

Quarterly laboratory surveillance of acquired carbapenemase-producing Gram-negative bacteria in England: October 2020 to June 2023

Health Protection Report Volume 17 Number 11 September 2023

Contents

Background	3
Microbiology services	4
Recent developments	5
Specimen type	5
Quarterly trends	6
Geographic distribution	7
Geographical differences in carbapenemase family	10
Distribution of species and carbapenemase family	12
Age and sex distribution	14
Quarterly mandatory laboratory return reporting (July 2022 to June 2023)	15
References	16
Appendix: mandatory returns by acute trust	17
Acknowledgements	24
About the UK Health Security Agency	25

Background

Since 1 October 2020, all diagnostic laboratories in England have a duty to notify the following via 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 carbapenem resistance mechanism in any of the causative agents listed in <u>Schedule 2 of the Health</u> <u>Protection (Notifications) Regulations 2010</u>

This requirement was launched in conjunction with the national <u>Framework of actions to contain</u> <u>carbapenemase-producing Enterobacterales (CPE</u>) which sets out a range of measures that, if implemented well, will help health and social care providers minimise the impact of CPE. The analyses below are based on data relating to notifications of confirmed acquired carbapenemase-producing Gram-negative bacteria between 1 October 2020 and 30 June 2023 in England. The data was extracted on 15 August 2023 from both UKHSA's voluntary surveillance database, SGSS, and the <u>Antimicrobial Resistance and Healthcare-Associated</u> <u>Infections (AMRHAI) Reference Unit</u> database.

Rates of acquired carbapenemase-producing Gram-negative bacteria were calculated using <u>mid-year resident population estimates</u> 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 GP was used. Failing that, the postcode of the reporting laboratory was used. Cases in England were further assigned to one of 9 local areas, formed from the <u>administrative local authority boundaries</u>.

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 resistance mechanism results from the AMRHAI Reference Unit retained preferentially where patient specimen overlap occurred. This method differs slightly from the <u>weekly causative agent notification data</u>, where data is not de-duplicated incorporating specimen type. In addition, the data presented in the weekly notification reports utilises 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 are 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.

Carbapenemase family	Associated with common 'host' organism Enterobacterales	Associated common 'host' organism <i>Pseudomonas</i> spp.	Associated with common 'host' organism <i>Acinetobacter</i> spp.
КРС	¥	<10 ^D	<10 ^D
OXA-48-like	¥	<10 ▷	0
NDM	¥	¥	¥
VIM	¥	¥	<10▷
IMP	¥	¥	¥
IMI/NMC-A	¥ ^B	0	0
GES	¥	¥	<10 ^D
FRI	<10	0	0
SME	<10 ^c ¥	0	0
DIM	0	<10▷	0
GIM	<10▷	<10 ^D	0
SIM	0	<10 ▷	0
SPM	0	<10 ^D	0
OXA-23-like	<10 ^D	0	¥

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	Associated common 'host' organism <i>P</i> seudomonas spp.	Associated with common 'host' organism Acinetobacter spp.
OXA-40-like	0	0	¥
OXA-51-like ^₄	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

Unusual acquired carbapenemase-producing Gram-negative bacteria referred to the AMRHAI Reference Unit in Q2 2023 consisted of 2 VIM-producing *Acinetobacter* spp. referred from the East and North West of England, 1 DIM-producing *Pseudomonas aeruginosa* and a further isolate of *Proteus mirabilis* positive for the gene encoding an OXA-23-like carbapenemase. All originated from clinically relevant sites rather than colonisations.

Samples from unusual combinations of organism and mechanism should be referred to the AMRHAI reference unit for confirmation. Follow up of such unusual drug/bug combinations has shown that some were due to mixed cultures or reporting errors.

Specimen type

Between October 2020 and June 2023, there were 9,016 acquired carbapenemase-producing Gram-negative bacteria episodes. The majority were identified in screening samples, accounting for 70.3% of carbapenemase notifications, with only 4.9% reported in sterile site specimens (Table 2).

