Austria

Participating institutions
Federal Ministry of Social Affairs, Health, Care and Consumer Protection, www.sozialministerium.at
Ordensklinikum Linz, Elisabethinen, http://www.ordensklinikum.at

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Austria, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	ND	90	90	90	90
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	ND	ND	ND	ND	ND

ND: no data available.

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Austria, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	97	95	100	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories [a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Austria, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	37	5 579	7	35	5 122	9	35	5 659	9	36	6 388	8	34	6 056	5
Klebsiella pneumoniae	36	1 326	15	34	1 256	13	35	1 401	14	34	1 725	12	34	1 706	9
Pseudomonas aeruginosa	36	788	16	34	726	15	34	753	13	34	894	14	34	835	10
***Acinetobacter* spp.**	25	80	16	21	101	7	21	100	13	21	101	9	20	103	13
Staphylococcus aureus	36	3 444	14	36	3 124	12	35	3 325	12	36	3 421	12	35	2 989	8
Streptococcus pneumoniae	33	347	16	34	476	14	34	647	14	33	735	12	34	744	9
Enterococcus faecalis	36	898	23	35	918	15	34	897	15	34	974	16	34	984	10
Enterococcus faecium	31	701	36	30	668	31	28	590	25	29	623	26	28	602	19

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Austria

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.14	6.35	5.71	5.25	6.60	7.90	7.73	-	+8.3	+0.59	+79	-10	6.43	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.20	0.12	0.15	0.14	0.29	0.29	0.18	-	-10.0*	-0.02*	-1*	-2	0.20	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	2.17	1.56	1.22	1.51	1.81	2.21	1.61	-	-25.8*	-0.56*	-44*	-6	2.04	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Austria

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	26.95^	26.54	27.68^	30.73^	28.40^	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.71	5.25	6.60	7.90	7.73	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.01	0.07	0.09	0.05	0.04	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	10.39	8.25	9.92	11.22	10.04	-	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.81	3.16	3.08^	4.00^	3.93^	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.13	1.09^	1.21^	1.54^	1.43^	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1.59	1.46	2.37	3.00	2.59	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.15	0.14	0.29	0.29	0.18	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1.95	1.46	2.21	2.45	2.22	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.52	0.42	0.59^	0.75^	0.75^	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.34	0.21^	0.38^	0.59^	0.42^	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.81^	0.85^	0.82^	0.91^	1.00^	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.19	0.94	0.96	1.15	1.05	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.46	1.37	1.23	1.38	1.29	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.49	1.29	0.68^	0.99	0.77	↓	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.22^	0.20^	0.12^	0.18^	0.08^	↓	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.15^	0.28^	0.15^	0.32^	0.33^	↑	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.09^	0.04	0.09	0.01	0.08	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.14	0.01	0.06^	0.01^	0.11^	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.10	0.00^	0.07^	0.04^	0.08^	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.09^	0.00^	0.04^	0.00^	0.06^	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	1.22	1.51	1.81	2.21	1.61	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.21	0.27	0.49	0.69	0.58	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.60	0.63	0.82	0.92	0.98	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.10	0.11	0.23	0.36	0.27	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.46^	0.35^	0.49^	0.46^	0.52^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.17	0.22	0.22	0.24	0.42	↑	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Austria, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	4 805	45.1	4 669	45.9	4 885	46.4	5 384	47.0	5 067	46.4	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5 537	8.3	5 096	8.3	5 491	9.9	6 170	10.6	5 857	10.9	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	5 206	0.0	4 973	0.1	5 351	0.1	5 887	0.1	5 517	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5 539	15.1	4 788	13.9	5 409	15.0	5 966	15.5	5 524	15.0	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	5 320	5.8	4 653	5.5	4 705	5.4	5 382	6.1	5 025	6.5	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	5 286	1.7	4 307	2.0	4 489	2.2	5 072	2.5	4 675	2.5	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 305	9.8	1 233	9.6	1 384	14.0	1 697	14.6	1 679	12.7	32.8 (5.8-84.8)	↑*
	Carbapenem (imipenem/meropenem) resistance	1 229	1.0	1 247	0.9	1 335	1.8	1 624	1.5	1 651	0.9	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 303	12.0	1 183	10.0	1 303	13.9	1 612	12.5	1 572	11.7	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	1 235	3.4	1 157	2.9	1 208	4.0	1 516	4.1	1 415	4.4	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 227	2.2	1 066	1.6	1 115	2.8	1 420	3.5	1 301	2.7	18.4 (1.1-73.6)	↑*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	643	10.1	607	11.4	598	11.2	760	9.9	750	11.1	16.7 (0.0-59.5)	-
	Ceftazidime resistance	741	13.0	664	11.4	717	11.0	843	11.3	820	10.6	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	737	15.9	677	16.4	711	14.2	827	13.8	805	13.3	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	722	16.6	659	15.8	653	8.6	822	10.0	767	8.3	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	438	4.1	436	3.7	444	2.3	521	2.9	476	1.5	6.9 (0.0-50.0)	↓*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	279	4.3	255	9.0	287	4.2	405	6.4	393	6.9	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	70	10.0	94	3.2	97	7.2	93	1.1	94	7.4	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	80	13.8	94	1.1	87	5.7	81	1.2	87	10.3	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	75	10.7	74	0.0	71	8.5	82	3.7	67	10.4	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	70	10.0	67	0.0	58	5.2	60	0.0	50	10.0	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	3 159	3.1	3 108	3.9	3 297	4.5	3 404	5.3	2 944	4.5	14.1 (1.8-39.5)	↑*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	324	5.2	460	4.8	618	6.5	693	8.2	702	6.8	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	335	14.3	468	10.9	630	10.6	717	10.6	731	11.1	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	315	2.5	452	2.0	606	3.1	679	4.4	689	3.2	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	255	14.5	299	9.4	334	12.0	331	11.5	351	12.3	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	697	2.0	666	2.7	589	3.1	617	3.2	595	5.9	17.2 (0.0-62.2)	↑*

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Austria, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/4	ND	ND	0/3	ND	ND
	Cefiderocol	0/4	ND	ND	0/3	ND	ND
	Ceftazidime-avibactam	0/4	ND	ND	1/3	1	NA
	Imipenem-relebactam	0/4	ND	ND	1/3	1	NA
	Meropenem-vaborbactam	0/4	ND	ND	1/3	1	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/10	ND	ND	0/9	ND	ND
	Cefiderocol	0/10	ND	ND	2/9	2	NA
	Ceftazidime-avibactam	1/10	2	NA	1/9	1	NA
	Imipenem-relebactam	2/10	6	NA	2/9	2	NA
	Meropenem-vaborbactam	3/10	7	NA	4/9	6	NA
Pseudomonas aeruginosa	Cefiderocol	0/19	ND	ND	0/27	ND	ND
	Ceftazidime-avibactam	0/19	ND	ND	1/27	1	NA
	Ceftolozane-tazobactam	1/19	6	NA	3/27	7	NA
	Imipenem-relebactam	0/19	ND	ND	0/27	ND	ND
	Meropenem-vaborbactam	0/19	ND	ND	0/27	ND	ND
Acinetobacter spp.	Cefiderocol	0/1	ND	ND	2/4	3	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Belgium

Participating institutions
Sciensano, www.sciensano.be

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Belgium, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)					
Laboratories collecting *S. pneumoniae*	91	91	91	91	91
Laboratories collecting other species	43	42	42	40	40
Geographical representativeness					
Laboratories collecting *S. pneumoniae*	High	High	High	High	High
Laboratories collecting other species	High	High	High	Medium	Medium
Hospital representativeness					
Laboratories collecting *S. pneumoniae*	High	Medium	Medium	High	High
Laboratories collecting other species	High	Medium	Medium	Medium	Medium
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	100.8[a]	115.8[a]	115.7[a]	145.0[a]	ND

ND: no data available.
[a] Not including *S. pneumoniae* network

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Belgium, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	94	94	88	100	93

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories [a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Belgium, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	31	4 722	NA	31	4 540	NA	31	4 961	NA	29	5 318	NA	28	5 296	NA
Klebsiella pneumoniae	30	926	NA	29	888	NA	30	979	NA	29	1 167	NA	28	1 133	NA
Pseudomonas aeruginosa	30	479	NA	29	456	NA	30	467	NA	29	548	NA	28	577	NA
***Acinetobacter* spp.**	28	169	NA	27	170	NA	27	197	NA	26	226	NA	23	228	NA
Staphylococcus aureus	30	1 615	NA	30	1 501	NA	31	1 717	NA	29	1 882	NA	28	2 004	NA
Streptococcus pneumoniae	82	843	24	80	1 457	24	85	1 712	22	81	2 081	23	83	2 418	25
Enterococcus faecalis	31	712	NA	31	642	NA	30	702	NA	29	747	NA	27	716	NA
Enterococcus faecium	29	502	NA	29	424	NA	29	455	28	29	527	NA	28	603	NA

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Belgium

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	13.19#	10.29	7.84	8.07#	10.14#	13.39#	13.25#	-	+0.5	+0.06	+63	-12	11.61	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.27#	0.24	0.26	0.25#	0.47#	0.44#	0.46#	↑	+70.4	+0.19	+24	-2	0.26	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	2.62#	2.43	1.33	1.27#	2.07#	2.96#	2.92#	-	+11.5	+0.30	+48	-6	2.46	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Belgium

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	48.72	48.70#	52.45#	64.29#	61.18#	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.84	8.07#	10.14#	13.39#	13.25#	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.04	0.06#	0.08#	0.11#	0.13#	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	17.59	16.29#	18.33#	22.91#	21.50#	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.21	4.89^#	6.20^#	7.40^#	6.56^#	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.43	1.56^#	2.17^#	2.56^#	2.38^#	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3.52	3.30#	3.95#	5.18#	4.67#	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.26	0.25#	0.47#	0.44#	0.46#	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	3.54	3.66#	4.34#	5.71#	4.61#	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	1.67	1.58^#	1.85^#	2.31^#	2.25^#	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.37	1.25^#	1.46^#	2.01^#	1.87^#	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.97	1.06#	1.16#	1.31#	1.49#	↑	1.88 (0.00-8.69)
	Ceftazidime resistance	0.74	0.82#	0.83#	0.72#	0.99#	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.03	1.37#	1.09#	0.80#	0.84#	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.35	1.37#	1.48#	1.12#	1.09#	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.36^	0.27^#	0.30^#	0.38^#	0.46^#	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.40^	0.45^#	0.34^#	0.40^#	0.40^#	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.04	0.08#	0.16#	0.17#	0.17#	↑	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.36^	0.27#	0.34#	0.30#	0.46#	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.16	0.04^#	0.14^#	0.13^#	0.29^#	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.04^	0.00^#	0.04^#	0.06^#	0.13^#	↑	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	1.33	1.27#	2.07#	2.96#	2.92#	↑	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	1.44	1.94#	2.11#	2.86	3.43	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	1.32	2.00#	2.38#	3.20	3.46	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.79	1.11#	1.22#	1.76	2.12	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.60^	0.45^#	0.67^#	0.95^#	0.84^#	↑	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.28	0.12#	0.34#	0.38#	0.67#	↑	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Belgium, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	4 389	55.2	4 205	56.6	4 648	55.7	5 300	57.3	5 042	57.7	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4 721	8.3	4 500	8.8	4 956	10.1	5 311	11.9	5 285	11.9	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	4 722	0.0	4 296	0.1	4 958	0.1	5 156	0.1	5 140	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	4 721	18.5	4 536	17.5	4 957	18.2	5 313	20.4	5 278	19.4	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	4 267	6.1	3 733	6.4	4 039	7.6	4 246	8.2	3 869	8.1	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	4 265	1.7	3 694	2.1	4 033	2.7	4 240	2.9	3 862	2.9	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	926	18.9	879	18.3	979	19.9	1 167	21.0	1 131	19.6	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	926	1.4	835	1.4	979	2.3	1 116	1.9	1 095	2.0	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	926	19.0	887	20.2	978	21.9	1 166	23.2	1 129	19.4	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	858	9.7	726	10.6	794	11.5	960	11.4	866	12.4	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	858	7.9	716	8.5	793	9.1	959	9.9	864	10.3	18.4 (1.1-73.6)	↑
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	478	10.0	438	11.9	462	12.3	548	11.3	548	13.0	16.7 (0.0-59.5)	-
	Ceftazidime resistance	464	8.0	421	9.5	451	9.1	547	6.2	573	8.2	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	479	10.6	452	14.8	465	11.6	546	7.0	551	7.3	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	479	14.0	456	14.7	466	15.7	547	9.7	574	9.1	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	257	7.0	190	6.8	209	7.2	292	6.2	310	7.1	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	243	8.2	166	13.3	199	8.5	290	6.6	260	7.3	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	167	1.2	168	2.4	194	4.1	223	3.6	217	3.7	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	146	12.3	156	8.3	196	8.7	226	6.2	228	9.6	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	153	5.2	143	1.4	149	4.7	186	3.2	177	7.9	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	130	1.5	129	0.0	145	1.4	185	1.6	170	3.5	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	1 614	4.1	1 492	4.2	1 700	6.0	1 882	7.4	1 930	7.2	14.1 (1.8-39.5)	↑*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	843	18.0	1 457	14.1	1 712	13.1	2 081	14.8	2 418	15.3	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	843	16.5	1 457	14.6	1 712	14.8	2 081	16.5	2 418	15.5	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	843	9.8	1 457	8.0	1 712	7.6	2 081	9.1	2 418	9.5	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	351	8.5	325	6.8	363	9.1	460	9.8	488	8.2	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	502	2.8	423	1.4	454	3.7	526	3.4	598	5.4	17.2 (0.0-62.2)	↑*

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Belgium, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/4	ND	ND	0/6	ND	ND
	Cefiderocol	0/4	ND	ND	2/6	2	NA
	Ceftazidime-avibactam	2/4	3	NA	3/6	3	NA
	Imipenem-relebactam	0/4	ND	ND	0/6	ND	ND
	Meropenem-vaborbactam	0/4	ND	ND	0/6	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/7	ND	ND	2/9	2	NA
	Cefiderocol	0/7	ND	ND	1/9	1	NA
	Ceftazidime-avibactam	2/7	3	NA	5/9	17	NA
	Imipenem-relebactam	0/7	ND	ND	0/9	ND	ND
	Meropenem-vaborbactam	0/7	ND	ND	1/9	1	NA
Pseudomonas aeruginosa	Cefiderocol	0/13	ND	ND	1/10	1	NA
	Ceftazidime-avibactam	7/13	31	32.3	5/10	29	37.9
	Ceftolozane-tazobactam	4/13	10	NA	3/10	18	NA
	Imipenem-relebactam	0/13	ND	ND	0/10	ND	ND
	Meropenem-vaborbactam	0/13	ND	ND	0/10	ND	ND
Acinetobacter spp.	Cefiderocol	0/6	ND	ND	0/3	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Bulgaria

Participating institutions
National Center of Infectious and Parasitic Diseases,
https://ncipd.org/index.php?option=com_content&view=featured&Itemid=730&lang=en

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Bulgaria, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	45	45	45	45	45
Geographical representativeness	Medium	Medium	Medium	Medium	Medium
Hospital representativeness	Medium	Medium	Medium	Medium	Medium
Isolate representativeness	Medium	Medium	Medium	Medium	Medium
Blood culture sets/1 000 patient-days	11.4	11.3	12.8	12.2	12.7

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Bulgaria, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	96	100	100	83	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories [a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Bulgaria, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	22	263	15	18	239	21	20	306	25	20	336	25	18	293	31
Klebsiella pneumoniae	19	242	47	20	260	43	19	405	53	19	466	53	16	435	63
Pseudomonas aeruginosa	15	83	45	14	76	54	17	84	54	18	87	46	13	75	48
***Acinetobacter* spp.**	18	217	70	15	160	66	16	183	74	15	210	76	13	154	79
Staphylococcus aureus	19	211	15	20	233	22	22	290	27	18	320	31	18	293	35
Streptococcus pneumoniae	6	11	NA	10	27	30[c]	10	31	45	10	43	44	10	29	48[c]
Enterococcus faecalis	21	190	37	20	145	30	19	168	40	18	161	47	17	145	41
Enterococcus faecium	13	148	62	15	145	54	19	128	53	15	131	53	15	122	63

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Bulgaria

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.05#	3.24#	2.95#	2.92#	3.68#	3.75#	3.40#	-	-16.0*	-0.65*	-65*	0	4.05	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	2.24#	2.19#	3.52#	3.91#	7.75#	10.62#	10.23#	↑	+356.7	+7.99	+502	-4	2.15	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	1.43#	0.78#	0.96#	0.85#	1.49#	1.13#	0.97#	-	-32.2*	-0.46*	-38*	-3	1.39	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Bulgaria

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	4.85#	5.00#	6.62#	6.43#	5.86#	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2.95#	2.92#	3.68#	3.75#	3.40#	-	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.03#	0.00#	0.03#	0.06#	0.03#	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2.65#	2.95#	3.94#	3.07#	3.33#	-	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.14#	1.77#	2.81#	2.33#	1.88#	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.17#	1.04#	1.74#	1.16#	1.36#	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.19#	6.48#	11.13#	13.25#	12.46#	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	3.52#	3.91#	7.75#	10.62#	10.23#	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5.41#	5.40#	10.01#	12.61#	12.16#	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.25#	5.12#	10.01#	11.60#	11.31#	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	4.56#	4.39#	8.87#	11.23#	10.81#	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.24#	1.29#	1.18#	1.11#	1.07#	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.31#	1.50#	1.22#	1.03#	1.15#	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.93#	1.08#	1.03#	0.92#	1.07#	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.90#	1.04#	0.96#	1.11#	1.00#	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.72#	0.70^#	0.59#	0.37^#	0.55^#	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.90#	0.87^#	0.96#	0.41^#	0.81^#	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	5.96#	4.53#	5.98#	7.19#	5.38#	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	6.14#	4.60#	6.28#	7.30#	5.38#	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	6.24#	4.64#	5.98#	7.08#	4.55#	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	5.50#	4.28#	5.56#	6.89#	4.51#	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	0.96#	0.85#	1.49#	1.13#	0.97#	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.04#	0.23#	0.29#	0.49#	0.12#	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.08#	0.23#	0.45#	0.78#	0.29#	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.00#	0.12#	0.16#	0.45#	0.12#	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	3.02#	2.16#	2.29#	2.43#	1.98#	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.53#	0.32#	0.26#	0.72#	0.83#	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Bulgaria, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	263	61.2	239	68.6	306	67.0	336	59.2	293	61.8	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	263	37.3	239	40.2	306	37.3	336	34.5	293	35.8	16.9 (6.8-42.7)	-
	Carbapenem (imipenem/meropenem) resistance	263	0.4	239	0.0	306	0.3	336	0.6	293	0.3	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	263	33.5	239	40.6	306	39.9	336	28.3	293	35.2	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	263	27.0	239	24.3	306	28.4	336	21.4	293	19.8	10.3 (4.3-23.1)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	263	14.8	239	14.2	306	17.6	336	10.7	293	14.3	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	242	81.4	260	78.5	405	81.5	466	84.3	435	84.8	32.8 (5.8-84.8)	↑
	Carbapenem (imipenem/meropenem) resistance	242	46.3	260	47.3	405	56.8	466	67.6	435	69.7	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	242	71.1	260	65.4	405	73.3	466	80.3	435	82.8	30.1 (6.9-82.8)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	242	69.0	260	61.9	405	73.3	466	73.8	435	77.0	21.1 (2.4-77.0)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	242	59.9	260	53.1	405	64.9	466	71.5	435	73.6	18.4 (1.1-73.6)	↑*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	83	43.4	76	48.7	84	38.1	87	34.5	75	38.7	16.7 (0.0-59.5)	-
	Ceftazidime resistance	83	45.8	76	56.6	84	39.3	87	32.2	75	41.3	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	83	32.5	76	40.8	84	33.3	87	28.7	75	38.7	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	83	31.3	76	39.5	84	31.0	87	34.5	75	36.0	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	83	25.3	55	36.4	84	19.0	49	20.4	57	26.3	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	83	31.3	55	45.5	84	31.0	49	22.4	57	38.6	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	217	77.9	160	79.4	183	86.3	210	90.5	154	92.2	31.5 (0.0-95.4)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	217	80.2	160	80.6	183	90.7	210	91.9	154	92.2	33.9 (0.0-96.5)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	217	81.6	160	81.3	183	86.3	210	89.0	154	77.9	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	217	71.9	160	75.0	183	80.3	210	86.7	154	77.3	27.1 (0.0-91.8)	↑
Staphylococcus aureus	MRSA[d]	211	15.2	233	12.0	290	15.9	320	10.9	293	10.2	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	11	NA	27	22.2[f]	31	22.6	43	27.9	29	10.3[f]	16.4 (5.1-30.2)	NA
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	11	NA	27	22.2[f]	31	35.5	43	44.2	29	24.1[f]	18.5 (4.0-30.7)	NA
	Combined penicillin non-wild-type and resistance to macrolides[e]	11	NA	27	11.1[f]	31	12.9	43	25.6	29	10.3[f]	10.1 (1.0-18.9)	NA
Enterococcus faecalis	High-level gentamicin resistance	190	48.4	145	44.8	168	38.7	161	42.9	145	38.6	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	148	10.1	145	6.2	128	5.5	131	14.5	122	18.0	17.2 (0.0-62.2)	↑*

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; −indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Bulgaria, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/2	ND	ND	0/1	ND	ND
	Cefiderocol	0/2	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/2	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/2	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/2	ND	ND	0/1	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/18	ND	ND	0/16	ND	ND
	Cefiderocol	0/18	ND	ND	0/16	ND	ND
	Ceftazidime-avibactam	0/18	ND	ND	2/16	19	NA
	Imipenem-relebactam	0/18	ND	ND	1/16	7	NA
	Meropenem-vaborbactam	0/18	ND	ND	1/16	7	NA
Pseudomonas aeruginosa	Cefiderocol	0/8	ND	ND	0/10	ND	ND
	Ceftazidime-avibactam	0/8	ND	ND	1/10	1	NA
	Ceftolozane-tazobactam	0/8	ND	ND	0/10	ND	ND
	Imipenem-relebactam	0/8	ND	ND	0/10	ND	ND
	Meropenem-vaborbactam	0/8	ND	ND	0/10	ND	ND
Acinetobacter spp.	Cefiderocol	0/13	ND	ND	1/13	4	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Croatia

Participating institutions

Reference Center for Antimicrobial Resistance Surveillance University Hospital for Infectious Diseases (Dr Fran Mihaljević), Zagreb, https://bfm.hr/referentni-centar-za-pracenje-rezistencijebakterija-na-antibotike

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Croatia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	100	90	90	90	90
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	38.3	34.0	29.0	39.1	32.3

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Croatia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	87	97	97	97	97

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Croatia, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	19	729	12	23	989	13	24	1 310	14	19	1 058	8	19	1 363	15
Klebsiella pneumoniae	18	361	32	22	369	30	22	568	27	19	500	22	19	627	31
Pseudomonas aeruginosa	15	214	45	20	263	37	21	367	37	17	249	34	19	277	34
***Acinetobacter* spp.**	18	408	75	21	291	60	20	266	53	17	216	41	18	173	47
Staphylococcus aureus	18	600	30	21	618	21	24	735	20	19	587	14	19	682	16
Streptococcus pneumoniae	14	80	23	20	83	18	19	131	20	13	125	9	17	156	13
Enterococcus faecalis	17	199	38	20	215	25	24	224	24	19	214	25	17	225	27
Enterococcus faecium	14	113	50	18	133	37	22	150	33	18	137	28	19	159	35

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Croatia

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.31	4.22	3.34	4.93	7.56	5.90	8.35	↑	+57.3	+3.04	+107	0	5.31	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	1.20	1.57	2.87	2.52	4.53	4.49	6.11	↑	+409.2	+4.91	+188	-4	1.15	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	2.73	3.82	5.18	5.44	6.35	5.03	4.56	↑	+67.0	+1.83	+65	-6	2.57	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Croatia

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	10.06	15.67	21.21	17.29	22.05	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3.34	4.93	7.56	5.90	8.35	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.03	0.06	0.00	0.00	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5.18	8.45	11.11	8.78	12.45	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.11	4.53	6.67	5.50	7.34	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.29	2.12	4.13	2.88	4.02	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.55	5.73	9.03	8.95	10.98	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	2.87	2.52	4.53	4.49	6.11	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5.70	5.59	9.23	8.92	11.24	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.11	4.35	6.06	5.96	8.57	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	3.82	3.95	5.51	5.58	7.83	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.55	0.95	1.07	1.06	0.98	↑	1.88 (0.00-8.69)
	Ceftazidime resistance	0.92	1.66	2.05	1.67	1.69	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.66	2.64	3.03	2.39	1.86	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.04	2.01	3.29	1.93	1.84	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	ND	ND	ND	ND	0.32^	NA	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	ND	ND	ND	0.34^	NA	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	10.03	8.22	7.33	5.70	4.73	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	10.01	8.16	7.30	5.75	4.79	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	9.91	7.93	6.98	5.50	4.47	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	9.81	7.88	6.84	5.38	4.42	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	5.18	5.44	6.35	5.03	4.56	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.32^	0.46	0.46	0.66	0.83	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.45	0.63	0.63	0.72	0.80	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.27^	0.43	0.29	0.35	0.40	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.91	2.32	1.90	1.84	1.95	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	1.11	1.37	1.01	2.19	2.15	↑	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Croatia, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	728	55.8	981	55.8	1 284	57.2	1 051	57.2	1 359	56.6	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	726	18.6	987	17.4	1 309	20.0	1 057	19.4	1 357	21.4	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	686	0.0	980	0.1	1 301	0.2	1 054	0.0	1 360	0.0	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	721	29.0	975	30.3	1 298	29.7	1 047	29.1	1 355	32.0	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	725	11.7	985	16.0	1 300	17.8	1 055	18.1	1 351	18.9	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	714	7.3	973	7.6	1 289	11.1	1 046	9.6	1 339	10.5	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	361	62.0	369	54.2	565	55.4	498	62.4	627	61.1	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	353	32.9	367	24.0	567	27.7	498	31.3	621	34.3	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	360	63.9	363	53.7	565	56.6	497	62.4	623	62.9	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	356	46.6	366	41.5	561	37.4	497	41.6	617	48.5	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	355	43.4	362	38.1	557	34.3	495	39.2	615	44.4	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	209	10.5	260	12.7	364	10.2	247	15.0	275	12.4	16.7 (0.0-59.5)	-
	Ceftazidime resistance	212	17.5	258	22.5	364	19.5	242	24.0	276	21.4	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	214	31.3	263	35.0	366	28.7	247	33.6	276	23.6	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	213	19.7	261	26.8	366	31.1	247	27.1	271	23.6	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	ND	ND	ND	ND	ND	ND	ND	ND	64	17.2	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	ND	ND	ND	ND	ND	ND	ND	63	19.0	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	407	99.5	291	98.6	265	95.8	213	93.0	173	95.4	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	405	99.8	289	98.6	262	96.6	214	93.5	173	96.5	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	405	98.8	288	96.2	262	92.4	213	89.7	170	91.8	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	402	98.5	286	96.2	259	91.5	210	89.0	170	90.6	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	600	34.8	611	31.1	732	30.1	587	29.8	677	23.5	14.1 (1.8-39.5)	↓*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	71	18.3	83	19.3	127	12.6	124	18.5	156	18.6	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	79	22.8	83	26.5	130	16.9	125	20.0	154	18.2	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	70	15.7	83	18.1	126	7.9	124	9.7	154	9.1	10.1 (1.0-18.9)	↓
Enterococcus faecalis	High-level gentamicin resistance	195	39.5	212	38.2	217	30.4	212	30.2	220	30.9	22.3 (2.3-62.1)	↓
Enterococcus faecium	Vancomycin resistance	113	39.8	131	36.6	149	23.5	137	55.5	159	47.2	17.2 (0.0-62.2)	↑

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Croatia, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/0	NA	NA	0/0	NA	NA
	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/17	ND	ND	0/18	ND	ND
	Cefiderocol	0/17	ND	ND	5/18	100	54.0
	Ceftazidime-avibactam	0/17	ND	ND	14/18	182	24.7
	Imipenem-relebactam	0/17	ND	ND	0/18	ND	ND
	Meropenem-vaborbactam	0/17	ND	ND	0/18	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/15	ND	ND	4/15	20	30.0
	Ceftazidime-avibactam	0/15	ND	ND	9/15	46	50.0
	Ceftolozane-tazobactam	0/15	ND	ND	10/15	47	38.3
	Imipenem-relebactam	0/15	ND	ND	0/15	ND	ND
	Meropenem-vaborbactam	0/15	ND	ND	0/15	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/16	ND	ND	6/18	66	4.5

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Cyprus

Participating institutions

Microbiology Department, Nicosia General Hospital, https://shso.org.cy/clinic/mikroviologiko

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Cyprus, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	75	75	82	82	86
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	73.8	84.4	69.4	70.6	70.9

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Cyprus, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	100	100	90	89

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories,[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Cyprus, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	4	192	13	5	225	14	8	331	NA	8	400	NA	9	467	NA
Klebsiella pneumoniae	4	141	35	5	199	36	9	220	33	8	326	NA	9	366	NA
Pseudomonas aeruginosa	4	103	42	5	98	36	8	105	29	8	161	43	9	134	NA
***Acinetobacter* spp.**	3	216	80	5	203	64	9	136	60	7	127	66	9	86	54
Staphylococcus aureus	4	177	39	5	197	21	8	229	13	8	235	NA	9	258	NA
Streptococcus pneumoniae	4	11	NA	5	14	NA	6	31	27	7	21	NA	5	19	NA
Enterococcus faecalis	4	139	57	5	126	39	9	149	31	8	173	40	8	136	43
Enterococcus faecium	4	84	46	5	109	39	9	127	38	7	147	52	8	141	NA

Labs: laboratories.

