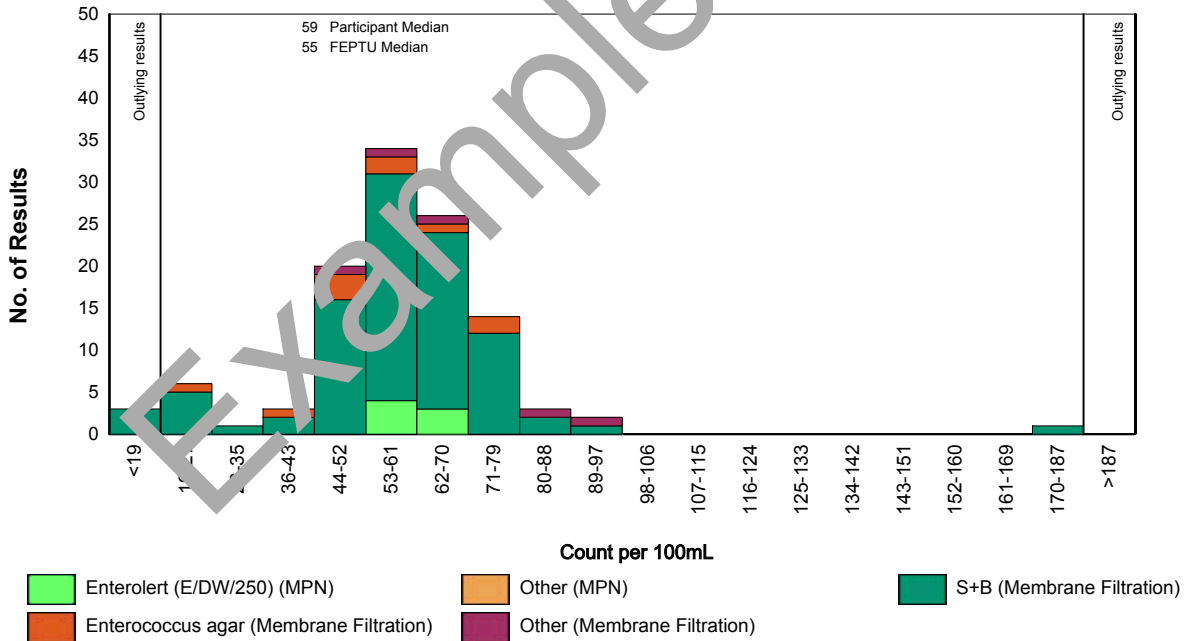
Method based presentation

S82A : Enterococci

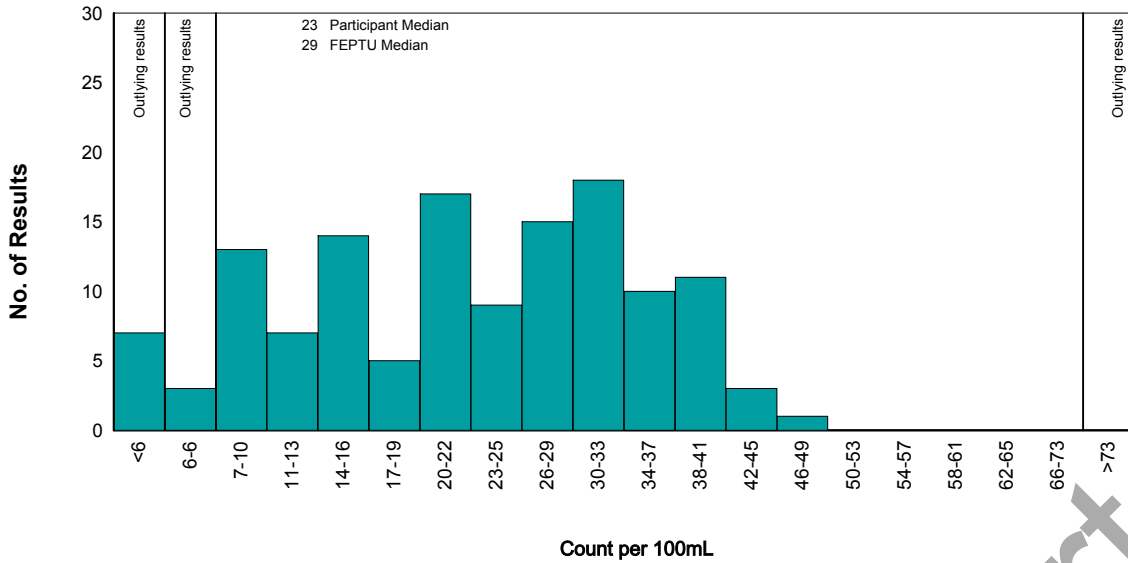
FEPTU Method: S+B

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Enterolert (E/DW/250)	7	0	6			-
Other (MPN)	0	0	0			-
S+B	91	0	80	59	0.09	0 - 183
Enterococcus agar	10	0	9	53	0.13	20 - 75
Other (Membrane filtration)	5	0	4			-