Table 2. Number and percentage of acquired carbapenemase-producing Gram-negative bacterial episodes by specimen type (England): October 2020 to June 2023[note 2]

Specimen type	All reports number	All reports percentage [note 4]	From AMRHAI number	From AMRHAI percentage [note 4]
Sterile site samples	438	4.9	160	10.4
Screening samples	6,335	70.3	733	47.6
Other samples [note 3]	2,243	24.9	648	42.1
All samples	9,016	100.0	1,541	100.0

Notes to Table 2

Note 2. The AMRHAI Reference Unit actively encourages submission of sterile site isolates for carbapenemase confirmation; the distribution of specimen type will reflect this.

Note 3. Samples that do not fall into either 'sterile site' or 'screening' samples, for example, urine and lower respiratory tract specimens.

Note 4. 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 June 2023 is shown in Figure 1.

Although this quarter the rate of carbapenemase-producing Gram-negative bacterial episodes has slightly increased from 1.94 per 100,000 population in Q1 2023 to 2.12 per 100,000 population in Q2 202, this rise was predominantly due to increases among screening samples, with the number of sterile site isolates remaining relatively stable (Figure 1). Most of this increase appears to correlate with increased detection relating to screening following localised hospital outbreaks.

Quarterly changes in rate of episodes may reflect an uptick in screening following changes to screening policy rather than an actual increase in incidence. Furthermore, as there are only 11 quarters 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.

The remaining data summaries in this report consider all samples grouped together.





Calendar year and quarter

Geographic distribution

The rate of acquired carbapenemase-producing Gram-negative bacterial episodes varied by Office for National Statistics (ONS) region (Figure 2), with the highest overall rate between July 2022 and June 2023 reported in the North West (2.01 episodes per 100,000 population), followed by the London region (1.68 episodes per 100,000 population). The lowest incidence across the last year was reported in the East of England and South West regions (0.22 and 0.14 episodes per 100,000 population, respectively).

Figure 2. Geographical distribution of acquired carbapenemase-producing Gram negative bacterial incidence rates per 100,000 population (England): July 2022 to June 2023 [note 5]



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Note to Figure 2

Note 5. 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 bacterial episodes for each ONS region by calendar quarter is shown in Table 3.

The rate of bacterial episodes in all ONS regions increased from Q1 2023 to Q2 2023 in all regions except East Midlands, North East and Yorkshire and The Humber. A large increase was noted in West Midlands, where the rate increased from 2.22 to 3.31 per 100,000 population. The increase in West Midlands was only seen in screening samples. The largest decrease was noted in the North East, where the bacterial episode rate decreased from 2.04 in Q1 2023 to 1.25 episodes per 100,000 population in Q2 2023.

Table 3. Rate per 100,000 population of acquired carbapenemase-producing Gram-negative bacterial episodes by ONS region(England): July 2022 to June 2023

ONS region	Q3 2022 number	Q3 2022 rate	Q4 2022 number	Q4 2022 rate	Q1 2023 number	Q1 2023 rate	Q2 2023 number	Q2 2023 rate
East Midlands	128	2.62	66	1.35	48	0.98	43	0.88
East of England	33	0.52	32	0.50	25	0.39	33	0.52
London	275	3.13	283	3.22	384	4.37	388	4.41
North East	45	1.70	35	1.32	54	2.04	33	1.25
North West	347	4.68	346	4.66	306	4.12	345	4.65
South East	49	0.53	64	0.69	60	0.65	69	0.74
South West	19	0.33	21	0.37	16	0.28	17	0.30
West Midlands	119	2.00	168	2.82	132	2.22	197	3.31
Yorkshire and The Humber	106	1.93	92	1.68	74	1.35	73	1.33

Geographical differences in carbapenemase family

Between July 2022 and June 2023, the most common carbapenemase families reported across all regions were OXA-48-like (35.3%), NDM (31.7%), and KPC (24.9%). However, similarly to the incidence of episodes, the distribution of carbapenemase families identified also varied regionally (Figure 3).

In the North West, which had the highest incidence rate, the most common carbapenemase families identified were KPC (51.8%) and OXA-48-like (27.5%). KPC was not as common in any of the other regions, accounting for fewer than 32.3% of episodes in each region. For example, in London, which also had a high overall incidence rate, KPC accounted for 4.9% of episodes with NDM and OXA-48-like carbapenemases dominating (48.2% and 36.8%, respectively).

