UK Health Security Agency

Protocol for the point prevalence survey of carbapenemase-producing Enterobacterales in intensive care units in England

Date: April 2022

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Document History

Revision date	Author	Version
07/04/2022	UK Health Security Agency	1.0

Contents

Background

Infections caused by Gram-negative bacteria have been recognised as an increasing cause of healthcare-associated infections worldwide. Of concern is the spread of multi-drug resistant Gram-negative bacteria, with increased resistance to carbapenems being seen globally. Carbapenems are a family of antibiotics that are used to treat serious infections and are often viewed as an antibiotic of last resort for multi-drug resistant bacterial infections. Therefore, the spread of carbapenem-resistant organisms (CROs) will complicate the management and treatment of infections in vulnerable patients, including those in intensive care.

There are several resistance mechanisms that have been adopted by CROs, but much attention has been paid to the production of carbapenemase by Gram-negative Enterobacterales (previously Enterobacteriaceae). Enterobacterales are a large family of bacteria that are common causes of infections (including *Escherichia coli* and *Klebsiella* spp). Carbapenemase is an enzyme acquired by these organisms that destroys carbapenems. In the past ten years, we have seen clusters and outbreaks associated with CROs and carbapenemase-producing Enterobacterales (CPE) in hospital settings in England, particularly in London and Manchester. However, globally, some countries are seeing near endemic-levels of CRO/CPE being reported, particularly in the European Mediterranean, Balkan states and Indian sub-continent.[1, 2]

While the number of CPE infections is still relatively low in most of England, they are increasing. A retrospective microbiology review at a London hospital with low CPE prevalence found no carbapenem resistant *K. pneumoniae* reported in 2011, but found 1.3% of *K. pneumoniae* isolates were carbapenem resistant two years later.[3] This represents a small but significant background rate of resistance. However, the epidemiology in England of CROs in general, and CPEs specifically, remains relatively unknown. We do know that there is significant variation in carriage and infection rates globally, but awareness of local prevalence and incidence is crucial to prevent spread, manage infections and identify appropriate treatment options.[4]

In 2013, Public Health England (PHE) published a toolkit for acute trusts for detecting and managing CPE in the hospital environment.[5] Considerable effort has been made to limit the propagation of these organisms, but further work must be done to reduce their impact. It is believed that carbapenem resistant infections are mostly healthcare acquired, but infections caused by many Enterobacterales are also found in the wider community. Therefore, there is a risk of colonisation or infection outside the hospital setting.

Currently, laboratory reports of carbapenemase-producing Gram-negative bacteria are notifiable.[6] However, CRO/CPEs are not monitored as part of the mandatory healthcare associated infections surveillance system; though blood-stream infections caused by some specific Gram-negative organisms are included. It is proposed that CPEs specifically are monitored as part of the mandatory system, with an initial focus on the most vulnerable patient groups – namely, those patients on intensive care units. However, an understanding of the epidemiology of CPEs in England is necessary to help establish a baseline. As part of this, a national point prevalence survey of CPEs in intensive care units in England is planned for Spring 2022.

Point prevalence surveys (PPS) can be conducted to identify priority areas for surveillance and guide implementation of interventions to reduce infections. Performing a CPE PPS in intensive care units will provide us with an understanding of the current CPE situation in this patient group. Furthermore, this data can be used to identify patients who may require more focused interventions to prevent CPE infections and inform the development of infection prevention strategies.

The case for conducting a CPE PPS in ICUs has been presented to the Infection in Critical Care Quality Improvement (ICCQIP) board members and has support from ICCQIP's Chair.

Methods

Aim and objectives

Aim

To generate an estimate of the prevalence of carbapenemase-producing *Enterobacterales* infections and colonisations among patients in intensive care units in England.

Objectives

- To describe patients, invasive procedures, infections, and antimicrobials prescribed.
- To estimate the prevalence of clinical isolates from ICU patients that are positive for carbapenemase-producing *Enterobacterales*.
- To estimate the prevalence of rectal screening isolates from ICU patients that are positive for carbapenemase-producing *Enterobacterales.*
- To understand patient characteristics, procedures, and antimicrobial use which are associated with CPE colonisation or infection
- To understand inequalities in the prevalence of CPE colonisation and infection.
- To raise awareness of the growing concern of CPE in ICU patients.

Study population

Patients of any age in critical care in England, in ICUs which provide levels 2 and 3 care for adults, level 3 care for paediatrics, and both high dependency units (HDUs) and critical care for neonates.

The selection of intensive care units as the focus for this survey is due to the unique characteristics of the patients admitted to these wards. These patients are highly vulnerable to infection. Patients in intensive care also often receive multiple courses of antibiotics, which has been identified as a risk factor for the acquisition of a CRO. The patient mix on these wards also means they often represent both surgical and medical specialities, which may give us wider insight into the true burden of both infection and colonisation with CPE.

Trusts

All NHS trusts which provide critical care in England are eligible for inclusion.

Wards

The wards of interest for this survey are specifically those that provide critical care. The survey will look at adult, paediatric, and neonatal wards. The care level indicated is age group-specific, based on the NHS England Critical Care Beds data for which the sample size has been calculated (levels 2 and 3 critical care for adults, level 3 only for paediatrics, and high dependency or critical care for neonates).[7]

Patients

All patients admitted to the ward before or at 8am and not discharged from the ward at the time of the survey will have the chance to be recruited to the study. This means that patients transferred in/out of the intensive care unit after 8am from/to another ward should not be included in study recruitment.

Study design

A prospective, cluster randomised cross-sectional survey approach will be used to provide estimates of prevalence of CPE for clinically indicated samples and rectal screening (stool sample or rectal swab) isolates from the randomly selected acute trusts.