S82A: Enterococci



S82A: *Pseudomonas aeruginosa*



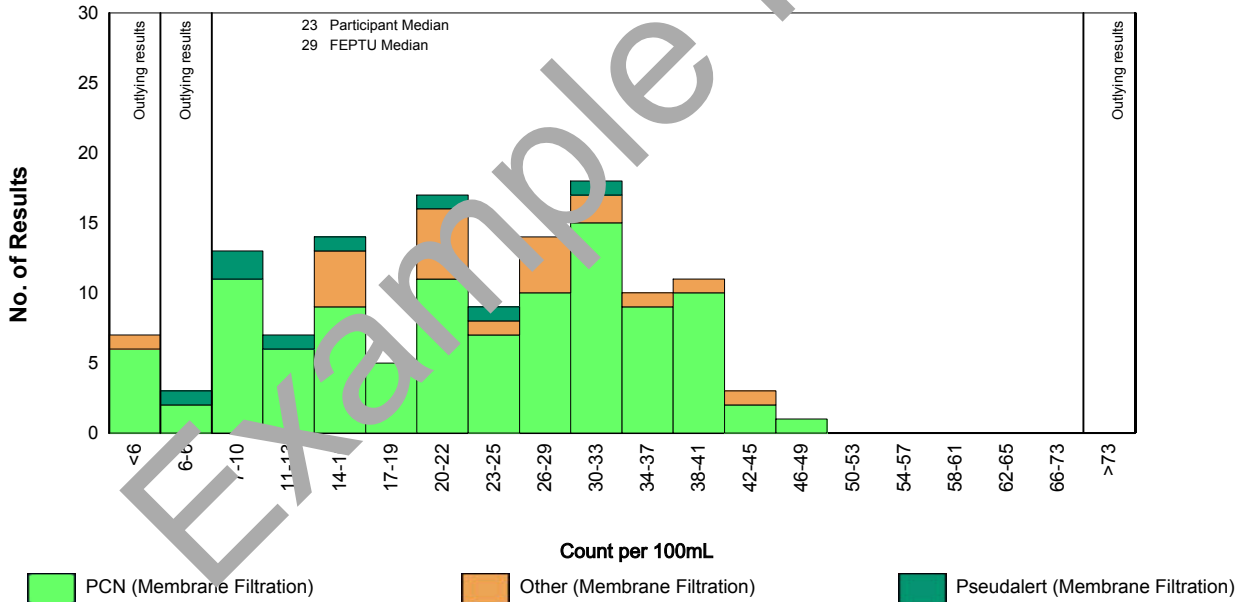
Method based presentation

S82A : *Pseudomonas aeruginosa*

FEPTU Method: PCN

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
PCN	104	0	78	23	0.24	0 - 47
Other (Membrane filtration)	20	0	15	23	0.16	0 - 44
Pseudalert	8	0	6			-

S82A: *Pseudomonas aeruginosa*



S82A: Total staphylococci

No data for graph

Method based presentation

S82A : Total staphylococci

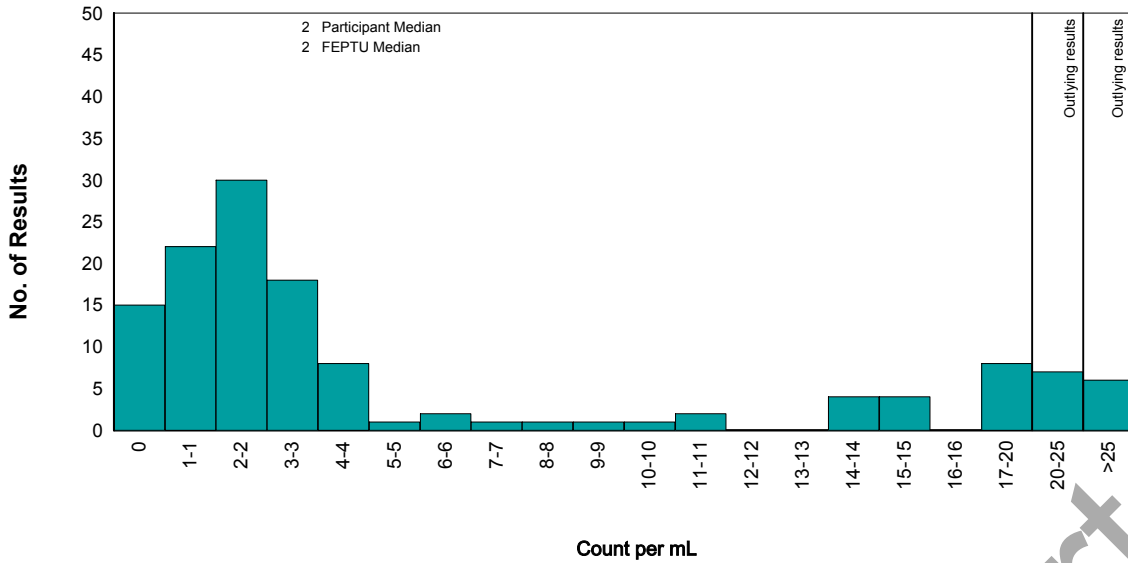
FEPTU Method: BPM

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
BPM	10	1	23	0	0.00	0 - 50
Mannitol Salt Agar	27	0	6	0	0.00	0 - 55
Other (Membrane filtration)	5	1	11			-

