UK Health Security Agency

Quarterly laboratory surveillance of acquired carbapenemase-producing Gram-negative bacteria in England: October 2020 to September 2022

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Contents

Background

Since 1 October 2020 all diagnostic laboratories in England have had a duty to notify the following via the UK Health Security Agency (UKHSA)'s Second Generation Surveillance System (SGSS):

- acquired carbapenemase-producing Gram-negative bacteria identified in human samples
- the results of any antimicrobial susceptibility test and any resistance mechanism for any of the causative agents listed in Schedule 2 of the Health Protection (Notifications) Regulations 2010

This requirement was launched in conjunction with the national Framework of actions to contain carbapenemase-producing Enterobacterales (CPE), which sets out a range of measures, that if implemented well, will help health and social care providers minimise the impact of CPE to improve patient outcomes.

These analyses are based on data relating to notifications of confirmed acquired carbapenemase-producing Gram-negative bacteria between October 2020 and September 2022 in England. The data was extracted on 25 October 2022 from both UKHSA's voluntary surveillance database, SGSS, and the Antimicrobial Resistance and Healthcare-Associated Infections (AMRHAI) Reference Unit database.

Rates of acquired carbapenemase-producing Gram-negative bacteria were calculated using mid-year resident population estimates for the respective year and geography. Geographical analyses were based on the patient's residential postcode. Where this information was unknown, the postcode of the patient's General Practitioner was used. Failing that, the postcode of the reporting laboratory was used. Cases in England were further assigned to one of the 9 regions using data from the Office for National Statistics (ONS).

As patients may have more than one positive specimen taken, specimens taken from the same patient that yielded growth of the same pathogen and carbapenemase within a 52-week period from the initial positive sterile site specimen, screening site specimen or other specimen type (grouped together), were regarded as comprising the same episode and were de-duplicated. Carbapenemase-producing Gram-negative bacteria referred isolates and local laboratory isolates were combined for this de-duplication process, with carbapenemase family results from the AMRHAI Reference Unit retained preferentially where patient specimen overlap occurred. This method differs slightly from the weekly causative agent notification data, where data is not de-duplicated incorporating specimen type. In addition, the data presented in the weekly notification reports is utilising SGSS reports only.

The following report summarises trends and geographical distribution of carbapenemase mechanisms identified from Gram-negative bacteria in human samples. Species, mechanism,

sample type, and age and sex of patients are also described. For the purposes of this report, quarters are calendar quarters, as such January to March is referred to as 'Q1', April to June is referred to as 'Q2', July to September is referred to as 'Q3' and October to December is referred to as 'Q4', alongside relevant years.

Microbiology services

For reference services, including species identification and confirmation of susceptibility testing results, laboratories should contact UKHSA's Antimicrobial Resistance and Healthcare Associated Infections (AMRHAI) Reference Unit in Colindale, London.

Table 1 summarises the carbapenemase gene families that are targeted using the routine PCR applied to referred Enterobacterales, *Pseudomonas* spp. and *Acinetobacter* spp. that are suspected of harbouring an acquired carbapenemase gene. UKHSA strongly recommends that all diagnostic laboratories should be able to detect at least the 4 carbapenemase families in bold (the 'big 4') using either PCR or immunochromatographic methods.

Where an 'exceptional' carbapenemase and species combination result (cells without a ¥ symbol in Table 1) has been identified, or where an unusual organism has been identified with an acquired carbapenemase (that is, any bacterial genera other than a member of the Enterobacterales, *Pseudomonas* spp. or *Acinetobacter* spp.), isolates should be sent to the AMRHAI Reference Unit for confirmation.

Table 1. Distribution of carbapenemase genes covered by AMRHAI Reference Unit molecular assay (based on AMRHAI data) [note 1]

Carbapenemase family	Associated with common 'host' organism		
	Enterobacterales	***Pseudomonas* spp.**	***Acinetobacter* spp.**
KPC	¥	<10[D]	<10[D]
OXA-48-like	¥	<10[D]	0
NDM	¥	¥	¥
VIM	¥	¥	<10[D]
IMP	¥	¥	¥
IMI/NMC-A	¥[B]	0	0
GES	¥	¥	<10[D]
FRI	<10	0	0
SME	<10[CD] ¥	0	0
DIM	0	<10[D]	0
GIM	<10[D]	0	0
SIM	0	<10[D]	0
SPM	0	<10[D]	0
OXA-23-like	<10[D]	0	¥
OXA-40-like	0	0	¥
OXA-51-like[A]	0	0	¥
OXA-58-like	0	0	¥

Notes to Table 1

Note 1. Table 1 uses the following symbols:
¥ = combinations of mechanism and species would not be considered as exceptional results.
A = intrinsic to *A. baumannii* and only expressed when associated with an insertion element.
B = almost exclusively reported in *Enterobacter* spp. with less than a handful of reports in other genera.
C = reported only in *Serratia marcescens*.
D = fewer than 10 in total ever referred to AMRHAI Reference Unit

Recent developments

The AMRHAI Reference Unit screens all Enterobacterales sent for investigation of carbapenem resistance with a multiplex PCR that includes the *bla*$_{\text{OXA-23-like}}$, *bla*$_{\text{OXA-40-like}}$ and *bla*$_{\text{OXA-58-like}}$ acquired carbapenemase genes consistently associated with resistance in *Acinetobacter* spp. since 2020.

In Q3 2022, AMRHAI detected the first known instance of an *Escherichia coli* isolate harbouring a gene encoding for OXA-23 carbapenemase amongst referrals. The isolate was resistant to ampicillin, amoxicillin/clavulanate, piperacillin/tazobactam, temocillin and ertapenem only and with meropenem above the EUCAST meropenem screening cut-off for CPE. *E. coli* harbouring a gene encoding for OXA-23 carbapenemase have been sporadically reported elsewhere (1, 2). However, it has been suggested that the OXA-23 gene is only maintained within *E. coli* in the presence of selective pressure, which may account for the very rare occurrence of such *E. coli* strains (1).

First 2 years of notification data (October 2020 to September 2022)

Between 1 October 2020 and 30 September 2022, there were 5,442 acquired carbapenemase-producing Gram-negative bacteria episodes. The majority were identified in screening samples, accounting for 68.7% of carbapenemase notifications, with only 5.2% reported in sterile site specimens (Table 2).

Table 2. Number and percentage of acquired carbapenemase-producing Gram-negative reports by specimen type (England): October 2020 to September 2022

Specimen type	All reports		From AMRHAI [note 1]	
	Number	% [note 3]	Number	% [note 3]
Sterile site samples	284	5.2	109	10.0
Screening samples	3,740	68.7	517	47.3
Other samples [note 2]	1,418	26.1	467	42.7
All samples	5,442	100.0	1,093	100.0

Notes to Table 2

Note 1. The AMRHAI Reference Unit actively encourages submission of sterile site isolates for carbapenemase confirmation; the distribution of specimen type will reflect this.
Note 2. Samples that do not fall into either ‘sterile site’ or ‘screening’ samples, for example, urine and lower respiratory tract specimens.
Note 3. The percentages presented in this table are column percentages, with the breakdown of specimen types shown for all reports and AMRHAI reports separately.