Samples taken for routine clinical management purposes from the selected patients (e.g. blood, urine, wound) will be included, as will rectal screening (stool sample or rectal swab) taken to determine if the patient is colonised with a CPE.

The selected patients receiving in-patient treatment in the participating trusts' units will be included in the survey on the survey date. A single survey day will be used for each trust to minimise the workload for the clinical teams and to optimise sample collection.

Intensive care ward staff will implement the survey by randomly selecting patients and providing relevant data for the survey. To ease the workload, an online survey tool will be used for data collection purposes. ICU staff will be advised on methods of randomly selecting patients within the ward; the method by which patients are selected will be dictated by the number of critical care beds.

Sampling procedure

Sampling will be carried out in the following stages:

- Sample size calculation for adults, paediatrics, and neonates based on total critical care populations for England (adults: levels 2 and 3, paediatrics: level 3 only, neonates: HDUs and neonatal critical care units)[7]
- Weighting of sample size by NHS England (NHSE) region
- Calculation of number of trusts required per region, for adults, paediatrics, and neonates
- Cluster sampling:
  - Random selection of trusts in each region, using the list of NHS trusts with critical care beds as the sampling frame
  - Random selection of patients per trust (dictated by number of critical care beds)

Sample size

For this study, three separate sample sizes will be calculated – for adult, paediatric, and neonatal ICUs. There are differences between the types and size of unit, and there are fewer paediatric intensive care beds than adult or neonatal. Stratified sampling strategy will help ensure we are able estimate the prevalence across population groups.

No studies have been carried out in English ICUs specifically to determine the prevalence of CPE. However, based on prevalence studies that have been carried out in hospital settings, hospital prevalence in England appears to lie between 0-11%. However, the upper range of that estimate was found at a hospital with a known outbreak, and therefore determined to not be representative. If we remove that upper estimate from consideration, the prevalence identified in trusts was up to 3-4%; this is still considered to be an overestimate nationally.

Population sizes were estimated using the NHS Statistics monthly critical care SitRep for September 2019. We used this time period as we aim to conduct the survey in September 2021. Data from March 2020 has not been published due to the COVID-19 response; however, as there would have been changes specific to September 2020 and the COVID-19 response, September 2019 data would have been used anyway. Some NHS trusts have merged since September 2019; the population and occupancies for those trusts have been aggregated in the tables below.

	Population (beds), n				
	Total trusts	**Total beds**	**Min**	**Median**	**Max**
Adult	135	4090	2	18	192
Paediatric	19	312	3	14	36
Neonatal	107	1441	1	8	58

	Occupancy, n				
	Total trusts	**Total occupancy**	**Min**	**Median**	**Max**
Adult	135	3305	1	14	142
Paediatric	19	232	0	11	28
Neonatal	107	1007	0	5	47

Assumptions

- Prevalence is assumed to be below 3%, and likely closer to 0.5-1%
- A confidence of 95% will be used for all groups.
- The intra-cluster correlation is not known but is assumed to be relatively small. A design effect of 2 will be used to account for the cluster design.
- The sample size has been increased by 10% in all patient groups to allow for non-completion of the survey.

Sample sizes for a range of prevalences and absolute precisions have been calculated for each age group. The prevalence and precision detectable are limited in some cases, especially in paediatrics, by the number of ICUs (e.g. the sample size required to detect 1% prevalence with absolute precision of 1% in the paediatric population is 379, greater than the number of ICU beds).

Option	**Assumed prevalence**	**Absolute precision**	**Total number of patients required**
Adult			
1	1%	+/- 2%	205
2	0.5%	+/- 1%	403
3	1%	+/- 1%	767
Paediatric			
1	0.5%	+/- 3%	44
2	0.5%	+/- 2%	93
3	1%	+/- 2%	162
Neonatal			
1	1%	+/- 2%	197
2	0.5%	+/- 1%	372
3	1%	+/- 1%	664

Weighting of sample size by NHSE region

All age mid-year population estimates from 2019 are used to stratify the population in England.

NHSE region	Population (all ages)	Proportion of total
East of England	6,600,056	0.12
London	8,961,989	0.16
Midlands	10,557,979	0.19
North East and Yorkshire	8,618,242	0.15
North West	7,013,321	0.12
South East	8,910,678	0.16
South West	5,624,696	0.10
Total	56,286,961	-

Sample size per region

In order to allow participation amongst ICUs of all sizes, we have estimated the average number of patients each unit will be able to collect data on in the one-day survey period. It is assumed that each ICU will be able to collect data on a maximum of 20 patients.

Using the occupancy data by region for September 2019, and capping at 20 patients per unit, the mean occupancies of adult, paediatric, and neonatal are calculated:

	Mean occupancy if capped at 20		
NHSE region	Adults	Paediatrics	Neonates
East of England	13	8	6
London	15	12	11
Midlands	13	9	9
North East and Yorkshire	13	11	7
North West	13	15	5
South East	15	11	10
South West	13	17	6

For each prevalence/precision option, the number of ICUs needed is:

NHSE region	Adults			Paediatrics			Neonates		
Option	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**
Prevalence	**1%**	**0.5%**	**1%**	**0.5%**	**0.5%**	**1%**	**1%**	**0.5%**	**1%**
Precision	**2%**	**1%**	**1%**	**3%**	**2%**	**2%**	**2%**	**1%**	**1%**
East of England	2	4	7	1	2	3	4	8	13
London	3	5	9	1	2	3	3	6	10
Midlands	4	6	12	1	2	4	5	9	15
North East and Yorkshire	3	5	10	1	2	3	5	9	15
North West	2	4	8	1	1	2	5	10	17
South East	3	5	9	1	2	3	4	6	11
South West	2	4	7	1	1	1	4	6	11
Total	19	33	62	7	12	19	30	54	92

Choosing the prevalence/precision option for each age group is a balance between what is clinically useful and what is feasible. For each age group, the larger number of trusts from the range of sample size calculations will be invited to participate: **62 trusts for adults, 19 for paediatrics, and 92 for neonates.**

Sampling trusts

The list for identifying trusts will be obtained from NHS Statistics monthly SitReps, which give details on monthly bed numbers and bed occupancy for critical care in NHS trusts in England.[7] Where relevant, trusts have been combined to reflect mergers which have occurred since 2019.

