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External Quality Assessment (EQA) of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025

Expected antimicrobial susceptibility testing results for the bacterial strains included in the 2025 EARS-Net EQA exercise

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The 2025 EQA focused on species identification and interpretation of the antimicrobial susceptibility testing (AST) results of the six strains shared with the participating laboratories: *Acinetobacter baumannii* (n=2), *Escherichia coli, Klebsiella pneumoniae*, *Staphylococcus aureus* and *Streptococcus pneumoniae*.

For this EQA, the strains were selected for from the strain collection at the Technical University of Denmark, National Food Institute (DTU Food). Selection was based on antimicrobial resistance profiles and the recommendations from the European Centre for Disease Prevention and Control (ECDC).

The expected AST results for each strain were the consensus of AST results from three reference laboratories: DTU Food (performed in triplicate); the EUCAST Development Laboratory (Växjö, Sweden); and the Microbiological Diagnostic Unit Public Health Laboratory (MDU PHL), The Doherty Institute, Australia. All reference laboratories used the same AST methodology, specifically the determination of minimum inhibitory concentration (MIC) values for each strain-antimicrobial combination by broth microdilution (or by determining zone diameters through disk diffusion when applicable) according to EUCAST clinical breakpoints tables v15.0. The consensus AST results were reviewed and validated by ECDC and the ECDC EARS-Net Disease Network Coordination Committee. DTU Food performed whole-genome sequencing and bioinformatics analyses of each EQA strain to detect relevant acquired antimicrobial resistance genes (ARG) and chromosomal point mutations (PM). During the preparation of the test swabs, DTU Food performed confirmatory AST of the strains by broth microdilution to confirm that the vials contained the correct strains with the expected AST results.

The EUCAST clinical breakpoints tables v15.0 were applied for the interpretation of the obtained AST results (https://www.eucast.org/clinical_breakpoints/) (Tables 2–7). This allowed for categorisation of the test results into three categories: “resistant” (R), ”susceptible, increased exposure” (I), and “susceptible, standard dosing regimen” (S).

The antimicrobial agents selected for this EQA corresponded to the panel of pathogen and antimicrobial agent combinations under surveillance by EARS-Net, presented in the antimicrobial resistance (AMR) reporting protocol 2025[1].

Participating laboratories should perform AST according to the laboratory’s applied routine procedures, i.e. automated systems, broth microdilution, agar dilution, disk/tablet diffusion, gradient-diffusion, or others, following EUCAST recommendations (https://www.eucast.org/ast_of_bacteria/).

If the species of the isolate was identified correctly, then the interpretation of AST results were evaluated using the scoring system of the EQA. Conversely, if the species was not identified correctly, the AST results for that isolate were not evaluated further.

The scoring system considered the ‘level of difficulty’ and ‘severity of error’ of every strain-antimicrobial combination. The level of difficulty, classified as ‘Difficult’ or ‘Easy’, reflected the challenge for participating laboratories to report the expected AST interpretation. ‘Difficult’ were situations where an AST result with a one-fold difference in dilution from the expected MIC value would have a different interpretation of S/I/R; AND/OR the expected MIC value was inside the area of technical uncertainty (ATU); AND/OR the EUCAST clinical breakpoint was recently

changed in, or added to, the latest EUCAST clinical breakpoint table. ‘Easy’ were situations where an AST result with a one-fold difference in dilution from the expected MIC value would have the same interpretation of S/I/R; AND the EUCAST clinical breakpoint was not recently changed in, nor added to, the latest EUCAST clinical breakpoint table. The scoring of a result reflected the level of difficulty, with errors in ‘difficult’ results being considered mild and errors in ‘easy’ results being considered severe. The severity of error was divided into three levels: very major error (VME), major error (ME) and no error. VME is reporting false susceptibility – expecting an R but obtaining an S or I. ME is reporting false resistance – expecting an S or I but obtaining an R. The scoring system penalised VMEs more severily for ‘easy’ results than for ‘difficult’ results, and did not penalise MEs if the test was considered ‘difficult’. The classification of ‘no error’ included situations where one susceptibility category (S or I) was expected, but the other susceptibility category was reported. However, this results in a lower score than if the expected susceptibility category was reported. Table 1 shows the 2025 EARS-Net EQA scoring system.

