Intended Result			Your Report	Your Score
Specimen 4391	*Escherichia coli* from urine			
	Amikacin	resistant	resistant	Not scored
	Amoxicillin	resistant	resistant	2
	Amoxicillin-clavulanic acid	resistant	resistant	2
	Ampicillin	resistant	resistant	2
	Cefotaxime	resistant	resistant	2
	Ceftazidime	resistant	resistant	2
	Ceftriaxone	resistant	resistant	2
	Cefuroxime	resistant	resistant	2
	Ciprofloxacin	resistant	resistant	2
	Colistin	susceptible	susceptible	2
	Ertapenem	resistant	resistant	2
	Gentamicin	resistant	resistant	2
	Imipenem	susceptible	susceptible	2
	Meropenem	susceptible	susceptible	2
	Piperacillin-tazobactam	resistant	resistant	2
	Tigecycline	susceptible	susceptible	2
	Tobramycin	resistant	resistant	2
	ESBL	positive	positive	2
	AmpC	negative	negative	2
	Carbapenemase	negative	negative	2
Specimen 4392	Beta-haemolytic streptococcus group G from blood			
	Clindamycin	dissociated resistant	resistant	2
	Erythromycin	resistant	resistant	2
	Penicillin	susceptible	susceptible	2
	Tetracycline	susceptible	susceptible	2

Cumulative score information

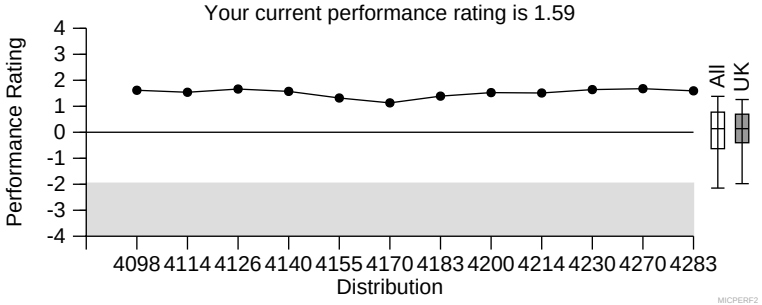
Total number of specimens sent to you for **UK NEQAS for Antimicrobial susceptibility** over the last 6 distributions was 12
Specimen numbers 4078 4079 4132 4133 4178 4179 4226 4227 4346 4347 4392 have been sent

Your cumulative score for the specimen/test combinations that you reported was 262 out of a possible 262
The mean score calculated from the results returned by **UK** laboratories testing the specimen/test combinations you examined was 255.89
with a standard error of 3.83.

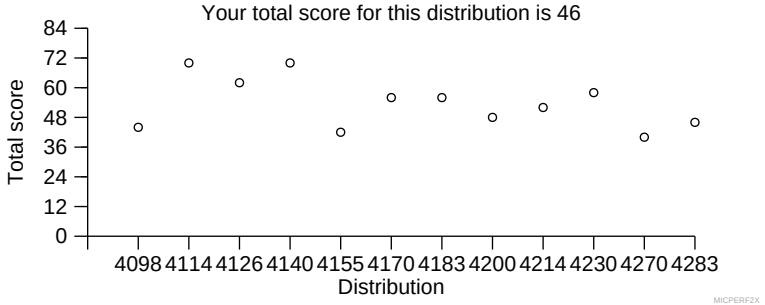
Performance rating
Your performance rating for **UK NEQAS for Antimicrobial susceptibility** (i.e. the number of standard errors by which your cumulative score lies above or below the mean for **UK** laboratories) is **1.59**

A performance rating of more than 1.96 standard errors below the mean indicates possible poor performance.
Your performance rating may change if other participants' results are amended.
No score penalty is incurred for non return of reports, however non return of results may be used as a measure of poor performance.

Your performance rating over the past 12 distributions
Your current performance rating is 1.59



Total score you achieved for each of the last 12 distributions
Your total score for this distribution is 46



Turn around time: The time taken to report your results was 7 days. This information is provided for your own use and does not form part of your performance assessment. Expert comments can be found on the final pages of the report. Report authorised by: Paul Chadwick, Scheme Organiser.