S82A: Total staphylococci

No data for graph

S82A: Colony Count 37°C/24 h



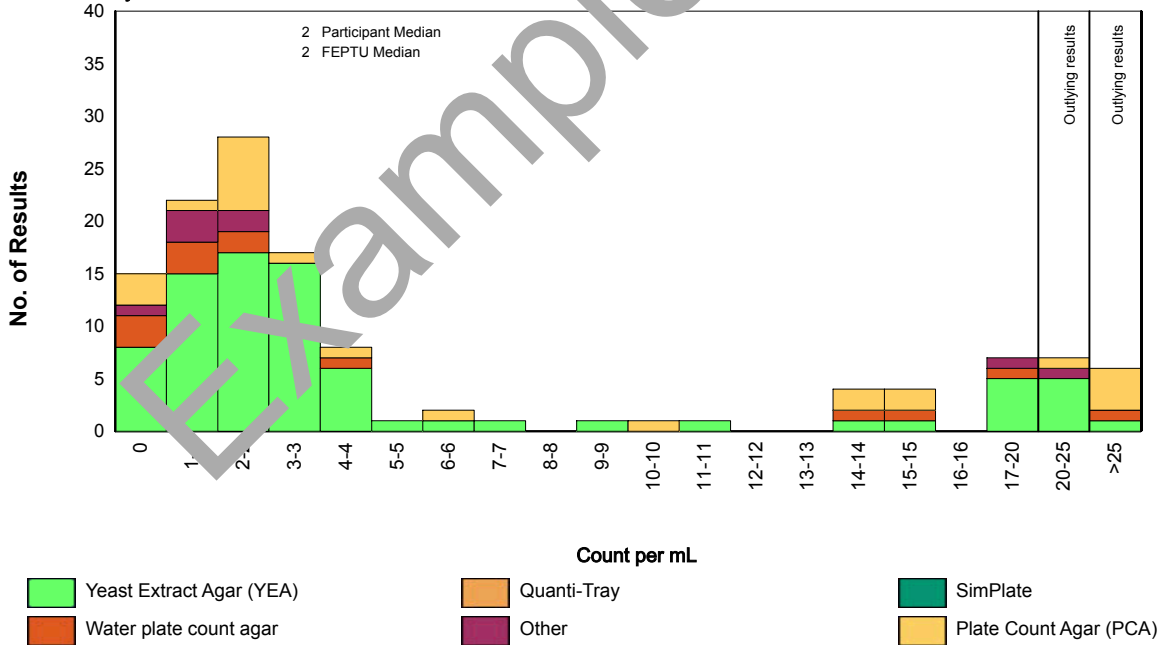
Method based presentation

S82A : Colony Count 37°C/24 h

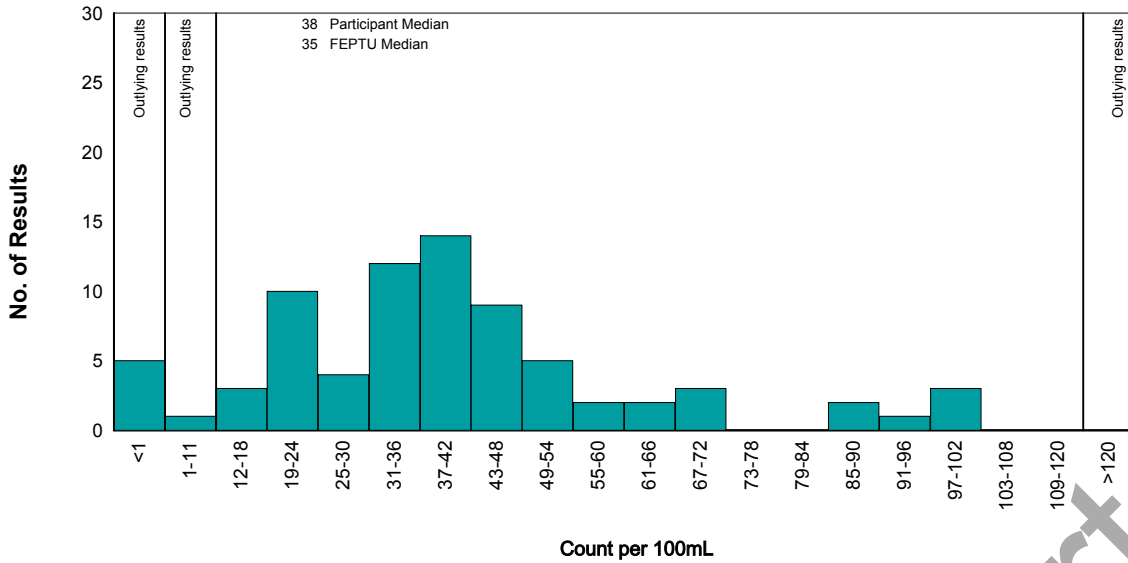
FEPTU Method: Yeast Extract Agar (YEA)

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Yeast Extract Agar (YEA)	80	0	64	2	0.34	0 - 30
Quanti-Tray	0	0	0			-
SimPlate	0	1	0			-
Water plate count agar	13	0	10	2	0.50	0 - 32
Other	8	0	6			-
Plate Count Agar (PCA)	24	0	19	4	0.59	0 - 100