NA: not applicable.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Cyprus

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.20	5.11	9.37	10.76	15.23	19.56	23.30	↑	+275.8	+17.10	+175	-5	5.89	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	2.61	2.55	5.51	9.87	9.80	19.81	21.29	↑	+715.7	+18.68	+186	-5	2.48	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	6.85	7.81	11.31	14.59	15.50	13.63	12.07	↑	+76.2	+5.22	+59	-18	5.62	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Cyprus

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	19.94	20.78	29.93	30.79^	24.96^	-	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	9.37	10.76	15.23	19.56	23.30	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.30	0.29	0.40	1.26	1.30	↑	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	14.73	15.03	18.81	24.86	27.80	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.65	5.01	8.08	9.21	7.22	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	3.12	3.83	5.56	6.44	4.61	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	11.46	18.72	17.62	28.02	30.28	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	5.51	9.87	9.80	19.81	21.29	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	10.42	15.18	16.03	28.77	28.98	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.44	10.91	9.67	17.16	15.38	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	7.14	9.28	8.61	16.15	13.96	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	2.23	4.42	3.97	7.45	5.80	↑	1.88 (0.00-8.69)
	Ceftazidime resistance	1.93	3.98	2.52	4.42	3.31	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	3.72	4.72	3.44	4.80	3.08	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	2.68	4.27	2.52	5.55	4.38	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.15^	0.88^	0.66^	2.02^	0.47^	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	1.19^	2.95^	1.72^	3.15^	0.47^	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	29.61	28.15	15.36	13.38	7.57	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	29.46	28.44	15.50	13.50	7.81	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	28.57	24.46	14.97	12.37	7.33	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	28.27	24.32	14.57	12.11	7.10	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	11.31	14.59	15.50	13.63	12.07	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.74	0.74	0.93	0.76^	0.71^	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.60	0.88	1.06	1.01	0.95	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.60	0.59	0.53	0.63^	0.47^	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.64	1.47	1.99^	3.79^	3.67^	↑	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	6.40	8.99	9.01	9.97	9.46	↑	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Cyprus, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	191	70.2	223	63.2	328	68.9	343	71.1	300	70.3	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	192	32.8	225	32.4	331	34.7	400	38.8	461	42.7	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	192	1.0	212	0.9	331	0.9	400	2.5	466	2.4	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	192	51.6	220	46.4	331	42.9	400	49.3	462	50.9	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	192	19.8	224	15.2	330	18.5	400	18.3	465	13.1	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	192	10.9	219	11.9	330	12.7	400	12.8	460	8.5	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	141	54.6	199	63.8	220	60.5	326	68.1	366	69.9	32.8 (5.8-84.8)	↑
	Carbapenem (imipenem/meropenem) resistance	141	26.2	184	36.4	220	33.6	324	48.5	366	49.2	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	141	49.6	191	53.9	220	55.0	326	69.9	366	66.9	30.1 (6.9-82.8)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	136	36.8	197	37.6	215	34.0	326	41.7	366	35.5	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	136	35.3	189	33.3	215	30.2	326	39.3	366	32.2	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	102	14.7	96	31.3	105	28.6	158	37.3	132	37.1	16.7 (0.0-59.5)	↑*
	Ceftazidime resistance	102	12.7	97	27.8	105	18.1	161	21.7	131	21.4	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	102	24.5	97	33.0	105	24.8	160	23.8	132	19.7	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	103	17.5	92	31.5	105	18.1	161	27.3	131	28.2	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	69	1.4	64	9.4	80	6.3	90	17.8	17	NA	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	69	11.6	63	31.7	80	16.3	88	28.4	15	NA	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	216	92.1	202	94.6	134	86.6	126	84.1	84	76.2	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	216	91.7	202	95.5	135	86.7	126	84.9	84	78.6	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	214	89.7	202	82.2	135	83.7	121	81.0	84	73.8	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	214	88.8	202	81.7	133	82.7	120	80.0	84	71.4	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	177	42.9	195	50.8	229	51.1	235	46.0	258	39.5	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	11	NA	14	NA	31	22.6	18	NA	13	NA	16.4 (5.1-30.2)	NA
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	11	NA	13	NA	31	25.8	21	38.1[f]	19	NA	18.5 (4.0-30.7)	NA
	Combined penicillin non-wild-type and resistance to macrolides[e]	11	NA	13	NA	31	12.9	18	NA	13	NA	10.1 (1.0-18.9)	NA
Enterococcus faecalis	High-level gentamicin resistance	138	8.0	124	8.1	126	11.9	114	26.3	70	44.3	22.3 (2.3-62.1)	↑*
Enterococcus faecium	Vancomycin resistance	84	51.2	109	56.0	127	53.5	147	53.7	139	57.6	17.2 (0.0-62.2)	-

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; −indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Cyprus, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/5	ND	ND	0/5	ND	ND
	Cefiderocol	0/5	ND	ND	0/5	ND	ND
	Ceftazidime-avibactam	1/5	1	NA	1/5	1	NA
	Imipenem-relebactam	0/5	ND	ND	0/5	ND	ND
	Meropenem-vaborbactam	0/5	ND	ND	1/5	1	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/7	ND	ND	0/8	ND	ND
	Cefiderocol	0/7	ND	ND	0/8	ND	ND
	Ceftazidime-avibactam	1/7	1	NA	0/8	ND	ND
	Imipenem-relebactam	0/7	ND	ND	0/8	ND	ND
	Meropenem-vaborbactam	0/7	ND	ND	0/8	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/5	ND	ND	0/7	ND	ND
	Ceftazidime-avibactam	2/5	2	NA	2/7	3	NA
	Ceftolozane-tazobactam	0/5	ND	ND	2/7	3	NA
	Imipenem-relebactam	0/5	ND	ND	2/7	3	NA
	Meropenem-vaborbactam	0/5	ND	ND	2/7	3	NA
Acinetobacter spp.	Cefiderocol	0/6	ND	ND	0/6	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Czechia

Participating institutions
National Institute of Public Health, www.szu.gov.cz
National Reference Laboratory for Antibiotics, https://szu.gov.cz/odborna-centra-a-pracoviste/centrum-epidemiologie-amikrobiologie/oddeleni-bakterialni-rezistence-na-antibiotika-a-sbirka-kultur/nrl-pro-antibiotika

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Czechia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	80	80	70	70	75
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	21.3	21.7	18.2	23.4	23.4

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Czechia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	88	92	100	98	96

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Czechia, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	40	2 939	16	40	3 579	14	40	3 897	14	41	4 282	13	44	4 718	14
Klebsiella pneumoniae	43	1 618	33	44	1 638	23	46	1 669	22	46	1 767	21	45	1 663	20
Pseudomonas aeruginosa	43	596	37	43	645	31	42	611	31	46	712	29	46	620	26
***Acinetobacter* spp.**	21	122	52	18	85	50	21	91	48	26	102	31	21	75	31
Staphylococcus aureus	44	2 279	26	45	2 417	21	44	2 308	20	42	2 317	19	46	2 403	18
Streptococcus pneumoniae	46	228	23	47	394	30	48	479	24	47	487	24	48	560	21
Enterococcus faecalis	40	764	37	40	640	25	39	708	30	40	693	22	40	679	23
Enterococcus faecium	40	581	46	40	381	33	38	402	36	38	415	30	40	388	27

Labs: laboratories.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Czechia

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.56	4.65	4.94	6.25	8.15	8.83	10.78	↑	+64.3	+4.22	+477	-5	6.23	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.09^	0.07^	0.16^	0.24^	0.26^	0.41^	0.35^	↑	+288.9	+0.26	+29	-2	0.09	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	3.06	2.28	2.51	2.15	2.92	2.79	2.29	-	-25.2*	-0.77*	-77*	-6	2.88	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Czechia

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	17.63	21.87	26.48	28.99	30.76	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.94	6.25	8.15	8.83	10.78	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00^	0.04^	0.00^	0.03^	0.05^	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6.75	7.73	8.81	10.73	11.42	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.29	3.99	5.01	5.36	5.84	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.93	2.06	2.49	2.67	2.87	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	9.39	9.65	10.19	10.22	8.10	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.16^	0.24^	0.26^	0.41^	0.35^	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	8.08	8.40	8.34	8.11	6.49	↓	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.86	7.76	8.06	8.10	5.90	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	6.40	6.36	6.23	6.16	4.38	↓	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.48	1.91	1.89	1.60	1.28	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.34	1.75	1.65	1.49	1.12	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.13	1.58	1.62	1.47	0.94	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.86	2.13	1.83	1.78	1.56	↓	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.88	1.27	1.07	0.86	0.72	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	1.06	1.34	1.23	1.00	0.78	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.76	0.39	0.45	0.34	0.18	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.76	0.42	0.46	0.37	0.22	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.72	0.38	0.42	0.28	0.17	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.72	0.37	0.41	0.28	0.15	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	2.51	2.15	2.92	2.79	2.29	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.15	0.30	0.26	0.38	0.40	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.28	0.48	0.65	0.71	0.78	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.09	0.12	0.08	0.24	0.27	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	3.42	2.33	2.47	2.87	2.11	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.85	0.89	1.10	1.00	0.89	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Czechia, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	2 934	51.4	3 564	51.6	3 892	51.6	4 271	51.8	4 704	53.5	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2 934	14.4	3 566	14.8	3 892	15.9	4 269	15.8	4 703	18.8	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	1 342	0.0	1 685	0.2	1 846	0.0	1 998	0.1	2 765	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2 934	19.7	3 564	18.2	3 889	17.2	4 268	19.2	4 699	19.9	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	2 935	9.6	3 567	9.4	3 892	9.8	4 269	9.6	4 704	10.2	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2 934	5.6	3 564	4.9	3 889	4.9	4 268	4.8	4 699	5.0	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 618	49.7	1 638	49.6	1 669	46.3	1 767	44.1	1 662	39.9	32.8 (5.8-84.8)	↓*
	Carbapenem (imipenem/meropenem) resistance	1 348	1.0	1 326	1.5	1 372	1.5	1 437	2.2	1 339	2.2	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 618	42.8	1 638	43.2	1 669	37.9	1 767	35.0	1 661	32.0	30.1 (6.9-82.8)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	1 618	41.6	1 638	39.9	1 669	36.6	1 767	35.0	1 662	29.1	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 618	33.9	1 638	32.7	1 669	28.3	1 767	26.6	1 661	21.6	18.4 (1.1-73.6)	↓*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	590	21.5	640	25.2	610	23.4	711	17.2	616	17.0	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	596	19.3	645	22.8	611	20.5	711	16.0	620	14.8	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	595	16.3	645	20.6	610	20.2	712	15.7	620	12.4	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	596	26.7	645	27.8	611	22.7	711	19.1	620	20.6	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	596	12.6	645	16.6	611	13.3	710	9.3	613	9.6	6.9 (0.0-50.0)	↓*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	589	15.4	640	17.7	609	15.3	710	10.7	609	10.5	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	122	53.3	85	38.8	91	37.4	102	25.5	75	20.0	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	122	53.3	85	41.2	91	38.5	102	27.5	75	24.0	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	122	50.8	85	37.6	91	35.2	102	20.6	75	18.7	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	122	50.8	85	36.5	91	34.1	102	20.6	75	16.0	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	2 279	9.4	2 417	7.5	2 304	9.6	2 301	9.3	2 383	7.8	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	228	5.7	394	6.3	479	4.2	487	6.0	560	5.9	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	228	10.5	394	10.2	479	10.2	487	11.1	560	11.4	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	228	3.5	394	2.5	479	1.3	487	3.7	560	3.9	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	762	38.5	639	30.7	707	26.4	675	32.4	618	28.0	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	578	12.6	379	19.8	401	20.7	415	18.3	388	18.8	17.2 (0.0-62.2)	↑*

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Czechia, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/2	ND	ND	2/4	2	NA
	Cefiderocol	0/2	ND	ND	2/4	2	NA
	Ceftazidime-avibactam	0/2	ND	ND	2/4	2	NA
	Imipenem-relebactam	0/2	ND	ND	2/4	2	NA
	Meropenem-vaborbactam	0/2	ND	ND	2/4	2	NA
Klebsiella pneumoniae	Aztreonam-avibactam	3/12	3	NA	11/13	25	4.0
	Cefiderocol	7/12	16	NA	11/13	25	12.0
	Ceftazidime-avibactam	10/12	25	76.0	11/13	25	96.0
	Imipenem-relebactam	9/12	21	81.0	11/13	25	100.0
	Meropenem-vaborbactam	10/12	25	84.0	11/13	25	100.0
Pseudomonas aeruginosa	Cefiderocol	17/38	45	15.6	25/32	56	12.5
	Ceftazidime-avibactam	29/38	92	21.7	25/32	56	42.9
	Ceftolozane-tazobactam	29/38	92	25.0	25/32	56	46.4
	Imipenem-relebactam	24/38	73	37.0	25/32	56	50.0
	Meropenem-vaborbactam	29/38	88	43.2	25/32	56	66.1
***Acinetobacter* spp.**	Cefiderocol	10/10	26	3.8	7/7	15	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Denmark

Participating institutions
Statens Serum Institut, https://www.ssi.dk
Danish Study Group for Antimicrobial Resistance Surveillance (DANRES), www.danmap.org

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Denmark, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	100	100	100	100	99
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	251.0	261.2	261.7	265.8	269.1

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Denmark, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	91	80	67	67

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Denmark, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	10	6 025	3	10	5 940	5	10	5 873	5	10	6 003	8	10	6 095	8
Klebsiella pneumoniae	10	1 346	4	10	1 360	5	10	1 410	7	9	1 425	9	9	1 619	7
Pseudomonas aeruginosa	10	517	5	10	498	4	10	462	6	10	488	10	10	509	10
***Acinetobacter* spp.**	10	103	11	10	99	4	10	90	8	10	99	9	10	103	11
Staphylococcus aureus	10	2 545	5	10	2 502	6	10	2 473	8	10	2 335	8	10	2 459	7
Streptococcus pneumoniae	10	334	NA	10	543	7	10	607	6	10	602	7	10	686	8
Enterococcus faecalis	10	686	7	10	660	7	10	643	9	10	596	7	10	647	9
Enterococcus faecium	10	802	28	10	638	22	10	614	25	10	588	23	10	584	20

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Denmark

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.61	6.08^	5.72^	6.01^	5.61^	6.09^	7.54^	-	+14.1	+0.93	+68	-5	6.28	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.07	0.19	0.10	0.10	0.08	0.10	0.10	-	+42.9	+0.03	+2	-2	0.07	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	0.83	0.70	0.79	0.61^	0.47^	0.55^	0.77^	-	-7.2*	-0.06*	-2*	-3	0.81	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Denmark

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	42.65	42.24	39.54	41.64	42.20	-	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.72^	6.01^	5.61^	6.09^	7.54^	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.10	0.02	0.03	0.05	0.07	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	10.79	10.74	10.28	10.69	11.91	-	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.49	4.78	4.42	4.53	4.99	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.13^	1.33^	1.18^	1.06^	1.22^	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1.08	1.11	1.21^	1.27	1.49^	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.10	0.10	0.08	0.10	0.10	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1.64	1.74	1.67	1.93	2.40	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.48	0.61	0.62	0.70	0.68	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.24	0.29	0.35^	0.30^	0.28^	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.45	0.37	0.35	0.32	0.28	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.19	0.22	0.22	0.22	0.12	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.31	0.20	0.25	0.12	0.13	↓	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.29	0.24	0.46	0.40	0.18	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.00^	0.00^	0.03^	0.03^	0.02^	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.05^	0.12^	0.08^	0.05^	0.02^	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.10	0.09	0.03	0.07	0.02	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.27	0.27	0.13	0.17	0.12	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.12	0.09	0.03	0.08	0.07	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.10	0.05	0.03	0.05	0.00	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	0.79	0.61^	0.47^	0.55^	0.77^	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.55	0.27	0.37	0.47	0.97	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.29	0.29	0.37	0.65^	0.42	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.17	0.07	0.19	0.25^	0.10	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	ND	0.07^	0.02^	0.02^	0.02^	NA	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	1.46	1.29	1.11	1.31	0.73	↓	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Denmark, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	6 001	41.5	5 883	42.2	5 799	40.5	5 941	41.8	6 027	42.0	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5 416	6.2	5 326	6.6	5 272	6.3	5 369	6.8	5 480	8.2	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	5 845	0.1	5 580	0.0	5 430	0.0	5 544	0.1	5 677	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6 016	10.5	5 892	10.7	5 828	10.5	5 944	10.7	6 045	11.8	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	6 017	4.4	5 909	4.8	5 839	4.5	5 959	4.5	6 049	4.9	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	5 409	1.2	5 299	1.5	5 237	1.3	5 326	1.2	5 448	1.3	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 228	5.1	1 244	5.2	1 261	5.7	1 291	5.9	1 441	6.0	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	1 324	0.5	1 312	0.5	1 326	0.4	1 361	0.4	1 559	0.4	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 346	7.1	1 345	7.6	1 396	7.1	1 409	8.2	1 604	8.6	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	1 344	2.1	1 348	2.7	1 401	2.6	1 415	3.0	1 606	2.4	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 228	1.1	1 232	1.4	1 251	1.7	1 279	1.4	1 432	1.1	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	517	5.0	495	4.4	461	4.6	488	3.9	509	3.3	16.7 (0.0-59.5)	-
	Ceftazidime resistance	482	2.3	473	2.7	429	3.0	461	2.8	470	1.5	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	514	3.5	494	2.4	457	3.3	482	1.5	506	1.6	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	517	3.3	495	2.8	461	5.9	488	4.9	509	2.2	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	226	0.0	267	0.0	265	0.8	287	0.7	291	0.3	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	225	1.3	265	2.6	263	1.9	287	1.0	291	0.3	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	102	5.9	96	5.2	90	2.2	99	4.0	102	1.0	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	103	15.5	96	16.7	89	9.0	99	10.1	103	6.8	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	100	7.0	97	5.2	89	2.2	98	5.1	99	4.0	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	99	6.1	93	3.2	88	2.3	98	3.1	98	0.0	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	2 545	1.8	1 945	1.9	1 870	1.5	1 763	1.9	1 874	2.5	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	334	9.6	539	3.0	596	3.7	598	4.7	684	8.5	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	334	5.1	503	3.4	553	4.0	537	7.3	620	4.0	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	334	3.0	503	0.8	551	2.0	537	2.8	620	1.0	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	ND	ND	5	NA	3	NA	3	NA	4	NA	22.3 (2.3-62.1)	NA
Enterococcus faecium	Vancomycin resistance	800	10.6	632	12.0	609	10.8	584	13.4	582	7.6	17.2 (0.0-62.2)	-

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Denmark, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/2	ND	ND	0/2	ND	ND
	Cefiderocol	0/2	ND	ND	0/2	ND	ND
	Ceftazidime-avibactam	0/2	ND	ND	0/2	ND	ND
	Imipenem-relebactam	0/2	ND	ND	0/2	ND	ND
	Meropenem-vaborbactam	0/2	ND	ND	0/2	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/3	ND	ND	2/5	2	NA
	Cefiderocol	0/3	ND	ND	2/5	2	NA
	Ceftazidime-avibactam	0/3	ND	ND	2/5	2	NA
	Imipenem-relebactam	0/3	ND	ND	0/5	ND	ND
	Meropenem-vaborbactam	0/3	ND	ND	0/5	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/4	ND	ND	0/4	ND	ND
	Ceftazidime-avibactam	0/4	ND	ND	0/4	ND	ND
	Ceftolozane-tazobactam	0/4	ND	ND	1/4	1	NA
	Imipenem-relebactam	0/4	ND	ND	0/4	ND	ND
	Meropenem-vaborbactam	0/4	ND	ND	0/4	ND	ND
Acinetobacter spp.	Cefiderocol	0/2	ND	ND	0/1	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Estonia

Participating institutions
Estonian Health Board, https://www.terviseamet.ee/et
East-Tallinn Central Hospital, https://itk.ee
Tartu University Hospital, https://www.kliinikum.ee/partnerile/uhendlabor

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Estonia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	100	100	100	100	100
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	39.2	39.9	40.2	38.4	42.8

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Estonia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	91	100	100	91	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Estonia, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	9	930	6	9	1 003	8	9	1 103	NA	10	1 178	NA	10	1 257	9
Klebsiella pneumoniae	9	235	14	9	235	13	9	303	NA	10	308	NA	9	345	18
Pseudomonas aeruginosa	9	87	23	9	86	16	8	79	23	9	119	32	9	104	18
***Acinetobacter* spp.**	3	5	NA	3	3	NA	7	14	NA	7	26	24[c]	6	12	NA
Staphylococcus aureus	9	398	8	9	407	8	9	448	NA	10	448	NA	9	502	11
Streptococcus pneumoniae	9	110	7	9	152	5	9	191	NA	9	207	NA	9	251	11
Enterococcus faecalis	7	85	9	9	96	14	9	128	22	8	105	NA	9	113	9
Enterococcus faecium	6	83	35	9	85	28	8	78	33	8	72	33	8	81	21

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).
[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Estonia

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.93	6.09	5.64	8.86	9.08	8.07	9.27	-	+16.9	+1.34	+22	-10	7.14	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.00^	0.00^	0.15	0.23^	0.44^	0.29^	0.44^	↑	NA	+0.44	+6	0	0.00	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	0.83	0.83	0.45	0.68	0.66	1.09	1.68	↑	+102.4	+0.85	+12	-3	0.81	4.56 (0.58-12.07)

NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Estonia

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	10.45^	8.94^	14.50^	15.79^	19.85^	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.64	8.86	9.08	8.07	9.27	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00^	0.08^	0.00^	0.00^	0.07^	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	9.32	12.09	10.25	11.57	12.99	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.83	4.20	3.88	4.00	4.09^	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.43	2.10	1.46	2.11^	1.46^	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2.26	2.63	2.86	3.06	2.70	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.15	0.23^	0.44^	0.29^	0.44^	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2.93	2.85	3.66	2.76	3.07	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	1.35	1.43	1.68	1.24	0.95^	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.98	1.13	1.17	0.87^	0.66^	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.45	0.68	0.29	0.58	0.73	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.23	0.53	0.22	0.36	0.66	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.98	0.98	0.73	0.58	0.73	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.05	0.90	0.73	0.65	0.80	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.00^	0.00^	0.07^	0.07^	0.00^	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.00^	0.00^	0.00^	0.00^	0.07^	NA	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.08	0.08	0.22	0.22	0.00	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.08^	0.08^	0.22^	0.15^	0.00	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.08^	0.00^	0.22^	0.15^	0.00^	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.08^	0.00^	0.15^	0.15^	0.00^	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	0.45	0.68	0.66	1.09	1.68	↑	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.38	0.53	0.44^	0.73^	1.53	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.45^	1.20^	1.83	2.76	3.72	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.30^	0.38^	0.29^	0.44^	1.31	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.60^	0.38^	0.51	0.51	0.80	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.45	0.68	0.66	0.22	0.66	-	2.10 (0.00-9.61)

NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Estonia, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	338	41.1	274	43.4	520	38.1	529	41.0	603	45.1	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	929	8.1	1 003	11.8	1 084	11.4	1 116	9.9	1 248	10.2	16.9 (6.8-42.7)	-
	Carbapenem (imipenem/meropenem) resistance	826	0.0	854	0.1	894	0.0	921	0.0	1 034	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	922	13.4	987	16.3	1 054	13.3	1 088	14.6	1 252	14.2	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	926	5.5	1 001	5.6	1 074	4.9	1 074	5.1	1 125	5.0	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	917	2.1	985	2.8	1 040	1.9	1 029	2.8	1 115	1.8	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	235	12.8	235	14.9	301	13.0	294	14.3	343	10.8	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	218	0.9	204	1.5	263	2.3	235	1.7	276	2.2	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	235	16.6	235	16.2	297	16.8	288	13.2	345	12.2	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	235	7.7	235	8.1	300	7.7	282	6.0	304	4.3	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	235	5.5	235	6.4	296	5.4	272	4.4	302	3.0	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	87	6.9	84	10.7	79	5.1	116	6.9	104	9.6	16.7 (0.0-59.5)	-
	Ceftazidime resistance	83	3.6	82	8.5	78	3.8	116	4.3	104	8.7	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	87	14.9	85	15.3	73	13.7	109	7.3	103	9.7	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	84	16.7	84	14.3	77	13.0	114	7.9	104	10.6	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	9	NA	6	NA	13	NA	25	4.0[f]	17	NA	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	5	NA	3	NA	13	NA	25	0.0[f]	16	NA	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	5	NA	3	NA	14	NA	25	12.0[f]	12	NA	31.5 (0.0-95.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	2	NA	2	NA	11	NA	17	NA	11	NA	33.9 (0.0-96.5)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	2	NA	1	NA	10	NA	16	NA	9	NA	30.0 (0.0-92.3)	NA
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	2	NA	1	NA	10	NA	16	NA	9	NA	27.1 (0.0-91.8)	NA
Staphylococcus aureus	MRSA[d]	398	1.5	407	2.2	436	2.1	442	3.4	501	4.6	14.1 (1.8-39.5)	↑*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	109	4.6	152	4.6	127	4.7	168	6.0	237	8.9	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	98	6.1	132	12.1	186	13.4	205	18.5	246	20.7	18.5 (4.0-30.7)	↑*
	Combined penicillin non-wild-type and resistance to macrolides[e]	97	4.1	132	3.8	122	3.3	167	3.6	232	7.8	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	73	11.0	75	6.7	125	5.6	100	7.0	113	9.7	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	83	7.2	85	10.6	77	11.7	68	4.4	81	11.1	17.2 (0.0-62.2)	-

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Estonia, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/0	NA	NA	0/1	ND	ND
	Cefiderocol	0/0	NA	NA	1/1	1	NA
	Ceftazidime-avibactam	0/0	NA	NA	1/1	1	NA
	Imipenem-relebactam	0/0	NA	NA	0/1	ND	ND
	Meropenem-vaborbactam	0/0	NA	NA	0/1	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/2	ND	ND	0/3	ND	ND
	Cefiderocol	1/2	3	NA	1/3	2	NA
	Ceftazidime-avibactam	1/2	3	NA	1/3	2	NA
	Imipenem-relebactam	0/2	ND	ND	0/3	ND	ND
	Meropenem-vaborbactam	0/2	ND	ND	0/3	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/6	ND	ND	1/4	4	NA
	Ceftazidime-avibactam	1/6	3	NA	1/4	5	NA
	Ceftolozane-tazobactam	1/6	3	NA	1/4	5	NA
	Imipenem-relebactam	0/6	ND	ND	0/4	ND	ND
	Meropenem-vaborbactam	0/6	ND	ND	0/4	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/2	ND	ND	0/0	NA	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Finland

Participating institutions
Finnish Institute for Health and Welfare, Department of Health Security, www.thl.fi
Finnish Study Group for Antimicrobial Resistance (FiRe), www.finres.fi
Finnish Hospital Infection Program (SIRO), https://thl.fi/en/web/infectious-diseases-and-vaccinations/diseases-and-diseasecontrol/healthcare-associated-infections