Quarterly trends

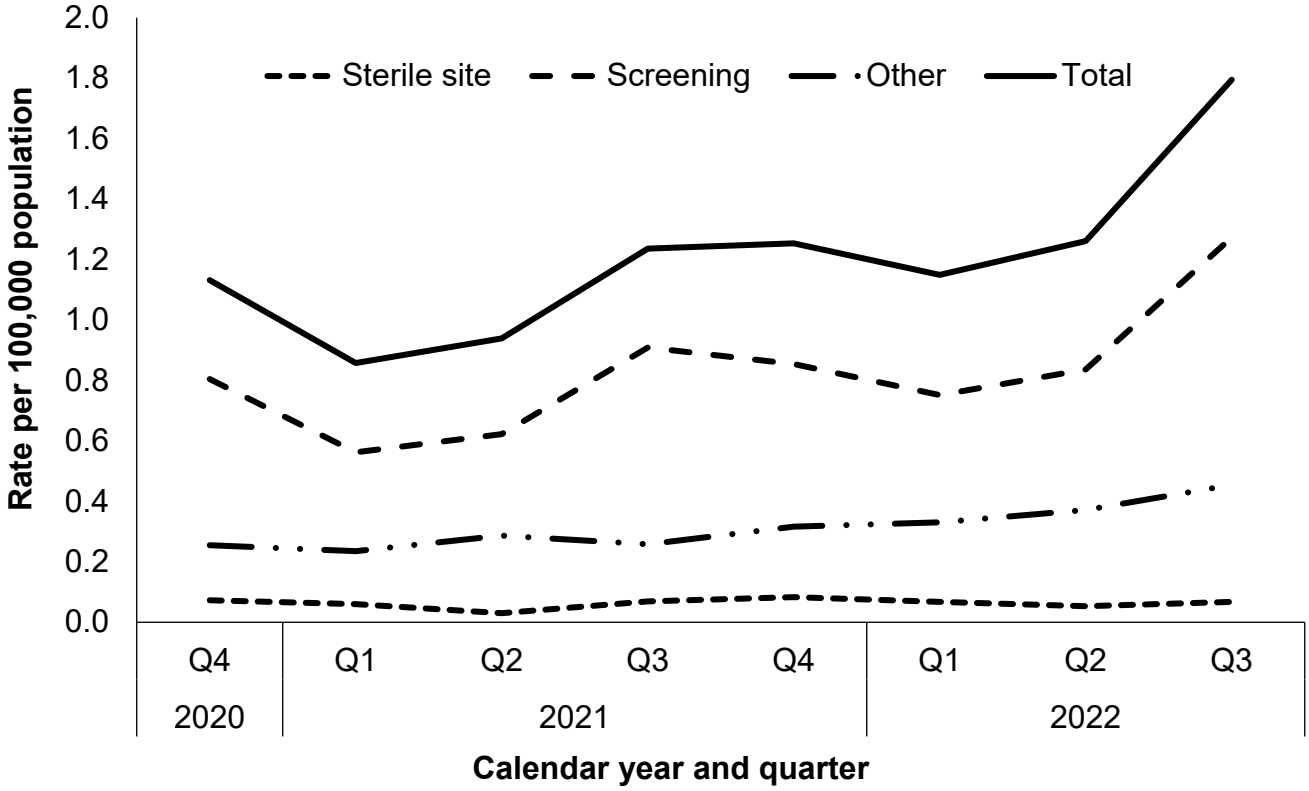
The quarterly rate of acquired carbapenemase-producing Gram-negative bacterial episodes between October 2020 and September 2022 is shown in Figure 1. For all specimen types grouped together, the overall rate of across the first 2 years of mandatory reporting was 1.20 episodes per 100,000 population.

This quarter, there was a sharp rise in the number of carbapenemase-producing Gram-negative bacterial episodes (1.80 per 100,000 population), with all previous quarters reporting below 1.26 episodes per 100,000 population. This increase was predominantly due to increases among screening and other samples, with the number of sterile site isolates remaining stable (Figure 1). The majority of this increase appears to correlate with increased detection relating to screening following localised hospital outbreaks.

The remaining data summaries in this report consider all samples grouped together. Comparing the quarterly rates of episodes across 2021, higher rates were seen in the second half of the calendar year (0.86, 0.94, 1.24 and 1.25 per 100,000 population from Q1 to Q4 2021. The decrease in the reported number of tested isolates for all organisms across all regions in Q1 and Q2 2022 in the SGSS AMR Module has now been resolved, and as such the rates for Q1 and Q2 2022 in this report are markedly increased compared to those reported last quarter. Each quarter in 2022 had a higher rate when compared to the same quarter in 2021, and this rose across the year (1.15, 1.26 and 1.80 per 100,000 population from Q1 to Q3 2022).

Quarterly changes in rate of episodes may reflect an uptake in screening following changes to screening policy rather than an actual increase in incidence. Furthermore, as there are only 2 years of notification data, it is too early to conclude that there may be any seasonality, particularly in light of the COVID-19 pandemic, where quarterly changes may be affected by COVID-19 ‘waves’ seen during this period or associated with local carbapenemase-producing Gram-negative bacteria outbreaks.

Figure 1. Rate of acquired carbapenemase-producing Gram-negative bacteria episodes by quarter, October 2020 to September 2022



Age and sex distribution

Figure 2 shows the number of acquired carbapenemase-producing Gram-negative bacteria episodes by age group each calendar quarter from October 2020 to September 2022. The number of acquired carbapenemase-producing Gram-negative bacteria episodes was highest among the oldest and youngest members of the population. A similar age pattern was noted for both sexes (Figure 3), although the rate was higher in males compared to females (overall rates of 10.9 and 8.2 reports per 100,000 population, respectively). This aligns with the age group and sex distribution noted in previously published reports on Gram-negative bacteraemia such as *E. coli*, *Klebsiella* spp., *P. aeruginosa* and *Enterobacter* spp. and has been consistent across all quarters of mandatory acquired carbapenemase-producing Gram-negative bacteria reporting.

Figure 2. Number of acquired carbapenemase-producing Gram-negative bacteria episodes by age group and calendar quarter (England): October 2020 to September 2022