S82A: Colony Count 37°C/24 h



S82B: Coagulase-positive staphylococci



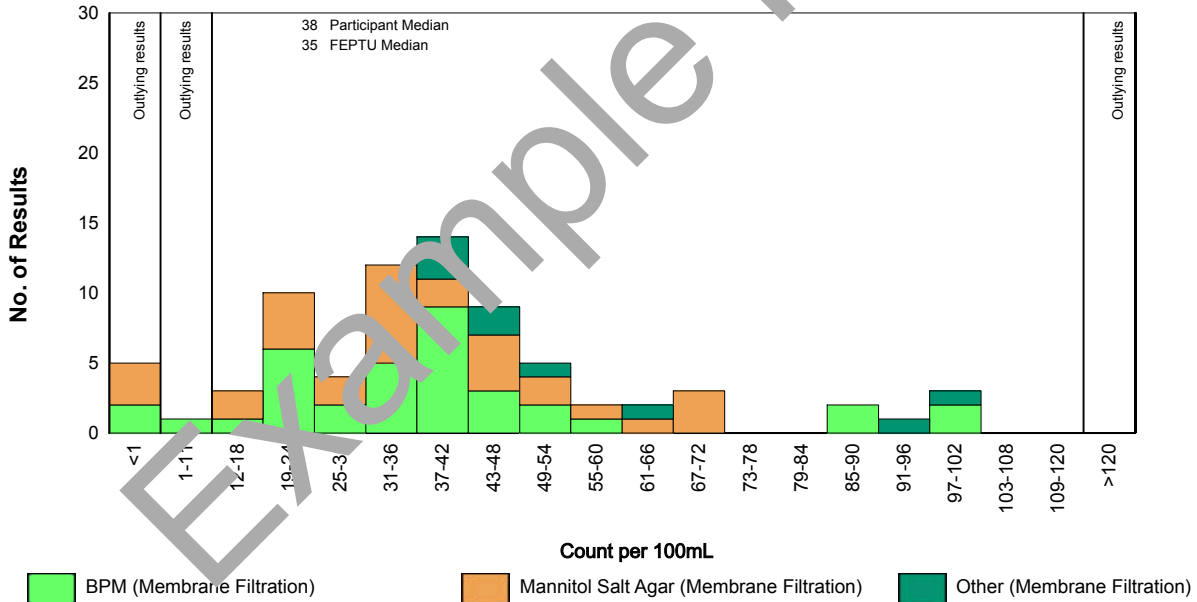
Method based presentation

S82B : Coagulase-positive staphylococci

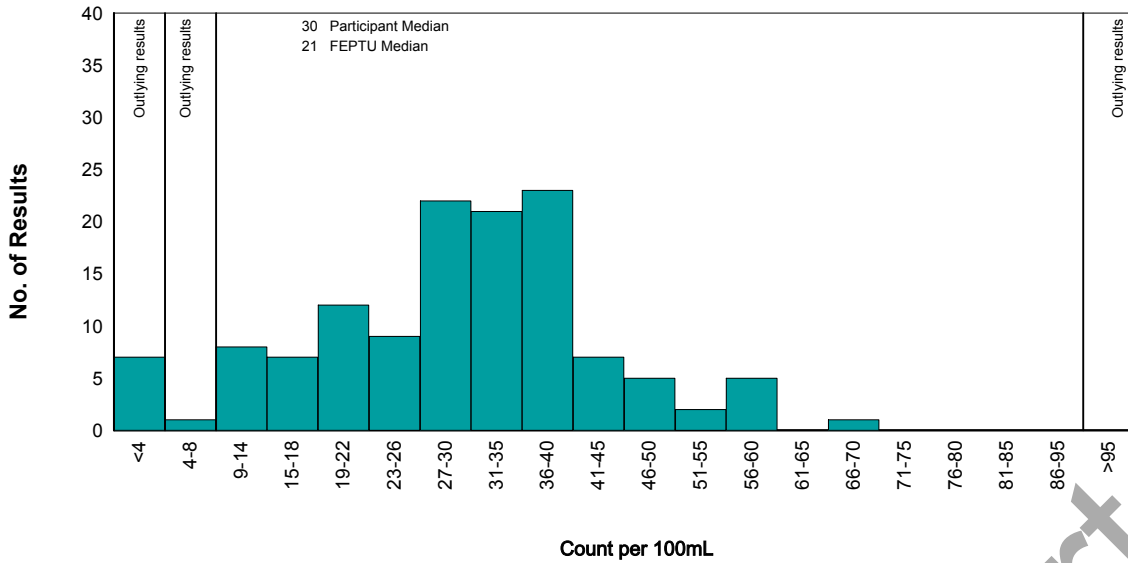
FEPTU Method: BPM

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
BPM	36	0	47	33	0.18	0 - 100
Mannitol Salt Agar	31	0	41	32	0.19	0 - 70
Other (Membrane filtration)	9	0	11	-	-	-

S82B: Coagulase-positive staphylococci



S82B: Coliform bacteria



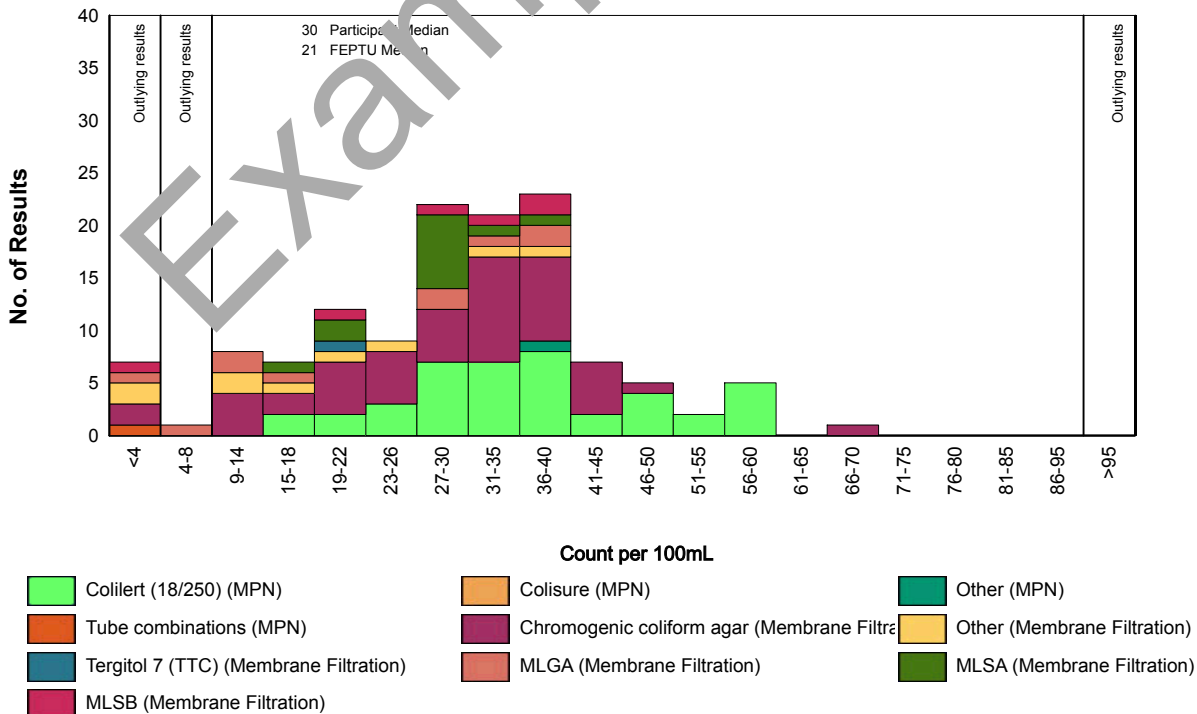
Method based presentation

S82B : Coliform bacteria

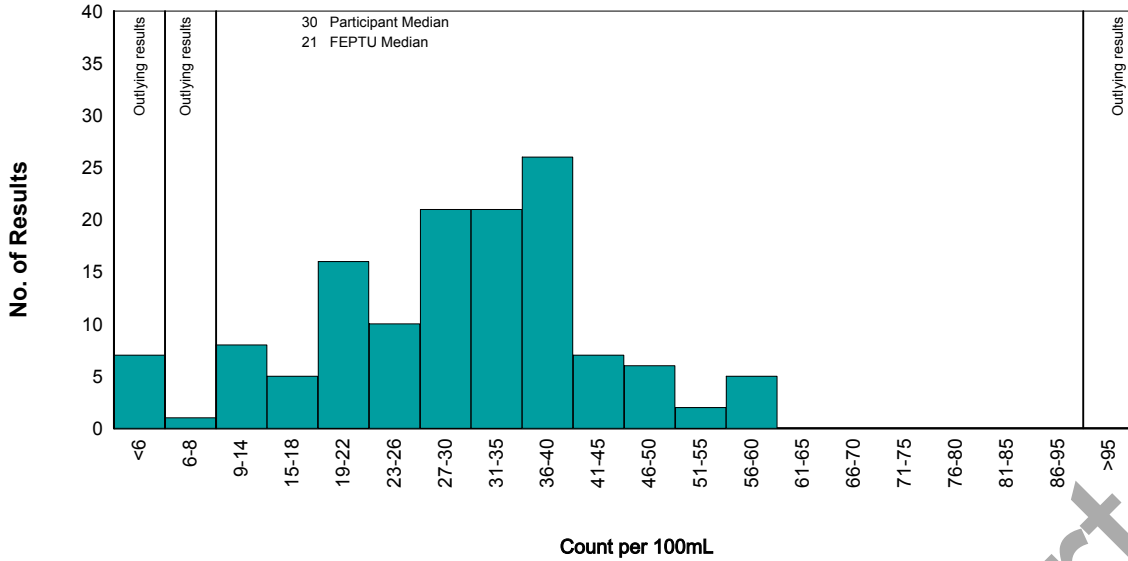
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	42	0	32	23	0.15	16 - 59
Colisure	0	0	0	-	-	-
Other (MPN)	1	0	0	-	-	-
Tube combinations	1	0	0	-	-	-
Chromogenic coliform agar	48	0	36	31	0.14	0 - 68
Other (Membrane filtration)	9	0	6	-	-	-
Tergitol 7 (TTC)	1	0	0	-	-	-
MLGA	10	0	7	23	0.32	0 - 39
MLSA	12	0	9	27	0.07	18 - 36
MLSB	6	0	4	-	-	-