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Finland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	96	87	84	82	84
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	143.9	188.6	195.8	188.7	167.6

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Finland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	88	92	100	92	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Finland, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	19	5 802	NA	15	4 575	NA	15	4 269	NA	12	4 132	NA	12	4 390	NA
Klebsiella pneumoniae	19	971	NA	14	794	NA	15	727	NA	12	869	NA	12	1 002	NA
Pseudomonas aeruginosa	19	451	NA	14	422	NA	15	367	NA	12	382	NA	12	371	NA
***Acinetobacter* spp.**	14	47	NA	10	28	NA	10	33	NA	10	42	NA	10	34	NA
Staphylococcus aureus	19	2 423	NA	15	2 418	NA	15	2 103	NA	12	2 294	NA	12	2 353	NA
Streptococcus pneumoniae	17	303	NA	15	470	NA	14	513	NA	11	483	NA	12	629	NA
Enterococcus faecalis	19	654	NA	14	490	NA	15	460	NA	11	424	NA	12	518	NA
Enterococcus faecium	18	262	NA	14	238	NA	13	196	NA	6	154	NA	7	136	NA

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).
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MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Finland

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	8.02	7.26	7.21	5.78	6.46	6.70	7.08	-	-11.7*	-0.94*	-44*	-10	7.22	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.06	0.02	0.00	0.00	0.02	0.04	0.06	-	0	0	0	-2	0.06	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	1.06	1.07	1.19	1.14	1.28	1.85	1.96	↑	+84.9	+0.90	+52	-3	1.03	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Finland

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	18.97^	17.61^	17.76^	15.80^	15.82^	↓	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.21	5.78	6.46	6.70	7.08	-	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.02	0.04	0.02	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	10.45	9.38	9.39	8.86	8.17	↓	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.52	4.02	4.39	4.09	3.97	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.92	1.72	1.93	1.63	1.25	↓	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1.02	0.79	1.35	2.05	2.26	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.02	0.04	0.06	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1.00	0.93	1.39	1.35	1.88	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.77	0.39	0.81	0.59	0.99	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.40	0.29	0.51	0.39	0.65	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.40	0.33	0.34	0.33	0.23^	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.41	0.31	0.28	0.33	0.27	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.36	0.44	0.53	0.20	0.34	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.83	0.64	0.58	0.54	0.55	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.08	0.04	0.09	0.07	0.06	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.13	0.12	0.15	0.09	0.17^	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.02	0.02	0.00	0.00	0.00	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.02	0.02	0.00	0.00	0.00	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.02	0.02	0.02	0.02	0.00	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.02	0.02	0.00	0.00	0.00	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	1.19	1.14	1.28	1.85	1.96	↑	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.68^	0.58^	0.73^	1.31	0.57^	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.75	1.08	1.20	1.11	1.37	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.40^	0.31^	0.45^	0.74	0.32^	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	ND	ND	ND	ND	ND	NA	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.02	0.04	0.02	0.02	0.02	-	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; - indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Finland, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	3 177	31.7	2 615	32.5	2 550	32.5	2 109	34.4	2 089	35.9	55.5 (35.9-70.3)	↑
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5 799	6.6	4 568	6.1	4 262	7.1	4 132	7.5	4 390	7.6	16.9 (6.8-42.7)	↑
	Carbapenem (imipenem/meropenem) resistance	5 801	0.0	4 575	0.0	4 268	0.0	4 132	0.0	4 386	0.0	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5 802	9.6	4 572	9.9	4 261	10.3	4 131	9.9	4 390	8.8	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	5 802	4.1	4 367	4.4	4 241	4.8	4 132	4.5	4 388	4.3	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	5 799	1.8	4 357	1.9	4 227	2.1	4 131	1.8	4 388	1.3	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	971	5.6	794	4.8	727	8.7	868	10.8	1 002	10.7	32.8 (5.8-84.8)	↑*
	Carbapenem (imipenem/meropenem) resistance	971	0.0	793	0.0	727	0.1	868	0.2	1 002	0.3	12.0 (0.0-69.7)	↑
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	971	5.5	794	5.7	727	8.9	868	7.1	1 002	8.9	30.1 (6.9-82.8)	↑
	Aminoglycoside (gentamicin/tobramycin) resistance	971	4.2	764	2.5	726	5.2	868	3.1	1 002	4.7	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	971	2.2	764	1.8	726	3.3	867	2.1	1 002	3.1	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	450	4.7	421	3.8	364	4.4	375	4.0	314	3.5	16.7 (0.0-59.5)	-
	Ceftazidime resistance	451	4.9	422	3.6	367	3.5	382	3.9	371	3.5	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	451	4.2	422	5.0	367	6.8	382	2.4	369	4.3	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	451	9.8	422	7.3	365	7.4	382	6.5	371	7.0	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	451	0.9	422	0.5	367	1.1	382	0.8	369	0.8	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	450	1.6	421	1.4	362	1.9	375	1.1	312	2.6	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	47	2.1	28	3.6[f]	33	0.0	42	0.0	34	0.0	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	47	2.1	28	3.6[f]	33	0.0	42	0.0	34	0.0	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	47	2.1	28	3.6[f]	33	3.0	42	2.4	34	0.0	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	47	2.1	28	3.6[f]	33	0.0	42	0.0	34	0.0	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	2 423	2.6	2 418	2.3	2 103	2.9	2 294	3.7	2 353	4.0	14.1 (1.8-39.5)	↑
Streptococcus pneumoniae	Penicillin non-wild-type[e]	247	14.6	339	8.3	419	8.1	483	12.4	527	5.1	16.4 (5.1-30.2)	↓*
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	301	13.3	470	11.1	499	11.2	482	10.6	629	10.3	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	245	8.6	339	4.4	405	5.2	482	7.1	527	2.8	10.1 (1.0-18.9)	↓*
Enterococcus faecalis	High-level gentamicin resistance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.3 (2.3-62.1)	NA
Enterococcus faecium	Vancomycin resistance	261	0.4	238	0.8	196	0.5	154	0.6	135	0.7	17.2 (0.0-62.2)	-

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Finland, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/2	ND	ND	0/1	ND	ND
	Cefiderocol	0/2	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/2	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/2	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/2	ND	ND	0/1	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/2	ND	ND	0/3	ND	ND
	Cefiderocol	0/2	ND	ND	2/3	2	NA
	Ceftazidime-avibactam	0/2	ND	ND	1/3	1	NA
	Imipenem-relebactam	0/2	ND	ND	1/3	1	NA
	Meropenem-vaborbactam	0/2	ND	ND	1/3	1	NA
Pseudomonas aeruginosa	Cefiderocol	0/7	ND	ND	1/7	1	NA
	Ceftazidime-avibactam	0/7	ND	ND	1/7	1	NA
	Ceftolozane-tazobactam	0/7	ND	ND	1/7	1	NA
	Imipenem-relebactam	0/7	ND	ND	0/7	ND	ND
	Meropenem-vaborbactam	0/7	ND	ND	1/7	1	NA
***Acinetobacter* spp.**	Cefiderocol	0/0	NA	NA	0/0	NA	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

France

Participating institutions

Santé Publique France, www.santepubliquefrance.fr

Since 2020: Surveillance and Prevention of Antimicrobial RESistance in hospital settings (SPARES), https://www.preventioninfection.fr

National Reference Centre for Pneumococci, https://cnr-pneumo.com

Up to 2019: French National Observatory for the Epidemiology of Bacterial Resistance to Antimicrobials (ONERBA), through three participating networks: Azay-Résistance, Île-de-France, Réussir, https://onerba.org

Population and hospitals contributing data: coverage, representativeness and blood culture rate, France, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)					
Laboratories collecting *S. pneumoniae* (CNRP)	56	55	57	58	60
Laboratories collecting other species (SPARES)	55	55	0	57	70
Geographical representativeness					
Laboratories collecting *S. pneumoniae* (CNRP)	High	High	High	High	High
Laboratories collecting other species (SPARES)	High	High	Low	High	High
Hospital representativeness					
Laboratories collecting *S. pneumoniae* (CNRP)	High	High	High	High	High
Laboratories collecting other species (SPARES)	High	High	Low	High	High
Isolate representativeness					
Laboratories collecting *S. pneumoniae* (CNRP)	High	High	High	High	High
Laboratories collecting other species (SPARES)	High	High	Low	High	High
Blood culture sets/1 000 patient-days	54.6	58.5	ND	61.5	62.4

ND: no data available.

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, France, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	ND	75	72	84	79

ND: no data available.

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, France, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	743	18 796	8	720	17 744	8	ND	ND	ND	796	21 699	8	935	26 623	8
Klebsiella pneumoniae	545	4 985	17	527	5 105	14	ND	ND	ND	602	6 405	13	710	8 113	12
Pseudomonas aeruginosa	489	3 918	26	468	3 574	20	ND	ND	ND	496	4 088	17	599	5 241	18
***Acinetobacter* spp.**	219	737	11	238	870	13	ND	ND	ND	291	1 248	12	372	1 476	13
Staphylococcus aureus	661	11 809	13	625	10 731	12	ND	ND	ND	668	12 373	11	842	16 321	12
Streptococcus pneumoniae	194	1 339	NA	162	928	NA	188	1 181	NA	162	1 101	NA	185	1 485	NA
Enterococcus faecalis	511	4 736	22	494	4 135	16	ND	ND	ND	542	5 473	14	656	6 716	14
Enterococcus faecium	311	1 567	27	291	1 504	24	ND	ND	ND	349	2 197	20	445	3 270	21

Labs: laboratories.

ND: no data available.

NA: not applicable.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, France

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	8.60	5.52	4.20	4.01	ND	5.74	6.61	NA	-23.1*	-1.99*	-1 204*	-10	7.74	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.22	0.08	0.10	0.13	ND	0.19	0.21	NA	-4.5*	-0.01*	-9*	-2	0.22	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	5.61	4.02	3.41	2.97	ND	3.06	3.42	NA	-39.0*	-2.19*	-1 401*	-18	4.60	4.56 (0.58-12.07)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached. Due to changes in the surveillance network in 2020 the progress toward the target should be interpreted with caution.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, France

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	24.87	24.33	ND	28.32	29.36	NA	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.20	4.01	ND	5.74	6.61	NA	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.02	0.05	ND	0.08	0.08	NA	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	7.32	6.90	ND	7.53	6.86	NA	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.76	2.62^	ND	3.50^	3.81	NA	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.20	1.07^	ND	1.39^	1.55	NA	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3.40	3.42	ND	4.39	4.40	NA	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.10	0.13	ND	0.19	0.21	NA	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	3.29	3.32	ND	3.65	3.41	NA	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.20	2.12	ND	2.33	2.24	NA	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.84	1.74	ND	1.82^	1.75	NA	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.63	1.42^	ND	1.45^	1.47	NA	1.88 (0.00-8.69)
	Ceftazidime resistance	1.27	1.07	ND	1.15	1.08	NA	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.25	1.06	ND	1.06	1.16	NA	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.44	1.23	ND	1.17	1.21	NA	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.44^	0.45^	ND	0.32^	0.33	NA	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.67^	0.54^	ND	0.51^	0.54^	NA	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.06	0.08	ND	0.10	0.12	NA	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.13	0.14	ND	0.17	0.19	NA	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.11	0.14^	ND	0.12	0.19	NA	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.04^	0.05^	ND	0.05^	0.07	NA	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	3.41	2.97	ND	3.06	3.42	NA	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	1.13	0.84	0.93	1.01	1.09	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.81	0.62	0.73	0.79	0.78	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.72	0.53	0.62	0.68	0.68	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	ND	ND	ND	ND	ND	NA	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.02	0.03	ND	0.03	0.04	NA	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, France, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	17 706	52.3	17 191	52.8	ND	ND	20 590	53.7	25 394	55.8	55.5 (35.9-70.3)	NA
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	18 735	8.3	17 722	8.4	ND	ND	21 395	10.5	26 482	12.0	16.9 (6.8-42.7)	NA
	Carbapenem (imipenem/meropenem) resistance	17 546	0.1	16 989	0.1	ND	ND	20 417	0.2	25 562	0.2	0.2 (0.0-2.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	18 446	14.8	17 517	14.7	ND	ND	21 298	13.8	26 135	12.7	22.0 (8.8-50.9)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	17 653	5.8	15 900	6.2	ND	ND	19 404	7.0	24 548	7.5	10.3 (4.3-23.1)	NA
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	17 301	2.6	15 681	2.6	ND	ND	19 049	2.8	24 080	3.1	5.4 (1.3-17.1)	NA
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4 973	25.4	5 097	25.0	ND	ND	6 331	27.1	8 079	26.2	32.8 (5.8-84.8)	NA
	Carbapenem (imipenem/meropenem) resistance	4 727	0.8	4 965	1.0	ND	ND	6 051	1.2	7 825	1.3	12.0 (0.0-69.7)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	4 889	25.0	5 040	24.6	ND	ND	6 290	22.6	8 005	20.6	30.1 (6.9-82.8)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	4 706	17.4	4 703	16.8	ND	ND	5 852	15.6	7 589	14.2	21.1 (2.4-77.0)	NA
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	4 617	14.9	4 644	14.0	ND	ND	5 750	12.4	7 474	11.3	18.4 (1.1-73.6)	NA
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	3 580	17.0	3 136	16.8	ND	ND	3 662	15.4	4 832	14.7	16.7 (0.0-59.5)	NA
	Ceftazidime resistance	3 754	12.5	3 375	11.9	ND	ND	3 766	11.9	4 933	10.6	13.5 (1.5-56.0)	NA
	Carbapenem (imipenem/meropenem) resistance	3 850	12.1	3 498	11.3	ND	ND	3 908	10.6	5 092	10.9	15.6 (0.0-57.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	3 785	14.1	3 359	13.7	ND	ND	3 792	12.0	5 089	11.5	14.9 (2.2-57.7)	NA
	Aminoglycoside (tobramycin) resistance	3 297	4.9	3 033	5.6	ND	ND	3 548	3.5	4 730	3.3	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	3 044	8.2	2 804	7.2	ND	ND	3 195	6.3	4 329	6.1	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	720	3.1	857	3.5	ND	ND	1 211	3.3	1 451	3.9	31.5 (0.0-95.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	672	7.1	791	6.4	ND	ND	1 194	5.7	1 460	6.3	33.9 (0.0-96.5)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	673	6.1	757	7.0	ND	ND	1 174	3.8	1 416	6.4	30.0 (0.0-92.3)	NA
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	626	2.4	700	2.6	ND	ND	1 117	1.9	1 387	2.5	27.1 (0.0-91.8)	NA
Staphylococcus aureus	MRSA[d]	11 536	11.0	10 628	10.4	ND	ND	12 060	9.9	16 066	10.3	14.1 (1.8-39.5)	NA
Streptococcus pneumoniae	Penicillin non-wild-type[e]	1 339	32.0	928	33.7	1 181	30.7	1 101	36.6	1 485	30.2	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	1 339	23.0	928	24.8	1 181	23.9	1 101	28.6	1 485	21.8	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	1 339	20.3	928	21.3	1 181	20.3	1 101	24.7	1 485	18.9	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	22.3 (2.3-62.1)	NA
Enterococcus faecium	Vancomycin resistance	1 517	0.5	1 470	0.7	ND	ND	2 056	0.5	3 107	0.5	17.2 (0.0-62.2)	NA

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, France, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/23	ND	ND	0/30	ND	ND
	Cefiderocol	1/23	4	NA	4/30	5	NA
	Ceftazidime-avibactam	7/23	12	NA	14/30	19	NA
	Imipenem-relebactam	2/23	2	NA	3/30	3	NA
	Meropenem-vaborbactam	2/23	2	NA	3/30	3	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/47	ND	ND	0/55	ND	ND
	Cefiderocol	4/47	6	NA	6/55	10	NA
	Ceftazidime-avibactam	23/47	35	54.3	23/55	35	62.9
	Imipenem-relebactam	2/47	2	NA	3/55	6	NA
	Meropenem-vaborbactam	3/47	3	NA	2/55	2	NA
Pseudomonas aeruginosa	Cefiderocol	2/176	2	NA	2/197	4	NA
	Ceftazidime-avibactam	36/176	69	17.4	58/197	164	11.0
	Ceftolozane-tazobactam	54/176	124	16.9	68/197	217	12.4
	Imipenem-relebactam	6/176	11	NA	17/197	55	10.9
	Meropenem-vaborbactam	5/176	8	NA	5/197	5	NA
***Acinetobacter* spp.**	Cefiderocol	4/25	9	NA	7/38	9	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Germany

Participating institutions
Robert Koch Institute, www.rki.de

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Germany, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	35	42	44	56	54
Geographical representativeness	High	High	High	High	High
Hospital representativeness	Medium	Medium	Medium	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	ND	ND	ND	ND	ND

ND: no data available.

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Germany, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	97	97	91	100	96

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Germany, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	56	29 024	15	72	33 982	16	70	37 744	15	117	53 118	14	114	54 819	14
Klebsiella pneumoniae	56	6 539	25	72	7 446	24	70	8 442	24	115	12 315	21	111	13 024	20
Pseudomonas aeruginosa	55	2 866	29	72	3 214	28	70	3 719	26	115	5 222	24	112	5 319	24
***Acinetobacter* spp.**	53	606	19	70	759	21	69	886	17	105	1 208	14	105	1 190	16
Staphylococcus aureus	56	15 804	23	72	18 907	22	70	19 926	21	116	27 059	20	110	28 191	19
Streptococcus pneumoniae	54	1 249	27	72	2 565	24	70	3 700	24	114	5 464	22	110	6 365	22
Enterococcus faecalis	56	4 938	25	72	5 788	24	70	6 099	23	116	8 455	20	111	8 316	19
Enterococcus faecium	55	4 732	49	72	5 087	46	70	5 423	43	115	7 523	39	111	8 272	39

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Germany

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	12.02#	10.74#	9.07#	9.15#	9.93#	12.27	13.51	-	+12.4	+1.49	+1 315	-12	10.58	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.20#	0.11#	0.18#	0.23#	0.23#	0.32	0.30	↑	+50.0	+0.10	+85	-2	0.20	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	3.56#	2.91#	2.64#	2.15#	2.33#	2.51	2.78	-	-21.9*	-0.78*	-633*	-10	3.20	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Germany

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	44.66#	43.86#	45.05#	53.55	58.43	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	9.07#	9.15#	9.93#	12.27	13.51	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.04#	0.03#	0.04#	0.06	0.09	↑	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	14.61#	14.74#	16.70#	18.96	19.16	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.28#	4.74#	5.16#	5.88	6.39	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.11#	1.72#	1.96#	2.14	2.19	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2.33#	2.26#	2.28#	2.84	3.09	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.18#	0.23#	0.23#	0.32	0.30	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2.41#	2.54#	2.61#	2.91	2.83	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.93#	0.87#	0.85#	0.85	0.87	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.57#	0.64#	0.61#	0.59	0.61	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.30#	1.28#	1.30#	1.50	1.48	↑	1.88 (0.00-8.69)
	Ceftazidime resistance	1.04#	0.94#	0.96#	0.98	0.93	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.46#	1.22#	1.26#	1.48	1.49	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.98#	0.90#	0.91#	0.94	0.98	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.17#	0.19#	0.16#	0.19^	0.13^	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.60^#	0.59#	0.58#	0.55^	0.49^	↓	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.09#	0.08#	0.07#	0.06	0.05	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.12#	0.11#	0.10#	0.10	0.08	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.08#	0.09^#	0.06#	0.09^	0.08^	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.05#	0.05^#	0.04#	0.03^	0.02^	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	2.64#	2.15#	2.33#	2.51	2.78	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.32#	0.42#	0.60#	0.62	0.84	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.27#	0.45#	0.63#	0.73	0.95	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.09#	0.19#	0.26#	0.28	0.38	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.33^#	1.30^#	1.33^#	1.32^	1.43^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	3.51#	2.67#	1.90#	1.73	1.94	↓	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Germany, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	28 500	45.6	33 372	45.9	36 011	46.4	51 557	48.5	53 395	49.4	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	29 021	9.1	33 978	9.4	37 551	9.8	53 106	10.8	54 794	11.1	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	29 015	0.0	33 974	0.0	37 550	0.0	53 007	0.1	54 771	0.1	0.2 (0.0-2.4)	↑
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	28 997	14.7	33 949	15.2	37 282	16.6	52 878	16.8	54 367	15.9	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	27 447	5.6	32 255	5.1	35 167	5.5	48 883	5.6	49 968	5.8	10.3 (4.3-23.1)	↑
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	27 427	2.2	32 232	1.9	34 866	2.1	48 715	2.1	49 597	2.0	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6 538	10.4	7 445	10.6	8 408	10.1	12 306	10.8	13 019	10.7	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	6 538	0.8	7 445	1.1	8 410	1.0	12 293	1.2	13 010	1.0	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6 422	10.9	7 443	11.9	8 350	11.6	12 288	11.1	12 949	9.9	30.1 (6.9-82.8)	↓
	Aminoglycoside (gentamicin/tobramycin) resistance	6 217	4.3	7 132	4.3	7 941	4.0	11 380	3.5	11 797	3.3	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	6 099	2.7	7 130	3.1	7 874	2.9	11 356	2.4	11 730	2.4	18.4 (1.1-73.6)	↓
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	2 842	13.3	3 202	14.0	3 663	13.2	5 197	13.5	5 302	12.6	16.7 (0.0-59.5)	-
	Ceftazidime resistance	2 861	10.6	3 209	10.3	3 670	9.8	5 212	8.8	5 304	7.9	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	2 864	14.8	3 209	13.2	3 691	12.7	5 219	13.2	5 309	12.7	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	2 865	10.0	3 209	9.8	3 675	9.1	5 213	8.4	5 301	8.3	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	2 600	1.9	2 993	2.2	3 404	1.7	4 466	1.9	4 463	1.3	6.9 (0.0-50.0)	↓*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	2 573	6.8	2 975	6.9	3 385	6.4	4 440	5.8	4 434	5.0	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	605	4.3	758	3.6	883	2.9	1 207	2.2	1 189	1.9	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	603	5.6	753	5.0	882	4.3	1 204	3.9	1 183	3.0	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	549	4.2	683	4.7	807	2.6	1 028	3.9	896	4.1	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	546	2.9	681	2.8	804	1.9	1 026	1.6	893	1.1	27.1 (0.0-91.8)	↓
Staphylococcus aureus	MRSA[d]	15 796	4.9	18 898	4.0	19 707	4.4	27 031	4.3	28 162	4.5	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	1 196	7.8	2 483	6.0	3 583	6.2	5 315	5.5	6 241	6.1	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	1 188	6.6	2 471	6.3	3 542	6.6	5 237	6.5	6 084	7.0	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	1 136	2.2	2 389	2.8	3 436	2.8	5 106	2.5	5 963	2.9	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	2 670	14.5	4 034	11.3	4 423	11.2	6 043	10.2	5 970	10.8	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	4 721	21.6	5 081	18.3	5 357	13.1	7 509	10.7	8 250	10.6	17.2 (0.0-62.2)	↓*

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Germany, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/20	ND	ND	0/22	ND	ND
	Cefiderocol	8/20	14	NA	11/22	18	NA
	Ceftazidime-avibactam	12/20	16	NA	12/22	22	54.5
	Imipenem-relebactam	6/20	9	NA	4/22	9	NA
	Meropenem-vaborbactam	5/20	8	NA	3/22	3	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/56	ND	ND	0/65	ND	ND
	Cefiderocol	21/56	65	63.1	31/65	57	42.1
	Ceftazidime-avibactam	36/56	108	52.8	36/65	69	44.9
	Imipenem-relebactam	14/56	46	76.1	15/65	34	79.4
	Meropenem-vaborbactam	10/56	16	NA	11/65	19	NA
Pseudomonas aeruginosa	Cefiderocol	2/101	2	NA	3/98	9	NA
	Ceftazidime-avibactam	11/101	71	19.7	8/98	60	10.0
	Ceftolozane-tazobactam	9/101	62	8.1	7/98	49	6.1
	Imipenem-relebactam	2/101	2	NA	1/98	4	NA
	Meropenem-vaborbactam	2/101	2	NA	1/98	4	NA
Acinetobacter spp.	Cefiderocol	3/14	3	NA	5/16	5	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Greece

Participating institutions

National Public Health Organization, Central Public Health Laboratory, https://eody.gov.gr/en/

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Greece, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	42	68	68	68	63
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	Medium	High	High	High	High
Blood culture sets/1 000 patient-days	ND	ND	ND	ND	ND

ND: no data available.

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Greece, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	85	90	90	95	88

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Greece, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	19	729	6	31	1 241	6	34	1 872	6	32	1 605	6	31	1 705	6
Klebsiella pneumoniae	19	1 418	49	30	1 814	37	35	2 207	30	32	1 777	25	32	1 724	24
Pseudomonas aeruginosa	19	576	38	31	896	36	34	1 301	33	32	1 151	28	31	1 073	29
***Acinetobacter* spp.**	19	1 378	60	31	1 565	44	35	1 637	41	30	1 152	36	31	1 123	34
Staphylococcus aureus	19	584	13	31	922	11	36	1 174	10	33	1 062	9	31	979	11
Streptococcus pneumoniae	ND	ND	ND	17	46	11	22	77	9	19	59	20	18	70	13
Enterococcus faecalis	19	687	38	31	971	27	34	1 046	27	33	829	23	31	785	23
Enterococcus faecium	18	964	47	29	1 181	34	33	1 284	24	31	983	22	32	1 059	19

Labs: laboratories.