Trusts by each age group will be randomly selected by region e.g. two trusts selected at random from the 17 in the East of England region to sample adult patients. This will be done by assigning each trust an ID number and using a random number generator to select unique IDs.

Where there are not enough trusts in a region to represent the population of that region (e.g. to power the PPS to detect 1% prevalence with a precision of 2% in paediatric patients, 3 trusts are required from East of England, which only has one trust with paediatric beds), additional trusts will be selected randomly from all regions.

Trusts which are not randomly selected, but which request participation, will be allowed to do so. Analyses will be run both including and excluding these participants.

Sampling patients

Patients in each included trust are to be selected at random by the NHS staff conducting the study. All patients should have an equal opportunity for selection regardless of their known or suspected infection or colonisation status. It is anticipated that collecting data on up to 20 patients will be manageable in the one-day survey period[1]. Trusts with fewer than 20 ICU patients will be asked to include all of their patients, those with more will be asked to select a random sample of 20.

Trusts with more than one ICU for the relevant age group should sample patients at random from across all their units.

Guidance will be provided on how to randomly select patients, for example:

As first preference, and for an ICU with any number of beds:

1. Use a random number generator to obtain a list of 20 bed numbers to sample e.g. https://www.random.org/

If a random number generator cannot be used:

For an ICU with approximately 40 patients:

1. Flip a coin to pick whether to start with bed 1 or 2
2. Sample every other bed

For an ICU with approximately 60 patients:

1. Draw lots to pick whether to start with bed 1, 2, or 3
2. Sample every third bed

Data collection

Data collection from patient records will be carried out by hospital staff, using a digital data collection system, adapted from the HCAI Data Capture System (DCS) used for ICCQIP and the mandatory surveillance of healthcare associated infections. Some additional data will be collected through linkage to Hospital Episodes Statistics. It is anticipated that the data collection will primarily be done by staff on the ward being surveyed, but it is also possible that infection prevention and control could also be brought in to assist with the survey process.

[1] Patients are recruited from a single day. However, there will be two weeks available following the study date for trusts to enter the data.

Training

For staff responsible for data collection, web-based training sessions will be provided by the PHE survey team prior to the survey. Training will include guidance on using the DCS, the random selection of patients for survey inclusion, and written user guides covering the DCS alongside this protocol.

Information collected

The survey will collect data on a number of broad topics. These include:

- Trust-level data
- ICU-level data
- Patient data
- Patient data (day of survey)
- Patient data (microbiology)

The majority of the survey will be filled in by ICU staff, but it is anticipated that some additional data not included in the survey can be provided via data linkage with other systems, including the Second Generation Surveillance System for microbiology results and Hospital Episodes Statistics for some patient data. All data that can be obtained via reliable data linkage has already been excluded from the Point Prevalence Survey questions. Data will be enriched using the NHS DBS.

Further details on the proposed questions to be included in the survey can be found in the appendix.

Data collection procedure

To minimise burden on clinical staff and to reduce time required for data analysis, it is proposed an online data collection system (DCS) will be used for this survey. This is already in use for ICCQIP. However, it is acknowledged that it may not be practical for staff to enter data directly while collecting data into the web-based tool, and therefore a printable version of the survey, which can be completed and data subsequently entered into the DCS, will be provided.

The HCAI/AMR team located at Colindale will provide the repository for the data and only key members of survey team will have access to that data, for all ICUs. A line listing report will be available for participating trusts to access and download their data; no data from other trusts will be available via the DCS.

Laboratory specimen collection, transport and analysis

No additional samples – either clinical or screening – will be collected for this survey. Patients included who do not have a CPE result will be assumed to be negative.

Data analysis

For hospital, ward and patient demographic variables, descriptive and summary statistics will be presented. CPE prevalence estimates will be calculated overall and also presented by strata. Associations between colonisation or infection with CPE and hypothesised risk factors data will also be analysed using univariable, and if required, multivariable analysis. Results will be stratified by ICU-type, with odds ratios, p-values and 95% CI. All analysis will be done using Stata 15.1.

Anonymised results from the survey may be used to inform additional CPE/CPO assessments to understand the impacts of AMR in line with the National Action Plan.[8, 9]

Patient consent

Existing regulations provide UKHSA with the legal option to process patient data without direct patient consent. The transfer of data to UKHSA and processing of said data will be conducted within information governance standard. Personal data on the population studied will be kept and handled in compliance with the Caldicott Principles.

UKHSA will manage the secure and encrypted transfer of data through the online data collection tool.

All data, including personally identifiable information, (forename, surname, NHS number, date of birth) will be kept confidential and retained in compliance with UK laws and the Caldicott principles. An anonymised dataset will be kept for use in modelling studies.