S82B: Coliform bacteria



S82B: *Escherichia coli*



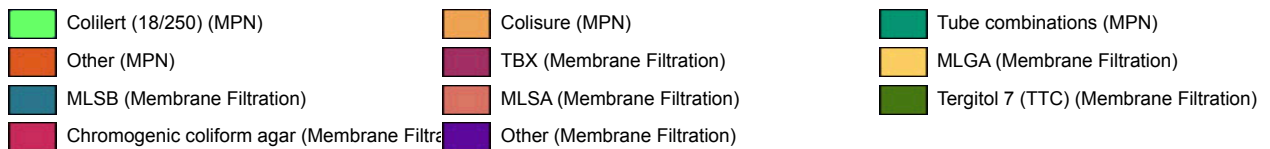
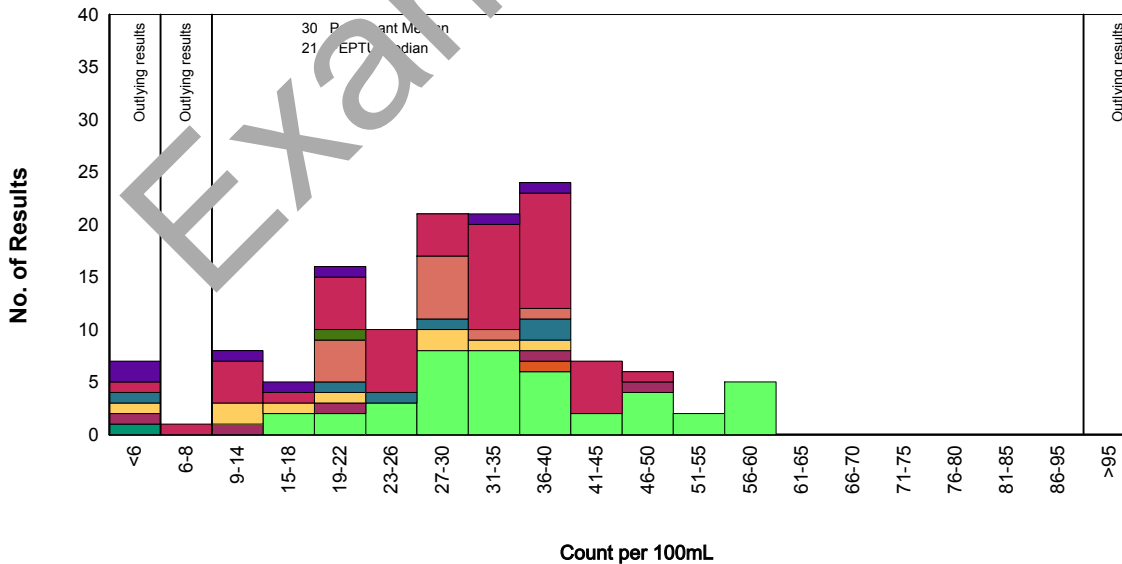
Method based presentation

S82B : *Escherichia coli*

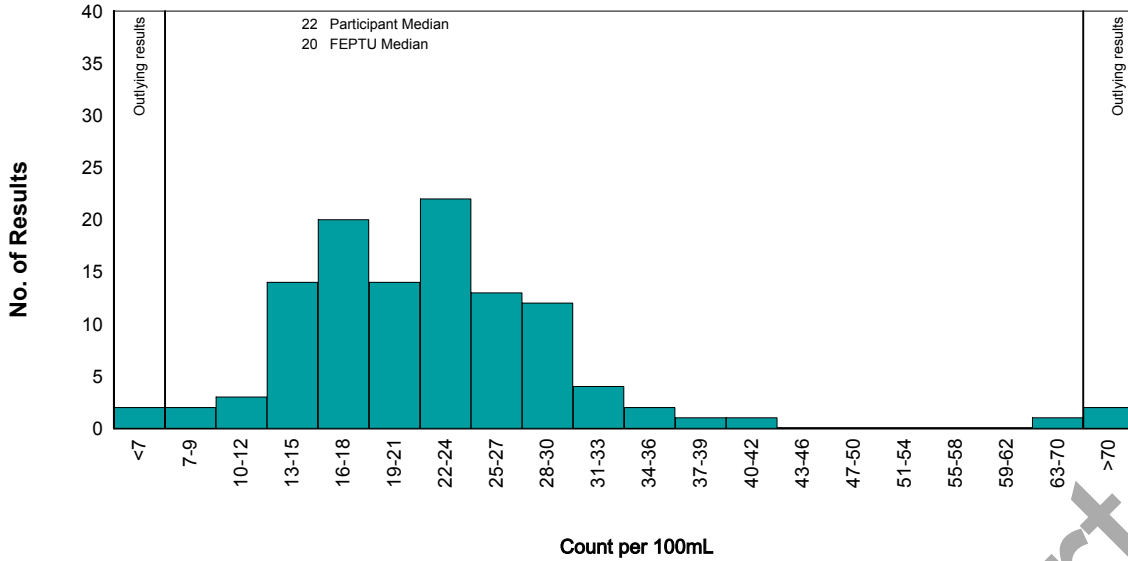
FEPTU Method: Chromogenic coliform agar

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Colilert (18/250)	42	0	31	27	0.14	15 - 59
Colisure	0	0	0	-	-	-
Tube combinations	1	0	0	-	-	-
Other (MPN)	1	0	0	-	-	-
TBX	5	0	3	-	-	-
MLGA	9	0	6	-	-	-
MLSB	6	0	4	-	-	-
MLSA	12	0	9	27	0.10	19 - 36
Tergitol 7 (TTC)	1	0	0	-	-	-
Chromogenic coliform agar	49	0	36	31	0.13	3 - 47
Other (Membrane filtration)	7	0	5	-	-	-