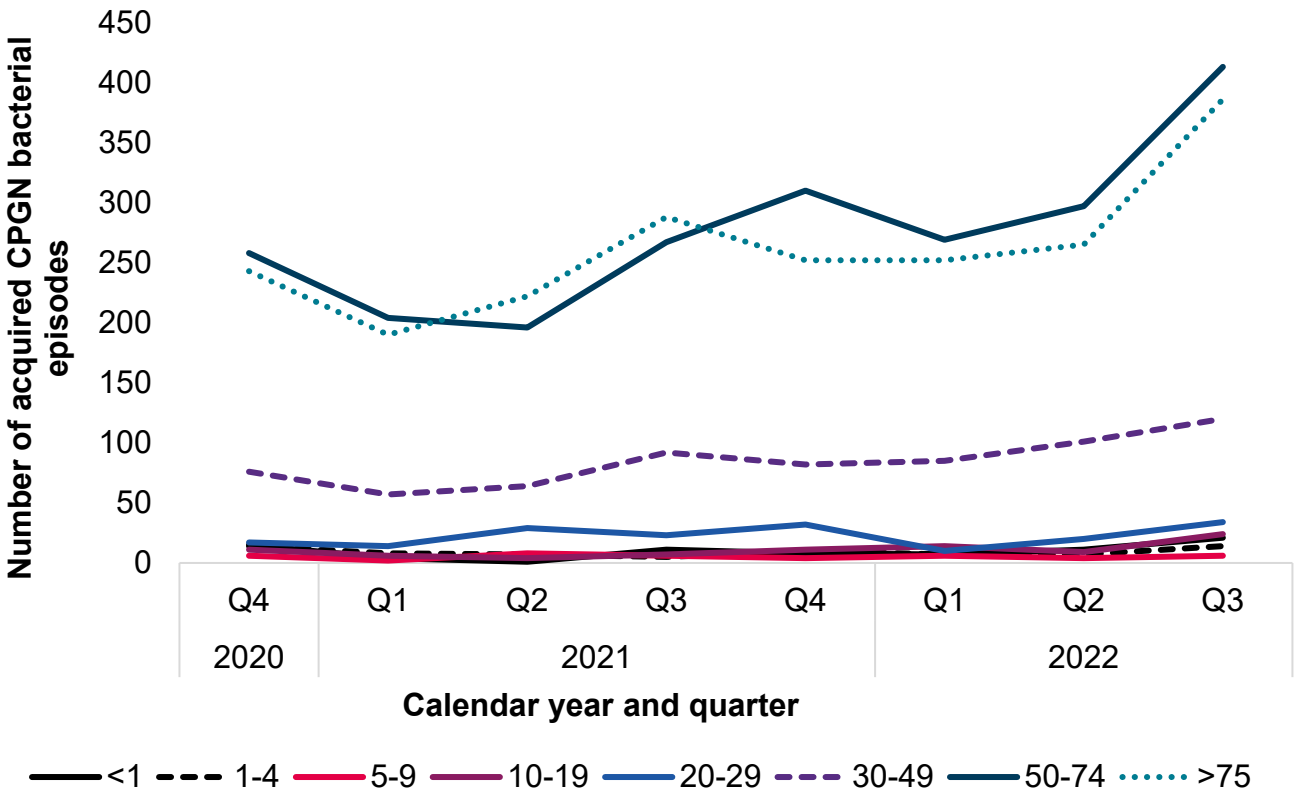
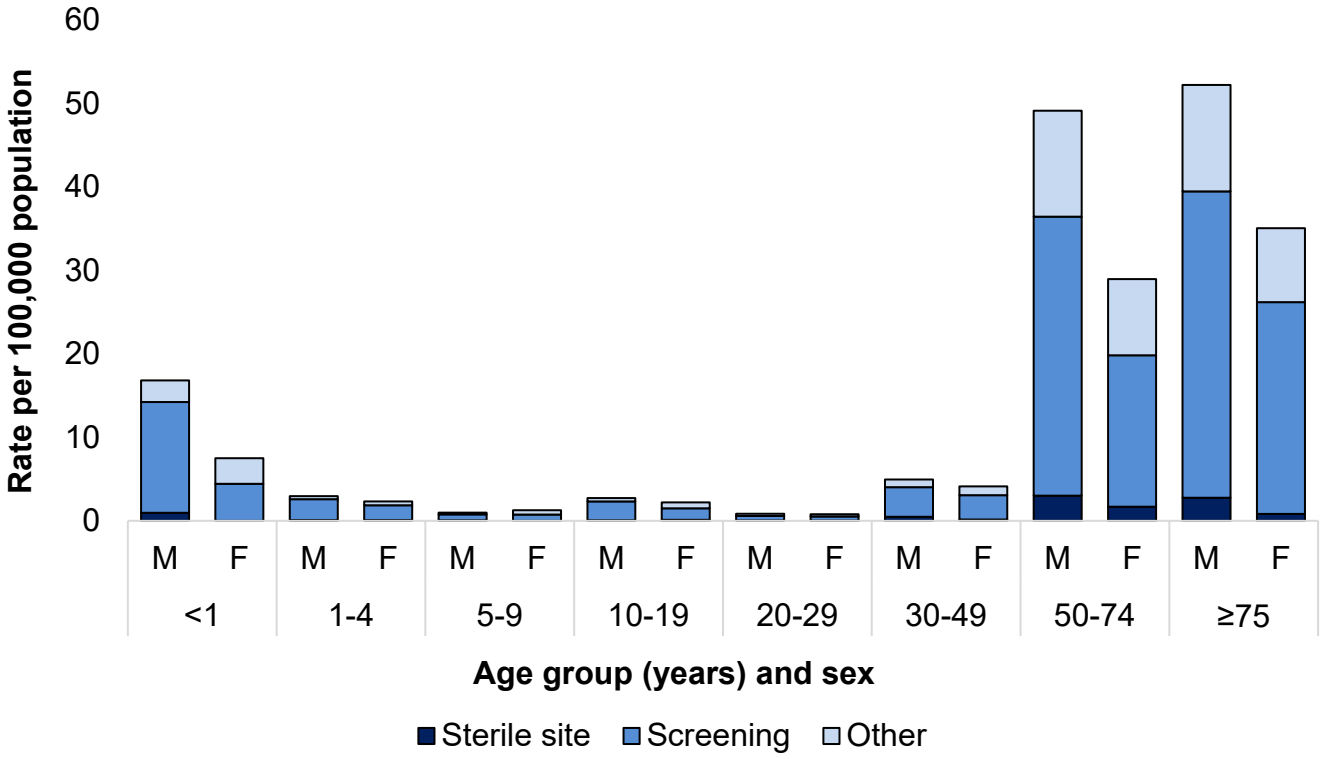


Figure 3 shows the acquired carbapenemase-producing Gram-negative bacterial incidence rates by age group, sex, and specimen type with the highest rate (males and females combined) reported in those aged 75 years and over (43.1 per 100,000 population) followed by those aged between 50 to 74 years old (39.5 per 100,000 population). The overall rate of confirmed acquired carbapenemase-producing Gram-negative bacteria was 13.0 per 100,000 population in infants less than 1 year old.

There was a higher percentage rate of sterile site specimens isolated from those aged 30 to 49 (7.1%) and 50 to 74 (6.3%) compared to other age groups (<3.9%).

Figure 3. Rates [note 4] of acquired carbapenemase-producing Gram-negative bacteria episodes per 100,000 population by age, specimen type, and sex [note 5] (England): October 2020 to September 2022



Notes to Figure 3

Note 4. Rates have been calculated using cumulative episodes across all 8 quarters of reporting, and as such cannot be compared to previous quarters.
Note 5. Information about patient sex is only recorded in 97.4% of cases.

Although the older age groups dominated acquired carbapenemase-producing Gram-negative bacteria episodes for England overall, there was variation regionally and by quarter (Figure 4a-b). In all regions, the quarterly bacterial notification rate was generally highest among those aged over 75 years, followed by those aged 50 to 74 years. However, in London and the North West, the rate was also high in some quarters in those under 1 years of age.

When interpreting the fluctuating rate of acquired carbapenemase-producing Gram-negative bacteria episodes among infants under 1 year old, it is important to note that the number of episodes was small (<14 episodes per quarter), and the total population of infants under 1 year used as the denominator is small compared to the other age-groups.