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London SE1 8UG

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Specimen : 4391

Escherichia coli from urine

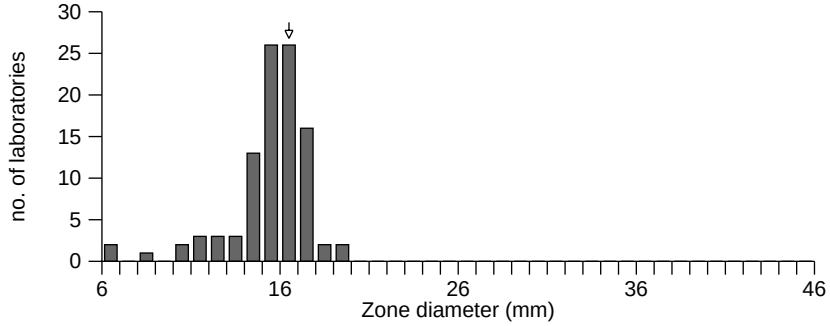
Reference Lab	ISO MIC mg/L 1	2	Result EUCAST	CLSI	Breakpoints EUCAST	CLSI
Amikacin	32	64	R	I/R	S≤8 R>16	S≤16 R≥64
Amoxicillin	>64	>64	R	R	S≤8 R>8	infer from amp
Amoxicillin-clavulanic acid	>64	>64	R	R	S≤8 R>8	S≤8 R≥32
Ampicillin	>64	>64	R	R	S≤8 R>8	S≤8 R≥32
Cefotaxime	>64	>64	R	R	S≤1 R>2	S≤1 R≥4
Ceftazidime	>64	>64	R	R	S≤1 R>4	S≤4 R≥16
Ceftriaxone	>64	>64	R	R	S≤1 R>2	S≤1 R≥4
Cefuroxime	>64	>64	R	R	S≤8 R>8	S≤8 R≥32
Ciprofloxacin	>64	>64	R	R	S≤0.25 R>0.5	S≤1 R≥4
Colistin	0.5	0.5	S	S	S≤2 R>2	
Ertapenem	4	16	R	R	S≤0.5 R>1	S≤0.5 R≥2
Gentamicin	>64	>64	R	R	S≤2 R>4	S≤4 R≥16
Imipenem	0.25	0.5	S	S	S≤2 R>8	S≤1 R≥4
Meropenem	0.5	2	S	S	S≤2 R>8	S≤1 R≥4
Piperacillin-tazobactam	>64	>64	R	R	S≤8 R>16	S≤16 R≥128
Tigecycline	≤0.12	≤0.12	S	S	S≤1 R>2	
Tobramycin	>64	>64	R	R	S≤2 R>4	S≤4 R≥16
ESBL	Pos	Pos				
AmpC	Neg	Neg				
Carbapenemase	Neg	Neg				

Amikacin - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

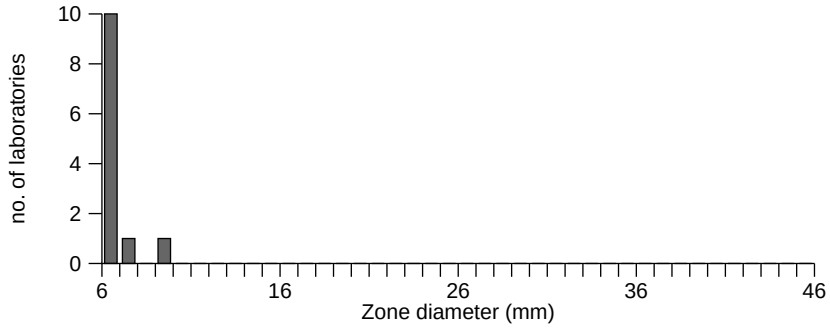
	S	I	R	% concordance
score				
BSAC	7	2	0	22.2
EUCAST	44	185	109	87.0
CLSI	33	31	10	55.4
SRGA	0	1	0	100
All	85	219	119	
UK	26	44	28	

Amoxicillin - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	5	100
EUCAST	0	0	152	100
CLSI	0	0	29	100
All	0	0	186	100.0
UK	0	0	49	100.0

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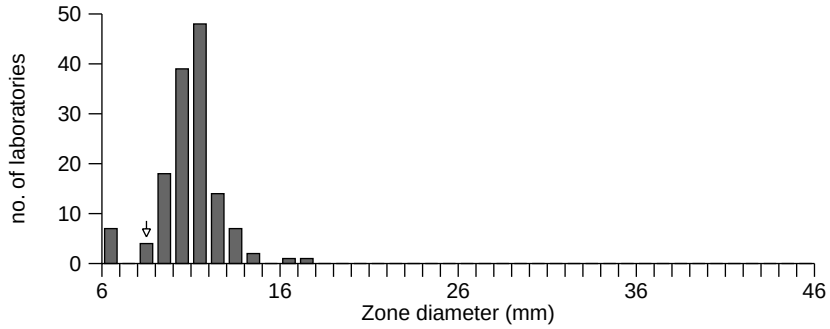
Amoxicillin-clavulanic acid - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