Practical considerations

Timeline

- Mid-July 2021 – finalisation of protocol and survey questions
- January to February 2022 – develop training materials
- February 2022 – contact hospitals selected for inclusion in survey
- March 2022 – training for survey leads
- April 2022 – conduct survey in hospitals
- May to July 2022 – data analysis
- August 2022 – produce report of results

September was determined to be the most sensible month for conducting this survey as it lies outside winter and winter pressures. However, the timeline was moved in response to the COVID-19 pandemic, with the next best option for conducting the survey being in the Spring.

Expected benefits

Output

The main output of this survey will be the production of a report outlining the results. This will be made available to stakeholders both within PHE and within the NHS. It is also anticipated that a journal article and a conference presentation regarding the findings will be produced. An anonymised dataset will be produced for use in modelling interventions.

Outcome

This work will improve our knowledge of CPE in intensive care, and will provide further support for the development of monitoring and surveillance of these organisms in England. Journal articles and conference presentations will help to provide further evidence of the burden of these organisms to key stakeholders.

References

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Appendix 1 – survey questions

CPE PPS questions

*Minimum (mandatory) dataset

The following data will be collected once per trust

Field name	Field description	Response
Trust code	Unique Trust code	System generated
*Reporting organisation	Trust name	Single select drop-down/system-filled
*Date survey commenced		DD-MM-YYYY
*What age groups are you submitting data on?		Multiselect drop-down: Adults Paediatrics Neonates
*Is there a CPE screening policy in operation at the trust?	Asked once per age group	Single select drop-down: Yes No Unknown
*What is the CPE screening policy at the trust?	Asked once per age group	Multiselect drop-down: All admissions High-risk admissions High-risk areas Known CPE carriers Contacts of cases Other
If "other" screening policy, please specify	Provide details of screening policy in operation at Trust	Text
*Number of ICU beds	Number of ICU beds in the trust for the age range sampled Asked once per age group	Integer

The following data will be collected once per unit

Field name	Field description	Response
ICU code	Unique study code for ICU	System assigned
*Reporting organisation	ICU name	Single select drop-down
*Date survey commenced	Chosen date of survey	DD-MM-YYYY
*ICU type	Specialty of ICU	Multiselect drop-down: Adult General medical General surgical Specialty Paediatric General medical General surgical Specialty Neonatal NICU Neonatal HDU
ICU specialty type	Specify type of ICU if "Specialty"	Text
*Care level	What levels of care are provided	Multiselect drop-down: Level 3 Level 2
*Compliance with CPE screening policy	Estimate how often screening policy is complied with at time of survey completion	Single select drop-down: Almost never Sometimes Often Almost always Unknown

*Awareness of CPE Framework of Actions	Indicate the level of awareness of the PHE document 'Framework of actions to contain carbapenemase-producing Enterobacterales'	Single select drop-down: Very few staff Some staff Most staff Almost all staff Unknown
*CPE screening frequency	Frequency of CPE screening	Multiselect drop-down: Admission Weekly Outbreak Known CPE carrier Other
If "other" screening frequency, please specify	Provide detail of screening frequency is "other"	Text
*Are antibiotic stewardship guidelines in place on the ward?		Single select drop-down: Yes No Unknown
*Number of beds	Number of NHS-funded beds on ward	Integer
*Bed occupancy	Number of beds occupied on the date of the survey	Integer

The following data will be collected once per patient

The following data should be answered in relation to the date as referenced in the list below.

Note only one date is required, please complete for the first that is applicable as working down the list

1. Date of screening test (if single test)
2. If multiple screening tests:
    a. If any positive, date of first positive screen OR
    b. If all negative, date of most recent screen
3. Today's date if never screened

Field name	Field description	Response/notes
Patient details		
Patient ID	Unique patient ID	System generated
*Reporting organisation	ICU name	Single select drop down
*Date of interest	Date of interest to which exposure questions relate. In order of preference: 1. Date of CPE screening test (if single test) 2. If multiple CPE screening tests: a. If any positive, date of first positive screen OR b. If all negative, date of most recent screen 3. Today's date if never screened	DD-MM-YYYY
*10-digit NHS number	10-digit NHS number, if not available, enter 999-999-9999	
*Forename	Patient first name	Text
*Surname	Patient surname	Text
*Date of birth	Patient date of birth	DD-MM-YYYY, if not known enter 01/01/1900
*Sex	Biological sex	Button options: Male Female Unknown
Patient details 2		
*Survey date	Date survey is conducted	DD-MM-YYYY
*Patient age group		Single select drop-down: Adults Paediatrics Neonates

Ethnicity	Ethnicity of patient	Two-stage single select drop-down
*UK resident	Indicate if patient normally resides in the UK NB. If for a neonate, please use details of mother	Single select drop-down: Yes No Unknown
Normal country of residence if not UK		Single select drop-down
*Birthweight	Birth weight (in grams) of neonatal patients i.e. babies less than 28 days old *OR* on NICU.	Number in grams
*Gestation	Gestation for babies aged under 1 year	Weeks + days
*Patient category	Indicate patient category on admission	Single select drop-down: NHS Private Diplomatic Other Unknown
Other patient category	Specify patient category if "other"	Text
*Date admitted to hospital	Date admitted to the trust, or date of birth if neonate and admitted since birth	DD-MM-YYYY
*Admitted from	Setting patient admitted from into the trust	Single select drop-down: Home A&E International transfer Nursing home Other Trust Non-NHS hospital Non-health-related institute Temporary accommodation Other Unknown
Other admitted from	Specify if admitted from "other" location	Text