Figure 4a. Rate of acquired carbapenemase-producing Gram-negative bacteria episodes (England) by age group and calendar quarter: October 2020 to September 2022

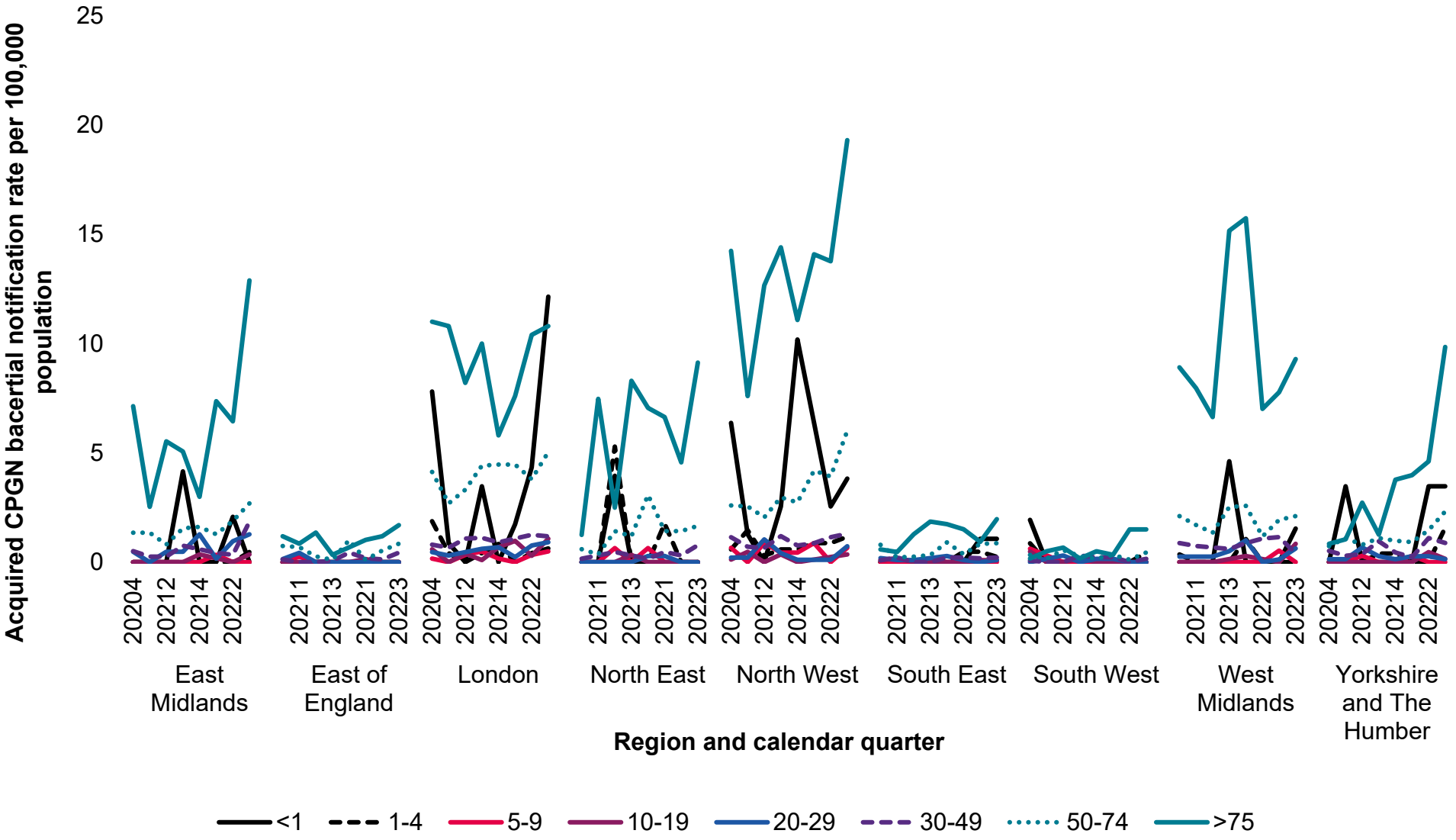
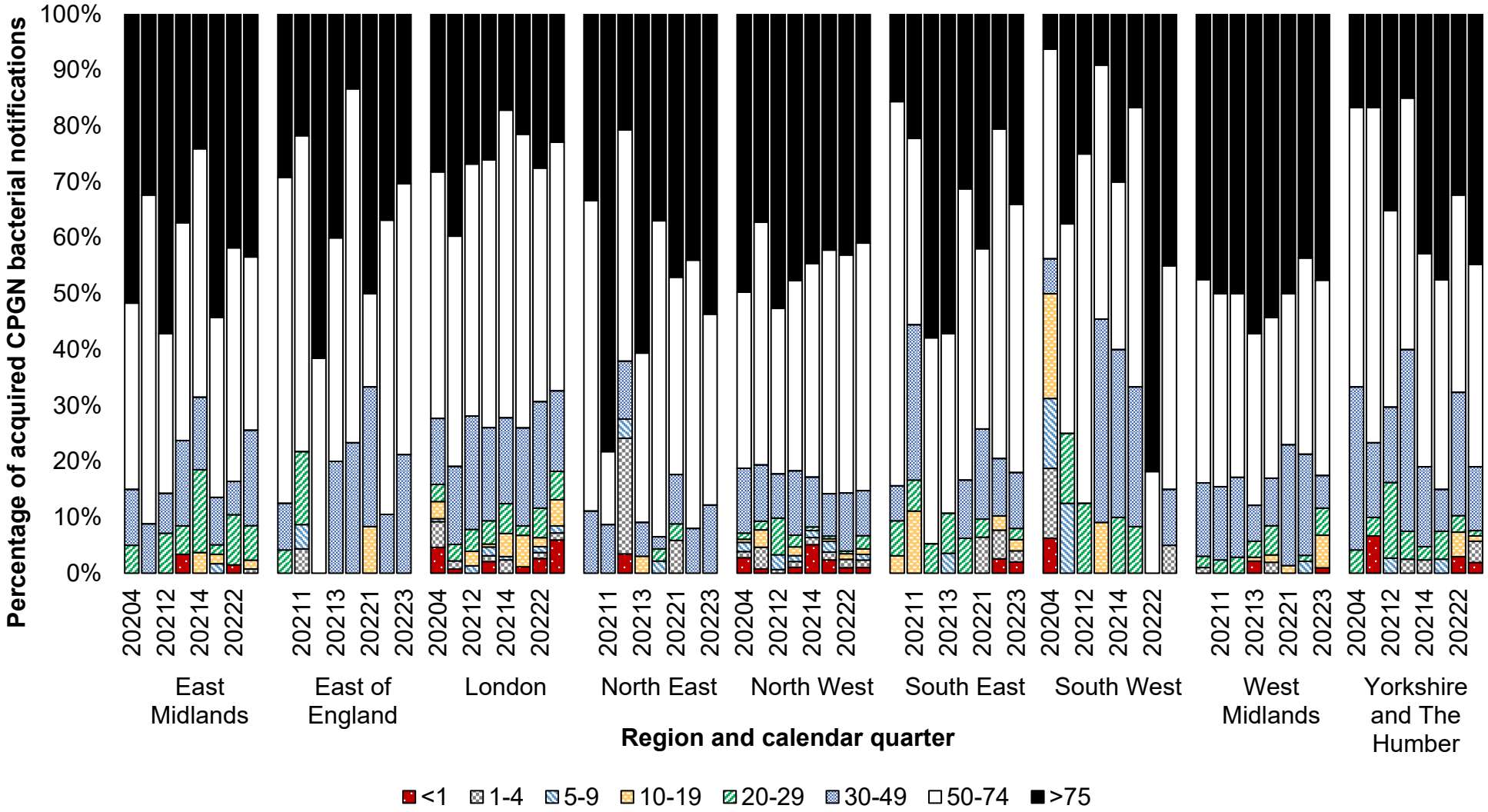