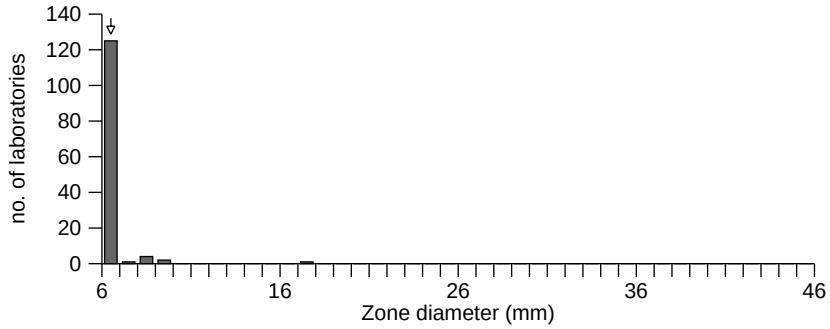
	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	12	100
EUCAST	1	0	467	99.8
CLSI	0	3	74	96.1
NWGA	0	0	2	100
SRGA	0	0	1	100
All	1	3	557	99.3
UK	1	0	168	99.4

Ampicillin - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

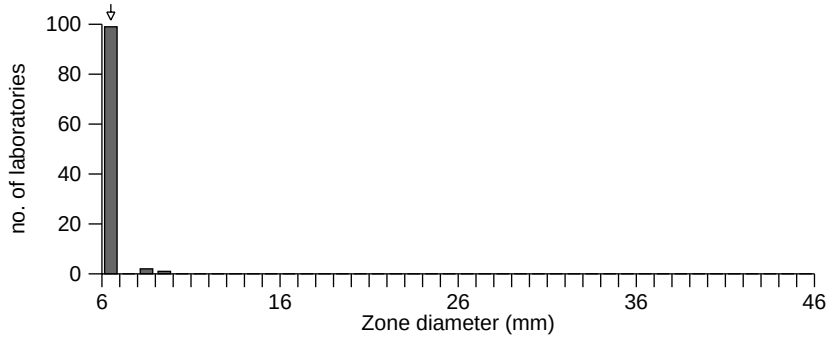
	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	10	100
EUCAST	1	1	421	99.5
CLSI	0	0	78	100
NWGA	0	0	3	100
SRGA	0	0	1	100
All	1	1	514	99.6
UK	0	0	151	100.0

Cefotaxime - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	6	100
EUCAST	1	0	403	99.8
CLSI	0	0	69	100
NWGA	0	0	3	100
SRGA	0	0	2	100
All	1	0	484	99.8
UK	0	0	127	100.0

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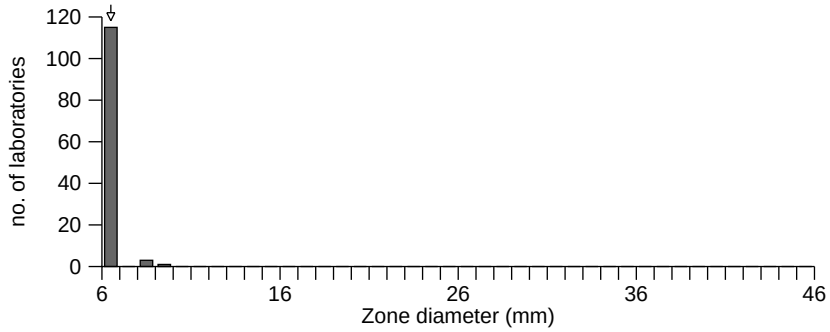
Ceftazidime - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

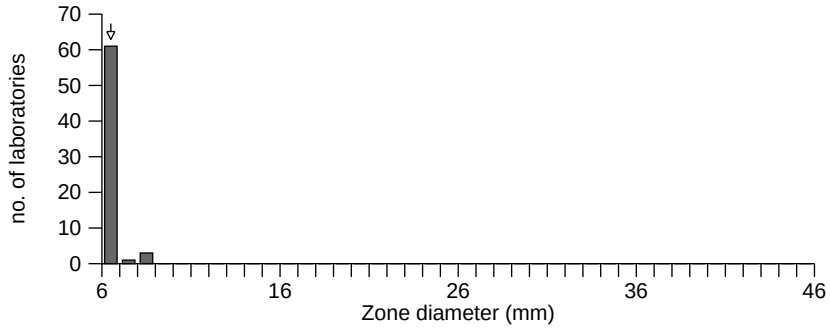
	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	9	100
EUCAST	0	0	452	100
CLSI	0	0	77	100
NWGA	0	0	3	100
SRGA	0	0	2	100
All	0	0	544	100.0
UK	0	0	147	100.0