Another regional difference was observed in the North East and South West, where IMP was more common compared to any of the other regions, accounting for 19.2% and 16.4% of episodes, respectively (other regions reporting fewer than 8.1%). However, given the small number of carbapenemases reported in some regions, the diversity of carbapenemases reported is likely to be strongly impacted by individual outbreaks. In the 2 regions that had the lowest incidence rates, the most common carbapenemase family was OXA-48-like (63.9% in the East of England and 35.6% in the South West, respectively).

The distribution of carbapenemase families within each ONS region also varied by quarter. For example, the most common carbapenemase family identified in the South West was predominantly OXA-48-like in Q2 2023 but in Q3 2022 it was predominantly NDM. However, for both quarters the majority were identified in screening samples.





Note to Figure 3

Note 6. Other carbapenemase families include DIM, GES, GIM, IMI, OXA-23 and SME.

Distribution of species and carbapenemase family

Between July 2022 and June 2023, the most frequently isolated Gram-negative bacterial species with a confirmed acquired carbapenemase was *Escherichia coli*, accounting for 34.1% of all specimens. This was followed by *Klebsiella pneumoniae*, and *Enterobacter* spp., which accounted for 32.6% and 16.1% of all specimens, respectively (Table 4).

The carbapenemase family most frequently identified in *E. coli* and *K. pneumoniae* isolates was OXA-48-like (40.7% and 37.7%, respectively) and in *Enterobacter* spp. isolates was NDM (33.3%). In *E. coli* and *K. pneumoniae* isolates, this was followed by NDM and KPC carbapenemase families (38.7% and 17.7% in *E. coli*, and 30.6% and 27.5% in *K. pneumoniae*, respectively), and in *Enterobacter* spp. this was followed by KPC (26.5%) and OXA-48-like (24.0%) 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 the 'big 5' carbapenemase families are referred to the AMRHAI Reference Unit for further screening. Between October 2020 and June 2023, DIM, GES, GIM, IMI, OXA-23 and SME carbapenemases were identified in small numbers (1, 26, 2, 23, 5 and 2, respectively), with only one isolate (GIM positive) being identified from an invasive specimen.

Species	IMP number	IMP %	KPC number	KPC %	NDM number	NDM %	OXA-48-like number	OXA-48-like %	VIM number	VIM %	Other number	Other %	Total number	% of total per species
Acinetobacter spp. [note 7]	13	22.8	2	3.5	35	61.4	4	7.0	3	5.3	0	0.0	57	1.3
Citrobacter spp.	12	5.2	56	24.5	46	20.1	105	45.9	10	4.4	0	0.0	229	5.1
Enterobacter spp.	89	12.2	193	26.5	243	33.3	175	24.0	20	2.7	9	1.2	729	16.1
Escherichia coli	23	1.5	274	17.7	598	38.7	629	40.7	20	1.3	0	0.0	1,544	34.1
Other <i>Escherichia</i> spp.	0	0.0	5	45.5	4	36.4	2	18.2	0	0.0	0	0.0	11	0.2
Klebsiella oxytoca	5	3.7	83	61.5	11	8.1	33	24.4	3	2.2	0	0.0	135	3.0
Klebsiella pneumoniae	33	2.2	453	30.6	407	27.5	557	37.7	28	1.9	1	0.1	1,479	32.6
Other <i>Klebsiella</i> spp.	0	0.0	16	20.3	20	25.3	39	49.4	4	5.1	0	0.0	79	1.7
<i>Morganella</i> spp.	0	0.0	0	0.0	4	36.4	7	63.6	0	0.0	0	0.0	11	0.2
Pseudomonas aeruginosa [note 7]	21	18.4	7	6.1	35	30.7	6	5.3	37	32.5	8	7.0	114	2.5
Other Pseudomonas spp. [note 7]	2	12.5	1	6.3	4	25.0	1	6.3	7	43.8	1	6.3	16	0.4
<i>Serratia</i> spp.	0	0.0	1	6.3	3	18.8	9	56.3	1	6.3	2	12.5	16	0.4
Other Enterobacterales [note 8]	1	1.0	36	34.3	28	26.7	32	30.5	6	5.7	2	1.9	105	2.3
Other Gram-negative bacteria [note 9]	2	40.0	1	20.0	2	40.0	0	0.0	0	0.0	0	0.0	5	0.1
Total	201	4.4	1,128	24.9	1,440	31.8	1,599	35.3	139	3.1	23	0.5	4,530	100.0

Table 4. Acquired carbapenemase-producing Gram-negative bacterial episodes by species and carbapenemase family (England): July 2022 to June 2023

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 and laboratories identifying these unusual combinations should be referring such isolates to AMRHAI.