S82B: *Escherichia coli*



S82B: Enterococci



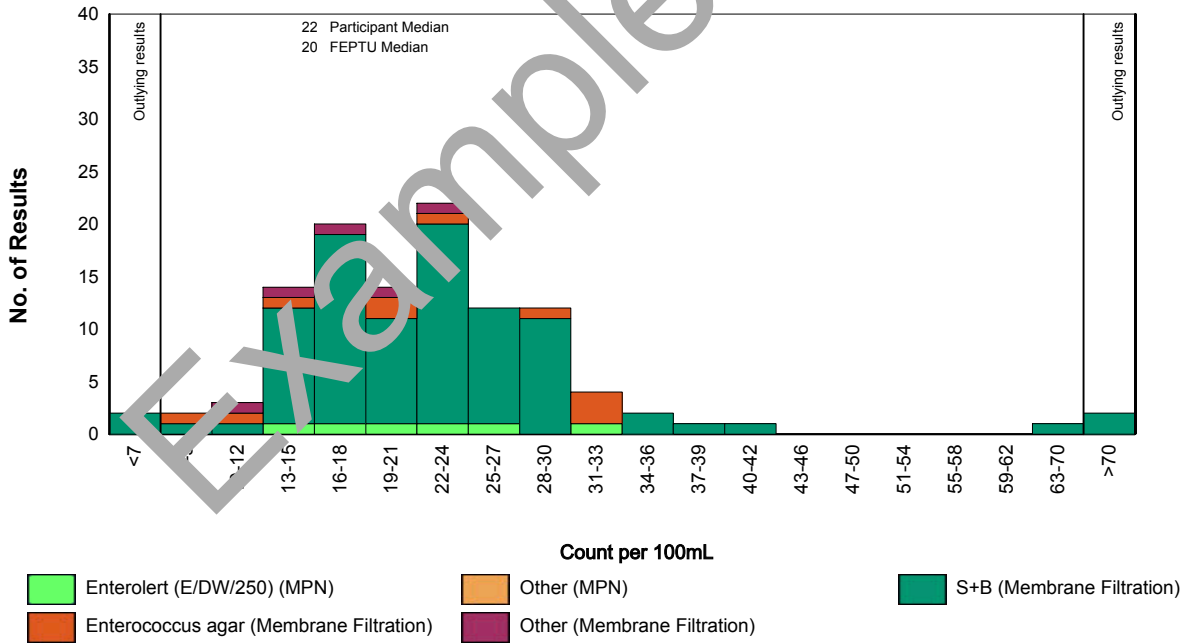
Method based presentation

S82B : Enterococci

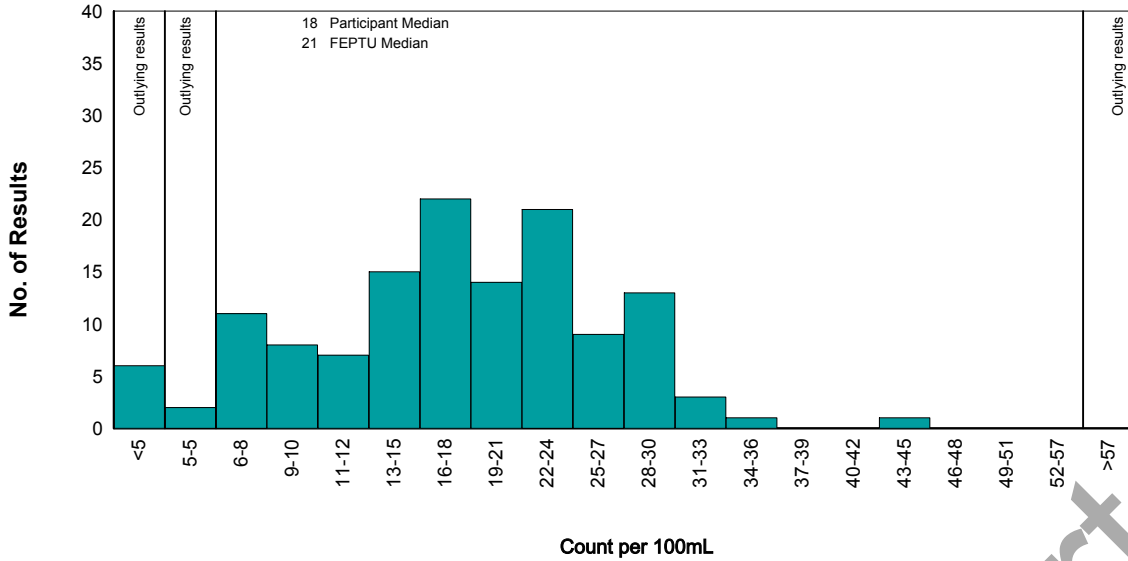
FEPTU Method: S+B

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Enterolert (E/DW/250)	6	0	5			-
Other (MPN)	0	0	0			-
S+B	92	0	81	22	0.13	0 - 406
Enterococcus agar	10	0	9	22	0.23	7 - 33
Other (Membrane filtration)	5	0	4			-