Table 1. Exercise scoring system for reported AST results in the 2025 EARS-Net EQA

		Difficulty of result and expected interpretation					
		Easy			Difficult		
		R	I	S	R	I	S
Obtained interpretation	R	1	-3 (ME)	-3 (ME)	4	0 (ME)	0 (ME)
	I	-4 (VME)	1	-1	-1 (VME)	4	2
	S	-4 (VME)	-1	1	-1 (VME)	2	4
	Not reported	-	-	-	-	-	-

Note: R: resistant, I: susceptible, increased exposure, S: susceptible, standard dosing regimen; VME: very major error, ME: major error; - : no data.

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References

1. Antimicrobial resistance (AMR) reporting protocol 2025. European Antimicrobial Resistance Surveillance Network (EARS-Net) surveillance data for 2025

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2025 EARS-Net 1: *Klebsiella pneumoniae*

Table 2. EUCAST clinical breakpoints for *Klebsiella pneumoniae* and the expected AST results, level of difficulty in interpretation and expected interpretations for strain '2025 EARS-Net 1' (*K. pneumoniae*), by antimicrobial agent

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*			EUCAST zone diameter breakpoints (mm)*			Level of difficulty**	Expected result***	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	ATU	S ≥	R <	ATU				
Amikacin	8	8		18	18		Difficult	16	R	aac(6')-Ib, aph(3')-VI
Amoxicillin-clavulanic acid iv (fixed 2 mg/L)	8	8		19	19	19-20	Easy	>64	R	blaNDM-1, blaDHA-1
Aztreonam-avibactam (fixed 4 mg/L)	4	4		25	25	22-24	Easy	0.06	S	Unknown - absent from databases
Cefepime	1	4		27	24		Easy	>16	R	blaNDM-1, blaCTX-M-15
Cefiderocol	2	2		23	23	21-23	Difficult	18 mm	R	Unknown - absent from databases
Cefotaxime	1	2		20	17		Easy	>8	R	blaNDM-1, blaDHA-1, blaCTX-M-15
Ceftazidime	1	4		22	19		Easy	>16	R	blaNDM-1, blaDHA-1, blaCTX-M-15
Ceftazidime-avibactam (fixed 4 mg/L)	8	8		13	13		Easy	>16	R	blaNDM-1
Ceftolozane-tazobactam (fixed 4 mg/L)	2	2		22	22	19-21	Easy	>8	R	Unknown - absent from databases
Ceftriaxone	1	2		27	24		Easy	>4	R	blaCTX-M-15
Ciprofloxacin	0.25	0.5	0.5	25	22	22-24	Difficult	1	R	qnrS1, qnrB4
Colistin	2	2		Note	Note		Easy	0.5	S	None

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*			EUCAST zone diameter breakpoints (mm)*			Level of difficulty**	Expected result***	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	ATU	S ≥	R <	ATU				
Ertapenem	0.5	0.5		23	23		Easy	>4	R	blaNDM-1
Gentamicin	2	2		17	17		Easy	0.5	S	None
Imipenem	2	4		22	19		Difficult	8	R	blaNDM-1
Imipenem-relebactam (fixed 4 mg/L)	2	2		22	22	20-22	Easy	8	R	Unknown - absent from databases
Levofloxacin	0.5	1		23	19		Difficult	1	I	qnrS1, qnrB4
Meropenem	2	8		22	16		Difficult	16	R	blaNDM-1
Meropenem-vaborbactam (fixed 8 mg/L)	8	8		20	20	15-19	Difficult	8	S	Unknown - absent from databases
Moxifloxacin	0.25	0.25		22	22		Easy	2	R	qnrS1, qnrB4
Ofloxacin	0.25	0.5		24	22		Easy	>2	R	qnrS1, qnrB4
Piperacillin-tazobactam (fixed 4 mg/L)	8	8	16	20	20	19	Easy	>64	R	blaNDM-1, blaDHA-1
Tobramycin	2	2		16	16		Easy	>8	R	aac(6')-Ib

* EUCAST Clinical Breakpoint Tables v15.0, valid from 01-01-2025. Note: Please refer to notes in the breakpoint tables.

** The level of difficulty reflects the challenge for participating laboratories to report the expected AST interpretation. 'Difficult' are situations where an AST result with a one-fold difference in dilution from the expected MIC value would have a different interpretation of S/I/R; AND/OR the expected MIC value is inside the area of technical uncertainty (ATU); AND/OR the EUCAST clinical breakpoint was recently changed in, or added to, the latest EUCAST clinical breakpoint table. 'Easy' are situations where an AST result with a one-fold difference in dilution from the expected MIC value will have the same interpretation of S/I/R; AND the EUCAST clinical breakpoint was not recently changed in, nor added to, the latest EUCAST clinical breakpoint table.