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

Note 9. The numbers reported here have not been confirmed by the AMRHAI Reference Unit and laboratories identifying these unusual combinations should be referring such isolates to AMRHAI.

Age and sex distribution

Between July 2022 and June 2023, the rate of acquired carbapenemase-producing Gramnegative bacterial episodes was highest among the oldest and youngest members of the population. A similar age pattern was noted for both sexes, although overall the rate was higher in males compared to females (overall rates of 9.1 and 6.8 episodes per 100,000 population, respectively: Figure 4). This aligns with the age group and sex distribution noted in <u>previously</u> <u>published reports</u> on Gram-negative bacteraemia such as *E. coli, Klebsiella* spp., *P. aeruginosa* and <u>Enterobacter spp</u>.





Notes to Figure 4

Note 10. Rates have been calculated using cumulative reports across all 10 quarters of reporting, and as such cannot be compared to previous quarters ($\underline{1}$). Note 11. Information about patient sex is only recorded in 99.1% of cases.

Figure 4 shows the acquired carbapenemase-producing Gram-negative bacterial incidence rates by age group between July 2022 to June 2023, with the highest rate reported in those 85 years and over (45.3 per 100,000 population) followed by those aged 75 to 84 years (28.8 per 100,000 population). The overall rate of confirmed carbapenemases was 11.6 per 100,000 population in infants less than one year old.

Quarterly mandatory laboratory return reporting (July 2022 to June 2023)

Table 5. Quarterly mandatory laboratory returns (QMLR) for the total number of rectal swabs and faecal screening specimens taken for CPE screening by acute trust type [note 12] (England): July 2022 to June 2023

Trust type	Q3 2022	Q3 2022	Q4 2022	Q4 2022	Q1 2023	Q1 2023	Q2 2023	Q2 2023
[note 12]	reported	total number						
	screens (%)	screens						
Small (n=22)	13 (59.1)	3,910	15 (68.2)	4,596	14 (63.6)	6,813	14 (63.6)	6,119
Medium (n=21)	18 (85.7)	5,200	18 (85.7)	4,494	18 (85.7)	5,725	18 (85.7)	6,216
Large (n=24)	21 (87.5)	13,670	21 (87.5)	14,040	19 (79.2)	11,980	18 (75.0)	11,811
Multi-service (n=7)	7 (100.0)	2,116	7 (100.0)	1,887	7 (100.0)	2,219	6 (85.7)	2,148
Specialist (n=16)	10 (62.5)	4,267	10 (62.5)	4,220	9 (56.3)	3,845	9 (56.3)	4,113
Teaching (n=47)	39 (83.0)	88,994	38 (80.9)	75,420	34 (72.3)	59,020	32 (68.1)	60,266
Total	108 (78.8)	118,157	109 (79.6)	104,657	101 (73.7)	89,602	97 (70.8)	90,673

Note to Table 5

Note 12. Trust type obtained through <u>NHS Digital Estate Return Information Collection</u> (ERIC).

Reporting of quarterly totals of rectal swabs and faecal specimens taken for CPE screening was added to the mandatory quarterly laboratory returns (QMLR) section of the HCAI DCS in October 2019, and reporting became mandatory in October 2020. Between July 2022 and June 2023, there were 403,089 screens reported by 115 NHS trusts leading to an overall trust reporting rate of 83.9% (Table 5). This means that across the 4 quarters, there were 133 instances where an NHS trust did not submit a return. Of the acute trusts that reported screening data, 3.6% reported that they conducted zero screens.

Between July 2022 and June 2023, the number of trusts that reported screens was stable, ranging from 70.8% to 79.6%. Screening was more predominant in the acute teaching trusts, accounting for 70.4% of screening swabs taken during this time period. By reporting acute trust, the total screens reported for the quarter ranged from 0 to 20,088. The full list of reporting, including those that did not submit a return, is available in the appendix by individual NHS acute trust.