ND: no data available.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Greece

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2.58#	3.86#	3.52#	3.99	5.61	5.40	6.57	↑	+154.7	+3.99	+404	0	2.58	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	13.05#	14.96#	23.30#	18.02	21.44	14.89	16.28	-	+24.8	+3.23	+289	-5	12.40	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	4.59#	5.60#	5.44#	4.96	6.51	5.54	5.48	-	+19.4	+0.89	+76	-10	4.13	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Greece

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	7.42^#	7.63^	12.89^	10.52^	13.05^	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3.52#	3.99	5.61	5.40	6.57	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.18#	0.26	0.41	0.27	0.23	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5.51#	6.49	9.93	8.20	9.01	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.99#	3.27	5.32	4.16	5.00	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.90#	1.72	2.89	2.62	2.72^	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	25.37#	19.55	22.18	16.43	17.89	↓	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	23.30#	18.02	21.44	14.89	16.28	↓	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	25.28#	19.67	23.53	17.26	18.59	↓	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	21.56#	16.99	19.53	14.24	15.72	↓	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	20.98#	16.49	18.17	12.88^	14.16	↓	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	4.17^#	5.94	9.31	7.45^	8.69^	↑	1.88 (0.00-8.69)
	Ceftazidime resistance	3.70#	5.28	9.15	7.61	8.66	↑	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	4.28#	5.99	9.76	8.34	9.23	↑	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	4.59#	6.03	9.46	8.05	9.30	↑	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	2.74^#	3.43^	5.99^	5.06^	5.91^	↑	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	2.68^#	3.47^	5.83^	4.91^	5.92^	↑	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	29.77#	20.36	21.18	14.59	16.04	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	29.70#	20.43	21.03	13.60^	15.36	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	25.86#	18.88	19.39	12.50^	14.58	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	25.71#	18.71	19.15	12.29^	14.17^	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	5.44#	4.96	6.51	5.54	5.48	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	ND	0.19^	0.35^	0.21^	0.21^	NA	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	ND	0.21	0.27	0.27	0.28	NA	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	ND	0.06^	0.14^	0.16^	0.08^	NA	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.09^#	1.28^	1.13^	0.82^	1.04^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	8.70#	7.95	10.48	8.17	9.61	-	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Greece, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	557	59.8	964	57.1	1 579	57.8	1 260	59.0	1 397	61.1	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	727	21.7	1 235	23.3	1 739	22.8	1 498	25.5	1 581	27.1	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	728	1.1	1 240	1.5	1 867	1.6	1 591	1.2	1 677	0.9	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	728	33.9	1 239	37.8	1 861	37.8	1 596	36.3	1 679	35.1	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	719	18.6	1 239	19.0	1 828	20.6	1 558	18.9	1 635	20.0	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	717	11.9	1 231	10.1	1 703	12.0	1 454	12.7	1 529	11.6	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 416	80.4	1 802	78.2	2 078	75.6	1 658	70.1	1 613	72.5	32.8 (5.8-84.8)	↓*
	Carbapenem (imipenem/meropenem) resistance	1 418	73.7	1 803	72.0	2 179	69.7	1 748	60.2	1 714	62.1	12.0 (0.0-69.7)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 418	80.0	1 802	78.7	2 166	76.9	1 748	69.9	1 709	71.1	30.1 (6.9-82.8)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	1 399	69.1	1 803	67.9	2 136	64.7	1 691	59.6	1 671	61.5	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 397	67.4	1 796	66.2	2 038	63.2	1 584	57.5	1 567	59.0	18.4 (1.1-73.6)	↓*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	513	36.5	847	50.5	1 212	54.4	982	53.7	954	59.5	16.7 (0.0-59.5)	↑*
	Ceftazidime resistance	529	31.4	851	44.8	1 229	52.7	1 045	51.5	1 011	56.0	13.5 (1.5-56.0)	↑*
	Carbapenem (imipenem/meropenem) resistance	576	33.3	887	48.7	1 294	53.4	1 105	53.4	1 050	57.4	15.6 (0.0-57.4)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	576	35.8	884	49.2	1 289	52.0	1 097	51.9	1 054	57.7	14.9 (2.2-57.7)	↑*
	Aminoglycoside (tobramycin) resistance	432	28.5	601	41.1	920	46.1	803	44.6	772	50.0	6.9 (0.0-50.0)	↑*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	378	31.7	549	45.5	851	48.5	731	47.5	720	53.8	10.0 (0.0-53.8)	↑*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	1 377	96.9	1 531	95.9	1 574	95.3	1 097	94.1	1 109	94.5	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1 371	97.2	1 527	96.5	1 566	95.1	1 011	95.2	1 043	96.3	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	1 269	91.4	1 527	89.1	1 558	88.1	997	88.7	1 032	92.3	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	1 262	91.4	1 522	88.6	1 551	87.4	989	87.9	1 009	91.8	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	583	41.9	918	39.0	1 118	41.2	967	40.5	928	38.6	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	ND	ND	30	46.7	64	39.1	52	28.8	53	26.4	16.4 (5.1-30.2)	NA
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	ND	ND	44	34.1	73	26.0	56	33.9	67	26.9	18.5 (4.0-30.7)	NA
	Combined penicillin non-wild-type and resistance to macrolides[e]	ND	ND	29	13.8[f]	60	16.7	50	22.0	53	9.4	10.1 (1.0-18.9)	NA
Enterococcus faecalis	High-level gentamicin resistance	517	9.5	755	12.2	762	10.5	587	9.9	431	15.8	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	950	41.1	1 168	49.1	1 266	58.6	981	58.9	1 010	62.2	17.2 (0.0-62.2)	↑*

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n < 30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Greece, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/11	ND	ND	0/10	ND	ND
	Cefiderocol	0/11	ND	ND	0/10	ND	ND
	Ceftazidime-avibactam	8/11	13	NA	0/10	ND	ND
	Imipenem-relebactam	3/11	5	NA	0/10	ND	ND
	Meropenem-vaborbactam	4/11	7	NA	0/10	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/31	ND	ND	0/30	ND	ND
	Cefiderocol	0/31	ND	ND	0/30	ND	ND
	Ceftazidime-avibactam	16/31	597	57.1	0/30	ND	ND
	Imipenem-relebactam	7/31	255	60.0	0/30	ND	ND
	Meropenem-vaborbactam	9/31	337	58.8	0/30	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/29	ND	ND	0/30	ND	ND
	Ceftazidime-avibactam	16/29	412	83.0	0/30	ND	ND
	Ceftolozane-tazobactam	13/29	351	82.3	0/30	ND	ND
	Imipenem-relebactam	6/29	156	87.8	0/30	ND	ND
	Meropenem-vaborbactam	6/29	166	90.4	0/30	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/30	ND	ND	0/31	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Hungary

Participating institutions

National Center for Public Health and Pharmacy, www.nngyk.gov.hu

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Hungary, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	90	90	90	90	90
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	22.0	18.4	19.5	21.9	21.3

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Hungary, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	93	96	96	96

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Hungary, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	30	2 474	16	27	2 567	13	23	2 761	10	23	3 068	7	23	3 163	7
Klebsiella pneumoniae	30	1 110	33	26	973	28	22	1 149	28	23	1 266	17	23	1 284	17
Pseudomonas aeruginosa	30	1 226	57	25	1 016	45	23	950	37	23	1 017	30	23	971	28
***Acinetobacter* spp.**	29	1 447	74	25	551	64	21	430	46	22	505	41	23	475	43
Staphylococcus aureus	29	2 359	22	24	2 072	17	22	2 028	16	21	2 204	11	21	2 123	10
Streptococcus pneumoniae	27	186	27	25	293	17	22	284	16	23	382	15	23	438	12
Enterococcus faecalis	31	1 562	55	25	1 020	38	24	946	30	23	1 020	24	23	1 043	21
Enterococcus faecium	30	710	NA	24	531	40	22	449	38	22	458	30	22	490	24

Labs: laboratories.

NA: not applicable.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Hungary

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.65	4.49	5.75	6.64	6.81	7.37	8.79	↑	+55.6	+3.14	+287	0	5.65	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.09	0.06	0.11	0.57	0.76	0.97	1.55	↑	+1 622.2	+1.46	+139	-2	0.09	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	4.15	3.61	5.20	4.97	4.85	4.42	4.82	-	+16.1	+0.67	+54	-10	3.73	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Hungary

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	15.12	15.64	16.72	17.98	16.75^	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.75	6.64	6.81	7.37	8.79	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.06	0.07	0.03	0.00	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	7.88	8.50	8.22	8.88	9.31	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.93	4.79	4.71	4.65	4.64	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.79	3.06	2.94	2.76	2.75	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.90	4.54	5.59	5.83	6.74	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.11	0.57	0.76	0.97	1.55	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	4.73	4.32	5.01	5.29	5.61	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.02	3.64	4.18	4.16	4.20	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	3.64	3.14	3.51	3.22	3.39	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	2.66	2.17	2.03	1.96	1.67	↓	1.88 (0.00-8.69)
	Ceftazidime resistance	2.76	2.08	1.96	1.74	1.55	↓	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	4.81	3.64	3.40	3.62	3.41	↓	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	3.09	2.12	1.72	1.62	1.32	↓	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	1.37	1.04	0.86	0.93	0.73	↓	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	2.16	1.43	1.37	1.39	1.02	↓	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	13.69	3.65	2.29	2.82	3.11	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	14.08	4.03	2.43	2.92	3.23	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	13.39	2.96	1.96	2.57	3.13	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	13.06	2.76	1.83	2.43	2.91	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	5.20	4.97	4.85	4.42	4.82	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.26	0.21	0.23	0.37	0.45	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.30	0.36	0.46	0.59	0.71	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.13	0.15	0.20	0.21	0.37	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	7.19	4.21	3.66	3.12^	3.23^	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	3.30	2.18	1.98	1.90	2.63	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Hungary, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	2 263	58.5	2 335	58.4	2 519	57.4	2 778	55.8	2 553	56.3	55.5 (35.9-70.3)	↓*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2 470	20.4	2 565	22.6	2 756	21.3	3 067	20.7	3 162	23.9	16.9 (6.8-42.7)	↑
	Carbapenem (imipenem/meropenem) resistance	2 391	0.0	2 515	0.2	2 688	0.2	3 005	0.1	3 083	0.0	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2 460	28.0	2 531	29.3	2 732	26.0	3 051	25.1	3 147	25.4	22.0 (8.8-50.9)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	2 469	17.5	2 561	16.3	2 754	14.8	3 058	13.1	3 154	12.6	10.3 (4.3-23.1)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2 452	10.0	2 526	10.6	2 726	9.3	3 041	7.8	3 137	7.5	5.4 (1.3-17.1)	↓*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 110	38.6	972	40.7	1 149	42.0	1 264	39.8	1 283	45.1	32.8 (5.8-84.8)	↑*
	Carbapenem (imipenem/meropenem) resistance	1 092	0.9	948	5.3	1 136	5.8	1 249	6.7	1 266	10.5	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 096	37.8	953	39.6	1 139	38.0	1 250	36.5	1 275	37.8	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	1 107	31.8	973	32.6	1 149	31.4	1 260	28.5	1 278	28.2	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 093	29.2	952	28.8	1 139	26.6	1 244	22.3	1 268	22.9	18.4 (1.1-73.6)	↓*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1 195	19.5	1 008	18.8	942	18.6	1 012	16.7	970	14.7	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	1 221	19.8	1 014	17.9	947	17.8	1 005	14.9	965	13.8	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	1 226	34.3	1 016	31.2	950	30.9	1 016	30.7	967	30.3	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1 221	22.2	1 014	18.2	948	15.7	1 012	13.8	967	11.7	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	1 207	9.9	990	9.2	938	7.9	1 001	8.0	965	6.5	6.9 (0.0-50.0)	↓*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	1 170	16.2	983	12.7	926	12.7	980	12.2	952	9.2	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	1 445	83.0	549	57.9	429	46.2	504	48.2	473	56.4	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1 441	85.6	550	63.8	429	49.0	500	50.4	472	58.7	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	1 434	81.8	547	47.2	426	39.7	503	44.1	473	56.9	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	1 429	80.1	544	44.3	424	37.3	499	42.1	469	53.3	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	2 359	19.3	2 072	20.9	2 028	20.7	2 204	17.3	2 108	19.6	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	185	12.4	293	6.1	284	7.0	380	8.4	433	9.0	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	175	14.9	288	10.8	279	14.3	376	13.6	423	14.4	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	174	6.3	288	4.5	279	6.1	374	4.8	418	7.7	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	1 561	40.4	1 020	36.0	946	33.4	792	34.0	835	33.2	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	710	40.7	531	35.8	448	38.2	456	36.0	490	46.1	17.2 (0.0-62.2)	-

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Hungary, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/3	ND	ND	0/0	NA	NA
	Cefiderocol	0/3	ND	ND	0/0	NA	NA
	Ceftazidime-avibactam	1/3	1	NA	0/0	NA	NA
	Imipenem-relebactam	0/3	ND	ND	0/0	NA	NA
	Meropenem-vaborbactam	0/3	ND	ND	0/0	NA	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/12	ND	ND	2/15	58	0.0
	Cefiderocol	4/12	23	69.6	7/15	27	33.3
	Ceftazidime-avibactam	8/12	55	89.1	7/15	89	60.7
	Imipenem-relebactam	0/12	ND	ND	0/15	ND	ND
	Meropenem-vaborbactam	0/12	ND	ND	0/15	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/22	ND	ND	0/22	ND	ND
	Ceftazidime-avibactam	9/22	126	33.3	8/22	129	21.7
	Ceftolozane-tazobactam	5/22	96	26.0	5/22	102	20.6
	Imipenem-relebactam	0/22	ND	ND	0/22	ND	ND
	Meropenem-vaborbactam	0/22	ND	ND	0/22	ND	ND
***Acinetobacter* spp.**	Cefiderocol	3/19	19	NA	0/20	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Iceland

Participating institutions
National University Hospital of Iceland, https://www.landspitali.is
Centre for Health Security and Infectious Disease Control, https://www.landlaeknir.is
Akureyri hospital, www.sak.is

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Iceland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	100	100	100	100	100
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	64.4	69.8	72.0	72.0	73.5

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Iceland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	50	50	100	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Iceland, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	2	278	1	2	235	2	2	258	3	2	290	1	2	311	3
Klebsiella pneumoniae	2	29	4[c]	2	32	0	2	44	5	2	41	5	2	60	5
Pseudomonas aeruginosa	2	32	7	2	35	6	2	27	8[c]	2	20	12[c]	2	27	4[c]
***Acinetobacter* spp.**	1	8	NA	1	2	NA	1	1	NA	2	3	NA	2	7	NA
Staphylococcus aureus	2	96	4	2	144	7	2	129	4	2	143	4	2	143	5
Streptococcus pneumoniae	2	16	NA	2	35	3	2	38	0	2	37	3	2	37	9
Enterococcus faecalis	2	37	6	2	29	7[c]	2	33	7	2	46	9	2	31	3
Enterococcus faecium	2	18	NA	2	33	6	2	39	11	2	28	7[c]	2	31	13

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).
[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Iceland

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.04	7.41	7.86	6.11	7.99	10.69	9.24	↑	+83.3	+4.2	+18	NA	NA	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	ND	0.00	0.00	0.00	0.00	0.00	0.00	NA	NA	NA	NA	NA	NA	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	1.96	1.65	0.27	1.06	2.06	2.09	1.03	-	-47.4	-0.93	-3	NA	NA	4.56 (0.58-12.07)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Iceland

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	34.98	29.24	35.07	40.41	42.37	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.86	6.11	7.99	10.69	9.24	-	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.00	0.26	0.26	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	10.85	6.38	8.51	10.43	10.53	-	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.05	4.78	3.61	6.78	7.19	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.17	2.39	2.06	3.13	1.80	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	0.27	0.27	0.77	0.52	2.31	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.00	0.00	0.00	NA	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	0.00	0.80	1.29	0.00	1.03	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.00	0.00	0.52	0.00	1.54	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.00	0.00	0.00	0.00	0.77	NA	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.63	0.80	0.26	0.26	0.00	↓	1.88 (0.00-8.69)
	Ceftazidime resistance	0.81	0.53	0.52	0.78	0.26	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.81	1.06	0.26	0.26	0.00	↓	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.54	1.06	0.52	0.52	0.26	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.00	0.00	0.00	0.00	0.00	NA	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.27	0.27	0.26	0.26	0.00	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.00	0.00	0.00	NA	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.00	0.00	0.00	0.00	0.00	NA	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.00	0.00	0.00	0.00	0.00	NA	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.00	0.00	0.00	0.00	0.00	NA	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	0.27	1.06	2.06	2.09	1.03	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	1.36	2.66	1.29	1.56	0.77	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	1.08	2.92	1.29	1.30	1.80	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	1.08	2.66	0.77	0.78	0.77	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.81	1.59	1.55	1.82	1.28	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.00	0.00	0.00	0.00	0.00	NA	2.10 (0.00-9.61)

NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Iceland, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	277	46.6	235	46.8	258	52.7	290	53.4	311	53.1	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	278	10.4	235	9.8	258	12.0	290	14.1	311	11.6	16.9 (6.8-42.7)	-
	Carbapenem (imipenem/meropenem) resistance	276	0.0	235	0.0	258	0.0	290	0.3	311	0.3	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	277	14.4	235	10.2	258	12.8	290	13.8	310	13.2	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	278	9.4	235	7.7	258	5.4	290	9.0	311	9.0	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	277	2.9	235	3.8	258	3.1	290	4.1	310	2.3	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	29	3.4[f]	32	3.1	44	6.8	41	4.9	60	15.0	32.8 (5.8-84.8)	↑*
	Carbapenem (imipenem/meropenem) resistance	29	0.0[f]	32	0.0	44	0.0	41	0.0	59	0.0	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	29	0.0[f]	32	9.4	44	11.4	41	0.0	58	6.9	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	29	0.0[f]	32	0.0	44	4.5	41	0.0	59	10.2	21.1 (2.4-77.0)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	29	0.0[f]	32	0.0	44	0.0	41	0.0	58	5.2	18.4 (1.1-73.6)	↑*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	31	19.4	35	8.6	27	3.7[f]	20	5.0[f]	27	0.0[f]	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	32	9.4	35	5.7	27	7.4[f]	20	15.0[f]	27	3.7[f]	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	32	9.4	35	11.4	27	3.7[f]	20	5.0[f]	27	0.0[f]	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	32	6.3	35	11.4	27	7.4[f]	20	10.0[f]	27	3.7[f]	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	32	0.0	35	0.0	27	0.0[f]	20	0.0[f]	27	0.0[f]	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	31	3.2	35	2.9	27	3.7[f]	20	5.0[f]	27	0.0[f]	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	8	NA	2	NA	1	NA	3	NA	7	NA	31.5 (0.0-95.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	8	NA	2	NA	1	NA	3	NA	7	NA	33.9 (0.0-96.5)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	8	NA	2	NA	1	NA	3	NA	7	NA	30.0 (0.0-92.3)	NA
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	8	NA	2	NA	1	NA	3	NA	7	NA	27.1 (0.0-91.8)	NA
Staphylococcus aureus	MRSA[d]	95	1.1	144	2.8	129	6.2	143	5.6	140	2.9	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	16	NA	35	28.6	38	13.2	37	16.2	37	8.1	16.4 (5.1-30.2)	NA
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	16	NA	35	31.4	38	13.2	37	13.5	37	18.9	18.5 (4.0-30.7)	NA
	Combined penicillin non-wild-type and resistance to macrolides[e]	16	NA	35	28.6	38	7.9	37	8.1	37	8.1	10.1 (1.0-18.9)	NA
Enterococcus faecalis	High-level gentamicin resistance	37	8.1	29	20.7[f]	33	18.2	46	15.2	31	16.1	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	18	NA	33	0.0	39	0.0	28	0.0[f]	31	0.0	17.2 (0.0-62.2)	NA

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Iceland, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/1	ND	ND	0/1	ND	ND
	Cefiderocol	1/1	1	NA	1/1	1	NA
	Ceftazidime-avibactam	1/1	1	NA	1/1	1	NA
	Imipenem-relebactam	0/1	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	1/1	1	NA	1/1	1	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/0	NA	NA	0/0	NA	NA
	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
Pseudomonas aeruginosa	Cefiderocol	1/1	1	NA	0/0	NA	NA
	Ceftazidime-avibactam	1/1	1	NA	0/0	NA	NA
	Ceftolozane-tazobactam	0/1	ND	ND	0/0	NA	NA
	Imipenem-relebactam	0/1	ND	ND	0/0	NA	NA
	Meropenem-vaborbactam	0/1	ND	ND	0/0	NA	NA
***Acinetobacter* spp.**	Cefiderocol	0/0	NA	NA	0/0	NA	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Ireland

Participating institutions
Health Protection Surveillance Centre, www.hpsc.ie

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Ireland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	96	93	92	85	76
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	56.5	55.8	56.5	59.5	65.6

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Ireland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	ND	85	90	91	88

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Ireland, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	32	2 906	NA	32	3 008	NA	30	3 120	NA	31	2 885	3	28	2 703	2
Klebsiella pneumoniae	31	502	NA	30	469	NA	28	571	NA	28	494	8	24	453	8
Pseudomonas aeruginosa	26	280	NA	27	303	NA	27	287	NA	29	264	9	21	273	7
***Acinetobacter* spp.**	17	68	NA	17	78	NA	16	65	6	15	57	6	16	70	10
Staphylococcus aureus	32	1 213	NA	31	1 178	NA	29	1 242	NA	29	1 060	6	27	1 120	5
Streptococcus pneumoniae	24	168	NA	25	286	NA	24	341	NA	24	352	2	21	332	1
Enterococcus faecalis	31	349	NA	30	357	NA	26	363	NA	30	288	9	27	305	8
Enterococcus faecium	25	603	NA	25	610	NA	27	614	NA	25	512	16	24	475	15

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Ireland

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	8.28	7.07	6.01	6.18	6.70	7.54	8.88	-	+7.2	+0.60	+77	-10	7.45	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.11	0.04	0.06	0.06	0.04	0.02	0.02	-	-81.8*	-0.09*	-4*	-2	0.11	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	3.06	2.50	2.68	2.61	2.47	2.57	2.73	-	-10.8*	-0.33*	-1*	-6	2.88	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Ireland

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	37.99	39.42	40.46	39.24	40.83	-	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.01	6.18	6.70	7.54	8.88	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.04	0.04	0.02	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	9.63	9.95	10.08	9.50	10.11	-	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.78	5.53	5.61	5.96	6.29	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.39	2.25	2.04	2.42	2.66	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1.62	1.25	1.88	1.63	1.67	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.06	0.06	0.04	0.02	0.02	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1.69	0.98	1.79	1.03	1.35	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	1.10	0.79	1.03	0.64	0.94	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.79	0.34	0.64	0.31	0.70	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.83	0.51^	0.64	0.31	0.63	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.65	0.57	0.39	0.24	0.34	↓	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.48	0.55	0.39	0.31	0.41	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.50	0.49	0.43	0.42	0.24	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.17^	0.11^	0.04^	0.09^	0.10	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.29^	0.23^	0.21^	0.09^	0.17^	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.02	0.04	0.00	0.00	0.02	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.04^	0.02^	0.02	0.07^	0.05	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.04	0.02^	0.00^	0.02	0.12	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.00^	0.00^	0.00^	0.00^	0.00	NA	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	2.68	2.61	2.47	2.57	2.73	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.69	1.49	1.18	1.63	1.67	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.42	0.91	1.03	1.03	1.35	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.25	0.70	0.62	0.77	0.89	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.94^	0.85^	0.95^	0.51^	0.94^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	3.45	3.68	2.66	2.37	2.66	↓	2.10 (0.00-9.61)

NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Ireland, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	2 898	63.0	3 003	61.8	3 115	63.0	2 800	63.7	2 583	65.4	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2 903	10.0	3 007	9.7	3 118	10.4	2 879	11.9	2 701	13.6	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	2 891	0.0	2 996	0.0	3 069	0.1	2 883	0.1	2 677	0.0	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2 898	16.0	3 000	15.6	3 062	16.0	2 872	15.0	2 681	15.6	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	2 904	9.6	3 004	8.7	3 111	8.7	2 884	9.4	2 688	9.7	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2 895	4.0	2 995	3.5	3 052	3.2	2 868	3.8	2 679	4.1	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	502	15.5	469	12.6	570	16.0	492	15.0	453	15.2	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	497	0.6	468	0.6	563	0.4	493	0.2	450	0.2	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	500	16.2	466	9.9	561	15.5	485	9.7	446	12.6	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	502	10.6	469	7.9	571	8.8	493	5.9	452	8.6	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	500	7.6	466	3.4	560	5.5	485	2.9	446	6.5	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	262	15.3	237	10.1	278	11.2	259	5.4	270	9.6	16.7 (0.0-59.5)	↓
	Ceftazidime resistance	277	11.2	281	9.6	279	6.8	261	4.2	270	5.2	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	280	8.2	302	8.6	287	6.6	262	5.3	271	6.3	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	277	8.7	299	7.7	277	7.6	263	7.2	270	3.7	14.9 (2.2-57.7)	↓
	Aminoglycoside (tobramycin) resistance	244	3.3	267	1.9	240	0.8	232	1.7	246	1.6	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	225	6.2	199	5.5	230	4.3	227	1.8	241	2.9	10.0 (0.0-53.8)	↓
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	66	1.5	78	2.6	64	0.0	56	0.0	69	1.4	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	60	3.3	65	1.5	62	1.6	51	5.9	67	3.0	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	64	3.1	67	1.5	58	0.0	57	1.8	68	7.4	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	56	0.0	56	0.0	56	0.0	51	0.0	65	0.0	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	1 213	10.6	1 178	10.4	1 242	9.7	1 060	11.0	1 120	10.1	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	168	19.6	286	24.5	341	16.7	352	21.0	332	20.8	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	159	12.6	270	15.9	333	15.0	351	13.4	323	17.3	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	159	7.5	270	12.2	333	9.0	351	10.0	323	11.5	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	260	17.3	259	15.4	299	15.4	199	11.6	221	17.6	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	602	27.6	609	28.4	613	21.0	512	21.1	475	23.2	17.2 (0.0-62.2)	↓

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Ireland, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/2	ND	ND	0/1	ND	ND
	Cefiderocol	0/2	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/2	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/2	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/2	ND	ND	0/1	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/1	ND	ND	0/1	ND	ND
	Cefiderocol	0/1	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	1/1	1	NA	1/1	1	NA
	Imipenem-relebactam	0/1	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/1	ND	ND	0/1	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/9	ND	ND	0/12	ND	ND
	Ceftazidime-avibactam	0/9	ND	ND	3/12	4	NA
	Ceftolozane-tazobactam	0/9	ND	ND	2/12	3	NA
	Imipenem-relebactam	0/9	ND	ND	0/12	ND	ND
	Meropenem-vaborbactam	0/9	ND	ND	0/12	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/0	NA	NA	0/1	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Italy

Participating institutions
National Institute of Health, www.iss.it

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Italy, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	61	61	66	67	70
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	66.6	60.1	61.2	65.7	66.8

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Italy, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	98	85	91	92	92

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Italy, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	156	22 038	7	172	25 850	7	192	28 756	7	205	31 994	7	214	36 093	6
Klebsiella pneumoniae	154	9 724	24	172	11 762	19	196	13 968	18	207	15 613	18	215	16 848	17
Pseudomonas aeruginosa	154	5 085	26	170	6 032	23	192	6 695	21	202	7 458	20	207	7 854	20
***Acinetobacter* spp.**	129	3 342	53	150	2 895	39	173	3 114	30	185	3 366	28	185	2 966	31
Staphylococcus aureus	154	12 680	14	170	14 863	12	194	15 425	11	207	16 640	11	216	17 619	11
Streptococcus pneumoniae	107	672	14	136	1 201	11	160	1 796	11	169	1 987	11	171	2 530	12
Enterococcus faecalis	150	7 686	27	166	8 261	20	191	8 174	18	201	8 823	17	210	9 012	17
Enterococcus faecium	150	5 358	26	164	6 070	20	183	6 109	17	201	6 425	17	207	6 385	17

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Italy

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	22.96	17.67	14.77	17.29	19.56	22.19	24.61	-	+7.2	+1.65	+650	-12	20.20	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	8.43	8.73	6.99	7.77	9.29	9.29	10.00	-	+18.6	+1.57	+806	-5	8.01	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	13.42	13.07	10.28	11.70	10.18	10.54	10.27	↓	-23.5*	-3.15*	-2 047*	-18	11.00	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Italy

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	9.66^	12.99^	14.53^	21.42^	27.83^	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	14.77	17.29	19.56	22.19	24.61	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.24	0.18	0.31	0.36	0.46	↑	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	19.98	22.26	24.55	27.31	29.98	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.98	10.04	11.76	13.26	14.40	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	5.00	6.28	7.32	8.15	8.51	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	14.27	17.24	19.58	20.60	21.12	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	6.99	7.77	9.29	9.29	10.00	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	13.32	15.59	17.42	18.27	18.25	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.96	10.17	11.56	12.10	12.39	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	7.20	9.24	10.26	10.60	10.70	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	3.27	3.95	3.68	3.71	3.93	-	1.88 (0.00-8.69)
	Ceftazidime resistance	2.73	3.11	2.98	3.04	3.08	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	2.40	2.72	2.72	2.57	2.49	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	2.66	3.07	2.74	2.61	2.77	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	ND	0.62^	0.77^	0.73^	0.78^	NA	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	1.08^	1.26^	1.07^	1.20^	NA	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	8.03	6.75	6.04	6.23	5.35	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	8.12	6.97	6.01	6.16	5.31	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.78	6.68	5.78	5.50	4.92	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	7.62	6.19	5.55	5.25	4.64^	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	10.28	11.70	10.18	10.54	10.27	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.14^	0.28^	0.41^	0.48^	0.69^	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.43	0.79	1.15	1.32	1.83	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.09^	0.15^	0.21^	0.29^	0.43^	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	3.23^	3.36^	3.07^	3.03^	3.19^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	3.87	5.04	5.03	5.58	5.71	↑	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Italy, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	5 850	59.6	7 590	61.6	8 951	63.2	13 065	64.8	17 749	64.7	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	21 897	24.4	25 656	24.2	28 557	26.7	31 619	27.7	35 627	28.5	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	20 645	0.4	24 042	0.3	27 623	0.4	31 435	0.4	34 634	0.5	0.2 (0.0-2.4)	↑
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	21 642	33.4	25 320	31.6	27 993	34.1	31 286	34.5	35 358	35.0	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	21 358	13.5	25 448	14.2	28 594	16.0	31 282	16.8	35 312	16.8	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	21 045	8.6	24 996	9.0	27 876	10.2	30 538	10.5	34 423	10.2	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	9 616	53.6	11 637	53.3	13 818	55.2	15 377	52.9	16 481	52.9	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	9 281	27.2	11 226	24.9	13 654	26.5	15 322	24.0	16 252	25.4	12.0 (0.0-69.7)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	9 487	50.7	11 513	48.7	13 547	50.1	15 139	47.7	16 216	46.4	30.1 (6.9-82.8)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	9 343	30.8	11 516	31.8	13 782	32.7	15 070	31.7	16 292	31.4	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	9 171	28.4	11 299	29.4	13 397	29.8	14 624	28.6	15 644	28.2	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	4 853	24.4	5 894	24.1	6 497	22.1	7 193	20.4	7 465	21.7	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	4 886	20.2	5 894	19.0	6 525	17.8	7 236	16.6	7 513	16.9	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	5 034	17.2	5 963	16.4	6 636	16.0	7 371	13.8	7 596	13.5	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	4 989	19.3	5 962	18.5	6 660	16.0	7 266	14.2	7 712	14.8	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	ND	ND	3 248	6.9	4 318	7.0	4 602	6.2	4 803	6.7	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	ND	3 128	12.5	4 090	12.0	4 286	9.9	4 487	11.0	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	3 291	88.1	2 742	88.5	3 098	75.9	3 317	74.3	2 864	77.1	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	3 286	89.3	2 811	89.1	3 043	76.9	3 238	75.1	2 795	78.4	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	3 253	86.4	2 827	85.0	3 061	73.6	3 142	69.2	2 793	72.6	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	3 205	86.0	2 648	84.1	2 998	72.1	3 048	68.1	2 632	72.8	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	12 158	30.5	14 053	29.9	14 909	26.6	16 201	25.7	17 098	24.8	14.1 (1.8-39.5)	↓*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	492	10.0	805	12.4	1 239	12.9	1 421	13.2	1 915	14.9	16.4 (5.1-30.2)	↑*
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	641	24.5	1 143	25.0	1 712	26.2	1 919	27.1	2 462	30.7	18.5 (4.0-30.7)	↑*
	Combined penicillin non-wild-type and resistance to macrolides[e]	474	6.5	773	7.0	1 175	6.8	1 382	8.4	1 875	9.4	10.1 (1.0-18.9)	↑*
Enterococcus faecalis	High-level gentamicin resistance	3 217	36.3	3 574	33.8	3 469	34.5	3 663	32.7	3 954	33.3	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	5 200	26.9	5 905	30.7	6 017	32.5	6 317	34.9	6 329	37.2	17.2 (0.0-62.2)	↑*

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Italy, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/75	ND	ND	5/82	9	NA
	Cefiderocol	0/75	ND	ND	0/82	ND	ND
	Ceftazidime-avibactam	49/75	93	57.0	63/82	128	57.0
	Imipenem-relebactam	13/75	23	60.9	27/82	41	46.3
	Meropenem-vaborbactam	35/75	67	38.8	43/82	90	48.9
Klebsiella pneumoniae	Aztreonam-avibactam	0/192	ND	ND	3/196	69	98.6
	Cefiderocol	1/192	24	20.8	0/196	ND	ND
	Ceftazidime-avibactam	146/192	2966	32.1	152/196	3362	39.7
	Imipenem-relebactam	49/192	950	33.2	75/196	1531	43.1
	Meropenem-vaborbactam	81/192	1668	25.5	115/196	2610	38.4
Pseudomonas aeruginosa	Cefiderocol	0/166	ND	ND	0/168	ND	ND
	Ceftazidime-avibactam	112/166	678	24.0	133/168	789	28.9
	Ceftolozane-tazobactam	117/166	772	23.1	126/168	779	27.2
	Imipenem-relebactam	37/166	153	41.2	65/168	330	35.8
	Meropenem-vaborbactam	0/166	ND	ND	0/168	ND	ND
***Acinetobacter* spp.**	Cefiderocol	9/156	49	10.2	0/144	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Latvia

Participating institutions

Centre for Disease Prevention and Control, Latvia, www.spkc.gov.lv

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Latvia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	90	90	90	90	100
Geographical representativeness	High	High	High	High	High
Hospital representativeness	Medium	Medium	High	High	High
Isolate representativeness	Medium	Medium	Medium	Medium	High
Blood culture sets/1 000 patient-days	17.0	16.8	24.8	20.1	20.1

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Latvia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	ND	93	86	86	100

ND: no data available.