*** For most antimicrobials the expected value corresponds to the MIC expressed in 'mg/L'. For cefiderocol the expected value corresponds to the inhibition zone diameter expressed in 'mm', because the latest EUCAST guidelines or EUCAST warnings recommend a disk diffusion test instead of broth microdilution.

**** Detected with ResFinder v4.6.0, AMRFinderPlus v4.0.19 and CARD-RGI v6.0.4. Additional antimicrobial resistance genes or chromosomal point mutations: blaTEM-1, blaOXA-9, blaSHV-11 (intrinsic), sul1, dfra14, aadA1, aph(6)-Id, aph(3")-Ib, mph(A), OqxA (intrinsic), OqxB (intrinsic), fosA6 (intrinsic), acrR mutations potentially associated with decreased susceptibility towards fluoroquinolones (P161R, G164A, F172S, R173G, L195V, F197I, K201M), ompK36 mutations potentially associated with decreased susceptibility towards cephalosporins (N49S, L59V, L191S, F207W, D224E, L228V, E232R, T254S), ompK36 mutations potentially associated with decreased susceptibility towards carbapenems (A217S, N218H), ompK37 mutations potentially associated with decreased susceptibility towards carbapenems (I70M, I128M).

2025 EARS-Net 2: *Acinetobacter baumannii*

Table 3. EUCAST clinical breakpoints for *Acinetobacter baumannii* and the expected AST results, level of difficulty in interpretation and expected interpretations for strain '2025 EARS-Net 2' (*A. baumannii*), by antimicrobial agent

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*		EUCAST zone diameter breakpoints (mm)*		Level of difficulty**	Expected result***	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	S ≥	R <				
Amikacin	8	8	19	19	Difficult	16	R	aph(3')-VI
Cefiderocol	Note	Note	Note	Note	Difficult	14 mm	R	Unknown - absent from databases
Ciprofloxacin	0.001	1	50	21	Easy	>4	R	gyrA S81L, parC S84L, parC V104I, parC D105E
Colistin	2	2	Note	Note	Easy	<=0,5	S	None
Gentamicin	4	4	17	17	Difficult	4	S	None
Imipenem	2	4	24	21	Easy	>8	R	blaNDM-1
Levofloxacin	0.5	1	23	20	Easy	>4	R	gyrA S81L, parC S84L, parC V104I, parC D105E
Meropenem	2	8	21	15	Easy	>16	R	blaNDM-1
Tobramycin	4	4	17	17	Easy	1	S	None

* EUCAST Clinical Breakpoint Tables v15.0, valid from 01-01-2025. Note: Please refer to notes in the breakpoint tables.
** The level of difficulty reflects the challenge for participating laboratories to report the expected AST interpretation. 'Difficult' are situations where an AST result with a one-fold difference in dilution from the expected MIC value would have a different interpretation of S/I/R; AND/OR the expected MIC value is inside the area of technical uncertainty (ATU); AND/OR the EUCAST clinical breakpoint was recently changed in, or added to, the latest EUCAST clinical breakpoint table. 'Easy' are situations where an AST result with a one-fold difference in dilution from the expected MIC value will have the same interpretation of S/I/R; AND the EUCAST clinical breakpoint was not recently changed in, nor added to, the latest EUCAST clinical breakpoint table.
*** For most antimicrobials the expected value corresponds to the MIC expressed in 'mg/L'. For cefiderocol the expected value corresponds to the inhibition zone diameter expressed in 'mm', because the latest EUCAST guidelines or EUCAST warnings recommend a disk diffusion test instead of broth microdilution.
**** Detected with ResFinder v4.6.0, AMRFinderPlus v4.0.19 and CARD-RGI v6.0.4. Additional antimicrobial resistance genes or chromosomal point mutations: msr(E), mph(E), sul2, ant(3")-IIa, blaOXA-94 (OXA-51-like, likely intrinsic), blaADC-25 (likely intrinsic).