Ceftriaxone - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

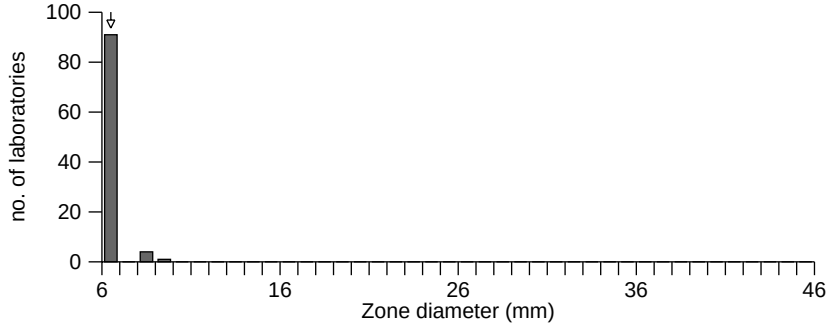
	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	4	100
EUCAST	0	0	207	100
CLSI	0	0	61	100
All	0	0	272	100.0
UK	0	0	50	100.0

Cefuroxime - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	8	100
EUCAST	0	0	374	100
CLSI	0	0	67	100
NWGA	0	0	3	100
All	0	0	452	100.0
UK	0	0	125	100.0

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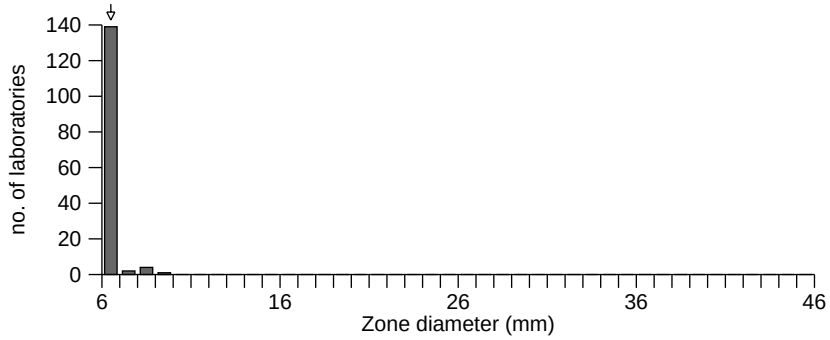
Ciprofloxacin - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	12	100
EUCAST	1	0	481	99.8
CLSI	0	0	76	100
NWGA	0	0	3	100
SRGA	0	0	2	100
All	1	0	576	99.8
UK	0	0	169	100.0

Colistin - specimen 4391

Intended result : susceptible

Your guideline : **EUCAST**

Result by guideline

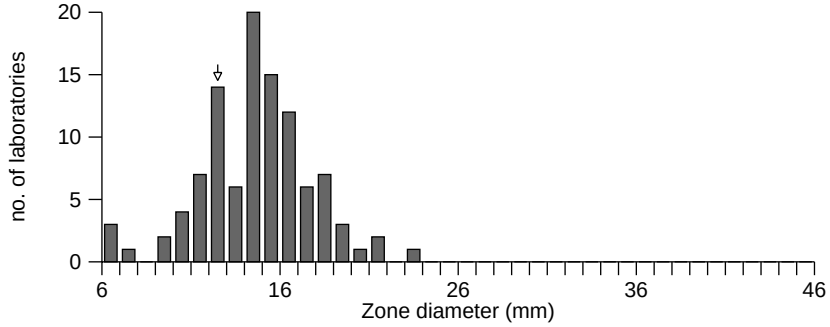
	S	I	R	% concordance
score	2	1	0	
BSAC	1	0	0	100
EUCAST	193	0	4	98.0
CLSI	34	0	2	94.4
All	229	0	6	97.4
UK	20	0	1	95.2

Ertapenem - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	-1	1	2	
BSAC	0	1	8	88.9
EUCAST	6	21	377	93.3
CLSI	2	6	53	86.9
NWGA	0	0	1	100
SRGA	0	0	1	100
All	8	28	441	92.5
UK	2	17	138	87.9

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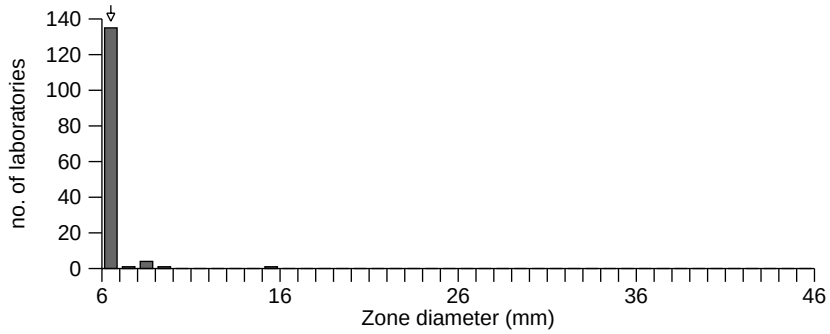
Gentamicin - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