*Date admitted to ICU	Date admitted to ICU	DD-MM-YYYY
Time admitted to ICU	Specify time admitted to ICU	HH:MM (24-hour clock)
*Location admitted to ICU from	Setting patient admitted from into ICU	Single select drop-down: Home A&E HDU within same Trust Other ward within same Trust International transfer Nursing home Other Trust Non-NHS hospital Non-health-related institute Temporary accommodation Other Unknown
Other admitted from (ICU)	Specify if admitted to ICU from "other" location	Text
*If admitted to ICU from another ward within the same Trust, please specify	Specify specialty patient was admitted into the ICU from	Single select drop down Adult Paeds Neonates Other
If other, please specify	Specify other/specialty	Text
Please specify Adult speciality		- General medical - General surgical - Specialty - Intensive care
Please specify Paeds speciality		- Medical - Surgical - Specialty - Intensive care
Please specify Neonates speciality		- NICU - Neonatal HDU - SCBU
If 'Specialty', please specify which Adult speciality	Specify other/specialty	Text

If 'Speciality', please specify which Paeds speciality	Specify other/specialty	Text
If 'Speciality', please specify which Neonatal speciality	Specify other/specialty	Text
APACHE II score	Score measures severity of disease for patients admitted to ICUs. Provide score assigned to patient on admission to ICU	Integer, ranging 0 - 71
Microbiology details		
*Was this patient tested for CPE, either as screening or as part of clinical investigations?		Single select drop-down: Yes No Unknown
*Was it a screening or clinical specimen?	Indicate if screening specimen or clinical specimen	Single select drop-down: Screening Clinical Unknown
*Date CPE specimen collected	Date specimen collected (if single specimen). If multiple specimens, please provide the most recent date.	DD-MM-YYYY
Specimen/laboratory number assigned to specimen		Free text
Indicate anatomical site specimen collected if clinical specimen		Single select drop-down
*Organism	Organism isolated associated with CPE positive result. If no result yet, select "Unknown/result awaited". If no organism isolated, select "No organism isolated".	Single select drop-down

Does phenotypic testing indicate the presence of a carbapenemase?	Indicate if phenotypic (antibiotic susceptibility) testing indicates presence of a carbapenemase	Single select drop-down: Yes No Unknown
Indicate which carbapenemase family was detected (select all that apply)	Indicate which carbapenemase family was detected (select all that apply)	Multiselect drop-down
If Other, specify other carbapenemase family		Text
Screening (NB no additional screening is required)		
*CPE on admission to Trust	Was the patient known to be CPE positive on admission to Trust	Single select drop-down: Yes – colonised Yes - infected No Unknown
*CPE screening on admission to Trust	Found to be CPE positive on admission to Trust. "Yes" if screening specimen positive, "no" if screening specimen negative, "unknown" if no screen performed.	Single select drop-down: Yes No Unknown
*CPE on admission to ICU	Known to be CPE positive on this admission to ICU i.e. communicated/identified at time of admission.	Single select drop-down: Yes No Unknown
*ICU screen required	Did patient meet requirement to be screened for CPE on ICU in accordance with your policy?	Single select drop-down: Yes No Unknown
*ICU admission screen	Was patient screened for CPE on this admission to ICU?	Single select drop-down: Yes No Unknown

*ICU admission screen date	Date admission screen was taken on ICU	DD-MM-YYYY
*Result of ICU admission screen	Indicate result from ICU CPE admission screen	Single select drop-down: Positive Negative Unknown
*Previous CPE	Indicate if patient known to be CPE colonised/infected in 12 months prior to first day of survey	Single select drop-down: Yes – colonised Yes - infected No Unknown
If previous history of CPE, specify date of most recent positive result.	Provide date of most recent CPE positive result (prior to ICU admission screen, if taken)	DD-MM-YYYY
Previous contact with CPE	Indicate if in contact with known CPE case during this admission	Single select drop-down: Yes No Unknown
Healthcare exposure		
*UK non-NHS hospital admission in previous 12 months	Any hospital admissions to non-NHS hospitals in the previous 12 months	Single select drop-down: Yes No Unknown
Specify UK non-NHS hospital admission	Provide name(s) of non-NHS hospitals admitted to in previous 12 months	Free text
*Healthcare overseas in previous 12 months	Any hospital admissions overseas in 12 months prior to admission at Trust	Single select drop-down: Yes No Unknown
Specify healthcare abroad	List countries where overseas healthcare received in previous 12 months	Multiselect dropdown of countries

*Healthcare worker	Includes working in hospitals, care/nursing homes, hospices	Single select drop-down: Yes No Unknown
Travel exposure		
*Overseas travel in previous 12 months (if known)	Any overseas travel in 12 months prior to admission to Trust	Single select drop-down: Yes No Unknown
*Specify overseas travel	List countries travelled to in previous 12 months	Multiselect dropdown of countries
Family travel	Any family members within the same household as patient travel in the previous 12 months	Single select drop-down: Yes No Unknown
Specify family travel	List countries where family members travelled in previous 12 months	Multiselect dropdown of countries
Interventions		
*Has the patient undergone major surgery since admission to the Trust, on or prior to the date of interest?	Surgery is defined as a procedure where an incision is made (not just a needle puncture), with breach of mucosa and/or skin (not necessarily in an operating theatre). If the patient has had more than one surgery since admission, report the most recent surgery.	Single select drop-down: Yes No Unknown
*Surgery date	If yes, date of surgery	DD-MM-YYYY
Surgery type	If yes, surgery type	Free text
*Has the patient undergone endoscopy since admission to the Trust, on or prior to the date of interest?	Undergone endoscopy during this admission, prior to date of interest	Single select drop-down: Yes No Unknown