S82B: Enterococci



S82B: *Pseudomonas aeruginosa*



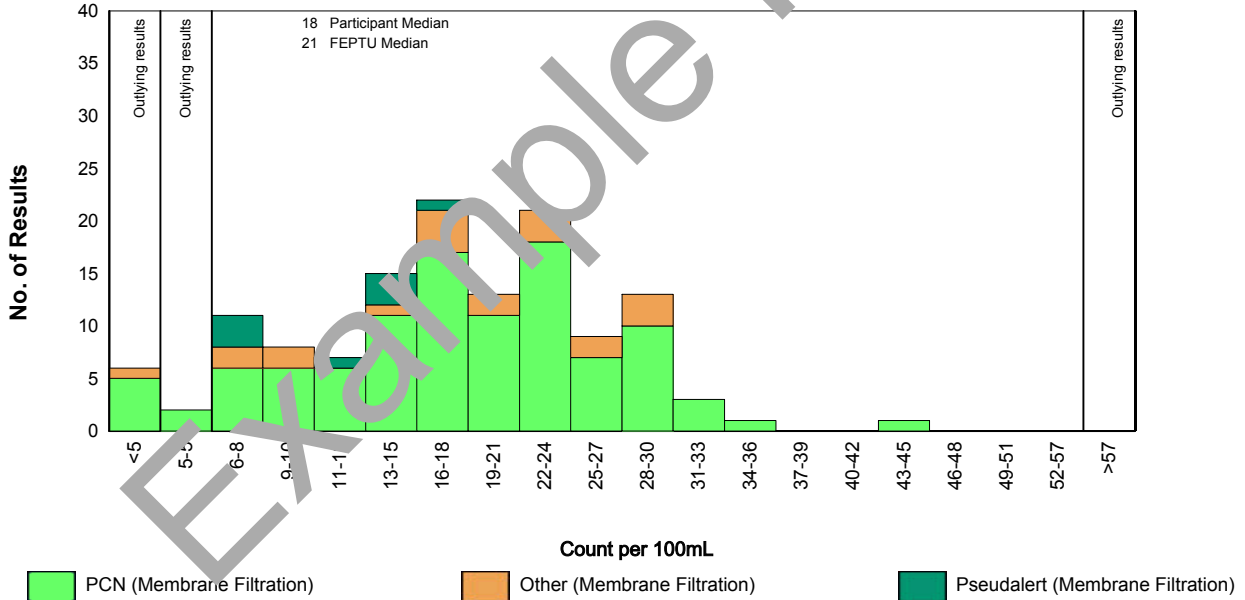
Method based presentation

S82B : *Pseudomonas aeruginosa*

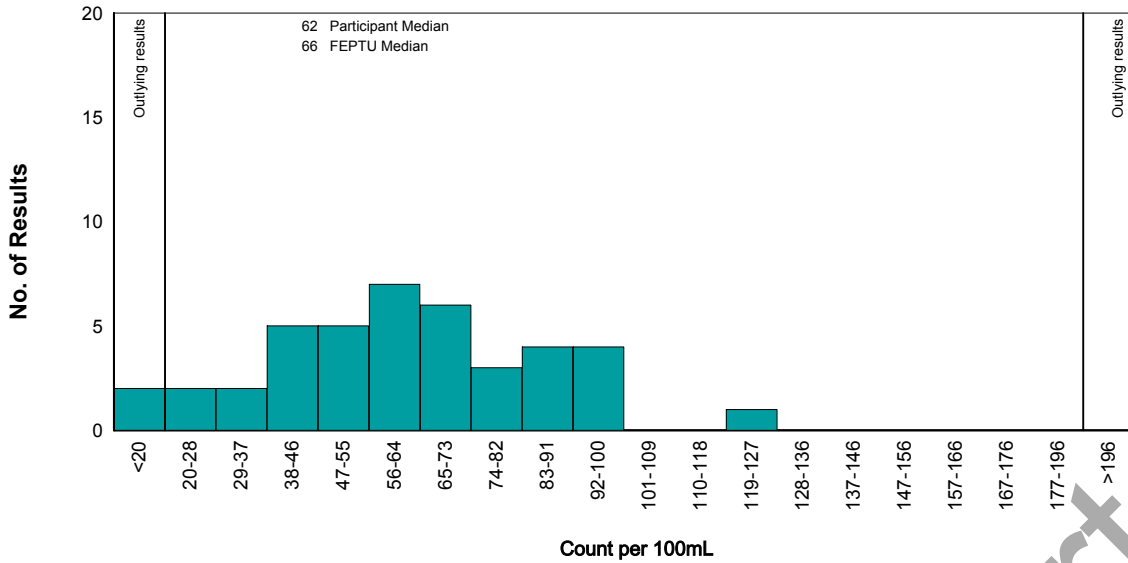
FEPTU Method: PCN

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
PCN	104	0	78	18	0.19	0 - 44
Other (Membrane filtration)	20	0	15	19	0.17	0 - 30
Pseudalert	8	0	6	-	-	-