Reference

1. UKHSA (2023). <u>Quarterly laboratory surveillance of acquired carbapenemase-producing</u> <u>Gram-negative bacteria in England: October 2020 to December 2022</u> [appendix corrected]

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): July 2022 to June 2023

Trust name	Trust type	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Airedale NHS Foundation Trust	Small	88	125	2,161	327
Alder Hey Children's NHS Foundation Trust	Specialist	1,143	1,193	1,210	1,256
Ashford and St Peter's Hospitals NHS Foundation Trust	Medium	265	461	257	228
Barking, Havering and Redbridge University Hospitals NHS Trust	Teaching	1,185	1,158	1,171	1,322
Barnsley Hospital NHS Foundation Trust	Small	38	30	43	228
Barts Health NHS Trust	Teaching	3,109	3,252	3,143	3,706
Bedfordshire Hospitals NHS Foundation Trust	Medium	125	161	109	112
Birmingham Women's and Children's NHS Foundation Trust	Specialist				
Blackpool Teaching Hospitals NHS Foundation Trust	Teaching	759	853	753	853
Bolton NHS Foundation Trust	Medium	342	339	358	697
Bradford Teaching Hospitals NHS Foundation Trust	Teaching	2,252	2,311	2,161	2,403
Buckinghamshire Healthcare NHS Trust	Multi-service	396	407	315	473
Calderdale and Huddersfield NHS Foundation Trust	Large	217	225	272	482
Cambridge University Hospitals NHS Foundation Trust	Teaching	1,627	1,815	1,719	1,876
Chelsea and Westminster Hospital NHS Foundation Trust	Teaching				
Chesterfield Royal Hospital NHS Foundation Trust	Small				
Countess of Chester Hospital NHS Foundation Trust	Small				

Trust name	Trust type	Q3 2022	Q4 2022	Q1 2023	Q2 2023
County Durham and Darlington NHS Foundation Trust	Multi-service	475	162	161	126
Croydon Health Services NHS Trust	Medium	400	272	493	119
Dartford and Gravesham NHS Trust	Small	309	217	263	230
Doncaster and Bassetlaw Teaching Hospitals NHS Foundation Trust	Teaching	177	193	222	304
Dorset County Hospital NHS Foundation Trust	Small	13	3	92	184
East and North Hertfordshire NHS Trust	Large	1,494	1,530	1,144	1,252
East Cheshire NHS Trust	Small				
East Kent Hospitals University NHS Foundation Trust	Teaching	426	312	328	462
East Lancashire Hospitals NHS Trust	Large	411	549	351	509
East Suffolk and North Essex NHS Foundation Trust	Large				
East Sussex Healthcare NHS Trust	Large	341	299	299	238
Epsom and St Helier University Hospitals NHS Trust	Teaching	288	246	277	265
Frimley Health NHS Foundation Trust	Large	745	757	679	793
Gateshead Health NHS Foundation Trust	Medium	22	15	55	
George Eliot Hospital NHS Trust	Small		254		213
Gloucestershire Hospitals NHS Foundation Trust	Large	103	100	129	131
Great Ormond Street Hospital For Children NHS Foundation Trust	Specialist	1,604	1,577	1,747	1,715
Great Western Hospitals NHS Foundation Trust	Medium	114	151	147	186
Guy's and St Thomas' NHS Foundation Trust	Teaching	433	492		
Hampshire Hospitals NHS Foundation Trust	Large	288	333	380	258
Harrogate and District NHS Foundation Trust	Small		84	109	101

Trust name	Trust type	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Homerton Healthcare NHS Foundation Trust	Teaching	875	844	854	892
Hull University Teaching Hospitals NHS Trust	Teaching	309	209	211	219
Imperial College Healthcare NHS Trust	Teaching	20,088	19,472	18,424	17,909
Isle of Wight NHS Trust	Multi-service	30	52	35	44
James Paget University Hospitals NHS Foundation Trust	Teaching	29	33		
Kettering General Hospital NHS Foundation Trust	Small	316	259	238	316
King's College Hospital NHS Foundation Trust	Teaching	10,622	9,679		
Kingston Hospital NHS Foundation Trust	Medium	113	88	100	257
Lancashire Teaching Hospitals NHS Foundation Trust	Teaching	501	591	596	826
Leeds Teaching Hospitals NHS Trust	Teaching	4,690	58	6,322	5,040
Lewisham and Greenwich NHS Trust	Large	1,572	1,572	829	785
Liverpool Heart and Chest Hospital NHS Foundation Trust	Specialist				
Liverpool University Hospitals NHS Foundation Trust	Teaching				
Liverpool Women's NHS Foundation Trust	Specialist				
London North West University Healthcare NHS Trust	Teaching	730	1,040	734	1,863
Maidstone and Tunbridge Wells NHS Trust	Large	314	297	293	311
Manchester University NHS Foundation Trust	Teaching				
Medway NHS Foundation Trust	Medium				
Mid and South Essex NHS Foundation Trust	Large				
Mid Cheshire Hospitals NHS Foundation Trust	Small				
Mid Yorkshire Hospitals NHS Trust	Large	134	137	95	136

