

### Urine Culture, quantitative Round 3, 2017

Thank you for participating in the scheme. Please find enclosed the results of the round. There were 247 participants altogether from 16 countries. Altogether 132 laboratories participated in screening only, whereas 116 laboratories performed further identification of the findings. The specimens were two lyophilized preparations as follows:

**Specimen 001:** *Escherichia coli* ATCC® 25922™,  $>10^5$  CFU/mL

**Specimen 002:** *Enterobacter cloacae* C090618,  $10^{3-4}$  CFU/mL

#### Results

The results of the quantitative urine culture are presented in summary tables. In the vertical column of the table the interpretation of the growth significance and the culture media are reported, and in the horizontal column the extent of the growth as well as whether the specimen/strain would have been referred to another laboratory.

Susceptibility testing results by disk diffusion method of S001 are shown as a numerical summary. Laboratory specific histograms are drawn for each antimicrobial agent if the laboratory's result is included in a group of at least three results. By "group" is meant results which are obtained and interpreted according to the same standard (e.g. EUCAST, CLSI, SRGA, BSAC etc.). Antimicrobial agents of which only a single result has been reported are excluded from the result processing. Please check that the client code on the printout showing your results is correct.

The laboratory specific numerical summaries and report letters of this round are also available on Labquality's homepage ([www.labquality.fi](http://www.labquality.fi)). Please choose Log-in to LabScala on the top right-hand corner and fill in your laboratory client code/personal user name and password. Then please choose "View reports" under "My reports".

#### Comments

##### Specimen 001

Background info: Acute cystitis of a basically healthy female.

The specimen contained *Escherichia coli* ATCC® 25922™,  $>10^5$  CFU/mL.

Altogether 240 out of 247 laboratories reported their results before the closing date. Significant growth was detected by 99.6% of the laboratories. Both the expected amount of bacteria ( $>10^5$  CFU/mL) and correct interpretation of the clinical significance (significant growth) was reported by 87.4% of the participants.

Altogether 25 laboratories used dip slide cultures and 40% of those had their quantitation lower than expected. It seems that there is a need to review the guide for use and interpretation to ensure an accurate result of a dip slide culture.

In all, 113 of the 116 laboratories performing identification reported their results. One of them reported that the finding does not belong to their examination selection. *Escherichia coli* was correctly named by 98.2% (111/113) of the participants. Performance was very good with this specimen.

2017-11-16

#### Final report

Items dispatched	2017-09-05
Closing date	2017-09-28
Expected results	2017-10-03
Final report	2017-11-16

Product no. 5065  
LQ761917031-032/US UN3373  
Subcontracting: Sample pretesting

#### The report includes

- the expected results
- comments on the results by the scheme expert
- laboratory specific tables and scores

#### Request for correction

Recording errors on laboratory's result forms are on laboratory's responsibility. Labquality accepts responsibility only for the result processing.

Requests for correction must be notified in writing within one month of the date in this letter.

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#### Next round

The next Quantitative Urine Culture EQA round 4, 2017, will be carried out in December 2017.

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## Comments on susceptibility results reported for specimen 001.

This *E. coli* ATCC 25922 strain is recommended both by EUCAST and CLSI as a standard reference strain for antimicrobial susceptibility testing. It represents the wild type and has no acquired resistance to relevant antimicrobial agents.

A vast majority of the participating laboratories reporting disk results followed the EUCAST standard. In general, the disk results fell within the accepted limits defined by the standard. However, some unacceptably low values, a few even interpreted as R, were reported among the beta-lactams ampicillin, and meropenem. Majority of the MIC results were reported as "<" or "≤" the MIC value, and, thus, cannot be compared exactly to the corresponding values reported by the reference laboratories and to those in the EUCAST standard. However, again with only a few exceptions, the results indicate susceptibility to all of the agents tested.

In general, this is a good result and tells of good comparability of antimicrobial susceptibility testing between different laboratories following the EUCAST standard. The number of results, reported by laboratories following the CLSI standard was so low that the evaluation of their performance is not possible. Those laboratories which reported results far outside the accepted limits must carefully check their performance. Too small zones of inhibition around some beta-lactam disk may be due to too heavy inoculum or, especially as far as meropenem is concerned, possible degradation of the antimicrobial agent due to inappropriate storage of the disks.

**Table 1.** The MIC results of specimen 001, *Escherichia coli* ATCC® 25922™, reported by two Finnish reference laboratories.