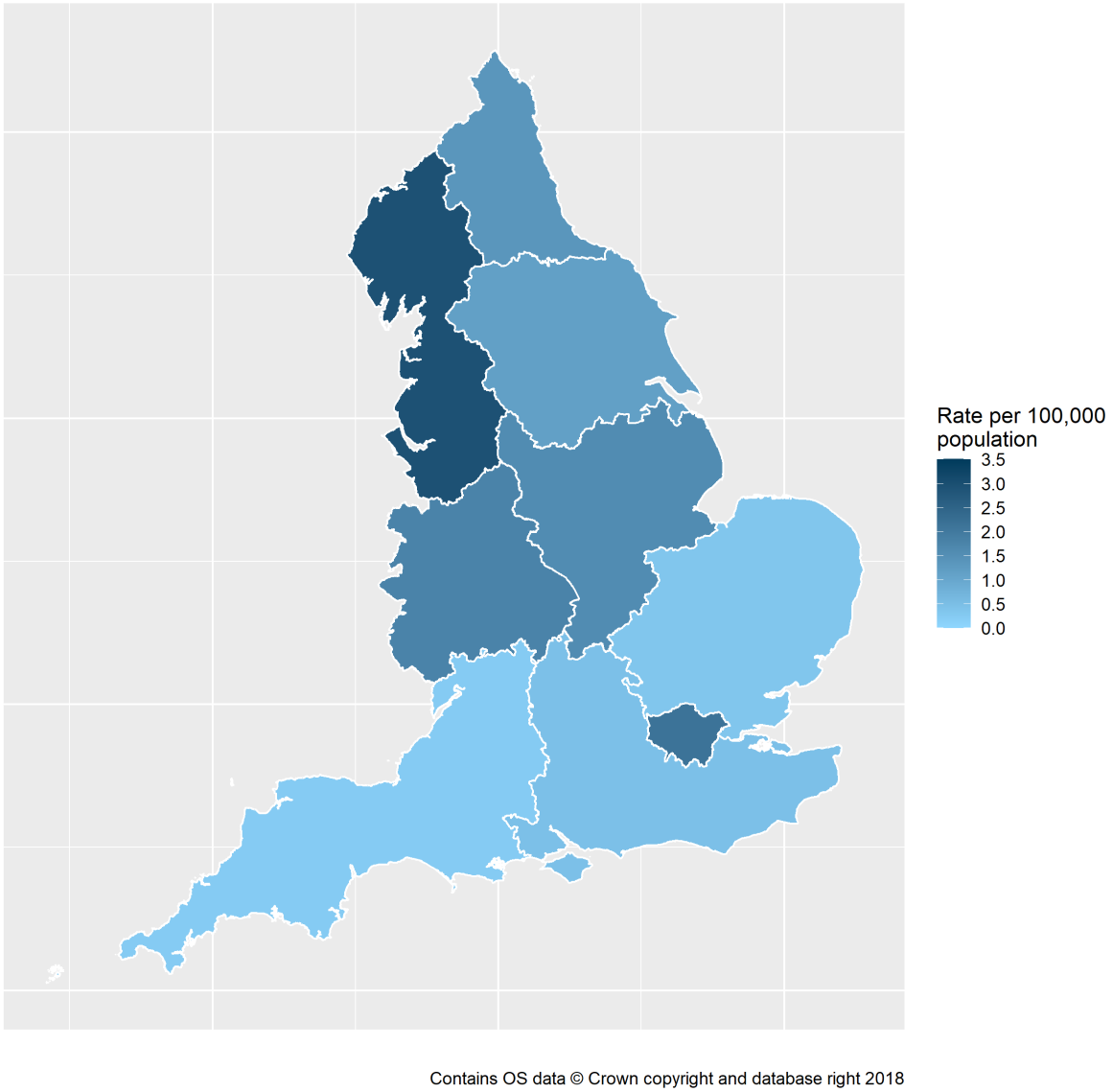
Figure 4b. Percentage of acquired carbapenemase-producing Gram-negative bacteria episodes (England) by age group and calendar quarter: October 2020 to September 2022



Geographic distribution

The rate of acquired carbapenemase-producing Gram-negative bacteria reports varied by ONS Region (Figure 5), with the highest overall rate for the last year reported in the North West (2.95 per 100,000 population), followed by the London region (2.14 per 100,000 population). The lowest incidence across the last year was reported in the South West and East of England regions (0.24 and 0.35 reports per 100,000 population, respectively).

Figure 5. Geographical distribution of acquired carbapenemase-producing Gram-negative bacteria incidence rates per 100,000 population (England): October 2021 to September 2022 [note 6]



Notes to Figure 5

Note 6. The region geography is based on the laboratory location and linked to the ONS data for regions.

The rate of acquired carbapenemase-producing Gram-negative episodes for each ONS Region by quarter is shown in Table 3. In Q3 2022, the rate of reporting in all ONS Regions rose compared to last quarter. Particularly large increases were noted in the North East (0.93 to 1.52 reports per 100,000 population), North West (2.74 to 4.04 reports per 100,000 population), Yorkshire and Humber (1.23 to 1.90 reports per 100,000 population), East Midlands (1.38 to 2.65 reports per 100,000 population), and London regions (2.10 to 2.62 reports per 100,000 population).

Table 3. Rate per 100,000 population of acquired carbapenemase-producing Gram-negative episodes by ONS Region (England): October 2020 to September 2022

ONS Region	PHE Centre	Q4 2020		Q1 2021		Q2 2021		Q3 2021		Q4 2021		Q1 2022		Q2 2022		Q3 2022	
		No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate
North of England	North East	9	0.34	23	0.86	29	1.08	33	1.23	46	1.72	34	1.27	25	0.93	41	1.53
	North West	181	2.46	129	1.75	152	2.06	191	2.59	157	2.13	211	2.86	202	2.74	298	4.04
	Yorks. and Humber	24	0.43	30	0.54	37	0.67	40	0.72	42	0.76	40	0.72	68	1.23	105	1.90
Midlands and East of England	East Midlands	60	1.23	34	0.70	42	0.86	59	1.21	54	1.11	59	1.21	67	1.38	129	2.65
	East of England	24	0.36	23	0.34	13	0.19	5	0.07	30	0.45	12	0.18	19	0.28	33	0.49
	West Midlands	99	1.66	84	1.41	70	1.17	140	2.35	153	2.57	74	1.24	94	1.58	103	1.73
London	London	195	2.17	136	1.51	153	1.70	192	2.13	169	1.88	177	1.97	189	2.10	236	2.62
South of England	South East	32	0.36	18	0.20	19	0.21	28	0.31	48	0.54	31	0.35	39	0.44	50	0.56
	South West	16	0.29	8	0.15	16	0.29	11	0.20	10	0.18	12	0.22	11	0.20	20	0.36
England overall	**England overall**	**640**	**1.13**	**485**	**0.86**	**531**	**0.94**	**699**	**1.24**	**709**	**1.25**	**650**	**1.15**	**714**	**1.26**	**1015**	**1.79**

Distribution of species and carbapenemase family

Across the first 2 years of mandatory reporting, the most frequently isolated Gram-negative bacterial species with a confirmed acquired carbapenemase was *Klebsiella pneumoniae*, accounting for 1,827 (33.5%) of all episodes. This was followed by *Escherichia coli* and *Enterobacter* spp., which accounted for 28.6% (n=1,557) and 18.8% (n=1,026) of all specimens, respectively (Table 4).

Across these 3 species, the carbapenemase family most frequently identified was OXA-48-like (43.1%, 43.7% and 33.0% in *K. pneumoniae*, *E. coli* and *Enterobacter* spp., respectively). In *K. pneumoniae* and *Enterobacter* spp. isolates, this was followed by KPC and NDM carbapenemase families (28.4% and 24.7% in *K. pneumoniae* and 31.1% and 21.8% in *Enterobacter* spp.), and in *E. coli* this was followed by NDM (33.1%) and KPC (20.0%) carbapenemase families.