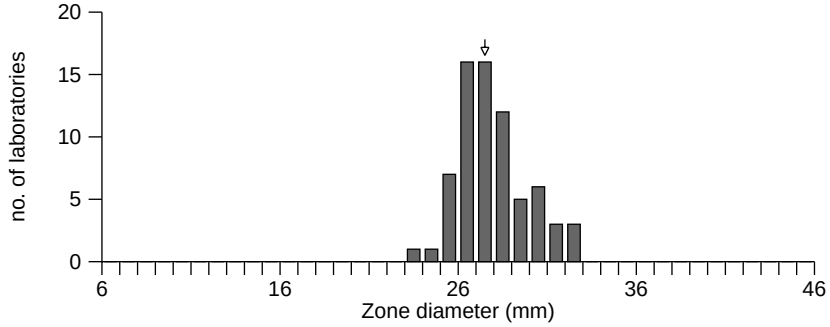
	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	12	100
EUCAST	1	0	469	99.8
CLSI	1	0	80	98.8
NWGA	0	0	3	100
SRGA	0	0	2	100
All	2	0	567	99.6
UK	0	0	171	100.0

Imipenem - specimen 4391

Intended result : susceptible

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

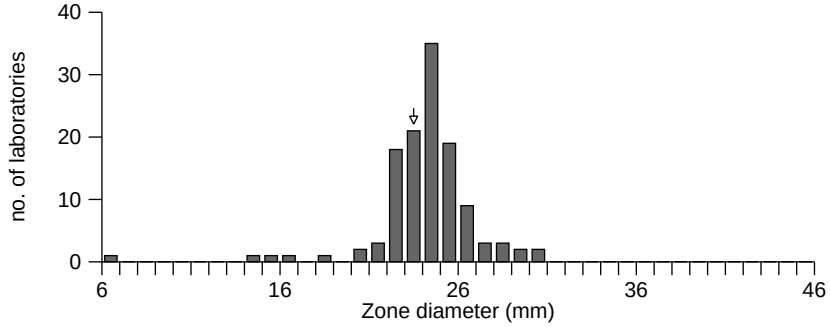
	S	I	R	% concordance
score	2	1	0	
BSAC	5	0	0	100
CRG	1	0	0	100
EUCAST	289	3	9	96.0
CLSI	68	1	1	97.1
NWGA	1	0	0	100
SRGA	2	0	0	100
All	367	4	10	96.3
UK	60	0	2	96.8

Meropenem - specimen 4391

Intended result : susceptible

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	2	1	0	
BSAC	10	2	0	83.3
EUCAST	425	33	15	89.9
CLSI	71	2	2	94.7
NWGA	3	0	0	100
SRGA	2	0	0	100
All	511	37	18	90.3
UK	140	17	7	85.4

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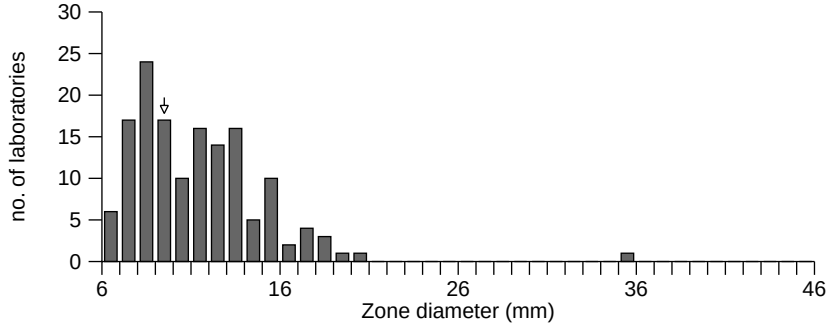
Piperacillin-tazobactam - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

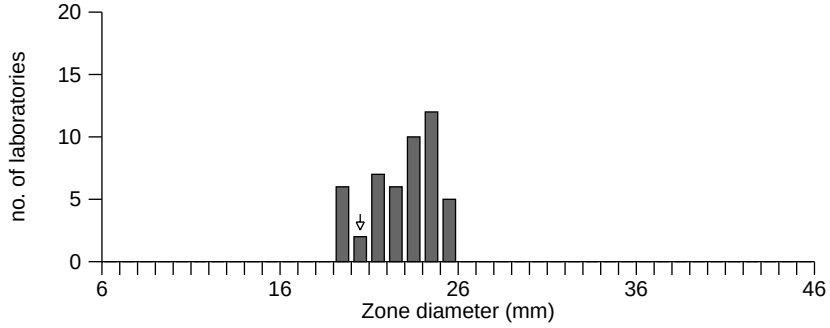
	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	11	100
EUCAST	2	7	462	98.1
CLSI	2	3	69	93.2
NWGA	0	0	3	100
SRGA	0	0	2	100
All	4	10	548	97.5
UK	1	5	161	96.4