Trust name	Trust type	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Milton Keynes University Hospital NHS Foundation Trust	Teaching				
Moorfields Eye Hospital NHS Foundation Trust	Specialist	0	0	0	0
Norfolk and Norwich University Hospitals NHS Foundation Trust	Teaching	542	604	524	523
North Bristol NHS Trust	Large	112	85		
North Cumbria Integrated Care NHS Foundation Trust	Small	1,077	1,057	1,030	1,163
North Middlesex University Hospital NHS Trust	Teaching				
North Tees and Hartlepool NHS Foundation Trust	Medium	306	285	284	290
North West Anglia NHS Foundation Trust	Large	168	172	151	207
Northampton General Hospital NHS Trust	Medium				662
Northern Care Alliance NHS Foundation Trust	Teaching	801	859	804	894
Northern Lincolnshire and Goole NHS Foundation Trust	Medium	25	31	52	184
Northumbria Healthcare NHS Foundation Trust	Large	195	218	185	225
Nottingham University Hospitals NHS Trust	Teaching	2,030	1,527	1,732	1,696
Oxford University Hospitals NHS Foundation Trust	Teaching	1,690	1,824	1,781	2,002
Portsmouth Hospitals University National Health Service Trust	Large	221	268	246	264
Queen Victoria Hospital NHS Foundation Trust	Specialist	0	0	0	6
Royal Berkshire NHS Foundation Trust	Large	1,895	1,994	1,497	2,514
Royal Cornwall Hospitals NHS Trust	Large	122	174	202	224
Royal Devon University Healthcare NHS Foundation Trust	Large	366	258	192	330
Royal Free London NHS Foundation Trust	Teaching	8,451			
Royal National Orthopaedic Hospital NHS Trust	Specialist	136	255	189	201

Trust name	Trust type	Q3 2022	Q4 2022	Q1 2023	Q2 2023
Royal Papworth Hospital NHS Foundation Trust	Specialist	48	75	99	44
Royal Surrey County Hospital NHS Foundation Trust	Medium	1,177	1,162	1,209	1,249
Royal United Hospitals Bath NHS Foundation Trust	Medium	110	160	303	548
Salisbury NHS Foundation Trust	Small	111	113	144	188
Sandwell and West Birmingham Hospitals NHS Trust	Large	0	0		
Sheffield Children's NHS Foundation Trust	Specialist	79	54	111	86
Sheffield Teaching Hospitals NHS Foundation Trust	Teaching	1,212	1,135	1,127	1,138
Sherwood Forest Hospitals NHS Foundation Trust	Medium				
Somerset NHS Foundation Trust	Multi-service	826	853	854	1,450
South Tees Hospitals NHS Foundation Trust	Teaching	265	260	288	466
South Tyneside and Sunderland NHS Foundation Trust	Large				
South Warwickshire University NHS Foundation Trust	Medium	309	405	533	638
Southport and Ormskirk Hospital NHS Trust	Small				
St George's University Hospitals NHS Foundation Trust	Teaching	1,521	1,476	988	1,176
St Helens and Knowsley Teaching Hospitals NHS Trust	Teaching	1,580	1,491	1,274	1,634
Stockport NHS Foundation Trust	Medium	465	420	388	427
Surrey and Sussex Healthcare NHS Trust	Medium	167	177	252	265
Tameside and Glossop Integrated Care NHS Foundation Trust	Small	153	182	192	
The Christie NHS Foundation Trust	Specialist				393
The Clatterbridge Cancer Centre NHS Foundation Trust	Specialist				
The Dudley Group NHS Foundation Trust	Medium	86	24	40	39