Aside from the 'big 5' carbapenemase families (KPC, OXA-48-like, NDM, VIM and IMP), the AMRHAI Reference Unit also screens for rarer carbapenemase families, and it is recommended that all isolates suspected to produce a carbapenemase but negative for one of the ‘big 5’ carbapenemases are referred to the AMRHAI Reference Unit for identification and/or confirmation. Between October 2020 and September 2022, both GES and IMI carbapenemases were identified in small numbers (34 in total), none being identified from invasive specimens. One GES and 2 IMI carbapenemases were identified this quarter (Q3 2022, and all 15 IMI carbapenemases were identified in *Enterobacter* spp. isolates. The majority of GES carbapenemases (84.2%; n=16/19) were identified among *Pseudomonas aeruginosa* isolates.

Table 4. Episodes of acquired carbapenemase-producing Gram-negative bacteria by species and carbapenemase family (England): October 2020 to September 2022

Carbapenemase family	IMP		KPC		NDM		OXA-48-like		VIM		Other		Total	
Species	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Acinetobacter spp. [note 7]	13	27.7	0	0.0	28	59.6	4	8.5	1	2.1	1	2.1	47	100.0
Citrobacter spp.	15	4.9	71	23.1	70	22.7	139	45.1	12	3.9	1	0.3	308	100.0
Enterobacter spp.	115	11.2	319	31.1	224	21.8	339	33.0	14	1.4	15	1.5	1026	100.0
Escherichia coli	33	2.1	311	20.0	516	33.1	681	43.7	15	1.0	1	0.1	1557	100.0
Other *Escherichia* spp.	0	0.0	3	30.0	3	30.0	4	40.0	0	0.0	0	0.0	10	100.0
Klebsiella oxytoca	11	5.9	91	48.7	12	6.4	68	36.4	5	2.7	0	0.0	187	100.0
Klebsiella pneumoniae	47	2.6	519	28.4	452	24.7	787	43.1	22	1.2	0	0.0	1827	100.0
Other *Klebsiella* spp.	9	7.2	20	16.0	38	30.4	53	42.4	5	4.0	0	0.0	125	100.0
Morganella spp.	0	0.0	0	0.0	6	27.3	16	72.7	0	0.0	0	0.0	22	100.0
Pseudomonas aeruginosa [note 7]	43	22.8	5	2.6	52	27.5	8	4.2	65	34.4	16	8.5	189	100.0
Other Pseudomonas spp. [note 7]	6	14.6	5	12.2	8	19.5	4	9.8	18	43.9	0	0.0	41	100.0
Serratia spp.	0	0.0	0	0.0	4	23.5	13	76.5	0	0.0	0	0.0	17	100.0
Other Enterobacterales [note 8]	3	3.4	28	32.2	14	16.1	38	43.7	4	4.6	0	0.0	87	100.0
Other Gram-negative bacteria [note 9]	0	0.0	0	0.0	0	0.0	3	100.0	0	0.0	0	0.0	3	100.0
Total	295		1,372		1,427		2,157		161		34		5,446	

Notes to Table 4

Note 7. KPC and OXA-48-like in *Pseudomonas* spp. and OXA-48-like in *Acinetobacter* spp. are extremely rare, and results should be interpreted with caution. The numbers reported here have not been confirmed by the AMRHAI Reference Unit.

Note 8. Includes coliform, *Cronobacter* spp., *Hafnia* spp., *Kluyvera* spp., *Leclercia adecarboxylata*, *Mixta calida*, *Pantoea* spp., *Phytobacter ursingii*, *Pluralibacter gergoviae*, *Proteus mirabilis*, *Providencia* spp., *Raoultella* spp., and *Shigella* spp.

Note 9. Includes *Aeromonas hydrophila*, and *Bacteroides fragilis*. The numbers reported here have not been confirmed by the AMRHAI Reference Unit.

Quarterly mandatory laboratory return reporting (QMLR) (October 2020 to September 2022)

Table 5. Quarterly mandatory laboratory return reporting (QMLR) returns for the total number of rectal swabs and faecal screening specimens taken for CPE screening by acute Trust type [note 10] (England): October to September 2022

	Q4 2020		Q1 2021		Q2 2021		Q3 2021		Q4 2021		Q1 2022		Q2 2022		Q3 2022	
Trust type [note 1]	**No. Trusts reported screens (%)**	**Total # screens**	**No. Trusts reported screens (%)**	**Total # screens**	**No. Trusts reported screens (%)**	**Total # screens**	**No. Trusts reported screens (%)**	**Reported screens (%)**	**No. Trusts reported screens (%)**	**Total # screens**	**No. Trusts reported screens (%)**	**Total # screens**	**No. Trusts reported screens (%)**	**Total # screens**	**No. Trusts reported screens (%)**	**Total # screens**
Small	21 (77.8)	3,759	20 (74.1)	3,708	19 (70.4)	6,247	17 (63.0)	3,295	16 (59.3)	1,921	13 (48.1)	1,847	14 (51.9)	2,632	11 (40.7)	3,277
Medium	22 (84.6)	6,943	22 (84.6)	7,725	22 (84.6)	9,853	22 (84.6)	10,001	20 (76.9)	8,203	19 (73.1)	7,506	18 (69.2)	8,107	16 (61.5)	7,859
Large	25 (92.6)	10,055	23 (85.2)	9,868	23 (85.2)	10,183	22 (81.5)	11,194	22 (81.5)	12,113	21 (77.8)	10,039	19 (70.4)	9,196	17 (63.0)	11,433
Multi-service	3 (75.0)	480	3 (75.0)	406	3 (75.0)	581	3 (75.0)	536	3 (75.0)	576	3 (75.0)	533	3 (75.0)	957	1 (25.0)	396
Specialist	13 (81.3)	5,412	14 (87.5)	5,547	13 (81.3)	4,717	13 (81.3)	5,472	14 (87.5)	5,998	10 (62.5)	4,178	9 (56.3)	2,766	9 (56.3)	3,354
Teaching	31 (86.1)	74,281	31 (86.1)	65,181	27 (75.0)	50,692	26 (72.2)	37,777	26 (72.2)	38,219	24 (66.7)	31,643	25 (69.4)	36,819	21 (58.3)	37,934
Total	**115 (84.6)**	**100,930**	**113 (83.1)**	**92,435**	**107 (78.7)**	**82,273**	**103 (75.7)**	**68,275**	**101 (74.3)**	**67,030**	**90 (66.2)**	**55,746**	**88 (64.7)**	**60,477**	**75 (55.1)**	**64,253**

Notes to Table 5

Note 10. Trust type obtained through NHS Digital Estate Return Information Collection (ERIC)

Reporting of quarterly totals of rectal swabs and faecal specimens taken for CPE screening was added to the quarterly mandatory laboratory returns (QMLR) section of the Healthcare Associated Infections Data Capture System in October 2019, and reporting became mandatory in October 2020. Across all 8 quarters, there were 591,419 screens reported by 115 out of 136 NHS Trusts leading to an overall percentage of Trusts reporting their CPE screens of 72.8% (Table 5). This means that across all 8 quarters, there were 296 instances where an NHS Trust did not submit a return and 16 acute NHS Trusts that did not submit a return for any of the quarters. Of the acute Trusts that reported screening data, 2.8% reported that they conducted 0 screens (by quarter from Q4 2020 to Q3 2022 there were 7, 4, 3, 5, 3, 3, 3, and 3 reports of 0 screens). UKHSA will be contacting Trusts who are not consistently reporting to remind them that this is a mandatory return and to retrospectively report missing data in due course.

Between each consecutive quarter, the number of Trusts that reported screens fell (115 Trusts reporting screens in Q4 2020 (84.6%) compared to 75 Trusts reporting screens in Q3 2022 (55.1%)). The total number of screens reported by all Trusts also decreased between Q4 2020 and Q1 2022 (from 100,930 screens in Q4 2020 to 655,746 screens in Q1 2022) but rose in Q2 and Q3 2022 (60,477 and 64,253 screens, respectively). For large and specialist Trusts, the greatest number of screens was reported in Q4 2021 (12,113 and 5,998 respectively) whereas for small Trusts, this was in Q2 2021.