Tigecycline - specimen 4391

Intended result : susceptible

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

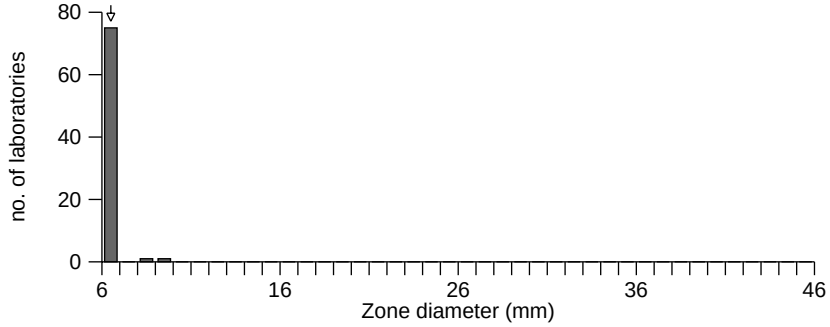
	S	I	R	% concordance
score	2	1	0	
BSAC	4	0	0	100
EUCAST	271	1	4	98.2
CLSI	46	0	0	100
NWGA	1	0	0	100
SRGA	1	0	0	100
All	323	1	4	98.5
UK	77	0	3	96.3

Tobramycin - specimen 4391

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	3	100
EUCAST	2	0	265	99.3
CLSI	1	0	54	98.2
NWGA	0	0	3	100
SRGA	0	0	2	100
All	3	0	328	99.1
UK	0	0	71	100.0

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ESBL - specimen 4391

Intended result : positive

Your guideline : **EUCAST**

Result by guideline

	POS	NEG	% concordance
score	2	0	
BSAC	4	6	40.0
EUCAST	333	73	82.0
CLSI	68	4	94.4
NWGA	2	0	100
SRGA	2	0	100
All	411	83	83.2
UK	75	48	61.0

AmpC - specimen 4391

Intended result : negative

Your guideline : **EUCAST**

Result by guideline

	POS	NEG	% concordance
score	0	2	
BSAC	3	5	62.5
EUCAST	35	192	84.6
CLSI	12	29	70.7
NWGA	0	2	100
SRGA	0	2	100
All	50	230	82.1
UK	11	75	87.2

Carbapenemase - specimen 4391

Intended result : negative

Your guideline : **EUCAST**

Result by guideline

	POS	NEG	% concordance
score	0	2	
BSAC	0	6	100
EUCAST	55	267	82.9
CLSI	4	52	92.9
NWGA	1	1	50.0
SRGA	0	1	100
All	60	328	84.5
UK	19	76	80.0

Specimen : 4392

Beta-haemolytic streptococcus group G from blood

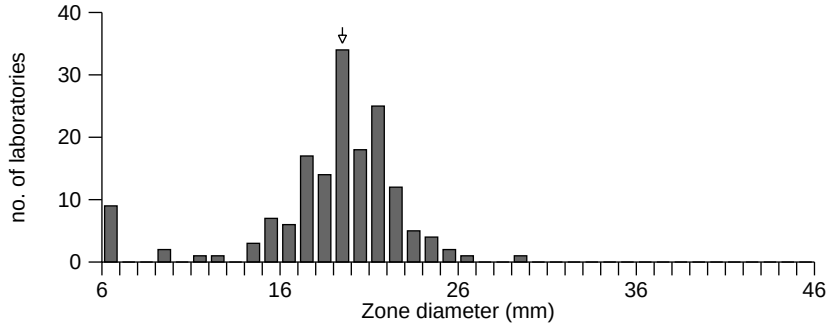
	ISO MIC mg/L		Result		Breakpoints	
Reference Lab	1	2	EUCAST	CLSI	EUCAST	CLSI
Clindamycin	≤0.03	0.06	S	S	S≤0.5 R>0.5	S≤0.25 R ≥1
Erythromycin	2	4	R	R	S≤0.25 R>0.5	S≤0.25 R ≥1
Penicillin	<0.004	0.008	S	S	S≤0.25 R>0.25	S≤0.12
Tetracycline	0.25	0.5	S	S	S≤1 R>2	S≤2 R≥8

Clindamycin - specimen 4392

Intended result : dissociated resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

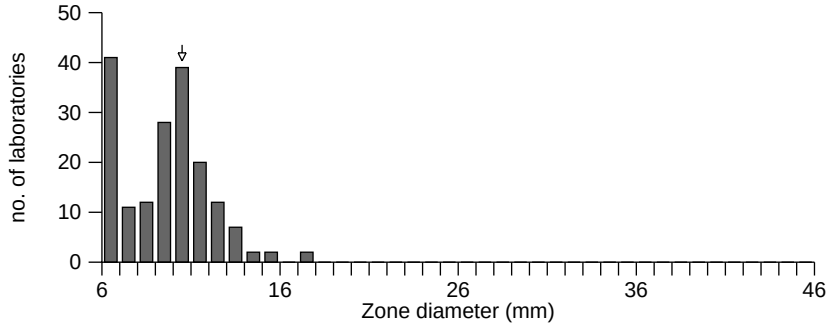
	S	I	R	% concordance
score	-1	1	2	
BSAC	1	0	12	92.3
EUCAST	48	1	401	89.1
CLSI	10	0	62	86.1
NWGA	0	0	3	100
SRGA	0	0	2	100
All	59	1	481	88.9
UK	12	0	137	91.9