S82B: *Pseudomonas aeruginosa*



S82B: Total staphylococci



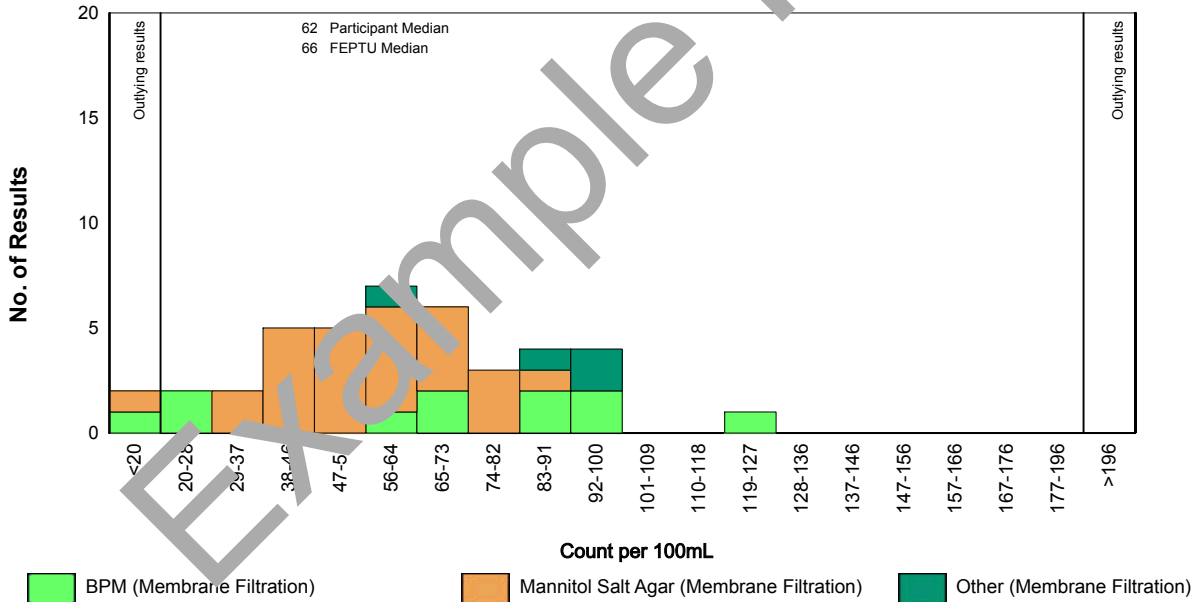
Method based presentation

S82B : Total staphylococci

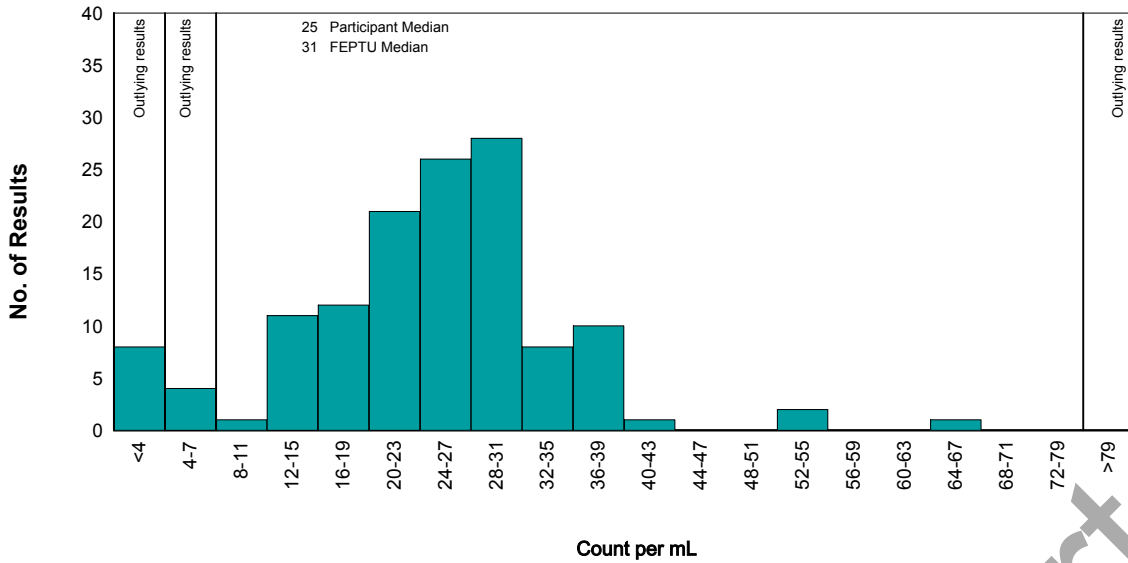
FEPTU Method: BPM

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
BPM	11	0	26	7	0.25	10 - 125
Mannitol Salt Agar	26	1	6	56	0.13	15 - 86
Other (Membrane filtration)	4	1	9			-

S82B: Total staphylococci



S82B: Colony Count 37°C/24 h



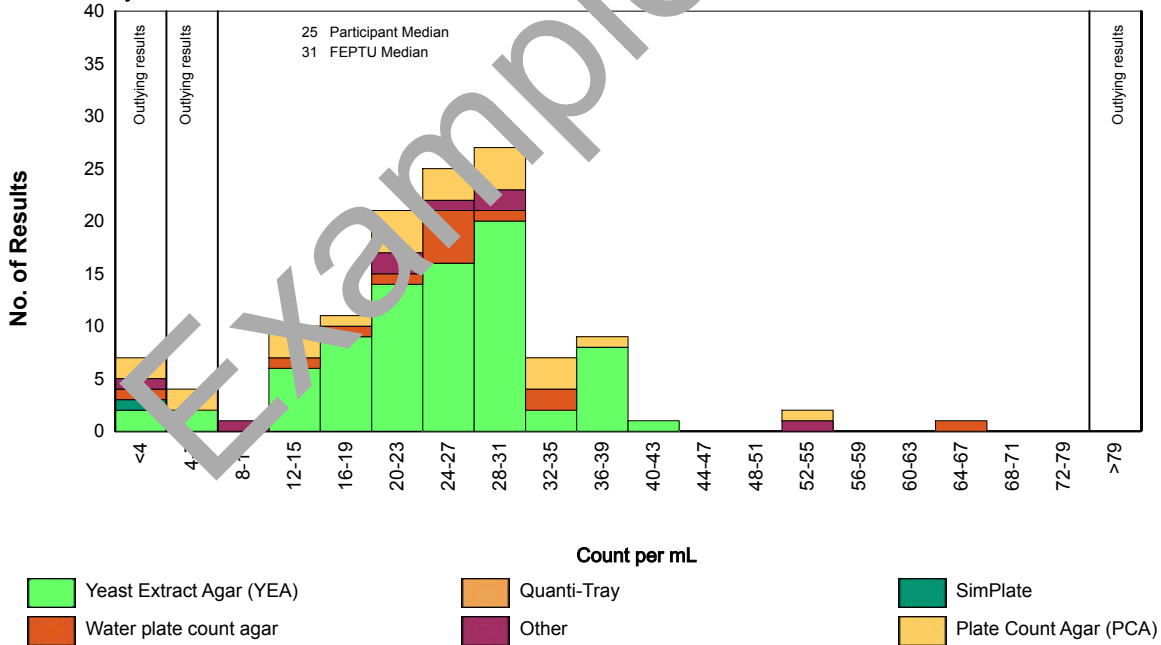
Method based presentation

S82B : Colony Count 37°C/24 h

FEPTU Method: Yeast Extract Agar (YEA)

Method	Number of Results	Excluded Results	Percentage of the total	Median	Robust S* (Log ₁₀)	Range Reported
Yeast Extract Agar (YEA)	80	0	64	25	0.13	0 - 40
Quanti-Tray	0	0	0			-
SimPlate	0	1	0			-
Water plate count agar	13	0	10	26	0.11	0 - 65
Other	8	0	6			-
Plate Count Agar (PCA)	24	0	19	24	0.21	2 - 52

S82B: Colony Count 37°C/24 h



Method based presentation of enumeration results:

Participants are advised if less than 10 laboratories report a result for a method, no data is shown for the Median, Robust SD and the Range Reported in the 'Method based presentation' tables.

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. Therefore, we will post generic reports on the website, which will be available for 12 months after the distribution has closed, so you can access the missing data.

End of report.

Example Report

Example Report