Antimicrobial agent	Ref. laboratory 1		Ref. laboratory 2	
	MIC (mg/L)	SIR*	MIC (mg/L)	SIR*
Amoxicillin-clavulanate	3	S	6	S
Cefotaxime	0.125	S	NA	NA
Ceftazidime	0.19	S	0.125	S
Ceftriaxone	0.125	S	0.047	S
Cefuroxime	4	S	2	S
Cephalexin	NA	NA	20 mm**	S
Ciprofloxacin	0.008	S	0.004	S
Ertapenem	0.004	S	0.004	S
Mecillinam	0.125	S	27 mm**	S
Meropenem	0.012	S	0.016	S
Nitrofurantoin	8	S	6	S
Piperacillin-tazobactam	NA	NA	25 mm**	S
Tobramycin	1	S	0.38	S
Trimethoprim	1.5	S	1	S
Trimethoprim-sulfa	0.125	S	0.125	S
<b>Other tests</b>	<b>Result:</b>			
ESBL	negative		negative	
Carbapenemase	negative		negative	

\* The reference laboratories are following the EUCAST standard.

\*\* Determined by disk diffusion method.

## Specimen 002

Background info: A 90-year-old female with an indwelling catheter.

The specimen contained *Enterobacter cloacae*,  $10^{3-4}$  CFU/mL.

Altogether 240 out of 247 laboratories reported their results before the closing date. Not significant growth was reported by 27.2% of the laboratories.

Deviation in quantification was as expected according to the results of pre-testing. Only few (18) laboratories had estimated the growth  $>10^5$  CFU/mL and most of the participants ended up with the same quantitation as pre-testing laboratories. Those estimating the lower amount of  $10^{3-4}$  CFU/mL reported clearly more often the growth as non-significant as well. Estimating the significance of the growth in samples that are taken through indwelling catheter is challenging indeed. Devices get colonized easily with various species and on the other hand bacteriuria without any symptoms is common in elderly people. Typically scarce background info with this specimen didn't help in interpretation either. Low quantity refers more to colonization and interpretation as non-significant is thus well-founded. The finding doesn't belong to the primary pathogens of UTI either. The results regarding the significance are not scored for this sample.

In all, 113 of the 116 laboratories performing identification reported their results. Ten participants reported that the finding does not belong to their examination selection and three reported a preliminary gram staining result. Altogether, 67.3% (76/113) of participants reported their finding as *E. cloacae*.

This finding was not expected to be identified and it is not scored.

## In general

Before the dispatch of the round a pre-testing of the specimen lots was conducted in two Finnish microbiology laboratories. The specimens were cultured by loop method on CLED and chromogenic culture media. The number of microbes obtained from specimen S001 was  $>10^5$  CFU/mL and from specimen S002  $10^{3-4}$  CFU/mL and  $10^{4-5}$  CFU/mL.

## Scoring

Scoring is implemented for each specimen when 60% or more of the laboratories report a correct/expected result. The following general rules are followed:

### A. Amount and significance of growth (maximum score/specimen is 2p.+ 2p.= 4p.):

- 2 points are given to the expected/correct result regarding the significance of the growth. Laboratories that don't evaluate the significance of the growth but send all plates indicating any growth to the reference laboratory are given 2 points according to the referral.
- 2 points are given to the expected/correct result regarding the amount of the growth (CFU/mL)
- 0 points are given for an incorrect/false result or not reporting the results before closing-date

**Note!** The specimen 002 is scored only for quantitation results in this round, the significance is not scored.

Maximum score in this round is 6p.

	CFU/mL				
	no growth	$<10^3$	$10^3 - <10^4$	$10^4 - 10^5$	$>10^5$
<b>Specimen 001</b>					
Significant growth	-	-	2p.	2p.	4p.
Mixed flora	-	-	-	-	2p.
Not evaluated* / Sent to ref. lab.	-	-	-	2p.	-
<b>Specimen 002</b>					
Significant growth	-	2p.	2p.	2p.	0p.
Mixed flora	-	-	2p.	-	-
No significant growth	0p.	2p.	2p.	2p.	-.
No growth	0p.	-	2p.	-	-
Significance not reported	-	-	2p.	-	-
New sample requested	-	-	2p.	-	-
Unclear	-	-	2p.	2p.	-
Not evaluated* / Sent to ref. lab.	-	-	-	2p.	-

\* These laboratories don't routinely evaluate the significance of the growth but send all plates indicating any growth to the reference laboratory.

Results not returned before closing date      0p.

B. Identification (maximum score is 4p./specimen):

- 4p. (maximum score) is reached by reporting the expected correct result
- 1-3p. is given to results that are partly correct/insufficient regarding the expected finding
- 0p. is given for an incorrect/false result or not reporting the results before closing-date

**Note!** If the finding is not included in the test selection of the laboratory, and they would refer the microbe for further identification, they will reach 2/2p. (maximum score for these referring laboratories is 2 points). However, all laboratories that perform identification are expected to recognize *E. coli*.