2025 EARS-Net 3: *Staphylococcus aureus*

Table 4. EUCAST clinical breakpoints for *Staphylococcus aureus* and the expected AST results, level of difficulty in interpretation and expected interpretations for strain '2025 EARS-Net 3' (*S. aureus*), by antimicrobial agent

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*		EUCAST zone diameter breakpoints (mm)*		Level of difficulty**	Expected result***	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	S ≥	R <				
Oxacillin	Note	Note	Note	Note	Easy	>8	R	mecA
Cefoxitin	Note	Note	22	22	Easy	11 mm	R	mecA
Ciprofloxacin	0.001	2	50	17	Easy	<=0,5	I	None
Levofloxacin	0.001	1	50	22	Easy	<=0,25	I	None
Norfloxacin	-	-	17	17	Difficult	20 mm	S	None
Vancomycin	2	2	Note	Note	Easy	<=1	S	None
Linezolid	4	4	21	21	Easy	<=2	S	None
Daptomycin	1	1	Note	Note	Easy	<=0,25	S	None
Rifampicin	0.06	0.06	26	26	Easy	<=0,08	S	None

* EUCAST Clinical Breakpoint Tables v15.0, valid from 01-01-2025. Note: Please refer to notes in the breakpoint tables.
** The level of difficulty reflects the challenge for participating laboratories to report the expected AST interpretation. 'Difficult' are situations where an AST result with a one-fold difference in dilution from the expected MIC value would have a different interpretation of S/I/R; AND/OR the expected MIC value is inside the area of technical uncertainty (ATU); AND/OR the EUCAST clinical breakpoint was recently changed in, or added to, the latest EUCAST clinical breakpoint table. 'Easy' are situations where an AST result with a one-fold difference in dilution from the expected MIC value will have the same interpretation of S/I/R; AND the EUCAST clinical breakpoint was not recently changed in, nor added to, the latest EUCAST clinical breakpoint table.
*** For most antimicrobials the expected value corresponds to the MIC expressed in 'mg/L'. For cefoxitin and norfloxacin the expected value corresponds to the inhibition zone diameter expressed in 'mm', because the latest EUCAST guidelines or EUCAST warnings recommend a disk diffusion test instead of broth microdilution.
**** Detected with ResFinder v4.6.0, AMRFinderPlus v4.0.19 and CARD-RGI v6.0.4. Additional antimicrobial resistance genes or chromosomal point mutations: blaZ, tet(M), dfrG, str, murA mutations potentially associated with decreased susceptibility towards fosfomycin (D278E, E291D), glpT mutations potentially associated with decreased susceptibility towards fosfomycin (F3I, A100V).

2025 EARS-Net 4: *Acinetobacter baumannii*

Table 5. EUCAST clinical breakpoints, expected AST results for *Acinetobacter baumannii* and the level of difficulty in interpretation and expected interpretations for strain '2025 EARS-Net 4' (*A baumannii*), by antimicrobial agent

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*		EUCAST zone diameter breakpoints (mm)*		Level of difficulty*	Expected result**	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	S ≥	R <				
Amikacin	8	8	19	19	Easy	>32	R	armA, aph(3')-Via
Cefiderocol	Note	Note	Note	Note	Difficult	19 mm	I	Unknown - absent from databases
Ciprofloxacin	0.001	1	50	21	Easy	>4	R	gyrA S81L, parC S84L, parC V104I, parC D105E
Colistin	2	2	Note	Note	Easy	>4	R	None
Gentamicin	4	4	17	17	Easy	>16	R	armA, aph(3')-Via
Imipenem	2	4	24	21	Easy	>8	R	blaOXA-23
Levofloxacin	0.5	1	23	20	Easy	>4	R	gyrA S81L, parC S84L, parC V104I, parC D105E
Meropenem	2	8	21	15	Easy	>16	R	blaOXA-23
Tobramycin	4	4	17	17	Easy	>8	R	armA

* EUCAST Clinical Breakpoint Tables v15.0, valid from 01-01-2025. Note: Please refer to notes in the breakpoint tables.
** The level of difficulty reflects the challenge for participating laboratories to report the expected AST interpretation. 'Difficult' are situations where an AST result with a one-fold difference in dilution from the expected MIC value would have a different interpretation of S/I/R; AND/OR the expected MIC value is inside the area of technical uncertainty (ATU); AND/OR the EUCAST clinical breakpoint was recently changed in, or added to, the latest EUCAST clinical breakpoint table. 'Easy' are situations where an AST result with a one-fold difference in dilution from the expected MIC value will have the same interpretation of S/I/R; AND the EUCAST clinical breakpoint was not recently changed in, nor added to, the latest EUCAST clinical breakpoint table.
*** For most antimicrobials the expected value corresponds to the MIC expressed in 'mg/L'. For cefiderocol the expected value corresponds to the inhibition zone diameter expressed in 'mm', because the latest EUCAST guidelines or EUCAST warnings recommend a disk diffusion test instead of broth microdilution.
**** Detected with ResFinder v4.6.0, AMRFinderPlus v4.0.19 and CARD-RGI v6.0.4. Additional antimicrobial resistance genes or chromosomal point mutations: msr(E), mph(E), sul2, tet(B), aph(6)-Id, aph(3')-Ia, aph(3")-Ib, ant(3")-IIa, blaTEM-1, blaOXA-66 (OXA-51-like, likely intrinsic), blaADC-25 (likely intrinsic), ftsI A515V potentially associated with decreased susceptibility towards carbapenems, pmrC R125P potentially associated with decreased susceptibility towards colistin.