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Latvia, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	11	394	20	11	484	19	13	465	8	10	642	18	10	799	13
Klebsiella pneumoniae	10	253	38	11	288	23	15	238	17	10	353	29	10	362	20
Pseudomonas aeruginosa	9	78	51	9	72	35	11	44	12	9	66	29	7	97	24
Acinetobacter spp.	8	82	67	8	73	41	9	77	44	7	61	47	7	53	29
Staphylococcus aureus	11	457	15	13	521	15	15	465	6	11	531	16	10	700	15
Streptococcus pneumoniae	7	56	22	8	106	25	11	70	6	5	68	34	8	105	19
Enterococcus faecalis	10	161	39	10	162	24	10	116	22	9	132	25	10	211	20
Enterococcus faecium	8	113	60	10	97	32	10	61	28	9	102	36	9	132	30

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Latvia

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.03#	5.30#	4.23#	5.75#	6.96#	10.98#	11.13	↑	+121.3	+6.10	+110	0	5.03	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.00#	0.12#	0.23#	0.47#	0.89#	2.08#	1.67	↑	NA	+1.67	+31	0	0.00	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	1.91#	1.92#	1.41#	2.19#	1.48#	1.96#	1.29	-	-32.5*	-0.62*	-13*	-6	1.80	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Latvia

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	9.98^#	13.27^#	6.20^#	20.66#	18.60^	-	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.23#	5.75#	6.96#	10.98#	11.13	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00#	0.00#	0.00#	0.24#	0.05	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	4.75#	6.22#	7.67#	11.40#	10.80	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.52#	3.38#	4.07#	8.25#	5.80	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.94#	2.72#	3.48#	6.77#	4.89	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.34#	6.58#	5.84#	9.91#	6.88	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.23#	0.47#	0.89#	2.08#	1.67	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	4.58#	5.63#	5.07#	9.50#	6.29	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.29#	4.21#	3.60#	7.54#	5.21	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.99#	3.67#	3.19#	6.89#	4.41	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.23#	1.13#	0.53#	0.83^#	1.13	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.17#	0.95^#	0.77#	1.25#	1.13	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.35#	0.89#	0.59#	0.53#	0.70	↓	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.47#	1.42#	0.65#	1.19#	1.07	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.23^#	0.77^#	0.06^#	0.24^#	0.21^	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.18^#	0.53^#	0.12^#	0.30^#	0.27^	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	3.81#	3.08#	3.19#	2.37#	1.83	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	3.05^#	2.78^#	2.42^#	2.55#	1.40^	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.29#	2.49#	2.30#	2.31#	1.61	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	2.46^#	2.25^#	1.95^#	2.14#	1.07^	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	1.41#	2.19#	1.48#	1.96#	1.29	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.12#	0.18#	0.47#	0.00^#	0.38^	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.00^#	0.30#	0.24#	0.12^#	0.27	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.00^#	0.06#	0.24#	0.00^#	0.05^	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	4.17#	9.42#	5.84^#	3.56#	2.58^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	2.00#	1.54#	0.83#	1.25^#	3.01	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Latvia, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	344	49.4	432	51.9	209	50.2	587	59.3	614	56.4	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	393	18.3	484	20.0	462	25.5	641	28.9	798	25.9	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	393	0.0	481	0.0	456	0.0	632	0.6	794	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	392	20.7	481	21.8	456	28.5	632	30.4	790	25.4	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	394	10.9	483	11.8	458	15.1	639	21.8	793	13.6	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	391	8.4	481	9.6	449	13.1	628	18.2	785	11.6	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	253	36.0	287	38.7	238	41.6	352	47.4	362	35.4	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	253	1.6	288	2.8	237	6.3	353	9.9	360	8.6	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	252	31.0	287	33.1	235	36.6	352	45.5	358	32.7	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	252	22.2	288	24.7	237	25.7	353	36.0	360	26.9	21.1 (2.4-77.0)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	251	20.3	286	21.7	234	23.1	351	33.0	357	23.0	18.4 (1.1-73.6)	↑*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	76	27.6	72	26.4	44	20.5	52	26.9	97	21.6	16.7 (0.0-59.5)	-
	Ceftazidime resistance	77	26.0	52	30.8	41	31.7	64	32.8	97	21.6	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	78	29.5	72	20.8	44	22.7	66	13.6	97	13.4	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	78	32.1	72	33.3	44	25.0	66	30.3	97	20.6	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	23	17.4[f]	42	31.0	7	NA	36	11.1	38	10.5	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	23	13.0[f]	24	37.5[f]	7	NA	35	14.3	38	13.2	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	82	79.3	73	71.2	77	70.1	59	67.8	52	65.4	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	60	86.7	60	78.3	49	83.7	61	70.5	43	60.5	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	82	68.3	73	57.5	77	50.6	60	65.0	52	57.7	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	60	70.0	60	63.3	49	67.3	58	62.1	41	48.8	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	457	5.3	513	7.2	464	5.4	478	6.9	672	3.6	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	56	3.6	106	2.8	68	11.8	44	0.0	73	9.6	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	34	0.0	103	4.9	67	6.0	44	4.5	103	4.9	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	34	0.0	103	1.0	65	6.2	44	0.0	73	1.4	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	153	46.4	159	100.0	100	99.0	122	49.2	178	27.0	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	113	30.1	96	27.1	61	23.0	88	23.9	132	42.4	17.2 (0.0-62.2)	-

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Latvia, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/4	ND	ND	0/1	ND	ND
	Cefiderocol	0/4	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/4	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/4	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/4	ND	ND	0/1	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/5	ND	ND	0/5	ND	ND
	Cefiderocol	0/5	ND	ND	0/5	ND	ND
	Ceftazidime-avibactam	1/5	21	38.1	1/5	19	NA
	Imipenem-relebactam	0/5	ND	ND	0/5	ND	ND
	Meropenem-vaborbactam	0/5	ND	ND	0/5	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/5	ND	ND	0/3	ND	ND
	Ceftazidime-avibactam	0/5	ND	ND	0/3	ND	ND
	Ceftolozane-tazobactam	0/5	ND	ND	0/3	ND	ND
	Imipenem-relebactam	0/5	ND	ND	0/3	ND	ND
	Meropenem-vaborbactam	0/5	ND	ND	0/3	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/4	ND	ND	0/5	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Liechtenstein

Participating institutions
Liechtensteinisches Landesspital, https://www.landesspital.li
Laboratory Dr Risch[a], https://www.risch.ch/de
The Swiss Center for Antibiotic Resistance (ANRESIS)[b], https://www.anresis.ch
[a] Liechtenstein uses Laboratory Dr Risch as a participating institution at national level.
[b] Liechtenstein uses the Swiss Center for Antibiotic Resistance as a participating institution at national level.

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Liechtenstein, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	ND	40	40	40	40
Geographical representativeness	ND	Medium	Medium	Medium	Medium
Hospital representativeness	ND	Medium	Medium	Medium	Medium
Isolate representativeness	ND	Medium	Medium	Medium	Medium
Blood culture sets/1 000 patient-days	ND	2.7	2.1	1.5	2.1

ND: no data available.

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Liechtenstein, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	ND	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	ND	100	100	100	ND

ND: no data available.
For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Liechtenstein, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	ND	ND	ND	1	13	NA	1	8	NA	1	12	NA	1	8	NA
Klebsiella pneumoniae	ND	ND	ND	ND	ND	ND	1	2	NA	1	4	NA	1	2	NA
Pseudomonas aeruginosa	ND	ND	ND	ND	ND	ND	1	2	NA	ND	ND	ND	1	3	NA
***Acinetobacter* spp.**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Staphylococcus aureus	ND	ND	ND	1	5	NA	1	2	NA	2	5	NA	1	3	NA
Streptococcus pneumoniae	ND	ND	ND	1	3	NA	1	1	NA	2	2	NA	1	2	NA
Enterococcus faecalis	ND	ND	ND	ND	ND	ND	1	2	NA	1	1	NA	1	3	NA
Enterococcus faecium	ND	ND	ND	ND	ND	ND	ND	ND	ND	1	1	NA	ND	ND	ND

Labs: laboratories.
ND: no data available.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Liechtenstein

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	ND	ND	ND	6.36#	0.00#	0.00#	0.00#	NA	NA	NA	NA	NA	NA	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	ND	ND	ND	ND	0.00#	0.00#	0.00#	NA	NA	NA	NA	NA	NA	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	ND	ND	ND	6.36#	0.00#	6.25#	0.00#	NA	NA	NA	NA	NA	NA	4.56 (0.58-12.07)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Liechtenstein

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	ND	19.08#	18.90#	18.74#	12.23#	NA	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	ND	6.36#	0.00#	0.00#	0.00#	NA	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	ND	0.00#	0.00#	0.00#	0.00#	NA	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	ND	12.72#	12.60#	6.25#	0.00#	NA	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	ND	0.00#	0.00#	0.00#	6.11#	NA	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	ND	0.00#	0.00#	0.00#	0.00#	NA	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	ND	ND	0.00#	0.00#	0.00#	NA	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	ND	ND	0.00#	0.00#	0.00#	NA	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	ND	ND	0.00#	0.00#	0.00#	NA	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	ND	ND	0.00#	0.00#	0.00#	NA	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	ND	ND	0.00#	0.00#	0.00#	NA	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	ND	ND	0.00#	ND	0.00^#	NA	1.88 (0.00-8.69)
	Ceftazidime resistance	ND	ND	0.00#	ND	0.00#	NA	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	ND	ND	0.00#	ND	0.00#	NA	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	ND	ND	0.00#	ND	6.11#	NA	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	ND	ND	0.00^#	ND	0.00#	NA	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	ND	0.00^#	ND	0.00^#	NA	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	ND	ND	ND	ND	ND	NA	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	ND	ND	ND	ND	ND	NA	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	ND	ND	ND	ND	ND	NA	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	ND	ND	ND	ND	ND	NA	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	ND	6.36#	0.00#	6.25#	0.00#	NA	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	ND	0.00^#	0.00#	0.00#	0.00#	NA	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	ND	0.00#	0.00#	6.25#	0.00#	NA	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	ND	0.00^#	0.00#	0.00#	0.00#	NA	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	ND	ND	0.00#	6.25#	6.11#	NA	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	ND	ND	ND	0.00#	ND	NA	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Liechtenstein, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	ND	ND	13	NA	8	NA	12	NA	8	NA	55.5 (35.9-70.3)	NA
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	ND	ND	13	NA	8	NA	12	NA	8	NA	16.9 (6.8-42.7)	NA
	Carbapenem (imipenem/meropenem) resistance	ND	ND	13	NA	8	NA	12	NA	8	NA	0.2 (0.0-2.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	ND	ND	13	NA	8	NA	12	NA	8	NA	22.0 (8.8-50.9)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	ND	ND	13	NA	8	NA	12	NA	8	NA	10.3 (4.3-23.1)	NA
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	ND	ND	13	NA	8	NA	12	NA	8	NA	5.4 (1.3-17.1)	NA
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	ND	ND	ND	ND	2	NA	4	NA	2	NA	32.8 (5.8-84.8)	NA
	Carbapenem (imipenem/meropenem) resistance	ND	ND	ND	ND	2	NA	4	NA	2	NA	12.0 (0.0-69.7)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	ND	ND	ND	ND	2	NA	4	NA	2	NA	30.1 (6.9-82.8)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	ND	ND	ND	ND	2	NA	4	NA	2	NA	21.1 (2.4-77.0)	NA
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	ND	ND	ND	ND	2	NA	4	NA	2	NA	18.4 (1.1-73.6)	NA
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	ND	ND	ND	ND	2	NA	ND	ND	2	NA	16.7 (0.0-59.5)	NA
	Ceftazidime resistance	ND	ND	ND	ND	2	NA	ND	ND	3	NA	13.5 (1.5-56.0)	NA
	Carbapenem (imipenem/meropenem) resistance	ND	ND	ND	ND	2	NA	ND	ND	3	NA	15.6 (0.0-57.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	ND	ND	ND	ND	2	NA	ND	ND	3	NA	14.9 (2.2-57.7)	NA
	Aminoglycoside (tobramycin) resistance	ND	ND	ND	ND	1	NA	ND	ND	3	NA	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	ND	ND	ND	1	NA	ND	ND	2	NA	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.5 (0.0-95.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	33.9 (0.0-96.5)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	30.0 (0.0-92.3)	NA
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	27.1 (0.0-91.8)	NA
Staphylococcus aureus	MRSA[d]	ND	ND	5	NA	2	NA	5	NA	3	NA	14.1 (1.8-39.5)	NA
Streptococcus pneumoniae	Penicillin non-wild-type[e]	ND	ND	2	NA	1	NA	2	NA	2	NA	16.4 (5.1-30.2)	NA
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	ND	ND	3	NA	1	NA	2	NA	2	NA	18.5 (4.0-30.7)	NA
	Combined penicillin non-wild-type and resistance to macrolides[e]	ND	ND	2	NA	1	NA	2	NA	2	NA	10.1 (1.0-18.9)	NA
Enterococcus faecalis	High-level gentamicin resistance	ND	ND	ND	ND	2	NA	1	NA	3	NA	22.3 (2.3-62.1)	NA
Enterococcus faecium	Vancomycin resistance	ND	ND	ND	ND	ND	ND	1	NA	ND	ND	17.2 (0.0-62.2)	NA

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Liechtenstein, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/0	NA	NA	0/0	NA	NA
	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/0	NA	NA	0/0	NA	NA
	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
Pseudomonas aeruginosa	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Ceftolozane-tazobactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
***Acinetobacter* spp.**	Cefiderocol	0/0	NA	NA	0/0	NA	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).
NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Lithuania

Participating institutions
National Public Health Surveillance Laboratory, www.nvspl.lt
Institute of Hygiene, www.hi.lt

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Lithuania, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	100	100	100	100	100
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	9.8	7.9	8.8	14.6	20.1

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Lithuania, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	93	93	93	88

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Lithuania, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	17	1 154	16	16	1 309	15	15	1 481	15	15	1 738	18	15	1 991	12
Klebsiella pneumoniae	14	512	29	14	517	29	15	541	28	16	725	26	15	825	26
Pseudomonas aeruginosa	12	162	35	13	170	29	11	142	31	12	173	32	14	223	26
***Acinetobacter* spp.**	13	361	78	12	141	62	12	122	45	11	145	67	15	132	57
Staphylococcus aureus	16	746	21	15	828	18	15	813	19	15	929	19	16	999	16
Streptococcus pneumoniae	15	109	25	15	172	16	14	178	21	14	210	20	13	239	17
Enterococcus faecalis	14	183	41	13	167	29	14	162	17	14	200	26	14	227	15
Enterococcus faecium	13	211	44	13	164	42	11	156	31	12	196	33	13	219	30

Labs: laboratories.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Lithuania

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.62	6.51	5.62	7.20	8.78	9.53	13.73	↑	+144.3	+8.11	+240	0	5.62	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.54	0.43	0.18	0.11	0.73	2.39	2.08	↑	+285.2	+1.54	+45	-4	0.52	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	2.18	2.47	2.40	2.78	2.45	3.22	3.87	↑	+77.5	+1.69	+51	-6	2.05	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Lithuania

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	23.43	27.33	31.71	34.79	40.23	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.62	7.20	8.78	9.53	13.73	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.11	0.11	0.03	0.24	0.07	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	7.19	8.77	10.46	11.95	14.67	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.40	3.88	5.84	5.75	8.44	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.00	2.57	3.46	3.95	5.98	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.87	7.34	8.22	11.99	11.49	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.18	0.11	0.73	2.39	2.08	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6.98	7.31	7.84	11.09	11.17	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.29	4.99	5.53	8.91	8.51	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	4.54	3.96	4.55	6.27	6.68	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.82	1.10	0.63	1.04	1.31	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.75	0.93	0.49	0.97	1.00	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.47	1.46	0.70	1.52	1.38	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.93	1.07	0.49	1.04	1.49	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	ND	ND	ND	ND	ND	NA	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	ND	ND	ND	ND	NA	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	12.38	4.45	3.95	4.19	3.74	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	12.48	4.42	3.85	4.02	3.77	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	11.73	3.99	3.46	3.81	3.15	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	11.63	3.88	3.43	3.74	3.08	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	2.40	2.78	2.45	3.22	3.87	↑	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.32	0.39	0.59	0.76	0.83	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.72	0.89	1.12	1.07	1.11	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.18	0.18	0.38	0.45	0.59	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.61^	0.82^	1.01^	0.69^	1.04^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	5.01	3.96	3.32	4.19	4.19	-	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Lithuania, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	1 147	57.1	1 303	58.9	1 477	61.3	1 733	57.9	1 987	58.5	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 153	13.6	1 309	15.4	1 480	17.0	1 738	15.8	1 991	19.9	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	1 149	0.3	1 309	0.2	1 478	0.1	1 736	0.4	1 989	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 139	17.6	1 293	19.0	1 455	20.5	1 721	20.0	1 971	21.5	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	1 141	8.3	1 308	8.3	1 473	11.3	1 733	9.6	1 988	12.3	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 126	5.0	1 293	5.6	1 446	6.8	1 717	6.6	1 968	8.8	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	512	43.0	517	39.8	541	43.4	725	47.7	824	40.3	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	511	1.0	517	0.6	541	3.9	725	9.5	824	7.3	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	510	38.2	514	39.9	532	42.1	721	44.4	821	39.3	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	511	29.0	516	27.1	540	29.3	722	35.6	823	29.9	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	509	25.0	514	21.6	531	24.5	718	25.2	818	23.6	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	162	14.2	170	18.2	142	12.7	173	17.3	223	17.0	16.7 (0.0-59.5)	-
	Ceftazidime resistance	160	13.1	170	15.3	142	9.9	172	16.3	222	13.1	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	161	25.5	169	24.3	142	14.1	173	25.4	222	18.0	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	158	16.5	170	17.6	140	10.0	172	17.4	217	19.8	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9 (0.0-50.0)	NA
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.0 (0.0-53.8)	NA
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	360	96.1	141	88.7	122	92.6	145	83.4	132	81.8	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	361	96.7	139	89.2	119	92.4	144	80.6	132	82.6	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	351	93.4	133	84.2	120	82.5	144	76.4	128	71.1	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	350	92.9	131	83.2	118	83.1	143	75.5	128	69.5	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	746	9.0	828	9.4	813	8.6	929	10.0	999	11.2	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	109	8.3	172	6.4	178	9.6	210	10.5	239	10.0	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	109	18.3	172	14.5	176	18.2	208	14.9	238	13.4	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	109	4.6	172	2.9	176	6.3	208	6.3	238	7.1	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	94	18.1	101	22.8	99	29.3	101	19.8	134	22.4	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	211	66.4	164	67.7	156	60.9	196	61.7	219	55.3	17.2 (0.0-62.2)	↓*

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Lithuania, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/4	ND	ND	0/2	ND	ND
	Cefiderocol	0/4	ND	ND	0/2	ND	ND
	Ceftazidime-avibactam	0/4	ND	ND	0/2	ND	ND
	Imipenem-relebactam	0/4	ND	ND	0/2	ND	ND
	Meropenem-vaborbactam	0/4	ND	ND	0/2	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/10	ND	ND	0/10	ND	ND
	Cefiderocol	0/10	ND	ND	0/10	ND	ND
	Ceftazidime-avibactam	0/10	ND	ND	0/10	ND	ND
	Imipenem-relebactam	0/10	ND	ND	0/10	ND	ND
	Meropenem-vaborbactam	0/10	ND	ND	0/10	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/8	ND	ND	0/9	ND	ND
	Ceftazidime-avibactam	0/8	ND	ND	0/9	ND	ND
	Ceftolozane-tazobactam	0/8	ND	ND	0/9	ND	ND
	Imipenem-relebactam	0/8	ND	ND	0/9	ND	ND
	Meropenem-vaborbactam	0/8	ND	ND	0/9	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/11	ND	ND	0/14	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).
ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

Luxembourg

Participating institutions
National Health Laboratory, https://lns.lu
Microbiology Laboratory, Centre Hospitalier de Luxembourg, https://www.chl.lu/fr/service/laboratoire-de-bacteriologie-microbiologie

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Luxembourg, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	100	99	100	99	99
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	42.1	43.9	42.5	44.1	54.0

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Luxembourg, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	80	100	100	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Luxembourg, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	4	354	10	4	469	4	4	461	7	4	524	9	4	493	8
Klebsiella pneumoniae	4	101	20	4	117	17	4	85	18	4	136	13	4	112	19
Pseudomonas aeruginosa	3	37	27	4	47	30	4	47	17	4	58	22	4	60	10
***Acinetobacter* spp.**	2	8	NA	2	13	NA	2	7	NA	3	12	NA	3	10	NA
Staphylococcus aureus	4	199	20	4	235	13	4	190	14	4	195	17	4	210	13
Streptococcus pneumoniae	4	21	5[c]	4	44	14	4	63	13	4	33	9	4	52	15
Enterococcus faecalis	4	84	37	4	86	19	4	81	14	4	77	13	4	97	18
Enterococcus faecium	4	58	38	4	69	37	4	74	24	4	58	21	4	69	22

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).
[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Luxembourg

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	10.20	7.91	6.30	7.67	8.17	10.22	12.15	-	+19.1	+1.95	+20	-12	8.98	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.16	0.16	0.16	0.31	0.30	0.15	0.00	-	-100.0*	-0.16*	-1*	-2	0.16	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	2.14	0.97	1.73	1.72	1.66	1.50	1.33	-	-37.9*	-0.81*	-4*	-6	2.01	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Luxembourg

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	29.62	36.47	36.02	42.84	39.25	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.30	7.67	8.17	10.22	12.15	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.15	0.00	0.00	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	11.66	12.36	10.90	14.73	16.44	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.88	5.32	6.96	5.11	6.67	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.36	1.88	2.42	2.10	3.11	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.10	3.44	2.72	4.06	2.52	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.16	0.31	0.30	0.15	0.00	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	3.78	3.91	2.42	3.16	2.67	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.36	1.72	1.36	1.20	0.89	↓	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.05	0.94	1.06	0.90	0.74	↓	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.00	0.47	1.36	1.35	0.89	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.47	0.47	1.21	1.50	0.89	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.47	0.47	0.91	1.35	0.89	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.42	0.94	0.61	1.50	0.44	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.16	0.00^	0.15	0.00	0.00	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.00	0.00^	0.76	0.90	0.15	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.00	0.16	0.00^	0.00	0.00	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.16	0.00	0.15	0.00	0.15	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.00	0.00	0.15	0.00	0.00	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.00	0.00	0.00^	0.00	0.00	NA	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	1.73	1.72	1.66	1.50	1.33	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.47	0.94	1.21	0.45	1.04	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.95	1.10	1.06	0.45	1.33	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.32	0.78	0.61	0.30	0.89	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.58	1.41	1.36^	0.75	0.89^	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.00	0.63	0.76	0.00	0.15	-	2.10 (0.00-9.61)

NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Luxembourg, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	352	53.4	469	49.7	461	51.6	524	54.4	493	53.8	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	354	11.3	469	10.4	461	11.7	524	13.0	493	16.6	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	354	0.0	469	0.0	461	0.2	524	0.0	493	0.0	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	354	20.9	469	16.8	461	15.6	524	18.7	493	22.5	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	354	8.8	469	7.2	461	10.0	524	6.5	493	9.1	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	354	4.2	469	2.6	461	3.5	524	2.7	493	4.3	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	101	25.7	117	18.8	85	21.2	135	20.0	112	15.2	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	101	1.0	117	1.7	84	2.4	136	0.7	112	0.0	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	101	23.8	117	21.4	85	18.8	135	15.6	112	16.1	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	101	14.9	117	9.4	85	10.6	135	5.9	112	5.4	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	101	12.9	117	5.1	85	8.2	135	4.4	112	4.5	18.4 (1.1-73.6)	↓*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	35	0.0	47	6.4	47	19.1	57	15.8	60	10.0	16.7 (0.0-59.5)	-
	Ceftazidime resistance	37	8.1	47	6.4	47	17.0	57	17.5	60	10.0	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	37	8.1	45	6.7	47	12.8	57	15.8	60	10.0	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	37	24.3	47	12.8	47	8.5	57	17.5	60	5.0	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	37	2.7	31	0.0	45	2.2	55	0.0	60	0.0	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	35	0.0	29	0.0[f]	45	11.1	55	10.9	60	1.7	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	8	NA	13	NA	5	NA	12	NA	10	NA	31.5 (0.0-95.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	8	NA	13	NA	7	NA	12	NA	10	NA	33.9 (0.0-96.5)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	8	NA	13	NA	7	NA	12	NA	10	NA	30.0 (0.0-92.3)	NA
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	8	NA	13	NA	5	NA	12	NA	10	NA	27.1 (0.0-91.8)	NA
Staphylococcus aureus	MRSA[d]	199	5.5	235	4.7	190	5.8	195	5.1	210	4.3	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	21	14.3[f]	44	13.6	63	12.7	33	9.1	52	13.5	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	21	28.6[f]	44	15.9	63	11.1	33	9.1	52	17.3	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	21	9.5[f]	44	11.4	63	6.3	33	6.1	52	11.5	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	84	11.9	86	10.5	65	13.8	77	6.5	79	7.6	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	58	0.0	69	5.8	74	6.8	58	0.0	69	1.4	17.2 (0.0-62.2)	-

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Luxembourg, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/0	NA	NA	0/0	NA	NA
	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/1	ND	ND	0/0	NA	NA
	Cefiderocol	0/1	ND	ND	0/0	NA	NA
	Ceftazidime-avibactam	1/1	1	NA	0/0	NA	NA
	Imipenem-relebactam	0/1	ND	ND	0/0	NA	NA
	Meropenem-vaborbactam	0/1	ND	ND	0/0	NA	NA
Pseudomonas aeruginosa	Cefiderocol	0/3	ND	ND	0/4	ND	ND
	Ceftazidime-avibactam	0/3	ND	ND	1/4	3	NA
	Ceftolozane-tazobactam	0/3	ND	ND	0/4	ND	ND
	Imipenem-relebactam	0/3	ND	ND	0/4	ND	ND
	Meropenem-vaborbactam	0/3	ND	ND	0/4	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/0	NA	NA	0/0	NA	NA

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Malta

Participating institutions

Malta Mater Dei Hospital, Msida, https://healthservices.gov.mt/en/MDH/Pages/Home.aspx

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Malta, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	95	95	95	95	95
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	37.7	34.9	32.8	35.0	33.2

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Malta, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	100	100	100	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Malta, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	1	299	4	1	326	3	1	416	4	1	493	2	1	399	3
Klebsiella pneumoniae	1	135	14	1	120	14	1	147	9	1	176	7	1	125	8
Pseudomonas aeruginosa	1	35	29	1	47	13	1	40	8	1	51	6	1	37	5
***Acinetobacter* spp.**	1	16	NA	1	14	NA	1	21	21[c]	1	12	NA	1	15	NA
Staphylococcus aureus	1	103	8	1	116	8	1	110	5	1	105	8	1	96	4
Streptococcus pneumoniae	1	6	NA	1	14	NA	1	26	4[c]	1	26	4[c]	1	20	15[c]
Enterococcus faecalis	1	39	16	1	33	16	1	30	7	1	30	23	1	29	7[c]
Enterococcus faecium	1	38	42	1	32	20	1	25	21[c]	1	39	23	1	26	12[c]

Labs: laboratories.