Erythromycin - specimen 4392

Intended result : resistant

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

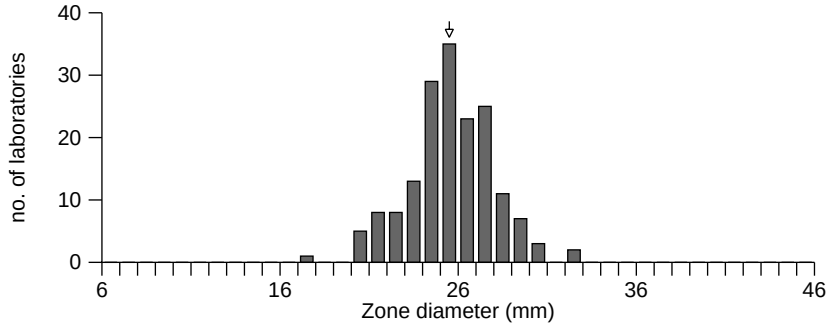
	S	I	R	% concordance
score	-1	1	2	
BSAC	0	0	20	100
EUCAST	3	0	473	99.4
CLSI	0	1	74	98.7
NWGA	0	0	3	100
SRGA	0	0	2	100
All	3	1	573	99.3
UK	0	0	172	100.0

Penicillin - specimen 4392

Intended result : susceptible

Your guideline : **EUCAST**

EUCAST - Disk diffusion EUCAST



Result by guideline

	S	I	R	% concordance
score	2	1	0	
BSAC	21	0	0	100
EUCAST	474	0	0	100
CLSI	74	0	1	98.7
NWGA	3	0	0	100
SRGA	2	0	0	100
All	575	0	1	99.8
UK	172	0	0	100.0

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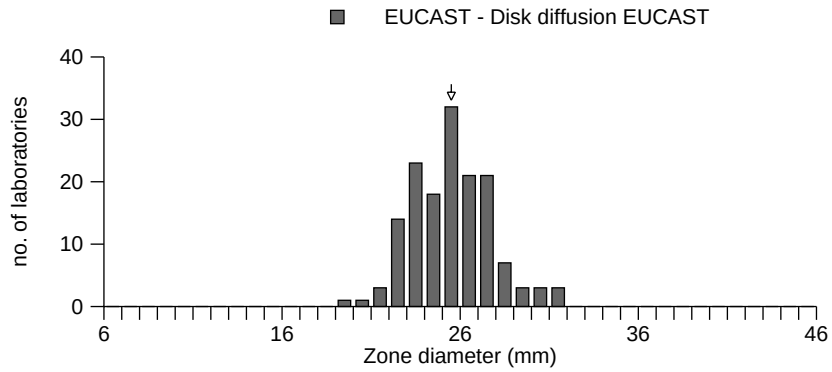
Tetracycline - specimen 4392

Intended result : susceptible

Your guideline : **EUCAST**



Result by guideline

	S	I	R	% concordance
score	2	1	0	
BSAC	19	0	1	95.0
CRG	1	0	0	100
EUCAST	406	8	3	97.4
CLSI	62	4	2	91.2
NWGA	2	0	0	100
All	492	12	6	96.5
UK	166	0	1	99.4

Operated by Public Health England
NIS - Specialist Microbiology Services
133-155 Waterloo Road
Wellington House
London SE1 8UG

UK NEQAS for Microbiology
PO Box 63003
London NW9 1GH

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Distribution 4283

Specimen 4391

This specimen contained a multi-resistant *Escherichia coli*.

Whole genome sequencing indicated the presence of genes encoding multiple beta-lactamases, including, TEM-1, the ESBL CTX-M-15, and the oxacillinase OXA-1. The combination of these enzymes results in resistance to all of the penicillins, cephalosporins and beta-lactam/beta-lactamase combinations tested and also resistance to ertapenem.

For the penicillins, beta-lactam/beta-lactamase inhibitors, and cephalosporins, performance was good, with >97% of participants correctly reporting resistant results. Ertapenem resistance was correctly identified by 92.5% of participants, and imipenem sensitivity was reported correctly by 96.3% of participants. Performance for meropenem was less good. As can be seen in Table 1, only 89.8% of EUCAST-users correctly reported sensitivity, and it appears that incorrect calling of resistance was more common for users of automated systems. This may be due to the rules bases used within the systems.