2025 EARS-Net 5: *Escherichia coli*

Table 6. EUCAST clinical breakpoints for *Escherichia coli* and the expected AST results, level of difficulty in interpretation and expected interpretations for strain '2025 EARS-Net 5' (*E. coli*), by antimicrobial agent

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*			EUCAST zone diameter breakpoints (mm)*			Level of difficulty **	Expected result***	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	ATU	R <	S ≤	ATU				
Amikacin	8	8		18	18		Easy	4	S	aac(6')-Ib-cr
Amoxicillin	8	8		Note	Note		Easy	>32	R	blaNDM-5, blaOXA-1, blaOXA-181, blaCMY-2
Amoxicillin-clavulanic acid (fixed 2 mg/L)	8	8		19	19	19-20	Easy	>32	R	blaNDM-5, blaOXA-1, blaOXA-181, blaCMY-2
Ampicillin	8	8		14	14		Easy	>32	R	blaNDM-5, blaOXA-1, blaOXA-181, blaCMY-2
Aztreonam-avibactam (fixed 4 mg/L)	4	4		25	25	22-24	Easy	2	S	Unknown - absent from databases
Cefepime	1	4		27	24		Easy	>16	R	blaNDM-5, blaCTX-M-15, blaOXA-1, blaOXA-181
Cefiderocol	2	2		23	23	21-23	Easy	16 mm	R	Unknown - absent from databases
Cefotaxime	1	2		20	17		Easy	>8	R	blaNDM-5, blaCTX-M-15, blaCMY-2
Ceftazidime	1	4		22	19		Easy	>16	R	blaNDM-5, blaCTX-M-15, blaCMY-2
Ceftazidime-avibactam (fixed 4 mg/L)	8	8		13	13		Easy	>16	R	blaNDM-5
Ceftolozane-tazobactam (fixed 4 mg/L)	2	2		22	22	19-21	Easy	>8	R	Unknown - absent from databases
Ceftriaxone	1	2		27	24		Easy	>4	R	blaCTX-M-15
Ciprofloxacin	0.25	0.5	0.5	25	22	22-24	Easy	>4	R	qnrS1, aac(6')-Ib-cr, gyrA S83L, gyrA D87N, parC S80I, parE S458A

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*			EUCAST zone diameter breakpoints (mm)*			Level of difficulty **	Expected result***	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	ATU	R <	S ≤	ATU				
Colistin	2	2		Note	Note		Easy	<=0,5	S	None
Ertapenem	0.5	0.5		23	23		Easy	>4	R	blaNDM-5, blaOXA-181
Gentamicin	2	2		17	17		Easy	>16	R	aac(3)-Iid
Imipenem	2	4		22	19		Easy	>8	R	blaNDM-5, blaOXA-181
Imipenem-relebactam (fixed 4 mg/L)	2	2		22	22	20-22	Easy	>4	R	Unknown - absent from databases
Levofloxacin	0.5	1		23	19		Easy	>4	R	qnrS1, aac(6')-Ib-cr, gyrA S83L, gyrA D87N, parC S80I, parE S458A
Meropenem	2	8		22	16		Easy	>16	R	blaNDM-5, blaOXA-181
Meropenem-vaborbactam (fixed 8 mg/L)	8	8		20	20	15-19	Easy	>16	R	Unknown - absent from databases
Moxifloxacin	0.25	0.25		22	22		Easy	>8	R	qnrS1, aac(6')-Ib-cr, gyrA S83L, gyrA D87N, parC S80I, parE S458A
Ofloxacin	0.25	0.5		24	22		Easy	>2	R	qnrS1, aac(6')-Ib-cr, gyrA S83L, gyrA D87N, parC S80I, parE S458A
Piperacillin-tazobactam (fixed 4 mg/L)	8	8	16	20	20	19	Easy	>64	R	blaNDM-5, blaOXA-1, blaOXA-181, blaCMY-2
Tigecycline	0.5	0.5		18	18		Easy	<=0,25	S	None
Tobramycin	2	2		16	16		Easy	>8	R	aac(6')-Ib-cr