NA: not applicable.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Malta

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	12.37	6.96	8.36	7.48	9.13	22.79	19.25	↑	+55.6	+6.88	+49	-12	10.89	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	2.13	2.05	1.84	1.21	0.97	0.93	0.73	↓	-65.7*	-1.40*	-6*	-4	2.04	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	3.84	3.68	4.28	4.45	3.11	2.99	2.57	-	-33.1*	-1.27*	-4*	-10	3.46	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Malta

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	39.36	41.42	50.49	64.08	50.78	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	8.36	7.48	9.13	22.79	19.25	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.00	0.00	0.00	NA	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	18.76	17.38	22.53	39.61	33.73	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.75	7.88	8.35	27.28	16.86	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	4.90	3.03	4.47	19.99	12.46	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.95	6.67	7.19	9.15	7.33	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	1.84	1.21	0.97	0.93	0.73	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	9.59	7.68	8.35	10.28	9.17	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.51	1.41	3.11	3.18	3.67	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	4.49	1.21	2.33	2.62	3.12	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	2.04	0.81	0.97	1.31	0.37	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.02	0.20	0.78	0.93	0.18	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.82	1.01	0.39	0.75	1.10	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.61	0.40	0.58	0.93	0.73	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.20	0.00	0.19	0.19	0.18	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.61	0.40	0.39	0.75	0.18	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.00	0.40	0.00	0.19	0.37	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.00	0.40	0.19	0.00	0.37	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.00	0.20	0.00	0.00	0.37	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.00	0.20	0.00	0.00	0.37	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	4.28	4.45	3.11	2.99	2.57	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.61	0.61	1.36	1.31	0.37	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.61	1.01	2.72	1.87	1.28	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.41	0.40	1.36	1.12	0.37	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.22	1.41	0.39	0.93	3.30	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	4.28	2.42	1.75	2.24	1.28	↓	2.10 (0.00-9.61)

NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Malta, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	299	64.5	326	62.9	416	62.5	493	69.6	399	69.4	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	299	13.7	326	11.3	416	11.3	493	24.7	399	26.3	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	299	0.0	326	0.0	416	0.0	493	0.0	399	0.0	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	299	30.8	326	26.4	416	27.9	493	43.0	399	46.1	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	299	12.7	326	12.0	416	10.3	493	29.6	398	23.1	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	299	8.0	326	4.6	416	5.5	493	21.7	398	17.1	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	135	28.9	120	27.5	147	25.2	176	27.8	125	32.0	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	135	6.7	120	5.0	147	3.4	176	2.8	125	3.2	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	135	34.8	120	31.7	147	29.3	176	31.3	125	40.0	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	135	20.0	120	5.8	147	10.9	176	9.7	124	16.1	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	135	16.3	120	5.0	147	8.2	176	8.0	124	13.7	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	35	28.6	47	8.5	40	12.5	51	13.7	35	5.7	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	35	14.3	47	2.1	40	10.0	50	10.0	37	2.7	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	35	11.4	47	10.6	40	5.0	51	7.8	37	16.2	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	35	8.6	47	4.3	40	7.5	51	9.8	37	10.8	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	35	2.9	47	0.0	40	2.5	51	2.0	37	2.7	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	35	8.6	47	4.3	40	5.0	50	8.0	35	2.9	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	16	NA	14	NA	21	0.0[f]	12	NA	15	NA	31.5 (0.0-95.4)	NA
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	16	NA	14	NA	21	4.8[f]	12	NA	15	NA	33.9 (0.0-96.5)	NA
	Aminoglycoside (gentamicin/tobramycin) resistance	16	NA	14	NA	21	0.0[f]	12	NA	15	NA	30.0 (0.0-92.3)	NA
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	16	NA	14	NA	21	0.0[f]	12	NA	15	NA	27.1 (0.0-91.8)	NA
Staphylococcus aureus	MRSA[d]	103	20.4	116	19.0	110	14.5	105	15.2	96	14.6	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	6	NA	14	NA	26	26.9[f]	26	26.9[f]	20	10.0[f]	16.4 (5.1-30.2)	NA
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	6	NA	14	NA	26	53.8[f]	26	38.5[f]	19	NA	18.5 (4.0-30.7)	NA
	Combined penicillin non-wild-type and resistance to macrolides[e]	6	NA	14	NA	26	26.9[f]	26	23.1[f]	19	NA	10.1 (1.0-18.9)	NA
Enterococcus faecalis	High-level gentamicin resistance	38	15.8	33	21.2	29	6.9[f]	30	16.7	29	62.1[f]	22.3 (2.3-62.1)	↑*
Enterococcus faecium	Vancomycin resistance	38	55.3	32	37.5	25	36.0[f]	39	30.8	26	26.9[f]	17.2 (0.0-62.2)	↓*

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Malta, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/0	NA	NA	0/0	NA	NA
	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/1	ND	ND	0/1	ND	ND
	Cefiderocol	0/1	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/1	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/1	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/1	ND	ND	0/1	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/1	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/1	ND	ND	0/1	ND	ND
	Ceftolozane-tazobactam	0/1	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/1	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/1	ND	ND	0/1	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/1	ND	ND	0/1	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Netherlands

Participating institutions

National Institute for Public Health and the Environment, www.rivm.nl

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Netherlands, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	72	74	76	78	82
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	ND	ND	ND	ND	ND

ND: no data available.

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Netherlands, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	79	91	88	93

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Netherlands, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	35	6 576	3	36	7 217	3	38	7 843	3	45	9 014	3	36	8 185	3
Klebsiella pneumoniae	35	1 270	5	36	1 385	5	38	1 504	4	45	1 798	3	35	1 675	3
Pseudomonas aeruginosa	35	730	13	36	756	9	38	775	10	45	906	8	36	830	6
***Acinetobacter* spp.**	33	192	13	35	201	8	36	214	9	42	216	6	34	228	9
Staphylococcus aureus	35	3 235	9	36	3 609	7	38	3 740	6	45	4 271	6	36	4 201	6
Streptococcus pneumoniae	35	839	6	36	1 538	4	38	1 695	4	45	1 908	4	36	1 854	4
Enterococcus faecalis	35	1 302	29	36	1 172	14	38	1 221	11	45	1 278	9	36	1 268	9
Enterococcus faecium	35	1 272	54	36	1 081	38	37	990	35	45	1 149	34	36	1 075	32

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Netherlands

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.54	3.97	3.47	4.29	4.62	5.84	5.08	↑	+11.9	+0.54	+133	0	4.54	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.02	0.01	0.02	0.05	0.04	0.09	0.11	↑	+450.0	+0.09	+15	0	0.02	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	0.40	0.39	0.39	0.52	0.49	0.59	0.58	↑	+45.0	+0.18	+36	-3	0.39	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Netherlands

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	21.63	22.67	23.72	28.12	24.19	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3.47	4.29	4.62	5.84	5.08	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.02	0.02	0.05	0.06	0.06	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6.96	7.28	7.50	8.81	7.94	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.13	3.42	3.01	3.82	3.60	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.05	1.14	1.24	1.51	1.26	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1.02	1.04	1.13	1.65	1.37	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.02	0.05	0.04	0.09	0.11	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1.03	1.34	1.26	1.86	1.48	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.56	0.67	0.69	1.06	0.70	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.43	0.44	0.50	0.87	0.49	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.30	0.52	0.33	0.45	0.37	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.16	0.28	0.16	0.28	0.24	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.30	0.35	0.38	0.33	0.26	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.46	0.42	0.51	0.49	0.52	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.02	0.02	0.04	0.07	0.05	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.05	0.13	0.10	0.16	0.08	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.01	0.02	0.02	0.02	0.05	↑	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.06	0.05	0.08	0.07	0.10	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.06	0.03	0.07	0.08	0.09	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.00	0.01	0.02	0.01	0.03	↑	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	0.39	0.52	0.49	0.59	0.58	↑	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.32^	0.57^	0.66^	0.81^	1.10^	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.20	0.37	0.54	0.52	0.61	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.04^	0.12^	0.11^	0.13^	0.20^	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.88^	0.83^	0.61^	0.56^	0.35^	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.03	0.07	0.04	0.06	0.05	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Netherlands, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	6 571	41.4	7 210	40.9	7 834	41.0	9 003	43.7	8 174	43.8	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6 575	6.6	7 215	7.7	7 840	8.0	8 981	9.1	8 158	9.2	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	6 569	0.0	7 210	0.0	7 780	0.1	9 005	0.1	8 182	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6 575	13.3	7 213	13.1	7 840	12.9	9 011	13.7	8 180	14.4	22.0 (8.8-50.9)	↑
	Aminoglycoside (gentamicin/tobramycin) resistance	6 576	6.0	7 216	6.2	7 841	5.2	9 013	5.9	8 183	6.5	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	6 574	2.0	7 210	2.1	7 836	2.1	8 980	2.4	8 153	2.3	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 270	10.1	1 385	9.8	1 504	10.2	1 788	12.9	1 670	12.1	32.8 (5.8-84.8)	↑
	Carbapenem (imipenem/meropenem) resistance	1 270	0.2	1 384	0.4	1 483	0.4	1 685	0.8	1 566	1.0	12.0 (0.0-69.7)	↑
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 270	10.2	1 385	12.6	1 504	11.3	1 798	14.5	1 675	13.1	30.1 (6.9-82.8)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	1 270	5.6	1 385	6.3	1 504	6.3	1 798	8.3	1 675	6.1	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 270	4.3	1 385	4.1	1 504	4.5	1 788	6.8	1 670	4.4	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	699	5.4	720	9.4	738	6.1	873	7.2	796	6.9	16.7 (0.0-59.5)	-
	Ceftazidime resistance	728	2.7	756	4.8	773	2.8	905	4.3	830	4.2	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	730	5.2	756	6.0	773	6.6	906	5.1	830	4.6	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	730	7.9	756	7.3	775	8.9	905	7.6	830	9.3	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	728	0.4	756	0.4	775	0.6	905	1.1	829	1.0	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	696	0.9	720	2.4	735	1.8	872	2.5	795	1.5	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	185	0.5	198	1.0	210	1.4	208	1.4	222	3.6	31.5 (0.0-95.4)	↑
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	186	3.8	198	3.0	211	5.2	215	4.7	227	6.6	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	191	4.2	199	2.0	212	4.7	212	5.2	226	5.8	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	179	0.0	195	0.5	206	1.5	204	1.0	220	2.3	27.1 (0.0-91.8)	↑
Staphylococcus aureus	MRSA[d]	3 231	1.5	3 609	1.9	3 739	1.8	4 055	2.0	3 938	2.2	14.1 (1.8-39.5)	↑*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	648	6.2	1 157	6.4	1 156	7.8	1 404	8.1	1 467	11.1	16.4 (5.1-30.2)	↑*
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	766	3.3	1 419	3.4	1 578	4.6	1 813	4.0	1 799	5.0	18.5 (4.0-30.7)	↑*
	Combined penicillin non-wild-type and resistance to macrolides[e]	575	0.9	1 039	1.4	1 039	1.4	1 312	1.4	1 414	2.1	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	641	36.8	559	19.3	576	14.4	455	17.4	447	11.6	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	1 272	0.3	1 081	0.8	987	0.5	1 149	0.8	1 075	0.7	17.2 (0.0-62.2)	-

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Netherlands, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/8	ND	ND	0/7	ND	ND
	Cefiderocol	0/8	ND	ND	0/7	ND	ND
	Ceftazidime-avibactam	0/8	ND	ND	0/7	ND	ND
	Imipenem-relebactam	0/8	ND	ND	0/7	ND	ND
	Meropenem-vaborbactam	0/8	ND	ND	0/7	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/8	ND	ND	0/14	ND	ND
	Cefiderocol	0/8	ND	ND	0/14	ND	ND
	Ceftazidime-avibactam	0/8	ND	ND	0/14	ND	ND
	Imipenem-relebactam	0/8	ND	ND	0/14	ND	ND
	Meropenem-vaborbactam	0/8	ND	ND	0/14	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/21	ND	ND	0/21	ND	ND
	Ceftazidime-avibactam	0/21	ND	ND	0/21	ND	ND
	Ceftolozane-tazobactam	0/21	ND	ND	0/21	ND	ND
	Imipenem-relebactam	0/21	ND	ND	0/21	ND	ND
	Meropenem-vaborbactam	0/21	ND	ND	0/21	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/2	ND	ND	0/7	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).
ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

Norway

Participating institutions

University Hospital of North Norway, https://www.unn.no/fag-og-forskning/norm-norsk-overvakingssystem-for-antibiotikaresistens-hos-mikrober

Norwegian Institute of Public Health, https://www.fhi.no

St. Olav University Hospital, Trondheim, https://www.stolav.no

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Norway, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	94	94	94	94	94
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	87.4	97.3	80.9	91.7	92.8

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Norway, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	93	100	94	94	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Norway, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	18	3 840	3	18	3 835	3	18	3 984	3	18	3 976	11	18	4 234	3
Klebsiella pneumoniae	18	787	3	17	783	3	18	787	3	18	905	13	18	1 011	4
Pseudomonas aeruginosa	18	309	3	18	362	6	18	294	4	18	295	11	18	281	3
***Acinetobacter* spp.**	14	42	5	15	35	3	14	41	0	14	61	7	13	47	4
Staphylococcus aureus	18	1 728	6	18	1 864	6	18	1 829	5	18	1 878	11	18	2 015	5
Streptococcus pneumoniae	18	263	3	18	454	4	18	493	3	18	510	16	18	695	3
Enterococcus faecalis	18	608	6	18	655	4	18	608	6	18	610	15	18	612	6
Enterococcus faecium	18	218	11	18	244	9	18	254	13	18	240	11	17	246	11

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Norway

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.03	4.32	4.16	4.27	4.34	5.18	5.46	-	+8.5	+0.43	+37	NA	NA	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.04	0.02	0.04	0.04	0.08	0.13	0.02	-	-50	-0.02	-1	NA	NA	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	0.34	0.50	0.30	0.39	0.64	0.69	0.67	↑	+97.1	+0.33	+19	NA	NA	4.56 (0.58-12.07)

NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Norway

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	26.80	27.69	28.45	29.10	30.01	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.16	4.27	4.34	5.18	5.46	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.02	0.04	0.02	0.08	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	7.46	7.69	7.79	7.59	8.14	-	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.08	4.06	4.26	4.45	4.24	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1.20	1.14	1.03	1.15	1.14	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1.14	1.00	0.89	1.21	1.12	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.04	0.04	0.08	0.13	0.02	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1.82	1.51	1.78	1.96	1.81	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.79	0.61	0.64	0.88	0.65	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.45	0.45	0.41	0.52	0.38	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.32^	0.61^	0.43^	0.31^	0.34	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.37	0.51	0.37	0.38	0.38	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	0.41	0.43	0.41	0.29	0.25	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.26	0.53	0.47	0.36	0.29	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.00	0.04	0.02	0.06	0.02	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.14^	0.20^	0.08^	0.12^	0.13^	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.00	0.02	0.00	0.02	0.04	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.04	0.00	0.00	0.02	0.04	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.02	0.02	0.02	0.02	0.11	↑	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.00	0.00	0.00	0.02	0.04	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	0.30	0.39	0.64	0.69	0.67	↑	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.32	0.65	0.68	0.50	0.70	-	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.26	0.31	0.64	0.61	0.72	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.16	0.18	0.37	0.21	0.40	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.30^	0.25^	0.12^	0.17^	0.06^	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.02	0.06	0.04	0.06	0.02	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Norway, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	3 837	35.4	3 737	37.8	3 983	36.9	3 974	38.2	4 232	37.3	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3 839	5.5	3 739	5.8	3 984	5.6	3 976	6.8	4 234	6.8	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	3 820	0.0	3 738	0.0	3 984	0.1	3 973	0.0	4 234	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	3 827	9.9	3 726	10.5	3 971	10.1	3 962	10.0	4 229	10.1	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	3 839	5.4	3 831	5.4	3 983	5.5	3 976	5.8	4 151	5.4	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	3 826	1.6	3 726	1.6	3 970	1.3	3 962	1.5	4 146	1.4	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	787	7.4	769	6.6	787	5.8	904	7.0	1 010	5.8	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	783	0.3	769	0.3	787	0.5	902	0.8	1 010	0.1	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	782	11.8	765	10.1	783	11.7	900	11.3	1 008	9.4	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	786	5.1	782	4.0	787	4.2	904	5.1	993	3.4	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	782	2.9	764	3.0	783	2.7	900	3.0	991	2.0	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	278	5.8	316	9.8	261	8.4	256	6.3	254	7.1	16.7 (0.0-59.5)	-
	Ceftazidime resistance	295	6.4	354	7.3	285	6.7	286	7.0	274	7.3	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	309	6.8	362	6.1	294	7.1	295	5.1	281	4.6	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	309	4.2	361	7.5	293	8.2	295	6.4	281	5.3	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	308	0.0	362	0.6	294	0.3	294	1.0	281	0.4	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	263	2.7	307	3.3	251	1.6	246	2.4	247	2.8	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	42	0.0	34	2.9	41	0.0	61	1.6	47	4.3	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	42	4.8	34	0.0	41	0.0	61	1.6	47	4.3	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	42	2.4	35	2.9	40	2.5	57	1.8	46	13.0	30.0 (0.0-92.3)	↑*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	42	0.0	34	0.0	40	0.0	57	1.8	46	4.3	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	1 638	0.9	1 796	1.1	1 714	1.9	1 748	2.1	1 910	1.8	14.1 (1.8-39.5)	↑*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	262	6.1	453	7.3	491	7.1	509	5.1	687	5.4	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	242	5.4	418	3.8	487	6.8	501	6.4	668	5.7	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	241	3.3	417	2.2	485	3.9	500	2.2	664	3.2	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	159	9.4	155	8.4	138	4.3	156	5.8	132	2.3	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	216	0.5	243	1.2	253	0.8	229	1.3	232	0.4	17.2 (0.0-62.2)	-

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; −indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Norway, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/1	ND	ND	0/2	ND	ND
	Cefiderocol	0/1	ND	ND	0/2	ND	ND
	Ceftazidime-avibactam	0/1	ND	ND	0/2	ND	ND
	Imipenem-relebactam	0/1	ND	ND	0/2	ND	ND
	Meropenem-vaborbactam	0/1	ND	ND	0/2	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/4	ND	ND	0/1	ND	ND
	Cefiderocol	0/4	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/4	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/4	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/4	ND	ND	0/1	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/10	ND	ND	0/8	ND	ND
	Ceftazidime-avibactam	1/10	1	NA	0/8	ND	ND
	Ceftolozane-tazobactam	1/10	1	NA	1/8	2	NA
	Imipenem-relebactam	0/10	ND	ND	0/8	ND	ND
	Meropenem-vaborbactam	0/10	ND	ND	0/8	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/1	ND	ND	0/1	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Poland

Participating institutions
National Medicines Institute, Department of Epidemiology and Clinical Microbiology, https://www.nil.gov.pl
National Reference Centre for Susceptibility Testing, https://korld.nil.gov.pl

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Poland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	20	18	21	20	20
Geographical representativeness	Medium	Medium	Medium	Medium	Medium
Hospital representativeness	Medium	Medium	Medium	Medium	Medium
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	54.7	51.2	55.1	57.7	67.2

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Poland, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	98	88	97	99	97

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Poland, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	52	2 376	28	52	2 538	25	52	3 072	24	54	3 696	20	52	3 660	35
Klebsiella pneumoniae	52	1 447	47	52	1 357	39	52	1 583	38	54	2 066	30	52	2 102	45
Pseudomonas aeruginosa	49	445	49	52	476	39	49	480	39	53	655	31	52	669	41
***Acinetobacter* spp.**	50	832	69	49	469	51	48	454	56	48	478	40	48	452	58
Staphylococcus aureus	52	1 975	32	52	2 073	27	52	2 145	29	54	2 542	23	53	2 620	41
Streptococcus pneumoniae	47	260	35	49	456	33	50	518	27	53	628	23	52	727	33
Enterococcus faecalis	51	1 252	50	51	972	41	52	1 005	43	54	1 089	32	52	1 236	49
Enterococcus faecium	52	908	52	51	681	40	51	731	41	54	871	30	53	910	48

Labs: laboratories.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Poland

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.44#	6.24#	5.87#	6.98#	7.77#	9.43#	9.77#	↑	+31.3	+2.33	+741	-10	6.70	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	1.38#	1.45#	3.69#	3.30#	3.69#	5.15#	6.81#	↑	+393.5	+5.43	+1 961	-4	1.32	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	4.26#	3.08^#	3.74^#	3.91#	3.52#	3.43#	4.25^#	-	-0.2	-0.01	-68	-10	3.83	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Poland

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	6.47^#	7.23^#	8.12^#	8.33^#	8.22^#	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5.87#	6.98#	7.77#	9.43#	9.77#	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.04#	0.03#	0.08#	0.07#	0.12#	↑	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	9.92#	10.87#	12.68#	14.16#	13.45#	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.96#	4.18#	5.09#	6.17#	5.71#	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.80^#	2.55^#	3.29^#	4.03^#	3.60^#	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	13.24#	12.29#	13.11#	16.90#	17.58#	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	3.69#	3.30#	3.69#	5.15#	6.81#	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	13.28#	11.98#	12.93#	15.82#	16.44#	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	9.92#	8.69#	9.32#	11.84#	12.56#	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	9.42#	7.98^#	8.75^#	10.81^#	11.29^#	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.59#	1.59#	1.63#	1.84#	1.92#	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.19#	1.18#	1.32#	1.56#	1.47#	↑	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.63#	1.70#	1.58#	1.90#	1.90#	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.89#	1.65#	1.54#	1.79#	1.81#	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.52^#	0.65^#	0.74^#	0.68^#	0.55^#	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.98^#	0.94^#	0.93^#	0.89^#	0.75^#	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	9.02#	5.25#	4.65#	4.94#	4.82#	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	9.99#	5.62#	4.90#	5.12#	4.99#	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	7.95#	4.07#	3.82#	3.48#	3.40#	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	7.00#	3.63#	3.60#	3.33#	3.12^#	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	3.74^#	3.91#	3.52#	3.43#	4.25^#	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.63#	0.78#	0.65#	1.27#	1.18#	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.82^#	1.28^#	1.27^#	1.32^#	1.32^#	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.41^#	0.46^#	0.44^#	0.68^#	0.58^#	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	8.42#	6.15#	5.58#	6.29#	6.45^#	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	4.08#	4.07#	3.90#	4.31#	4.15#	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Poland, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	809	60.6	857	57.2	956	65.6	1 085	56.2	1 042	57.6	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2 371	18.7	2 531	18.7	3 067	19.6	3 673	18.8	3 641	19.6	16.9 (6.8-42.7)	-
	Carbapenem (imipenem/meropenem) resistance	2 290	0.1	2 451	0.1	2 966	0.2	3 520	0.1	3 510	0.3	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2 268	33.1	2 392	30.8	3 040	32.2	3 614	28.7	3 530	27.8	22.0 (8.8-50.9)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	2 186	13.7	2 296	12.3	2 780	14.1	3 395	13.3	3 346	12.5	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2 077	10.2	2 149	8.1	2 748	9.2	3 302	8.9	3 213	8.2	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 432	70.0	1 345	61.9	1 573	64.3	2 042	60.6	2 076	61.8	32.8 (5.8-84.8)	↓*
	Carbapenem (imipenem/meropenem) resistance	1 429	19.5	1 332	16.8	1 572	18.1	2 000	18.9	2 043	24.3	12.0 (0.0-69.7)	↑
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 428	70.4	1 341	60.6	1 568	63.6	2 020	57.4	2 020	59.4	30.1 (6.9-82.8)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	1 364	55.1	1 242	47.4	1 442	49.9	1 904	45.5	1 937	47.3	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 333	53.5	1 221	44.3	1 424	47.4	1 849	42.8	1 861	44.3	18.4 (1.1-73.6)	↓*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	440	27.3	463	23.3	467	27.0	635	21.3	659	21.2	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	442	20.4	471	17.0	478	21.3	618	18.4	634	16.9	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	440	28.0	468	24.6	476	25.6	646	21.5	663	21.0	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	443	32.3	459	24.4	477	24.9	645	20.3	649	20.3	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	323	12.1	334	13.2	322	17.7	446	11.2	397	10.1	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	318	23.3	323	19.8	312	23.1	411	15.8	363	15.2	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	826	82.7	466	76.4	450	79.8	476	76.1	450	78.2	31.5 (0.0-95.4)	↓
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	816	92.6	452	84.3	441	85.7	465	80.6	436	83.5	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	812	74.1	450	61.3	433	68.1	454	56.2	411	60.3	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	791	67.0	432	56.9	421	66.0	439	55.6	398	57.3	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	1 718	16.5	2 000	13.3	1 953	13.9	2 334	10.8	2 287	13.6	14.1 (1.8-39.5)	↓*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	255	18.8	445	11.9	504	9.9	597	15.6	659	13.1	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	213	29.1	352	24.7	392	25.0	448	21.7	476	20.2	18.5 (4.0-30.7)	↓*
	Combined penicillin non-wild-type and resistance to macrolides[e]	208	14.9	342	9.1	381	8.9	427	11.7	412	10.2	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	1 153	55.2	878	47.5	914	47.2	1 004	45.9	1 096	43.0	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	900	34.3	680	40.6	728	41.3	867	36.4	906	33.4	17.2 (0.0-62.2)	-