Trust name	Trust type	Q3 2022	Q4 2022	Q1 2023	Q2 2023
The Hillingdon Hospitals NHS Foundation Trust	Small				
The Newcastle Upon Tyne Hospitals NHS Foundation Trust	Teaching	666	539	670	1,001
The Princess Alexandra Hospital NHS Trust	Small	265	250	232	254
The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust	Small	220	211	219	203
The Robert Jones and Agnes Hunt Orthopaedic Hospital NHS Foundation Trust	Specialist	44	27	104	
The Rotherham NHS Foundation Trust	Small	1	1	16	26
The Royal Marsden NHS Foundation Trust	Specialist	913	691		
The Royal Orthopaedic Hospital NHS Foundation Trust	Specialist	300	348	385	412
The Royal Wolverhampton NHS Trust	Large	1,847	2,401	2,219	2,525
The Shrewsbury and Telford Hospital NHS Trust	Medium	107	116	114	104
The Walton Centre NHS Foundation Trust	Specialist				
Torbay and South Devon NHS Foundation Trust	Multi-service	13	8	1	8
United Lincolnshire Hospitals NHS Trust	Large	950	597	743	627
University College London Hospitals NHS Foundation Trust	Teaching	967	902	957	950
University Hospital Southampton NHS Foundation Trust	Teaching	553	574	647	1,290
University Hospitals Birmingham NHS Foundation Trust	Teaching				
University Hospitals Bristol and Weston NHS Foundation Trust	Teaching			0	
University Hospitals Coventry and Warwickshire NHS Trust	Teaching	1,058	1,200	1,146	
University Hospitals Dorset NHS Foundation Trust	Teaching		229	170	224
University Hospitals of Derby and Burton NHS Foundation Trust	Teaching	256			227

Trust name	Trust type	Q3 2022	Q4 2022	Q1 2023	Q2 2023
University Hospitals of Leicester NHS Trust	Teaching	7,352	8,011	8,018	7,911
University Hospitals of Morecambe Bay NHS Foundation Trust	Teaching	195	127	204	232
University Hospitals of North Midlands NHS Trust	Teaching	8,893	8,988		
University Hospitals Plymouth NHS Trust	Teaching	473	808	919	
University Hospitals Sussex NHS Foundation Trust	Teaching	542	487	526	483
Walsall Healthcare NHS Trust	Small	836	873	991	1,513
Warrington and Halton Teaching Hospitals NHS Foundation Trust	Teaching	334	290	272	388
West Hertfordshire Teaching Hospitals NHS Trust	Medium	825	0	836	0
West Suffolk NHS Foundation Trust	Small				
Whittington Health NHS Trust	Multi-service	64	79	543	
Wirral University Teaching Hospital NHS Foundation Trust	Teaching	1,457	1,486		
Worcestershire Acute Hospitals NHS Trust	Large	2,175	2,074	2,074	
Wrightington, Wigan and Leigh NHS Foundation Trust	Medium	242	227	195	211
Wye Valley NHS Trust	Multi-service	312	326	310	47
Yeovil District Hospital NHS Foundation Trust	Small	483	937	1,083	1,173
York and Scarborough Teaching Hospitals NHS Foundation Trust	Teaching	56	45	58	91

Acknowledgements

These reports would not be possible without the weekly contributions from microbiology colleagues in laboratories across England. The support from colleagues within the UK Health Security Agency, and the AMRHAI Reference Unit in particular, is valued in the preparation of the report. Feedback and specific queries about this report are welcome via <u>hcai.amrdepartment@ukhsa.gov.uk</u>

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The <u>UK Health Security Agency</u> is responsible for protecting every member of every community from the impact of infectious diseases, chemical, biological, radiological and nuclear incidents and other health threats. We provide intellectual, scientific and operational leadership at national and local level, as well as on the global stage, to make the nation health secure.

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Prepared by: Emily Mason, Katherine Henderson, Katie Hopkins, Daniele Meunier, Berit Muller-Pebody, Alicia Demirjian, Russell Hope and Colin Brown

For queries relating to this document, please contact: <u>hcai.amrdepartment@ukhsa.gov.uk</u>

Published: September 2023 Publishing reference: GOV-15469

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