* EUCAST Clinical Breakpoint Tables v15.0, valid from 01-01-2025. Note: Please refer to notes in the breakpoint tables.
** The level of difficulty reflects the challenge for participating laboratories to report the expected AST interpretation. 'Difficult' are situations where an AST result with a one-fold difference in dilution from the expected MIC value would have a different interpretation of S/I/R; AND/OR the expected MIC value is inside the area of technical uncertainty (ATU); AND/OR the EUCAST clinical breakpoint was recently changed in, or added to, the latest EUCAST clinical breakpoint table. 'Easy' are situations where an AST result with a one-fold difference in dilution from the expected MIC value will have the same interpretation of S/I/R; AND the EUCAST clinical breakpoint was not recently changed in, nor added to, the latest EUCAST clinical breakpoint table.

*** For most antimicrobials the expected value corresponds to the MIC expressed in ‘mg/L’. For cefiderocol the expected value corresponds to the inhibition zone diameter expressed in ‘mm’, because the latest EUCAST guidelines or EUCAST warnings recommend a disk diffusion test instead of broth microdilution.
**** Detected with ResFinder v4.6.0, AMRFinderPlus v4.0.19 and CARD-RGI v6.0.4. Additional antimicrobial resistance genes or chromosomal point mutations: blaTEM-1, aph(6)-Id, aph(3")-Ib, aadA2, aadA5, mph(A), catB3, sul1, sul2, tet(B), dfrA12, dfrA17, ompC R195L potentially associated with decreased susceptibility towards carbapenems, glpT E448K potentially associated with decreased susceptibility towards fosfomycin, ftsI N337NYRIN potentially associated with decreased susceptibility towards aztreonam and cephalosporins.

2025 EARS-Net 6: *Streptococcus pneumoniae*

Table 7. EUCAST clinical breakpoints for *Streptococcus pneumoniae* and the expected MIC value, level of difficulty in interpretation and interpretation for strain '2025 EARS-Net 6' (*S. pneumoniae*), by antimicrobial agent

Antimicrobial	EUCAST clinical breakpoints MIC (mg/L)*		EUCAST zone diameter breakpoints (mm)*		Level of difficulty**	Expected result***	Expected interpretation	Genetic determinants of AMR****
	S ≤	R >	S ≥	R <				
Oxacillin	-	-	20	20	Easy	27 mm	S	None
Azithromycin	0.25	0.25	Note	Note	Easy	<=0,06	S	None
Benzylpenicillin	0.06	1	Note	Note	Easy	0.015	S	None
Cefotaxime	0.5	2	Note	Note	Easy	<=0,03	S	None
Ceftriaxone	0.5	2	Note	Note	Easy	<=0,03	S	None
Clarithromycin	0.25	0.25	Note	Note	Easy	<=0,03	S	None
Erythromycin	0.25	0.25	22	22	Easy	0.03	S	None
Levofloxacin	0.001	2	50	16	Easy	1	I	None
Moxifloxacin	0.5	0.5	22	22	Easy	0.125	S	None
Norfloxacin	-	-	10	10	Easy	20 mm	S	None

* EUCAST Clinical Breakpoint Tables v15.0, valid from 01-01-2025. Note: Please refer to notes in the breakpoint tables.
** The level of difficulty reflects the challenge for participating laboratories to report the expected AST interpretation. 'Difficult' are situations where an AST result with a one-fold difference in dilution from the expected MIC value would have a different interpretation of S/I/R; AND/OR the expected MIC value is inside the area of technical uncertainty (ATU); AND/OR the EUCAST clinical breakpoint was recently changed in, or added to, the latest EUCAST clinical breakpoint table. 'Easy' are situations where an AST result with a one-fold difference in dilution from the expected MIC value will have the same interpretation of S/I/R; AND the EUCAST clinical breakpoint was not recently changed in, nor added to, the latest EUCAST clinical breakpoint table.
*** For most antimicrobials the expected value corresponds to the MIC expressed in 'mg/L'. For oxacillin and norfloxacin the expected value corresponds to the inhibition zone diameter expressed in 'mm', because the latest EUCAST guidelines or EUCAST warnings recommend a disk diffusion test instead of broth microdilution.
**** Detected with ResFinder v4.6.0, AMRFinderPlus v4.0.19 and CARD-RGI v6.0.4. Additional antimicrobial resistance genes or chromosomal point mutations: None.