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Poland, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/5	ND	ND	0/7	ND	ND
	Cefiderocol	0/5	ND	ND	1/7	1	NA
	Ceftazidime-avibactam	2/5	2	NA	2/7	2	NA
	Imipenem-relebactam	0/5	ND	ND	1/7	1	NA
	Meropenem-vaborbactam	1/5	1	NA	1/7	1	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/50	ND	ND	0/50	ND	ND
	Cefiderocol	1/50	1	NA	3/50	7	NA
	Ceftazidime-avibactam	24/50	116	55.2	19/50	120	52.5
	Imipenem-relebactam	8/50	20	70.0	4/50	22	63.6
	Meropenem-vaborbactam	9/50	23	43.5	7/50	48	39.6
Pseudomonas aeruginosa	Cefiderocol	1/38	1	NA	0/39	ND	ND
	Ceftazidime-avibactam	6/38	14	NA	8/39	22	36.4
	Ceftolozane-tazobactam	4/38	10	NA	6/39	12	NA
	Imipenem-relebactam	2/38	7	NA	4/39	6	NA
	Meropenem-vaborbactam	4/38	6	NA	5/39	10	NA
***Acinetobacter* spp.**	Cefiderocol	0/41	ND	ND	0/42	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Portugal

Participating institutions
National Institute of Health Doutor Ricardo Jorge, https://www.insa.min-saude.pt
Directorate-General of Health, https://www.dgs.pt

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Portugal, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	97	97	98	98	98
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	256.0	363.7	323.6	205.1	254.6

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Portugal, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	81	91	83	93	82

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Portugal, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	57	5 633	4	63	5 558	4	69	6 414	4	66	7 324	4	65	7 253	5
Klebsiella pneumoniae	56	2 602	14	58	3 035	10	62	3 424	10	65	3 732	9	62	4 045	10
Pseudomonas aeruginosa	53	1 016	14	56	1 131	10	58	1 187	11	59	1 274	11	58	1 206	13
***Acinetobacter* spp.**	26	67	17	33	125	17	33	156	22	30	157	17	35	135	20
Staphylococcus aureus	59	2 948	10	65	3 602	8	66	3 291	7	64	3 725	7	63	3 432	7
Streptococcus pneumoniae	41	427	NA	50	706	2	57	957	3	55	1 069	4	56	1 149	3
Enterococcus faecalis	52	999	13	55	1 123	10	59	1 045	9	60	1 217	10	59	1 127	11
Enterococcus faecium	43	416	17	44	520	19	53	524	14	50	598	13	52	670	17

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Portugal

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	10.32	8.38	7.36	7.76	10.73	13.08	13.61	↑	+31.9	+3.29	+402	-12	9.08	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	2.93	3.22	2.92	3.01	4.19	4.22	6.06	↑	+106.8	+3.13	+350	-5	2.78	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	11.39	9.80	7.23	8.81	7.39	8.22	7.83	↓	-31.3*	-3.56*	-328*	-18	9.34	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Portugal

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	27.26	28.51	31.39	37.64	37.55	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.36	7.76	10.73	13.08	13.61	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.18	0.17	0.32	0.33	0.34	↑	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	12.65	11.81	15.18	16.52	16.64	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.96	6.46	8.23	9.49	8.59	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.84	3.28	3.96	4.69	4.16	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	11.63	13.56	16.82	16.54	19.65	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	2.92	3.01	4.19	4.22	6.06	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	10.81	12.28	14.71	14.02	16.53	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	6.48	6.98	7.92	7.11	8.13	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	5.31	5.90	6.84	6.31	7.06	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.62	1.69	1.76	1.87	1.92	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.54	1.45	1.55	1.53	1.52	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.43	1.32	1.17	1.28	1.43	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.83	1.59	1.73	1.60	1.59	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.55^	0.40^	0.38^	0.31^	0.43	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	1.11^	0.77^	0.78^	0.83^	0.95	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.07	0.38	0.65	0.38	0.24	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.11	0.40	0.70	0.37	0.21	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.08	0.25	0.42	0.33	0.20	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.05^	0.22	0.41	0.26	0.16	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	7.23	8.81	7.39	8.22	7.83	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.53^	0.52^	0.90^	1.26	1.83	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.77	1.02	1.36	1.60	2.00	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.34^	0.32^	0.45^	0.68	0.97	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.46^	1.71^	1.48^	1.69^	2.00^	↑	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.35	0.57	0.53	0.66	0.82	↑	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Portugal, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	5 164	52.7	5 486	52.2	5 923	54.4	7 127	55.1	7 108	55.7	55.5 (35.9-70.3)	↑*
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	5 615	13.1	5 526	14.1	6 403	17.2	7 290	18.7	7 248	19.8	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	5 466	0.3	5 362	0.3	6 183	0.5	6 932	0.5	7 241	0.5	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5 618	22.5	5 530	21.4	6 399	24.3	7 265	23.7	7 239	24.2	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	5 605	10.6	5 544	11.7	6 407	13.2	7 247	13.6	7 246	12.5	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	5 591	5.1	5 496	6.0	6 385	6.4	7 200	6.8	7 231	6.1	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2 581	45.0	3 013	45.2	3 403	50.7	3 727	46.3	4 038	51.3	32.8 (5.8-84.8)	↑*
	Carbapenem (imipenem/meropenem) resistance	2 520	11.6	2 935	10.3	3 280	13.1	3 513	12.5	4 040	15.8	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2 596	41.6	3 030	40.7	3 415	44.2	3 695	39.6	4 032	43.2	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	2 592	25.0	3 031	23.1	3 418	23.8	3 680	20.1	4 036	21.2	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2 571	20.6	3 005	19.7	3 394	20.7	3 666	17.9	4 025	18.5	18.4 (1.1-73.6)	↓*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	985	16.4	1 125	15.1	1 172	15.4	1 272	15.3	1 204	16.8	16.7 (0.0-59.5)	-
	Ceftazidime resistance	1 013	15.2	1 120	13.0	1 181	13.5	1 270	12.6	1 205	13.3	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	1 015	14.1	1 129	11.8	1 181	10.2	1 274	10.4	1 206	12.5	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1 012	18.1	1 120	14.3	1 186	14.9	1 273	13.1	1 206	13.8	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	875	6.3	991	4.0	1 047	3.7	1 127	2.8	1 132	4.0	6.9 (0.0-50.0)	↓*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	872	12.7	980	7.9	1 034	7.7	1 126	7.7	1 130	8.8	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	67	10.4	122	31.1	155	43.2	156	25.6	133	18.8	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	62	17.7	123	32.5	156	46.2	157	24.8	133	16.5	33.9 (0.0-96.5)	↓
	Aminoglycoside (gentamicin/tobramycin) resistance	64	12.5	118	21.2	152	28.3	150	22.7	132	15.9	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	59	8.5	114	19.3	151	27.8	149	18.1	129	13.2	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	2 873	25.1	3 544	25.0	3 284	23.1	3 600	23.8	3 360	24.6	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	369	14.4	583	8.9	818	11.2	987	13.3	1 082	17.8	16.4 (5.1-30.2)	↑*
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	404	19.1	684	14.9	928	15.0	1 048	15.9	1 124	18.8	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	348	9.8	566	5.7	795	5.8	969	7.3	1 059	9.6	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	802	18.2	873	19.7	826	18.4	1 001	17.6	986	21.4	22.3 (2.3-62.1)	-
Enterococcus faecium	Vancomycin resistance	409	8.6	513	11.1	522	10.3	598	11.5	670	12.8	17.2 (0.0-62.2)	↑

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Portugal, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/16	ND	ND	0/20	ND	ND
	Cefiderocol	0/16	ND	ND	0/20	ND	ND
	Ceftazidime-avibactam	8/16	19	NA	10/20	22	40.9
	Imipenem-relebactam	0/16	ND	ND	0/20	ND	ND
	Meropenem-vaborbactam	0/16	ND	ND	0/20	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/44	ND	ND	0/48	ND	ND
	Cefiderocol	0/44	ND	ND	0/48	ND	ND
	Ceftazidime-avibactam	25/44	271	11.1	29/48	459	15.7
	Imipenem-relebactam	0/44	ND	ND	0/48	ND	ND
	Meropenem-vaborbactam	0/44	ND	ND	0/48	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/35	ND	ND	0/37	ND	ND
	Ceftazidime-avibactam	9/35	36	8.3	17/37	66	13.6
	Ceftolozane-tazobactam	21/35	95	8.4	27/37	109	16.5
	Imipenem-relebactam	0/35	ND	ND	0/37	ND	ND
	Meropenem-vaborbactam	0/35	ND	ND	0/37	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/9	ND	ND	0/10	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Romania

Participating institutions
National Institute of Public Health, www.insp.gov.ro

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Romania, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	11	13	13	15	17
Geographical representativeness	Low	Low	Low	Low	Low
Hospital representativeness	Low	Low	Low	Low	Low
Isolate representativeness	Low	Low	Low	Low	Low
Blood culture sets/1 000 patient-days	26.4	32.5	39.7	32.9	44.9

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Romania, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	94	100	91	91

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Romania, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	16	499	18	17	702	15	18	993	12	22	1 340	14	22	1 513	7
Klebsiella pneumoniae	16	538	52	17	628	48	19	944	39	22	1 167	39	22	1 236	35
Pseudomonas aeruginosa	16	208	51	16	230	50	19	264	46	22	258	43	20	299	38
***Acinetobacter* spp.**	16	386	73	15	319	69	18	337	62	21	441	63	22	414	61
Staphylococcus aureus	16	469	27	17	597	22	18	782	22	22	1 028	19	22	1 066	14
Streptococcus pneumoniae	10	28	23[c]	11	43	7	14	81	17	16	123	17	14	148	16
Enterococcus faecalis	16	227	47	17	246	36	19	314	39	22	379	37	22	401	24
Enterococcus faecium	14	194	53	16	185	45	17	179	39	22	210	36	21	261	30

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Romania

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.32#	4.19#	4.40#	4.97#	7.63#	9.68#	9.70#	↑	+53.5	+3.38	+620	-5	6.00	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	7.12#	10.77#	13.87#	12.12#	20.02#	20.31#	18.66#	↑	+162.1	+11.54	+2 171	-5	6.76	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	13.72#	9.03#	8.95#	9.37#	11.99#	13.15#	10.78#	-	-21.4*	-2.94*	-611*	-18	11.25	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Romania

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	10.70^#	13.66^#	18.93^#	21.33^#	20.97^#	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.40#	4.97#	7.63#	9.68#	9.70#	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.09#	0.16#	0.73#	0.42#	0.25#	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	5.82#	6.63#	10.05#	11.75#	10.72#	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.04^#	2.91^#	4.44^#	5.03^#	4.51^#	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.95^#	1.45^#	2.06^#	2.90^#	2.75^#	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	17.90#	15.76#	26.24#	27.34#	24.43#	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	13.87#	12.12#	20.02#	20.31#	18.66#	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	17.04#	15.07#	24.14#	26.19#	22.64#	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	10.75^#	10.83^#	18.45^#	18.81^#	16.90^#	↑	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	9.94^#	10.06^#	17.32^#	17.52^#	15.26^#	↑	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	4.36#	4.24#	5.01#	2.90#	2.93#	↓	1.88 (0.00-8.69)
	Ceftazidime resistance	4.40#	4.20#	5.01#	2.76#	2.97#	↓	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	4.50#	5.01#	5.57#	3.08#	3.18#	↓	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	4.36#	4.53#	5.17#	2.97#	2.78#	↓	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	3.31^#	3.07^#	3.51^#	1.71^#	1.45^#	↓	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	3.17^#	3.39^#	3.79^#	1.89^#	1.45^#	↓	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	17.09#	11.47#	11.79#	14.20#	11.46#	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	17.23#	11.60#	11.83#	14.27#	11.40#	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	14.49^#	9.58^#	9.49^#	12.10^#	9.24^#	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	14.25^#	9.33^#	9.29^#	11.89^#	9.14^#	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	8.95#	9.37#	11.99#	13.15#	10.78#	↑	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.47#	0.61#	1.01#	1.47#	1.30#	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.43^#	0.53^#	0.97#	1.26#	1.24^#	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.33^#	0.48^#	0.81#	1.05#	0.77^#	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	3.74#	3.80^#	5.29^#	3.39^#	3.40^#	-	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	4.02#	2.75#	2.95#	2.73#	3.43#	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Romania, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	352	64.2	542	62.4	760	61.7	974	62.6	1 045	65.0	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	495	18.8	690	17.8	990	19.1	1 340	20.7	1 512	20.8	16.9 (6.8-42.7)	-
	Carbapenem (imipenem/meropenem) resistance	498	0.4	697	0.6	985	1.8	1 305	0.9	1 440	0.6	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	498	24.7	690	23.8	980	25.4	1 334	25.2	1 500	23.1	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	406	10.6	602	12.0	865	12.7	1 172	12.3	1 328	11.0	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	401	5.0	582	6.2	849	6.0	1 166	7.1	1 317	6.8	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	534	70.8	614	63.5	936	69.4	1 167	67.0	1 228	64.4	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	538	54.5	627	47.8	940	52.8	1 156	50.3	1 216	49.7	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	536	67.2	618	60.4	935	64.0	1 161	64.5	1 225	59.8	30.1 (6.9-82.8)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	440	51.6	508	52.8	801	57.1	1 000	53.8	1 082	50.6	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	434	48.4	487	51.1	789	54.4	995	50.4	1 067	46.3	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	195	47.2	216	48.6	248	50.0	250	33.2	284	33.5	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	202	46.0	218	47.7	255	48.6	252	31.3	295	32.5	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	207	45.9	230	53.9	262	52.7	258	34.1	292	35.3	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	204	45.1	229	48.9	260	49.2	255	33.3	293	30.7	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	168	41.7	180	42.2	197	44.2	170	28.8	172	27.3	6.9 (0.0-50.0)	↓*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	159	42.1	176	47.7	190	49.5	167	32.3	165	28.5	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	386	93.5	318	89.3	336	86.9	438	92.7	413	89.8	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	385	94.5	315	91.1	334	87.7	436	93.6	410	90.0	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	336	91.1	267	88.8	285	82.5	385	89.9	347	86.2	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	335	89.9	264	87.5	282	81.6	380	89.5	344	86.0	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	461	41.0	596	38.9	754	39.4	1 021	36.8	1 025	34.0	14.1 (1.8-39.5)	↓*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	28	35.7[f]	42	35.7	77	32.5	123	34.1	144	29.2	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	25	36.0[f]	36	36.1	80	30.0	122	29.5	133	30.1	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	25	28.0[f]	36	33.3	76	26.3	122	24.6	132	18.9	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	212	37.3	218	43.1	280	46.8	326	29.8	323	34.1	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	191	44.5	184	37.0	177	41.2	209	37.3	256	43.4	17.2 (0.0-62.2)	-

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Romania, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/7	ND	ND	0/6	ND	ND
	Cefiderocol	1/7	1	NA	0/6	ND	ND
	Ceftazidime-avibactam	1/7	1	NA	1/6	1	NA
	Imipenem-relebactam	0/7	ND	ND	0/6	ND	ND
	Meropenem-vaborbactam	0/7	ND	ND	0/6	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/21	ND	ND	0/22	ND	ND
	Cefiderocol	2/21	25	64.0	5/22	120	48.3
	Ceftazidime-avibactam	7/21	140	85.7	11/22	280	80.4
	Imipenem-relebactam	4/21	100	88.0	6/22	169	96.4
	Meropenem-vaborbactam	1/21	53	92.5	5/22	157	93.6
Pseudomonas aeruginosa	Cefiderocol	1/22	1	NA	2/20	10	NA
	Ceftazidime-avibactam	2/22	7	NA	6/20	27	63.0
	Ceftolozane-tazobactam	1/22	6	NA	6/20	24	62.5
	Imipenem-relebactam	2/22	7	NA	3/20	11	NA
	Meropenem-vaborbactam	1/22	6	NA	1/20	8	NA
***Acinetobacter* spp.**	Cefiderocol	0/20	ND	ND	1/22	40	17.5

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Slovakia

Participating institutions
National Reference Centre for Antimicrobial Resistance, https://www.uvzsr.sk
Public Health Authority of the Slovak Republic, https://www.uvzsr.sk
Regional Public Health Authority Banska Bystrica, https://www.uvzsr.sk

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Slovakia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	56	56	54	53	51
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	32.1	29.5	30.6	31.6	33.0

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Slovakia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	100	100	86	93

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Slovakia, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	13	663	16	13	784	17	11	697	9	12	777	12	10	819	14
Klebsiella pneumoniae	13	551	41	13	409	30	11	310	18	11	381	25	10	430	19
Pseudomonas aeruginosa	13	275	42	13	238	30	11	228	27	11	202	23	10	195	22
***Acinetobacter* spp.**	12	148	57	12	155	42	8	76	28	8	94	21	9	57	32
Staphylococcus aureus	13	583	20	13	578	21	11	416	12	12	490	16	10	576	15
Streptococcus pneumoniae	6	22	18[c]	10	34	26	8	34	15	8	59	25	10	71	15
Enterococcus faecalis	12	335	42	12	275	31	11	214	19	10	208	21	10	212	21
Enterococcus faecium	12	224	52	13	155	36	10	142	17	11	138	20	10	140	34

Labs: laboratories.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).
[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Slovakia

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.39	6.45	4.91	5.98	5.12	6.64	7.31	-	+14.4	+0.92	+48	-5	6.07	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.52	1.05	1.96	1.87	1.33	1.74	1.92	↑	+269.2	+1.40	+75	-4	0.50	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	5.01	4.38	4.25	3.42	2.05	3.27	3.69	↓	-26.3*	-1.32*	-73*	-10	4.51	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

* Target reached.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Slovakia

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	11.77	13.67	13.64	15.06	17.26	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	4.91	5.98	5.12	6.64	7.31	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.03	0.07	0.04	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	6.44	8.31	7.37	8.10	8.29	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.07	3.55	3.27	3.65	4.27	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.19	2.73	2.46	2.50	2.79	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	12.20	7.36	5.56	7.41	8.57	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	1.96	1.87	1.33	1.74	1.92	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	11.68	6.44	4.81	6.61	7.81	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	10.76	5.85	4.26	5.57	7.09	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	9.22	4.90	3.75	4.77	6.37	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	2.62	1.74^	2.15	1.77	1.45	↓	1.88 (0.00-8.69)
	Ceftazidime resistance	2.68	1.77^	2.39	1.74	1.52	↓	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	3.73	2.20	3.38	2.78	2.71	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	4.28	3.38	3.17	2.68	2.10	↓	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	2.91	2.07	2.49	2.05	1.59	↓	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	2.71^	1.91^	2.29	1.95	1.45	↓	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	2.68	3.02	1.23	1.25	0.51	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	3.30	3.32	1.26	1.29	0.54	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.98	3.25	1.23	1.22	0.51	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	2.35	2.92	1.13	1.15	0.51	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	4.25	3.42	2.05	3.27	3.69	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.07	0.10	0.10	0.35	0.62	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.10	0.23	0.17^	0.42	0.43	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.03	0.03	0.00^	0.24	0.29	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	5.59	3.02	0.99	1.01	0.00^	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	2.49	2.10	1.09	1.25	1.16	↓	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Slovakia, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	660	54.5	767	54.2	684	58.5	761	56.9	798	59.8	55.5 (35.9-70.3)	↑
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	649	23.1	768	23.7	696	21.6	777	24.6	817	24.7	16.9 (6.8-42.7)	-
	Carbapenem (imipenem/meropenem) resistance	625	0.0	738	0.0	696	0.1	777	0.3	819	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	662	29.8	782	32.4	693	31.2	775	30.1	818	28.0	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	663	14.2	783	13.8	695	13.8	777	13.5	818	14.4	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	648	10.3	767	10.8	692	10.4	775	9.3	816	9.4	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	545	68.4	399	56.1	310	52.6	381	55.9	429	55.2	32.8 (5.8-84.8)	↓*
	Carbapenem (imipenem/meropenem) resistance	515	11.7	379	15.0	310	12.6	381	13.1	430	12.3	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	550	64.9	409	47.9	310	45.5	379	50.1	429	50.3	30.1 (6.9-82.8)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	551	59.7	408	43.6	310	40.3	380	42.1	428	45.8	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	544	51.8	399	37.3	310	35.5	378	36.2	427	41.2	18.4 (1.1-73.6)	↓
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	254	31.5	213	24.9	226	27.9	201	25.4	184	21.7	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	253	32.4	213	25.4	228	30.7	201	24.9	195	21.5	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	258	44.2	218	30.7	228	43.4	201	39.8	195	38.5	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	273	48.0	237	43.5	228	40.8	202	38.1	195	29.7	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	265	33.6	236	26.7	216	33.8	194	30.4	192	22.9	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	244	34.0	213	27.2	215	31.2	192	29.2	181	22.1	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	134	61.2	150	61.3	76	47.4	94	38.3	57	24.6	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	148	68.2	155	65.2	76	48.7	94	39.4	57	26.3	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	147	61.9	154	64.3	76	47.4	94	37.2	57	24.6	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	134	53.7	149	59.7	76	43.4	94	35.1	57	24.6	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	582	22.3	578	18.0	416	14.4	488	19.3	576	17.7	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	22	9.1[f]	33	9.1	32	9.4	59	16.9	70	24.3	16.4 (5.1-30.2)	↑
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	21	14.3[f]	32	21.9	28	17.9[f]	58	20.7	65	18.5	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	21	4.8[f]	31	3.2	26	0.0[f]	58	12.1	64	12.5	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	325	52.6	265	34.7	208	13.9	202	14.4	4	NA	22.3 (2.3-62.1)	NA
Enterococcus faecium	Vancomycin resistance	219	34.7	153	41.8	141	22.7	137	26.3	140	22.9	17.2 (0.0-62.2)	↓*

NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Slovakia, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/2	ND	ND	0/1	ND	ND
	Cefiderocol	0/2	ND	ND	0/1	ND	ND
	Ceftazidime-avibactam	0/2	ND	ND	0/1	ND	ND
	Imipenem-relebactam	0/2	ND	ND	0/1	ND	ND
	Meropenem-vaborbactam	0/2	ND	ND	0/1	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/7	ND	ND	0/8	ND	ND
	Cefiderocol	0/7	ND	ND	0/8	ND	ND
	Ceftazidime-avibactam	0/7	ND	ND	2/8	12	NA
	Imipenem-relebactam	0/7	ND	ND	0/8	ND	ND
	Meropenem-vaborbactam	0/7	ND	ND	0/8	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/10	ND	ND	0/9	ND	ND
	Ceftazidime-avibactam	0/10	ND	ND	0/9	ND	ND
	Ceftolozane-tazobactam	0/10	ND	ND	0/9	ND	ND
	Imipenem-relebactam	0/10	ND	ND	0/9	ND	ND
	Meropenem-vaborbactam	0/10	ND	ND	0/9	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/7	ND	ND	0/7	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Slovenia

Participating institutions
National Institute of Public Health, www.nijz.si
Medical Faculty, University of Ljubljana, https://imi.si
National Laboratory of Health, Environment and Food, https://www.nlzoh.si

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Slovenia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	99	99	99	99	99
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	56.1	56.4	44.7	66.8	47.4

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Slovenia, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	100	100	100	100

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Slovenia, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	10	1 681	5	10	1 660	5	10	1 639	5	10	1 709	7	10	1 643	6
Klebsiella pneumoniae	10	351	14	10	372	10	10	339	11	10	352	11	10	360	14
Pseudomonas aeruginosa	9	257	20	9	220	24	10	234	21	10	186	20	10	195	17
***Acinetobacter* spp.**	9	124	56	8	60	37	7	52	15	4	20	25[c]	6	29	17[c]
Staphylococcus aureus	10	768	12	10	644	8	10	673	8	10	679	8	10	687	11
Streptococcus pneumoniae	10	187	8	10	225	5	10	232	8	10	263	6	10	273	5
Enterococcus faecalis	9	205	20	10	194	11	9	177	11	10	178	14	10	169	14
Enterococcus faecium	10	219	34	8	158	30	9	171	25	9	150	29	10	139	35

Labs: laboratories.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

[c] A small number of isolates were tested (n <30), and the percentage of isolates from ICUs should be interpreted with caution.

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Slovenia

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.67	8.24	7.47	7.43	6.78	7.37	9.53	-	+24.3	+1.86	+43	-10	6.90	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.05	0.00	0.14	0.34	0.62	0.62	0.76	↑	+1 420.0	+0.71	+15	-2	0.05	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	2.38	3.37	2.87	2.68	3.24	2.81	3.60	-	+51.3	+1.22	+27	-6	2.24	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Slovenia

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	40.90	38.97	38.31	40.61	39.53	-	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.47	7.43	6.78	7.37	9.53	-	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.00	0.00	0.05	0.00	0.00	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	13.41	13.18	12.45	12.94	14.13	-	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	5.32	6.33	5.44	6.18	6.92	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.25	2.92	2.34	2.62	3.56	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3.64	3.69	3.72	3.28	3.79	-	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.14	0.34	0.62	0.62	0.76	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	4.07	3.93	4.39	3.47	4.36	-	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	2.30	2.21	2.77	1.76	2.28	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.06	1.97	2.24	1.28	1.85	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.82	1.39	1.19	1.19	1.19	-	1.88 (0.00-8.69)
	Ceftazidime resistance	1.77	1.39	1.24	1.19	1.14	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.63	1.53	1.34	1.19	1.23	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	2.06	1.10	1.05	1.33	1.80	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.29^	0.24	0.19	0.38	0.14	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.86^	0.81	0.72	0.67	0.52	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	3.98	1.25	0.57	0.10	0.09	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	4.36	1.34	0.62	0.10	0.09	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	4.07	1.25	0.62	0.05	0.05	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	3.98	1.20	0.57	0.05	0.05	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	2.87	2.68	3.24	2.81	3.60	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.57	0.77	1.29	2.14	1.66	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.62	0.86	0.67	0.71	0.95	-	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.19	0.29	0.43	0.38	0.43	-	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	1.82	1.63	0.91	0.81	1.04	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.38	0.10	0.38	0.19	0.19	-	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Slovenia, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	1 681	50.8	1 659	49.0	1 639	49.0	1 709	50.0	1 643	50.8	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1 681	9.3	1 660	9.3	1 639	8.7	1 709	9.1	1 643	12.2	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	1 681	0.0	1 660	0.0	1 639	0.1	1 709	0.0	1 643	0.0	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 681	16.7	1 660	16.6	1 639	15.9	1 709	15.9	1 643	18.1	22.0 (8.8-50.9)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	1 681	6.6	1 660	8.0	1 639	7.0	1 709	7.6	1 643	8.9	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 681	2.8	1 660	3.7	1 639	3.0	1 709	3.2	1 643	4.6	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	351	21.7	372	20.7	339	23.0	352	19.6	360	22.2	32.8 (5.8-84.8)	-
	Carbapenem (imipenem/meropenem) resistance	351	0.9	372	1.9	339	3.8	352	3.7	360	4.4	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	351	24.2	372	22.0	339	27.1	352	20.7	360	25.6	30.1 (6.9-82.8)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	351	13.7	372	12.4	339	17.1	352	10.5	360	13.3	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	351	12.3	372	11.0	339	13.9	352	7.7	360	10.8	18.4 (1.1-73.6)	-
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	257	14.8	220	13.2	234	10.7	186	13.4	195	12.8	16.7 (0.0-59.5)	-
	Ceftazidime resistance	257	14.4	220	13.2	234	11.1	186	13.4	195	12.3	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	257	13.2	220	14.5	234	12.0	186	13.4	195	13.3	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	257	16.7	220	10.5	234	9.4	186	15.1	195	19.5	14.9 (2.2-57.7)	-
	Aminoglycoside (tobramycin) resistance	174	3.4	204	2.5	230	1.7	183	4.4	191	1.6	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	174	10.3	204	8.3	230	6.5	183	7.7	191	5.8	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	124	66.9	60	43.3	52	23.1	20	10.0[f]	29	6.9[f]	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	124	73.4	60	46.7	52	25.0	20	10.0[f]	29	6.9[f]	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	124	68.5	60	43.3	52	25.0	20	5.0[f]	29	3.4[f]	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	124	66.9	60	41.7	52	23.1	20	5.0[f]	29	3.4[f]	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	768	7.8	644	8.7	673	10.1	678	8.7	687	11.1	14.1 (1.8-39.5)	-
Streptococcus pneumoniae	Penicillin non-wild-type[e]	187	6.4	225	7.1	232	11.6	263	17.1	273	12.8	16.4 (5.1-30.2)	↑*
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	187	7.0	225	8.0	232	6.0	263	5.7	273	7.3	18.5 (4.0-30.7)	-
	Combined penicillin non-wild-type and resistance to macrolides[e]	187	2.1	225	2.7	232	3.9	263	3.0	273	3.3	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	196	19.4	190	17.9	174	10.9	174	9.8	166	13.3	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	219	3.7	158	1.3	171	4.7	150	2.7	139	2.9	17.2 (0.0-62.2)	-

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

[f] A small number of isolates were tested (n <30), and the percentage resistance should be interpreted with caution.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Slovenia, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/0	NA	NA	0/0	NA	NA
	Cefiderocol	0/0	NA	NA	0/0	NA	NA
	Ceftazidime-avibactam	0/0	NA	NA	0/0	NA	NA
	Imipenem-relebactam	0/0	NA	NA	0/0	NA	NA
	Meropenem-vaborbactam	0/0	NA	NA	0/0	NA	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/3	ND	ND	2/4	7	NA
	Cefiderocol	0/3	ND	ND	3/4	10	NA
	Ceftazidime-avibactam	2/3	7	NA	3/4	10	NA
	Imipenem-relebactam	0/3	ND	ND	1/4	1	NA
	Meropenem-vaborbactam	0/3	ND	ND	0/4	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/7	ND	ND	0/4	ND	ND
	Ceftazidime-avibactam	2/7	9	NA	0/4	ND	ND
	Ceftolozane-tazobactam	0/7	ND	ND	0/4	ND	ND
	Imipenem-relebactam	0/7	ND	ND	0/4	ND	ND
	Meropenem-vaborbactam	0/7	ND	ND	0/4	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/2	ND	ND	0/2	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).