Table 1: Meropenem susceptibility reports for *Escherichia coli* specimen 4391.

Guideline	Method	n (%)* of participants reporting		
		S	I	R
EUCAST/EUCAST-related	Automated	174 (86.1)	21 (10.4)	7 (3.5)
	Disk diffusion	134 (91.2)	6 (4.1)	7 (4.8)
	MIC	81 (94.2)	4 (4.7)	1 (1.2)
	Multi/other	50 (92.6)	4 (7.4)	0 (0.0)
	Total	439 (89.8)	35 (7.2)	15 (3.1)
CLSI	Automated	25 (92.6)	1 (3.7)	1 (3.7)
	Disk diffusion	29 (100.0)	0 (0.0)	0 (0.0)
	MIC	5	0	1
	Multi/other	12	1	0
	Total	71 (94.7)	2 (2.7)	2 (2.7)

(correct result for each guideline is shaded)

*Percentages not included when totals for a method were <20.

Whole genome sequencing indicated the presence of four genes (*aac(3)-IIa, aac(6')-Ib-cr, aadA2, aph(3')-Ia*) encoding aminoglycoside modifying enzymes, resulting in reduced susceptibility to amikacin, gentamicin, and tobramycin.

More than 99% of participants correctly reported resistance to gentamicin and tobramycin. For amikacin, the reference MICs were 32mg/L and 64 mg/L. This was categorised as

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resistant according to EUCAST criteria (S≤8, R>16), but as intermediate or resistant according to CLSI criteria (S≤16, ≥64). As can be seen in Table 2, only 31.4% of EUCAST users correctly reported a resistant result, and only 55.4% of CLSI users reported the isolate as intermediate or resistant; there was no significant difference in performance between methods used. The poor performance may be due to the fact that the AAC(6')-I enzyme may not confer phenotypic resistance despite modification of amikacin. EUCAST users will be aware that there is an expert rule that attempts to account for this issue (rule 12.7), but the problem was confounded in this isolate by the presence of a multiplicity of aminoglycoside-modifying enzymes.

Table 2: Amikacin susceptibility reports for *Escherichia coli* specimen 4391.

Guideline	Method	n (%)* of participants reporting		
		S	I	R
EUCAST/EUCAST-related	**Automated**	11 (6.5)	103 (61.3)	54 (32.1)
	Disk diffusion	31 (26.1)	60 (50.4)	28 (23.5)
	MIC	7 (20.0)	14 (40.0)	14 (40.0)
	Multi/other	1 (4.0)	11 (44.0)	13 (52.0)
	Total	50 (14.4)	188 (54.2)	109 (31.4)
CLSI	**Automated**	10 (40.0)	10 (40.0)	5 (20.0)
	Disk diffusion	10 (40.0)	11 (44.0)	4 (16.0)
	MIC	8	3	0
	Multi/other	5	7	1
	Total	33 (44.6)	31 (41.9)	10 (13.5)

(correct result for each guideline is shaded)

*Percentages not included when totals for a method were <20.

Specimen 4392

This specimen contained a Beta-haemolytic streptococcus group G expressing disassociated resistance to clindamycin.

There were no significant issues with susceptibility testing.

Only EUCAST and CLSI breakpoints are presented in the report. Performance is assessed against EUCAST MIC breakpoints. Details of the EUCAST breakpoints and organisation are available on the EUCAST website at www.eucast.org and details of CLSI breakpoints and organisation are available at www.clsi.org

Reference MICs were determined by the ISO reference method for MIC determination by broth microdilution and interpreted according to EUCAST guidelines and CLSI guidelines.

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Additional tests used by laboratories for confirmation e.g. *mec*A PCR are not scored. Users of the Stokes method are included in the 'not specified' group under the guideline followed. Totals in the 'result by guideline' tables include results for all participants including those who did not state a guideline/method.

Scoring: For details please refer to the 'bacteriology scoring' document available on our website; click on the 'Scoring' tab

Test results should be reported to UK NEQAS in accordance with the scheme information and any relevant internationally agreed guidance (e.g. EUCAST or CLSI). Test results should be reported as found in the test results fields. Where there is a difference between test results obtained and results that you would report, the reported results should be entered into the reported results fields following international guidelines and NOT local policies.

Enquiries For repeat specimens please order using the web form or e-mail organiser@ukneqasmicro.org.uk stating your laboratory identification number, the distribution name and number, and specimen numbers. For any technical enquires related to this distribution, please contact Dr Paul Chadwick using the email address above. In-house test results are available should you experience a technical failure and wish to discuss the results. Digital images of the isolates included in this distribution are only available on our secure website; click on the DIST button to access intended results and images, usually available on the day following the closing date.

Please note that as of April 2018, participants are no longer be required to identify the organisms in the distribution, as the organism name for each specimen will be provided. Therefore a score will no longer be allocated.