Screening was more common in the acute teaching Trusts, accounting for 63.0% of screening swabs taken during this time period. By reporting acute Trust, the total screens reported by quarter ranged from 0 to 18,859. The full list of reporting, including those that did not submit a return, is available in the data appendix by individual NHS acute Trust.

References

1. Paul D and others.‘An unusual occurrence of plasmid-mediated bla$_{OXA-23}$ carbapenemase in clinical isolates of *Escherichia coli* from India’. International Journal of Antimicrobial Agents 2020: Volume 49, issue 5, pages 642 to 645
2. La MV and others. ‘Unusual detection of an Acinetobacter class D carbapenemase gene, blaOXA-23, in a clinical *Escherichia coli* isolate’. Journal of Clinical Microbiology 2014: volume 52, issue 10, pages 3,822 to 3,823

Appendix

Appendix Table 1. QMLR returns for the total number of rectal swabs and faecal screening specimens taken for CPE screening by acute Trust (England): January 2020 to September 2022

Trust name	Trust Type	2020: Q4	2021: Q1	2021: Q2	2021: Q3	2021: Q4	2022: Q1	2022: Q2	2022: Q3
Airedale NHS Foundation Trust	Small	4	11	22	24	32			
Alder Hey Children's NHS Foundation Trust	Specialist	1,216	890	261	1,151	1,344	1,231	1,129	1,143
Ashford And St Peter's Hospitals NHS Foundation Trust	Medium	271	267	253	283	337	245	239	265
Barking, Havering and Redbridge University Hospitals NHS Trust	Large	1,108	1,353						
Barnsley Hospital NHS Foundation Trust	Small	38	103	113	78	92	109	35	
Barts Health NHS Trust	Teaching	1,555	1,321	2,128	2,737	1,733	1,775	2,263	3,109
Bedfordshire Hospitals NHS Foundation Trust	Medium		154	155	158	134	148	122	125
Birmingham Women's and Children's NHS Foundation Trust	Specialist								
Blackpool Teaching Hospitals NHS Foundation Trust	Teaching	689	719	980	796	792	801	858	759
Bolton NHS Foundation Trust	Medium	362	389	409	403	425	344	396	
Bradford Teaching Hospitals NHS Foundation Trust	Teaching	629		288					
Buckinghamshire Healthcare NHS Trust	Multi-Service	405	389	546	501	503	444	555	396
Calderdale And Huddersfield NHS Foundation Trust	Large	37		62	101	39	40	81	217
Cambridge University Hospitals NHS Foundation Trust	Teaching	1,332	992	1,257	1,340	1,407	1,602	1,692	1,627
Chelsea And Westminster Hospital NHS Foundation Trust	Teaching								
Chesterfield Royal Hospital NHS Foundation Trust	Small								
Countess Of Chester Hospital NHS Foundation Trust	Small								
County Durham and Darlington NHS Foundation Trust	Multi-Service	68	12	30	28	63	82	363	
Croydon Health Services NHS Trust	Medium	358	288	449	503	500	502	527	400
Dartford And Gravesham NHS Trust	Small					0	246	296	309
Doncaster And Bassetlaw Teaching Hospitals NHS Foundation Trust	Teaching		55		85	78	122	202	177
Dorset County Hospital NHS Foundation Trust	Small	14	26	57	0	26	0	8	
East And North Hertfordshire NHS Trust	Large	1,206	982	1,314	1,308	1,274	1,166	1,104	1,494
East Cheshire NHS Trust	Small	10	33	19	29				
East Kent Hospitals University NHS Foundation Trust	Teaching	338	249	395	383	400	378	348	426
East Lancashire Hospitals NHS Trust	Large	453	489	538	751	697		556	411
East Suffolk and North Essex NHS Foundation Trust	Medium								
East Sussex Healthcare NHS Trust	Large	373	264	396	411	370	289		
Epsom And St Helier University Hospitals NHS Trust	Large	368	313	292	312	270	252		

Trust name	Trust Type	2020: Q4	2021: Q1	2021: Q2	2021: Q3	2021: Q4	2022: Q1	2022: Q2	2022: Q3
Essex Partnership University NHS Foundation Trust	Multi-Service								
Frimley Health NHS Foundation Trust	Medium	679	659	691	568	705	741	795	745
Gateshead Health NHS Foundation Trust	Small	3	17	18	15	22			
George Eliot Hospital NHS Trust	Small	74	47						
Gloucestershire Hospitals NHS Foundation Trust	Large	98	57	56	73	77	83	118	103
Great Ormond Street Hospital for Children NHS Foundation Trust	Specialist	1,200	1,223	1,324	1,353	1,420	1,445	1,121	1,604
Great Western Hospitals NHS Foundation Trust	Medium	125	186	139	135	118	147	159	114
Guy's And St Thomas' NHS Foundation Trust	Teaching	3,537	693						
Hampshire Hospitals NHS Foundation Trust	Large	218	266	250	273	290	235	283	288
Harrogate And District NHS Foundation Trust	Small	141							
Homerton University Hospital NHS Foundation Trust	Medium	938	1,080	1,164	1,170	882	808	1,094	875
Hull University Teaching Hospitals NHS Trust	Teaching								
Imperial College Healthcare NHS Trust	Teaching	18,859	15,952						
Isle Of Wight NHS Trust	Multi-Service	7	5	5	7	10	7	39	
James Paget University Hospitals NHS Foundation Trust	Small	15	7	10	10	10	50	44	29
Kettering General Hospital NHS Foundation Trust	Small	223	165	223	285	275	213	262	316
King's College Hospital NHS Foundation Trust	Teaching	11,008	9,471	10,547					
Kingston Hospital NHS Foundation Trust	Small	122	95	96	88	86	76	54	113
Lancashire Teaching Hospitals NHS Foundation Trust	Teaching	134	119	0	185	140	102	264	501
Leeds Teaching Hospitals NHS Trust	Teaching	1,488	1,319	1,188	2,214	2,360	2,155	2,633	4,690
Lewisham And Greenwich NHS Trust	Large	686	1,684	929	1,045	2,102	1,820	905	
Liverpool Heart and Chest Hospital NHS Foundation Trust	Specialist	327	381	367	413	364			
Liverpool University Hospitals NHS Foundation Trust	Teaching	2,744	2,970	2,940	2,707	3,166			
Liverpool Women's NHS Foundation Trust	Specialist	55	68	63	94	70			
London North West University Healthcare NHS Trust	Large	766	888	765	776	720	649	544	730
Maidstone And Tunbridge Wells NHS Trust	Large	392	341	478	310	332	315	308	314
Manchester University NHS Foundation Trust	Teaching								
Medway NHS Foundation Trust	Medium								
Mid And South Essex NHS Foundation Trust	Medium								
Mid Cheshire Hospitals NHS Foundation Trust	Small	22	120	98	86				
Mid Yorkshire Hospitals NHS Trust	Large	15	99	200	191	192	149	167	
Milton Keynes University Hospital NHS Foundation Trust	Small								
Moorfields Eye Hospital NHS Foundation Trust	Specialist	0	0	0	0	0	0	0	0