Spain

Participating institutions
Health Institute Carlos lll, www.isciii.es
National Centre for Microbiology, https://cnm.isciii.es
CIBERinfect, https://www.ciberinfec.es

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Spain, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	31	30	28	29	29
Geographical representativeness	Medium	Medium	Medium	Medium	Medium
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	165.4	705.3	606.6	588.1	524.1

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Spain, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	91	91	88	93	93

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Spain, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	39	7 583	NA	41	9 717	NA	40	9 635	NA	41	10 646	NA	40	11 145	NA
Klebsiella pneumoniae	39	2 174	NA	41	2 973	NA	40	3 138	NA	41	3 397	NA	40	3 616	NA
Pseudomonas aeruginosa	39	1 185	NA	41	1 403	NA	40	1 430	NA	41	1 408	NA	40	1 504	NA
***Acinetobacter* spp.**	24	95	NA	24	92	NA	26	79	NA	24	84	NA	29	99	NA
Staphylococcus aureus	40	2 594	NA	41	3 108	NA	40	2 973	NA	41	3 259	NA	40	3 456	NA
Streptococcus pneumoniae	37	391	NA	41	842	NA	40	1 203	NA	41	1 461	NA	40	1 424	NA
Enterococcus faecalis	40	1 542	NA	39	1 594	NA	40	1 567	NA	40	1 626	NA	40	1 674	NA
Enterococcus faecium	39	997	NA	39	1 095	NA	39	1 103	NA	41	1 337	NA	40	1 270	NA

Labs: laboratories.
NA: not applicable.
[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.
[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Spain

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7.84#	6.40#	6.65#	10.02#	11.16#	12.45#	13.81#	↑	+76.1	+5.97	+3 105	-10	7.06	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.76#	0.60#	0.72^#	1.08#	0.96#	1.20#	1.27#	↑	+67.1	+0.51	+268	-4	0.73	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	4.21#	3.13#	3.53^#	4.54^#	4.29^#	3.90^#	4.44^#	-	+5.5	+0.23	+208	-10	3.79	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Spain

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	27.07#	34.39^#	37.50#	40.01#	41.00#	↑	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	6.65#	10.02#	11.16#	12.45#	13.81#	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.06^#	0.38#	0.04#	0.22#	0.13#	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	13.71#	18.78#	19.68#	21.60#	22.05#	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	6.38#	8.22#	8.78#	9.51#	9.71#	↑	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.71#	3.96#	4.18#	4.21#	4.61#	↑	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	3.99#	5.51#	5.69#	5.51#	6.00#	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.72^#	1.08#	0.96#	1.20#	1.27#	↑	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	4.09#	5.71#	6.03#	6.55#	6.02#	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	3.04#	3.91#	3.90#	3.66#	3.92#	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.59#	3.18#	3.13#	2.87#	3.17#	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1.06#	1.50#	0.97#	0.87#	1.05^#	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.83^#	1.48#	0.76#	0.89#	0.94#	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.36#	2.21#	1.54#	1.62#	1.54#	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1.60#	2.22#	2.01#	1.86#	1.73#	-	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.85#	0.67#	0.66#	0.48^#	0.54#	↓	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.74^#	1.19^#	0.70^#	0.54^#	0.64^#	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.36#	0.23#	0.21^#	0.15#	0.14#	↓	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.37#	0.25#	0.25#	0.12^#	0.18#	↓	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.37#	0.21#	0.19#	0.12#	0.13#	↓	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.33#	0.19#	0.16^#	0.09^#	0.09#	↓	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	3.53^#	4.54^#	4.29^#	3.90^#	4.44^#	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.48^#	1.08^#	1.31^#	1.89^#	2.01^#	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.69#	1.15#	1.69^#	2.20^#	2.40^#	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.27^#	0.56^#	0.79^#	1.09^#	1.34^#	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	2.91^#	2.45^#	2.24^#	1.84^#	1.73^#	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.07#	0.22#	0.33#	0.23#	0.32#	↑	2.10 (0.00-9.61)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

One or more of the three representativeness indicators (geographical, hospital and/or isolate representativeness) were not reported as 'High'. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Spain, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	7 075	56.2	8 550	57.2	8 793	57.4	9 779	57.7	10 134	57.6	55.5 (35.9-70.3)	-
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	7 425	13.2	9 585	14.9	9 269	16.2	10 427	16.8	10 965	17.9	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	6 227	0.1	9 549	0.6	9 173	0.1	10 060	0.3	10 946	0.2	0.2 (0.0-2.4)	↓
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	7 571	26.6	9 343	28.6	9 617	27.6	10 157	30.0	10 948	28.7	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	7 567	12.4	9 367	12.5	9 609	12.3	10 469	12.8	11 120	12.4	10.3 (4.3-23.1)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	7 408	5.4	8 863	6.4	9 232	6.1	9 774	6.1	10 758	6.1	5.4 (1.3-17.1)	-
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2 127	27.6	2 938	26.7	3 033	25.3	3 306	23.5	3 570	23.9	32.8 (5.8-84.8)	↓*
	Carbapenem (imipenem/meropenem) resistance	1 847	5.7	2 917	5.2	3 003	4.3	3 163	5.3	3 573	5.1	12.0 (0.0-69.7)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2 168	27.7	2 816	28.8	3 133	25.9	3 267	28.3	3 539	24.2	30.1 (6.9-82.8)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	2 169	20.6	2 899	19.2	3 126	16.8	3 241	15.9	3 586	15.6	21.1 (2.4-77.0)	↓*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2 121	18.0	2 709	16.7	3 019	13.9	3 080	13.1	3 480	13.0	18.4 (1.1-73.6)	↓*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	1 124	13.9	1 306	16.3	1 303	10.1	1 292	9.4	1 336	11.2	16.7 (0.0-59.5)	↓*
	Ceftazidime resistance	1 036	11.8	1 373	15.3	1 378	7.4	1 302	9.7	1 456	9.2	13.5 (1.5-56.0)	↓*
	Carbapenem (imipenem/meropenem) resistance	1 175	17.0	1 392	22.6	1 371	15.1	1 355	16.9	1 499	14.6	15.6 (0.0-57.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	1 157	20.3	1 353	23.4	1 430	19.0	1 359	19.3	1 441	17.1	14.9 (2.2-57.7)	↓
	Aminoglycoside (tobramycin) resistance	1 143	10.9	1 327	7.2	1 313	6.8	1 237	5.4	1 474	5.2	6.9 (0.0-50.0)	↓*
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	980	11.1	1 218	13.9	1 199	7.8	1 113	6.8	1 298	7.0	10.0 (0.0-53.8)	↓*
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	93	57.0	92	35.9	71	39.4	83	25.3	98	20.4	31.5 (0.0-95.4)	↓*
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	93	58.1	92	39.1	79	43.0	70	24.3	98	26.5	33.9 (0.0-96.5)	↓*
	Aminoglycoside (gentamicin/tobramycin) resistance	93	58.1	91	33.0	76	32.9	80	21.3	97	19.6	30.0 (0.0-92.3)	↓*
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	92	53.3	91	29.7	69	30.4	67	17.9	95	13.7	27.1 (0.0-91.8)	↓*
Staphylococcus aureus	MRSA[d]	1 896	27.4	2 513	25.7	2 233	25.9	2 322	23.7	2 711	23.3	14.1 (1.8-39.5)	↓*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	329	21.3	703	21.8	947	18.7	1 196	22.3	1 136	25.2	16.4 (5.1-30.2)	↑*
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	373	27.1	788	20.8	1 074	21.1	1 310	23.7	1 238	27.6	18.5 (4.0-30.7)	↑*
	Combined penicillin non-wild-type and resistance to macrolides[e]	318	12.6	663	11.9	898	11.9	1 096	14.1	1 027	18.6	10.1 (1.0-18.9)	↑*
Enterococcus faecalis	High-level gentamicin resistance	1 362	31.4	1 400	24.9	1 215	24.8	1 165	22.3	1 245	19.8	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	996	1.0	1 080	2.9	1 092	4.0	1 220	2.6	1 259	3.6	17.2 (0.0-62.2)	↑*

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Spain, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/9	ND	ND	0/13	ND	ND
	Cefiderocol	0/9	ND	ND	0/13	ND	ND
	Ceftazidime-avibactam	0/9	ND	ND	0/13	ND	ND
	Imipenem-relebactam	0/9	ND	ND	0/13	ND	ND
	Meropenem-vaborbactam	0/9	ND	ND	0/13	ND	ND
Klebsiella pneumoniae	Aztreonam-avibactam	0/27	ND	ND	0/29	ND	ND
	Cefiderocol	0/27	ND	ND	0/29	ND	ND
	Ceftazidime-avibactam	0/27	ND	ND	0/29	ND	ND
	Imipenem-relebactam	0/27	ND	ND	0/29	ND	ND
	Meropenem-vaborbactam	0/27	ND	ND	0/29	ND	ND
Pseudomonas aeruginosa	Cefiderocol	0/37	ND	ND	0/34	ND	ND
	Ceftazidime-avibactam	0/37	ND	ND	0/34	ND	ND
	Ceftolozane-tazobactam	0/37	ND	ND	0/34	ND	ND
	Imipenem-relebactam	0/37	ND	ND	0/34	ND	ND
	Meropenem-vaborbactam	0/37	ND	ND	0/34	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/11	ND	ND	0/10	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).
ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

Sweden

Participating institutions

The Public Health Agency of Sweden, www.folkhalsomyndigheten.se

Population and hospitals contributing data: coverage, representativeness and blood culture rate, Sweden, 2021–2025

Parameter	2021	2022	2023	2024	2025
Estimated national population coverage (%)	89	89	89	89	89
Geographical representativeness	High	High	High	High	High
Hospital representativeness	High	High	High	High	High
Isolate representativeness	High	High	High	High	High
Blood culture sets/1 000 patient-days	ND	ND	112.4	112.4	165.3

ND: no data available.

Laboratories contributing data: use of clinical breakpoint guidelines and participation in EARS-Net EQA, Sweden, 2021–2025

Parameter	2021	2022	2023	2024	2025
Percentage of laboratories using EUCAST or EUCAST-harmonised guidelines	100	100	100	100	100
Percentage of laboratories participating in EARS-Net EQA	100	100	94	95	95

For more information about the EARS-Net EQA, the report 'External quality assessment (EQA) of the performance of laboratories participating in the European Antimicrobial Resistance Surveillance Network (EARS-Net), 2025'.

Annual number of reporting laboratories[a], number of reported isolates and percentage[b] of isolates reported from patients in ICUs, Sweden, 2021–2025

Bacterial species	2021			2022			2023			2024			2025		
	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)	Labs (n)	Isolates (n)	Isolates from ICU (%)
Escherichia coli	21	10 634	NA	21	10 563	NA	21	10 726	NA	20	10 504	NA	21	10 404	NA
Klebsiella pneumoniae	21	2 001	NA	21	2 164	NA	21	2 165	NA	21	2 484	NA	20	2 042	NA
Pseudomonas aeruginosa	21	803	NA	21	853	NA	21	858	NA	21	849	NA	21	816	NA
***Acinetobacter* spp.**	1	138	NA	1	149	NA	1	156	NA	1	175	NA	1	124	NA
Staphylococcus aureus	21	7 736	NA	21	7 940	NA	21	7 916	NA	20	7 466	NA	21	7 404	NA
Streptococcus pneumoniae	21	672	NA	21	1 102	NA	21	1 324	NA	21	1 286	NA	21	1 383	NA
Enterococcus faecalis	21	1 635	NA	21	1 581	NA	21	1 614	NA	21	1 533	NA	21	1 552	NA
Enterococcus faecium	21	1 006	NA	21	1 022	NA	21	1 002	NA	21	962	NA	21	1 039	NA

Labs: laboratories.

NA: not applicable.

[a] Number of laboratories reporting at least one isolate during the specific year. The total number of participating laboratories might be higher.

[b] Isolates with missing information on hospital department are excluded from the calculation, and the percentage of isolates from ICU is presented only if there are ≥20 isolates of which ≥70% have data on hospital department. If not, the percentage is presented as not applicable (NA).

MRSA, third-generation cephalosporin-resistant *Escherichia coli*, and carbapenem-resistant *Klebsiella pneumoniae* 2019–2025: estimated incidence, trend, change in proportion, estimated incidence and estimated number of cases, and the target as percentage reduction and estimated incidence in 2030, as well as the 2025 EU estimated incidence and country range, by bacterial species and antimicrobial group/agent, Sweden

Bacterial species	Antimicrobial group/agents	Estimated incidence[a] of isolates from bloodstream infections with resistance phenotype (n per 100 000 population)								Progress towards target			Target		2025 EU Estimated incidence and country range (n per 100 000 population)
		2019	2020	2021	2022	2023	2024	2025	Trend 2019–2025[b]	Change in estimated incidence (%) 2019–2025[c]	Change in estimated incidence (n per 100 000 population) 2019–2025	Change in estimated number of cases 2019–2025	Recommended change (%) 2019–2030[c]	Target 2030 (n per 100 000 population)	
Escherichia coli	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	9.24	8.73	8.19	8.52	9.08	10.55	10.47	↑	+13.3	+1.23	+164	-10	8.32	12.13 (3.40-24.61)
Klebsiella pneumoniae	Carbapenem (imipenem/meropenem) resistance	0.03	0.06	0.03	0.04	0.12	0.14	0.08	↑	+166.7	+0.05	+6	0	0.03	3.75 (0.00-21.29)
Staphylococcus aureus	MRSA[d]	1.34	1.80	1.65	1.58	1.79	2.07	1.83	↑	+36.6	+0.49	+56	-3	1.30	4.56 (0.58-12.07)

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] The 'Council recommendation on stepping up EU actions to combat antimicrobial resistance in a One Health Approach' (2023/C220/01) includes 2030 EU targets, with 2019 as the baseline year: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2023_220_R_0001

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

Estimated total incidence of bloodstream infections with resistance phenotype (number per 100 000 population) and trend, 2021–2025, as well as the 2025 EU/EEA estimated incidence and country range, by bacterial species and antimicrobial group/agent, Sweden

Bacterial species	Antimicrobial group/agent	Estimated incidence[a] of isolates from bloodstream infections with resistance						
		2021	2022	2023	2024	2025	Trend 2021–2025[b]	2025 EU/EEA Estimated incidence and country range (n per 100 000 population)
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	ND	ND	ND	ND	ND	NA	33.69 (5.86-61.18)
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	8.19	8.52	9.08	10.55	10.47	↑	12.04 (0.00-24.61)
	Carbapenem (imipenem/meropenem) resistance	0.06	0.04	0.04	0.09	0.07	-	0.15 (0.00-1.30)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	15.63	15.62	16.81	17.30	16.65	↑	15.94 (0.00-33.73)
	Aminoglycoside (gentamicin/tobramycin) resistance	6.67	6.42	7.05	7.15	6.18^	-	6.94 (1.88-16.86)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	2.07	2.39	2.47	2.60	2.30^	-	3.39 (0.00-12.46)
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	1.50	1.82	2.30	2.54	2.49	↑	9.17 (0.00-30.28)
	Carbapenem (imipenem/meropenem) resistance	0.03	0.04	0.12	0.14	0.08	-	3.70 (0.00-21.29)
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	2.38	2.85	2.92	3.57	3.01	↑	8.33 (0.00-28.98)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.82	0.78	1.04	1.13	0.80	-	5.61 (0.00-16.90)
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	0.48	0.46	0.69	0.69	0.58	-	4.82 (0.00-15.26)
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	0.76	0.64	0.69	0.86	0.74	-	1.88 (0.00-8.69)
	Ceftazidime resistance	0.57	0.47	0.49	0.61	0.62	-	1.52 (0.00-8.66)
	Carbapenem (imipenem/meropenem) resistance	1.03	1.01	0.89	0.89	0.87	-	1.74 (0.00-9.23)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.93	0.84	0.84	0.66	0.67	↓	1.67 (0.18-9.30)
	Aminoglycoside (tobramycin) resistance	0.04^	0.01^	0.01^	0.04^	0.04^	-	0.57 (0.00-5.91)
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	0.21^	0.24^	0.21^	0.21^	0.13^	-	0.78 (0.00-5.92)
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	0.01	0.04	0.03	0.03	0.06	-	2.22 (0.00-16.04)
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	0.02	0.03	0.04	0.04	0.05	-	2.24 (0.00-15.36)
	Aminoglycoside (gentamicin/tobramycin) resistance	0.08	0.02	0.02	0.05^	0.03^	-	1.92 (0.00-14.58)
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	0.00	0.02	0.02	0.01^	0.00^	-	1.80 (0.00-14.17)
Staphylococcus aureus	MRSA[c]	1.65	1.58	1.79	2.07	1.83	-	4.51 (0.00-12.07)
Streptococcus pneumoniae	Penicillin non-wild-type[d]	0.54	1.04	0.97	1.25	1.16	↑	1.10 (0.00-3.43)
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	0.35	0.64	0.76	0.76	1.05	↑	1.28 (0.00-3.72)
	Combined penicillin non-wild-type and resistance to macrolides[d]	0.18	0.34	0.40	0.43	0.47	↑	0.61 (0.00-2.12)
Enterococcus faecalis	High-level gentamicin resistance	0.78^	0.88^	0.65^	0.51^	0.42^	↓	2.22 (0.00-6.45)
Enterococcus faecium	Vancomycin resistance	0.03	0.03	0.07	0.11	0.23	↑	2.10 (0.00-9.61)

ND, no data available; NA, not applicable.

[a] Incidence was estimated using the EARS-Net data reported to EpiPulse Cases. Each de-duplicated isolate from a blood sample (>99% data) or cerebrospinal fluid sample (<1% data) was considered a proxy for a bloodstream infection.

[b] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively; – indicates no statistically significant trend.

[c] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene by PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[d] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

^ The antimicrobial group/agent was tested for <90% of isolates. The results should be interpreted with caution.

Total number of invasive isolates tested (n) and percentage of isolates with resistance phenotype (%)[a], by bacterial species and antimicrobial group/agent, 2025 EU/EEA range, population-weighted mean and trend, Sweden, 2021–2025

Bacterial species	Antimicrobial group/agent	2021		2022		2023		2024		2025		2025 EU/EEA range and population-weighted mean[b]	Trend 2021–2025[c]
		n	%	n	%	n	%	n	%	n	%		
Escherichia coli	Aminopenicillin (amoxicillin/ampicillin) resistance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	55.5 (35.9-70.3)	NA
	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	10 633	7.1	10 563	7.5	10 725	7.9	10 503	9.4	10 396	9.5	16.9 (6.8-42.7)	↑*
	Carbapenem (imipenem/meropenem) resistance	10 626	0.1	10 558	0.0	10 714	0.0	10 497	0.1	10 391	0.1	0.2 (0.0-2.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	10 570	13.7	10 513	13.8	10 674	14.7	10 438	15.6	10 329	15.2	22.0 (8.8-50.9)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	10 299	6.0	10 549	5.7	10 714	6.2	9 655	6.9	8 696	6.7	10.3 (4.3-23.1)	↑*
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	10 247	1.9	10 502	2.1	10 665	2.2	9 611	2.5	8 669	2.5	5.4 (1.3-17.1)	↑*
Klebsiella pneumoniae	Third-generation cephalosporin (cefotaxime/ceftriaxone/ceftazidime) resistance	2 000	7.0	2 161	7.8	2 165	9.9	2 483	9.6	2 042	11.5	32.8 (5.8-84.8)	↑*
	Carbapenem (imipenem/meropenem) resistance	1 997	0.2	2 162	0.2	2 164	0.5	2 483	0.5	2 041	0.4	12.0 (0.0-69.7)	↑*
	Fluoroquinolone (ciprofloxacin/levofloxacin/ofloxacin) resistance	1 989	11.1	2 147	12.3	2 155	12.7	2 472	13.6	2 036	13.9	30.1 (6.9-82.8)	↑*
	Aminoglycoside (gentamicin/tobramycin) resistance	1 939	3.9	2 160	3.4	2 164	4.5	2 283	4.6	1 864	4.0	21.1 (2.4-77.0)	-
	Combined resistance to third-generation cephalosporins, fluoroquinolones, and aminoglycosides	1 927	2.3	2 142	2.0	2 155	3.0	2 273	2.9	1 860	3.0	18.4 (1.1-73.6)	↑*
Pseudomonas aeruginosa	Piperacillin-tazobactam resistance	803	8.7	851	7.1	857	7.6	845	9.6	816	8.6	16.7 (0.0-59.5)	-
	Ceftazidime resistance	803	6.6	851	5.2	857	5.4	848	6.7	814	7.1	13.5 (1.5-56.0)	-
	Carbapenem (imipenem/meropenem) resistance	803	11.8	853	11.0	857	9.7	848	9.9	816	10.0	15.6 (0.0-57.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	803	10.7	851	9.2	857	9.2	848	7.3	814	7.7	14.9 (2.2-57.7)	↓*
	Aminoglycoside (tobramycin) resistance	562	0.7	603	0.2	590	0.2	527	0.8	451	0.9	6.9 (0.0-50.0)	-
	Combined resistance to ≥3 antimicrobial groups (among piperacillin-tazobactam, ceftazidime, carbapenems, fluoroquinolones and aminoglycosides)	562	3.4	598	3.7	590	3.4	527	3.8	451	2.7	10.0 (0.0-53.8)	-
***Acinetobacter* spp.**	Carbapenem (imipenem/meropenem) resistance	138	0.7	149	2.7	156	1.9	175	1.7	124	4.8	31.5 (0.0-95.4)	-
	Fluoroquinolone (ciprofloxacin/levofloxacin) resistance	137	1.5	149	2.0	156	2.6	175	2.3	123	4.1	33.9 (0.0-96.5)	-
	Aminoglycoside (gentamicin/tobramycin) resistance	138	5.1	147	1.4	153	1.3	152	3.3	102	2.9	30.0 (0.0-92.3)	-
	Combined resistance to carbapenems, fluoroquinolones and aminoglycosides	137	0.0	147	1.4	153	1.3	152	0.7	102	0.0	27.1 (0.0-91.8)	-
Staphylococcus aureus	MRSA[d]	7 733	2.0	7 936	1.9	7 915	2.1	7 465	2.6	7 177	2.4	14.1 (1.8-39.5)	↑*
Streptococcus pneumoniae	Penicillin non-wild-type[e]	668	7.5	1 096	8.9	1 323	6.9	1 282	9.1	1 382	7.9	16.4 (5.1-30.2)	-
	Macrolide (azithromycin/clarithromycin/erythromycin) resistance	669	4.8	1 100	5.5	1 321	5.4	1 284	5.5	1 366	7.2	18.5 (4.0-30.7)	↑*
	Combined penicillin non-wild-type and resistance to macrolides[e]	665	2.6	1 095	2.9	1 320	2.8	1 280	3.1	1 366	3.2	10.1 (1.0-18.9)	-
Enterococcus faecalis	High-level gentamicin resistance	1 078	6.7	999	8.2	914	6.7	997	4.8	692	5.8	22.3 (2.3-62.1)	↓*
Enterococcus faecium	Vancomycin resistance	984	0.3	1 021	0.3	1 000	0.7	959	1.0	1 003	2.2	17.2 (0.0-62.2)	↑*

ND, no data available; NA, not applicable.

[a] Percentages of isolates with resistance phenotype are presented only if data are available for ≥20 isolates. If not, the percentage is presented as not applicable (NA).

[b] Lowest and highest national resistance percentage among reporting EU/EEA countries (n = 30).

[c] ↑ and ↓ indicate statistically significant increasing and decreasing trends, respectively, in the overall data; * indicates confirmation by a significant trend in the data that only includes laboratories reporting continuously for all five years; –indicates no statistically significant trend. NA: not applicable indicates that data were not reported for all years, a significant change in data source occurred during the period, or the number of isolates was <20 in any year during the period.

[d] MRSA is based on AST results for cefoxitin or, if unavailable, oxacillin. AST results reported for cloxacillin, dicloxacillin, flucloxacillin or meticillin are accepted as a marker for oxacillin resistance if oxacillin is not reported. If no phenotypic results are available, data from molecular confirmation tests (detection of *mecA* gene PCR or a positive PBP2A-agglutination test), are accepted as a marker for MRSA.

[e] Penicillin results are based on penicillin or, if unavailable, oxacillin. For *S. pneumoniae*, the term penicillin non-wild-type is used in this report, referring to *S. pneumoniae* isolates reported by the local laboratories as susceptible, increased exposure (I) or resistant (R) to penicillin, assuming MIC to benzylpenicillin above those of wild-type isolates (>0.06 mg/L). This cut-off is also the EUCAST S-breakpoint for all indications (the R-breakpoint is variable depending on type of infection). The qualitative susceptibility categories (S/I/R) as reported by the laboratory are used, since quantitative susceptibility information is missing for a large part of the data.

Number of reporting laboratories, total number of invasive carbapenem-resistant isolates and percentage of invasive carbapenem-resistant isolates with resistance phenotype to the novel antimicrobial, by bacterial species, antimicrobial agent and year, Sweden, 2024–2025

Bacterial species	Antimicrobial agent	2024			2025		
		labs[a]/labs[b]	carbapenem-resistant isolates[c]	R	labs[a]/labs[b]	carbapenem-resistant isolates[c]	R
		n	n	%	n	n	%
Escherichia coli	Aztreonam-avibactam	0/5	ND	ND	1/4	3	NA
	Cefiderocol	0/5	ND	ND	0/4	ND	ND
	Ceftazidime-avibactam	0/5	ND	ND	2/4	4	NA
	Imipenem-relebactam	0/5	ND	ND	3/4	5	NA
	Meropenem-vaborbactam	0/5	ND	ND	2/4	2	NA
Klebsiella pneumoniae	Aztreonam-avibactam	0/5	ND	ND	1/4	2	NA
	Cefiderocol	0/5	ND	ND	0/4	ND	ND
	Ceftazidime-avibactam	0/5	ND	ND	2/4	3	NA
	Imipenem-relebactam	0/5	ND	ND	2/4	3	NA
	Meropenem-vaborbactam	0/5	ND	ND	1/4	1	NA
Pseudomonas aeruginosa	Cefiderocol	0/14	ND	ND	0/15	ND	ND
	Ceftazidime-avibactam	0/14	ND	ND	1/15	5	NA
	Ceftolozane-tazobactam	0/14	ND	ND	0/15	ND	ND
	Imipenem-relebactam	0/14	ND	ND	0/15	ND	ND
	Meropenem-vaborbactam	0/14	ND	ND	0/15	ND	ND
***Acinetobacter* spp.**	Cefiderocol	0/1	ND	ND	0/1	ND	ND

[a] Laboratories with at least 70% of carbapenem-resistant isolates tested for the novel antimicrobial.

[b] Laboratories reporting at least one carbapenem-resistant isolate.

[c] Number of carbapenem-resistant isolates reported by laboratories included in the analysis (labs[a]), for which antibiotic susceptibility testing results for new antimicrobials are available. The number of carbapenem-resistant isolates is used as a denominator for calculating percentages of resistance (%R).

ND: no laboratory with at least 70% carbapenem-resistant isolates tested for the novel antimicrobial.

NA: no laboratory reported at least one carbapenem-resistant isolate OR fewer than 20 isolates reported by the country for the novel antimicrobial (after implementing selection of isolates and laboratories).