*Endoscopy date	If yes, date of most recent endoscopy	DD-MM-YYYY
Endoscopy type	If yes, specify type of endoscopy	Single select drop-down: Colonoscopy Sigmoidoscopy Upper endoscopy/ Esophagogastroduodenoscopy (EGD) Endoscopic retrograde cholangiopancreatography (ERCP) Percutaneous endoscopic gastrostomy (PEG) Other
*Is the patient currently receiving Chemotherapy	Is the patient currently receiving chemotherapy for cancer treatment, or received chemotherapy in the four weeks prior to the date of interest	Single select drop-down: Yes No Unknown
Specify chemotherapy indication (select all that apply)		Single select drop-down: Oral, nasal and pharyngeal Oesophagus Stomach Colorectal Hepatobiliary Respiratory Larynx Lung Breast Female reproductive Prostate Testicular Renal Urinary bladder Bone and joint Melanoma Non-melanoma skin Soft-tissue sarcoma Brain Leukaemia (other than

		chronic B-cell leukaemia) Chronic lymphocytic (including hairy cell leukaemia) Other
Chemotherapy indication if other		Free text
*Is the patient currently receiving renal haemodialysis	Receiving regular renal haemodialysis or received haemodialysis in the four weeks prior to the date of interest	Single select drop-down: Yes No Unknown
* Is there at least one CVC in situ on date of interest?	Indicate if the patient had a CVC in place at the date of interest	Single select drop-down: Yes No Unknown
CVC date	If yes, when was it inserted. If multiple, select the insertion date of the CVC which has been in situ the longest.	DD-MM-YYYY
*Was a CVC in situ the day before the date of interest?	If no, indicate if the patient had a CVC in place the day before the date of interest	Single select drop-down: Yes No Unknown
Is there at least one PVC in situ on date of interest?	Indicate if the patient had a PVC in place at the date of interest	Single select drop-down: Yes No Unknown
PVC date	If yes, when was it inserted. If multiple, select the insertion date of the PVC which has been in situ the longest.	DD-MM-YYYY
Was a PVC in situ the day before the date of interest?	If no, indicate if the patient had a PVC in place the day before the date of interest	Single select drop-down: Yes No

		Unknown
Is there a urinary catheter in situ on the date of interest?	Indicate if the patient had a urinary catheter in place at the date of interest	Single select drop-down: Yes No Unknown
Urinary catheter date	If yes, when was it inserted	DD-MM-YYYY
Urinary catheter previously	If no, indicate if the patient had a urinary catheter in place in the 48 hours before the date of interest	Single select drop-down: Yes No Unknown
*Intubation	Indicate if the patient was under intubation with or without ventilation (endotracheal/nasotracheal tube or tracheostomy) at the date of interest	Single select drop-down: Yes No Unknown
Intubation date	If yes, when was it inserted	DD-MM-YYYY
*Intubation previously	If no, indicate if the patient was intubated in the 48 hours before the date of interest	Single select drop-down: Yes No Unknown
Nasogastric tube	Indicate if the patient had an NGT in place at the date of interest	Single select drop-down: Yes No Unknown
Nasogastric tube date	If yes, when was it inserted	DD-MM-YYYY
Nasogastric tube previously	If no, indicate if the patient had an NGT in place in the 48 hours before the date of interest	Single select drop-down: Yes No Unknown
Antimicrobials		
*Has the patient received carbapenems in the four	Indicate if the patient received carbapenems in	Single select drop-down: Yes

weeks prior to the date of interest?	the four weeks prior to the date of interest	No Unknown
If yes, which?	Carbapenems	Multiselect drop-down Doripenem Ertapenem Faropenem Imipenem Imipenem with cilastin Imipenem with cilastin and relebactam Meropenem Meropenem/vaborabactam
*Has the patient received carbapenems in the one year prior to the date of interest, but not in the four weeks prior?		Single select drop-down: Yes No Unknown
If yes, which	Carbapenems	Multiselect drop-down
*Has the patient received 3rd generation cephalosporins in the four weeks prior to the date of interest?		Single select drop-down: Yes No Unknown
If yes, which	3rd generation cephalosporins	Multiselect drop-down
*Has the patient received 3rd generation cephalosporins in the one year prior to the date of interest, but not in the four weeks prior		Single select drop-down: Yes No Unknown
If yes, which	3rd generation cephalosporins	Multiselect drop-down
*Antimicrobials prescribed and taken on the date of interest	Indicate if the patient has received at least one	Single select drop-down:

	systemic antibiotic on the date of interest (given or planned treatment, including intermittent treatments, e.g. alternate day or medical prophylaxis). For surgical prophylaxis, check whether any surgical prophylaxis was given in the 24 hours before 8 a.m. on the day of the survey. If "yes", collect antibiotic data.	Yes No Unknown
Please select the number of antimicrobials taken		Single select drop-down: 1 2 3 4 5
*Antimicrobial name 1-5 NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Select which antimicrobial	Single-select dropdown list of antimicrobials.
*Antimicrobial indication 1-5 NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Please give indication for this/these antimicrobial(s)	CI = treatment of community-acquired infection LI = treatment of infection acquired in long-term care facility (e.g. nursing home) HI = treatment for acute hospital-acquired infection SP = surgical prophylaxis MP = medical prophylaxis O = other indication UI = unknown indication (confirmed) UNK = unknown or missing information

*CPE indication for antimicrobial 1-5 NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Is this antibiotic prescribed to manage CPE?	Single select drop-down: Yes No Unknown
Start date for antimicrobial 1-5 NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Start date of the antibiotic. If the antibiotic was already given on admission to hospital, provide the date of admission.	DD-MM-YYYY.
Antibiotic stewardship 1-5 NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Is antibiotic prescription in line with local guidelines	Single select drop-down: Yes No Unknown
*Antimicrobials prior to the date of interest	Indicate how many antimicrobial(s) received since admission to hospital, but stopped prior to the date of interest. If more than 5 antimicrobials were prescribed, please enter details for the most recent 5.	Single select drop-down: Yes No Unknown
*Please select the number of antimicrobials taken this admission, prior to the date of interest	Indicate if antimicrobial(s) received since admission, prior to date of interest	Single select drop-down: 1 2 3 4 5
*Antimicrobial name 1-5 (prior survey)	Select the antimicrobial received since admission, prior to date of interest	Single-select dropdown list of antimicrobials.

NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken		
*Indication for antimicrobial 1-5 (before date of interest) NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Please give indication for this/these antimicrobial (s)	CI = treatment of community-acquired infection LI = treatment of infection acquired in long-term care facility (e.g. nursing home) HI = treatment for acute hospital-acquired infection SP = surgical prophylaxis MP = medical prophylaxis O = other indication UI = unknown indication (confirmed) UNK = unknown or missing information
*CPE indication for antimicrobial 1-5 (before date of interest) NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Is this antimicrobial prescribed to manage CPE?	Single select drop-down: Yes No Unknown
Start date for antimicrobial 1-5 (before date of interest) NOTE: Field repeated up to 5 times depending on the specified number of antimicrobials taken	Start date of the antimicrobial. If the antimicrobial was already given on admission to hospital, provide the date of admission.	DD-MM-YYYY
Antibiotic stewardship 1-5 (before date of interest) NOTE: Field repeated up to 5 times depending on the	Is antimicrobial prescription in line with local guidelines	Single select drop-down: Yes No Unknown

specified number of antimicrobials taken		

Appendix 2 – Trust sampling frame

Trust names were obtained from the September 2019 Critical Care SitRep. Some Trusts have since merged or changed names.

Adults

East Of England	Bedfordshire Hospitals NHS Foundation Trust
East Of England	Cambridge University Hospitals NHS Foundation Trust
East Of England	East And North Hertfordshire NHS Trust
East Of England	East Suffolk And North Essex NHS Foundation Trust
East Of England	James Paget University Hospitals NHS Foundation Trust
East Of England	Mid and South Essex NHS Foundation Trust
East Of England	Milton Keynes University Hospital NHS Foundation Trust
East Of England	Norfolk And Norwich University Hospitals NHS Foundation Trust
East Of England	North West Anglia NHS Foundation Trust
East Of England	Royal Papworth Hospital NHS Foundation Trust
East Of England	The Princess Alexandra Hospital NHS Trust
East Of England	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
East Of England	West Hertfordshire Hospitals NHS Trust
East Of England	West Suffolk NHS Foundation Trust
London	Barking, Havering And Redbridge University Hospitals NHS Trust
London	Barts Health NHS Trust
London	Chelsea And Westminster Hospital NHS Foundation Trust
London	Croydon Health Services NHS Trust
London	Epsom And St Helier University Hospitals NHS Trust
London	Guy's And St Thomas' NHS Foundation Trust
London	Homerton University Hospital NHS Foundation Trust
London	Imperial College Healthcare NHS Trust
London	King's College Hospital NHS Foundation Trust

London	Kingston Hospital NHS Foundation Trust
London	Lewisham And Greenwich NHS Trust
London	London North West University Healthcare NHS Trust
London	North Middlesex University Hospital NHS Trust
London	Royal Free London NHS Foundation Trust
London	Royal National Orthopaedic Hospital NHS Trust
London	St George's University Hospitals NHS Foundation Trust
London	The Hillingdon Hospitals NHS Foundation Trust
London	The Royal Marsden NHS Foundation Trust
London	University College London Hospitals NHS Foundation Trust
London	Whittington Health NHS Trust
Midlands	Birmingham Women's And Children's NHS Foundation Trust
Midlands	Chesterfield Royal Hospital NHS Foundation Trust
Midlands	George Eliot Hospital NHS Trust
Midlands	Kettering General Hospital NHS Foundation Trust
Midlands	Northampton General Hospital NHS Trust
Midlands	Nottingham University Hospitals NHS Trust
Midlands	Sandwell And West Birmingham Hospitals NHS Trust
Midlands	Sherwood Forest Hospitals NHS Foundation Trust
Midlands	Shrewsbury And Telford Hospital NHS Trust
Midlands	South Warwickshire NHS Foundation Trust
Midlands	The Dudley Group NHS Foundation Trust
Midlands	The Robert Jones And Agnes Hunt Orthopaedic Hospital NHS Foundation Trust
Midlands	The Royal Orthopaedic Hospital NHS Foundation Trust
Midlands	The Royal Wolverhampton NHS Trust
Midlands	United Lincolnshire Hospitals NHS Trust
Midlands	University Hospitals Birmingham NHS Foundation Trust
Midlands	University Hospitals Coventry And Warwickshire NHS Trust