Trust name	Trust Type	2020: Q4	2021: Q1	2021: Q2	2021: Q3	2021: Q4	2022: Q1	2022: Q2	2022: Q3
Norfolk And Norwich University Hospitals NHS Foundation Trust	Teaching	85	86	48	120	239	660	613	542
North Bristol NHS Trust	Large	62	164	37					
North Cumbria Integrated Care NHS Foundation Trust	Small	63	67	2,637	1,722	271	194	566	1,077
North Middlesex University Hospital NHS Trust	Small	2,362	2,396	2,099					
North Tees and Hartlepool NHS Foundation Trust	Medium	290	245	199	356				
North West Anglia NHS Foundation Trust	Large	158	86	142	172	174	147	143	168
Northampton General Hospital NHS Trust	Medium	181	762	1,062	858				
Northern Care Alliance NHS Foundation Trust	Teaching	286	275	275	296	242	219	669	
Northern Lincolnshire and Goole NHS Foundation Trust	Large	13		7	15	20	13	11	25
Northumbria Healthcare NHS Foundation Trust	Large	14	49	32	46	28	17	81	
Nottingham University Hospitals NHS Trust	Teaching	204	956	1,537	1,810	1,666	1,897	2,248	2,030
Oxford University Hospitals NHS Foundation Trust	Teaching	585	489	618	713	776	684	1,181	1,690
Portsmouth Hospitals University National Health Service Trust	Large	280	295	356	332	244	326	197	221
Queen Victoria Hospital NHS Foundation Trust	Specialist	0	2		0	1	1	6	0
Royal Berkshire NHS Foundation Trust	Large	696	394	551	524	525	407	812	1,895
Royal Cornwall Hospitals NHS Trust	Large	53	59	58	148	427	130	124	122
Royal Devon University Healthcare NHS Foundation Trust	Large	156	204	217	303	294	264	300	366
Royal Free London NHS Foundation Trust	Teaching	8,354	6,194	7,400					
Royal National Orthopaedic Hospital NHS Trust	Specialist	234	473	316		238	239	107	136
Royal Papworth Hospital NHS Foundation Trust	Specialist	85	125	66	64	47	51	59	48
Royal Surrey County Hospital NHS Foundation Trust	Medium	692	725	1,135	1,159	1,183	1,186	1,144	1,177
Royal United Hospitals Bath NHS Foundation Trust	Medium	0	244	334	229	173	160	145	110
Salisbury NHS Foundation Trust	Small	81	68	86					
Sandwell And West Birmingham Hospitals NHS Trust	Large	0	0						
Sheffield Children's NHS Foundation Trust	Specialist	0	0	2	0	3	1	11	79
Sheffield Teaching Hospitals NHS Foundation Trust	Teaching	353	259	463	496	644	560	812	1,212
Sherwood Forest Hospitals NHS Foundation Trust	Medium	0							
South Tees Hospitals NHS Foundation Trust	Teaching	46	16	88	143	304	412	210	265
South Tyneside and Sunderland NHS Foundation Trust	Large								
South Warwickshire NHS Foundation Trust	Small	0	0	0	0	0	0	0	0
Southport And Ormskirk Hospital NHS Trust	Small	172	180	224	270	241	198	236	
St George's University Hospitals NHS Foundation Trust	Teaching	84	906	979	961	1,268	1,332	1,639	1,521
St Helens And Knowsley Teaching Hospitals NHS Trust	Medium	1,541	1,222	1,546	1,688	1,557	1,334	1,419	1,580

Trust name	Trust Type	2020: Q4	2021: Q1	2021: Q2	2021: Q3	2021: Q4	2022: Q1	2022: Q2	2022: Q3
Stockport NHS Foundation Trust	Medium	161	126	241	269	203	258	312	465
Surrey And Sussex Healthcare NHS Trust	Medium	146	117	167	156	146			
Tameside And Glossop Integrated Care NHS Foundation Trust	Small	170	164	196	209	192		166	153
The Christie NHS Foundation Trust	Specialist	322	297	358	467	619			
The Clatterbridge Cancer Centre NHS Foundation Trust	Specialist								
The Dudley Group NHS Foundation Trust	Medium	14	9	16	46	30	32	44	86
The Hillingdon Hospitals NHS Foundation Trust	Small								
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	Teaching	591	842	740	749	673	595	647	666
The Princess Alexandra Hospital NHS Trust	Small	21	12	28	93	217	236	282	265
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	Small	3	2	4	5	94	126	193	220
The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust	Specialist	104	87	98	82	90	51	33	44
The Rotherham NHS Foundation Trust	Medium	68	94	520	548	452	14	11	1
The Royal Marsden NHS Foundation Trust	Specialist	1,200	1,175	1,200	1,148	1,159	1,101		
The Royal Orthopaedic Hospital NHS Foundation Trust	Specialist		25	56	31	38	58	300	300
The Royal Wolverhampton NHS Trust	Large	1,161	949	1,220	1,031	1,047	893	1,019	1,847
The Shrewsbury and Telford Hospital NHS Trust	Large	134	124	125	143	135	91	147	107
The Walton Centre NHS Foundation Trust	Specialist	669	801	606	669	605			
Torbay And South Devon NHS Foundation Trust	Medium	9	12	2	9	5	4	1	13
United Lincolnshire Hospitals NHS Trust	Large			303	394	512	421		950
University College London Hospitals NHS Foundation Trust	Teaching	419	537	601	793	912	970	899	
University Hospital Southampton NHS Foundation Trust	Teaching	282	1,390	224	254	386	328	505	553
University Hospitals Birmingham NHS Foundation Trust	Teaching								
University Hospitals Bristol and Weston NHS Foundation Trust	Teaching	1,302	1,322					0	
University Hospitals Coventry and Warwickshire NHS Trust	Teaching	433	448	547	809	978	811	902	1,058
University Hospitals of Derby and Burton NHS Foundation Trust	Teaching	100	48	94	93	97	85		
University Hospitals of Leicester NHS Trust	Teaching	6,818	5,870	7,325	6,919	6,834	6,348	6,842	7,352
University Hospitals of Morecambe Bay NHS Foundation Trust	Medium	89	72	112	130	106	81	56	
University Hospitals of North Midlands NHS Trust	Teaching	8,487	8,213	9,446	9,593	9,975	8,965	8,962	8,893
University Hospitals Plymouth NHS Trust	Teaching	132	167	146	416	628	535	405	473
University Hospitals Sussex NHS Foundation Trust	Large	162	88						
Walsall Healthcare NHS Trust	Medium	44	184	182	231	302	558	710	836
Warrington And Halton Teaching Hospitals NHS Foundation Trust	Teaching	390	376	392	288	296	276	285	334
West Hertfordshire Hospitals NHS Trust	Medium	668	549	780	857	662	713	724	825

Trust name	Trust Type	2020: Q4	2021: Q1	2021: Q2	2021: Q3	2021: Q4	2022: Q1	2022: Q2	2022: Q3
West Suffolk NHS Foundation Trust	Small								
Whittington Health NHS Trust	Medium	211	58	69	41	54	54		
Wirral University Teaching Hospital NHS Foundation Trust	Teaching	2,925	2,900		2,844	2,147		1,669	
Worcestershire Acute Hospitals NHS Trust	Large	1,446	720	1,855	2,535	2,344	2,332	2,296	2,175
Wrightington, Wigan and Leigh NHS Foundation Trust	Medium	96	283	228	204	229	177	209	242
Wye Valley NHS Trust	Small	178	167	273	329	304	246	304	312
Yeovil District Hospital NHS Foundation Trust	Small	43	28	44	52	59	153	186	483
York And Scarborough Teaching Hospitals NHS Foundation Trust	Teaching	92	27	46	33	78	31	71	56
Total		**100,930**	**92,435**	**82,273**	**68,275**	**67,030**	**55,746**	**60,477**	**64,253**

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About the UK Health Security Agency

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