**Specimen 001**

Not in test selection, referred for further identification	2/4p.
<i>Escherichia coli</i>	4/4p.
<i>Klebsiella pneumoniae</i>	0/4p.

**Specimen 002**

Not scored

Results not returned before closing date 0p.

The maximum score in this round is **4 p.**

For referring laboratories the maximum score is as well **4 p.**

Päivi Suomala, M.Sc., clinical microbiologist, ISLAB, South Savo regional laboratory, is the expert of this scheme. Antti Nissinen, Ph.D., Synlab and Chief Physician Antti Hakanen, M.D., Ph.D., TUCH Microbiology and Genetics, Finland, have commented on the susceptibility results.

## End of report

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**Annex 1. Urine Culture, 3, 2017.**

The MIC-results reported by the participating laboratories of specimen 001, *E. coli* ATCC 2592  
The results are grouped according to the standard followed in the laboratories.

Antimicrobial agent	MIC-value (mg/L)	SIR-interpretation	Reported results / followed standard		Results in all	n
			CLSI	EUCAST		
Amoxicillin-clavulanate	≤2	S	1	3	4	38
	4	S	5	23	28	
	≤8	S	1	3	4	
	8/12	S		1	1	
	<32	S		1	1	
Amikacin	≤2	S	1	10	11	15
	≤4	S		2	2	
	<8	S	1		1	
	≤16	S	1		1	
Amoxicillin	≤2	S		2	2	3
	<32	S		1	1	
Ampicillin	≤2	S		1	1	30
	4	S	4	19	23	
	≤8	S	2	3	5	
	>32	R		1	1	
Ampicillin-sulbactam	2	S		1	1	2
	4	S		1	1	
Augmentin	4	S		3	3	3
Cefepime	≤0.12	S		6	6	11
	≤1	S	1	4	5	
Cefixime	≤0.25	S		1	1	4
	0.5	S		2	2	
	1	R		1	1	
Cefotaxime	≤0.25	S		10	10	20
	≤1	S	2	7	9	
	≤8	S	1		1	
Cefoxitin	≤4	S		7	7	8
	≤8	S	1		1	
Ceftazidime	≤0.12	S	1	7	8	32
	0.25	S		5	5	
	≤0.5	S	1	3	4	
	≤1	S	2	12	14	
	8	S	1		1	
Ceftriaxone	≤0.5	S	1	1	2	10
	≤1	S		8	8	
Cefuroxime	<2	S		1	1	32
	≤4	S	2	27	29	
	4	R	1		1	
	8	S		1	1	
Cephalexin	<4	S		2	2	17
	8	S	1	7	8	
	16	S	2	5	7	
Ciprofloxacin	0.031	S		1	1	40
	<0.15	S		1	1	
	≤0.25	S	2	30	32	
	≤0.5	S	1	1	2	
	0.5-1	S		1	1	
	≤1	S	1	1	2	
	≤32	S		1	1	
Ertapenem	≤0.012	S	1	11	12	21
	≤0.5	S	1	8	9	
Gentamycin	≤1	S	3	21	24	27
	<2	S		1	1	
	≤4	S	1	1	2	

table continues on the next page

Antimicrobial agent	MIC-value (mg/L)	SIR-interpretation	Reported results / followed standard		Results in all	n
			CLSI	EUCAST		
Imipenem	≤0.25	S	1	5	6	7
	<1	S	1		1	
Levofloxacin	≤0.12	S		1	1	4
	≤0.5	S		1	1	
	1	S		1	1	
	≤2	S		1	1	
Mecillinam	<0.047	S		1	1	10
	≤1	S		9	9	
Meropenem	<0.015	S		1	1	32
	≤0.125	S		2	2	
	≤0.13	S		1	1	
	≤0.25	S	3	23	26	
	≤1	S	1	1	2	
Nitrofurantoin	<4	S		1	1	35
	≤16	S	4	27	31	
	≤32	S		2	2	
	64	S	1		1	
Norfloxacin	≤0.5	S	1	10	11	12
	≤4	S	1		1	
Phosphomycin	≤16	S		6	6	6
Piperacillin	≤4	S		2	2	2
Piperacillin-tazobactam	2	S		1	1	27
	≤4	S	3	20	23	
	≤16	S	1	1	2	
	<20	S		1	1	
Tigecycline	<0.5	S		2	2	2
Tobramycin	≤1	S		10	10	13
	2	S	1	1	2	
	≤4	S		1	1	
Trimethoprim	0.05	S		1	1	20
	<0.12	S		1	1	
	≤0.5	S	2	14	16	
	<2	S		1	1	
	≤8	S		1	1	
Trimethoprim-sulfa	0.125	S		1	1	29
	≤1	S		11	11	
	≤2	S	2	1	3	
	≤20	S	2	12	14	

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