Midlands	University Hospitals Of Derby And Burton NHS Foundation Trust
Midlands	University Hospitals Of Leicester NHS Trust
Midlands	University Hospitals Of North Midlands NHS Trust
Midlands	Walsall Healthcare NHS Trust
Midlands	Worcestershire Acute Hospitals NHS Trust
Midlands	Wye Valley NHS Trust
North East And Yorkshire	Airedale NHS Foundation Trust
North East And Yorkshire	Barnsley Hospital NHS Foundation Trust
North East And Yorkshire	Bradford Teaching Hospitals NHS Foundation Trust
North East And Yorkshire	Calderdale And Huddersfield NHS Foundation Trust
North East And Yorkshire	County Durham And Darlington NHS Foundation Trust
North East And Yorkshire	Doncaster And Bassetlaw Teaching Hospitals NHS Foundation Trust
North East And Yorkshire	Gateshead Health NHS Foundation Trust
North East And Yorkshire	Harrogate And District NHS Foundation Trust
North East And Yorkshire	Hull University Teaching Hospitals NHS Trust
North East And Yorkshire	Leeds Teaching Hospitals NHS Trust
North East And Yorkshire	Mid Yorkshire Hospitals NHS Trust
North East And Yorkshire	North Cumbria University Hospitals NHS Trust
North East And Yorkshire	North Tees And Hartlepool NHS Foundation Trust
North East And Yorkshire	Northern Lincolnshire And Goole NHS Foundation Trust

North East And Yorkshire	Northumbria Healthcare NHS Foundation Trust
North East And Yorkshire	Sheffield Teaching Hospitals NHS Foundation Trust
North East And Yorkshire	South Tees Hospitals NHS Foundation Trust
North East And Yorkshire	South Tyneside And Sunderland NHS Foundation Trust
North East And Yorkshire	The Newcastle Upon Tyne Hospitals NHS Foundation Trust
North East And Yorkshire	The Rotherham NHS Foundation Trust
North East And Yorkshire	York Teaching Hospital NHS Foundation Trust
North West	Blackpool Teaching Hospitals NHS Foundation Trust
North West	Bolton NHS Foundation Trust
North West	Countess Of Chester Hospital NHS Foundation Trust
North West	East Cheshire NHS Trust
North West	East Lancashire Hospitals NHS Trust
North West	Lancashire Teaching Hospitals NHS Foundation Trust
North West	Liverpool Heart And Chest Hospital NHS Foundation Trust
North West	Liverpool University Hospitals NHS Foundation Trust
North West	Liverpool Women's NHS Foundation Trust
North West	Manchester University NHS Foundation Trust
North West	Mid Cheshire Hospitals NHS Foundation Trust
North West	Pennine Acute Hospitals NHS Trust
North West	Salford Royal NHS Foundation Trust
North West	Southport And Ormskirk Hospital NHS Trust
North West	St Helens And Knowsley Teaching Hospitals NHS Trust
North West	Stockport NHS Foundation Trust
North West	Tameside And Glossop Integrated Care NHS Foundation Trust
North West	The Christie NHS Foundation Trust

North West	The Walton Centre NHS Foundation Trust
North West	University Hospitals Of Morecambe Bay NHS Foundation Trust
North West	Warrington And Halton Hospitals NHS Foundation Trust
North West	Wirral University Teaching Hospital NHS Foundation Trust
North West	Wrightington, Wigan And Leigh NHS Foundation Trust
South East	Ashford And St Peter's Hospitals NHS Foundation Trust
South East	Brighton And Sussex University Hospitals NHS Trust
South East	Buckinghamshire Healthcare NHS Trust
South East	Dartford And Gravesham NHS Trust
South East	East Kent Hospitals University NHS Foundation Trust
South East	East Sussex Healthcare NHS Trust
South East	Frimley Health NHS Foundation Trust
South East	Hampshire Hospitals NHS Foundation Trust
South East	Isle Of Wight NHS Trust
South East	Maidstone And Tunbridge Wells NHS Trust
South East	Medway NHS Foundation Trust
South East	Oxford University Hospitals NHS Foundation Trust
South East	Portsmouth Hospitals NHS Trust
South East	Queen Victoria Hospital NHS Foundation Trust
South East	Royal Berkshire NHS Foundation Trust
South East	Royal Surrey County Hospital NHS Foundation Trust
South East	Surrey And Sussex Healthcare NHS Trust
South East	University Hospital Southampton NHS Foundation Trust
South East	Western Sussex Hospitals NHS Foundation Trust
South West	Dorset County Hospital NHS Foundation Trust
South West	Gloucestershire Hospitals NHS Foundation Trust
South West	Great Western Hospitals NHS Foundation Trust
South West	North Bristol NHS Trust
South West	Northern Devon Healthcare NHS Trust
South West	Royal Cornwall Hospitals NHS Trust
South West	Royal Devon And Exeter NHS Foundation Trust

South West	Royal United Hospitals Bath NHS Foundation Trust
South West	Salisbury NHS Foundation Trust
South West	Somerset NHS Foundation Trust
South West	Torbay And South Devon NHS Foundation Trust
South West	University Hospitals Bristol and Weston NHS Foundation Trust
South West	University Hospitals Dorset NHS Foundation Trust
South West	University Hospitals Plymouth NHS Trust
South West	Yeovil District Hospital NHS Foundation Trust

Paediatrics

East Of England	Cambridge University Hospitals NHS Foundation Trust
London	Barts Health NHS Trust
London	Great Ormond Street Hospital For Children NHS Foundation Trust
London	Guy's And St Thomas' NHS Foundation Trust
London	Imperial College Healthcare NHS Trust
London	King's College Hospital NHS Foundation Trust
London	St George's University Hospitals NHS Foundation Trust
Midlands	Birmingham Women's And Children's NHS Foundation Trust
Midlands	Nottingham University Hospitals NHS Trust
Midlands	University Hospitals Of Leicester NHS Trust
Midlands	University Hospitals Of North Midlands NHS Trust
North East And Yorkshire	Leeds Teaching Hospitals NHS Trust
North East And Yorkshire	Sheffield Children's NHS Foundation Trust
North East And Yorkshire	The Newcastle Upon Tyne Hospitals NHS Foundation Trust
North West	Alder Hey Children's NHS Foundation Trust
North West	Manchester University NHS Foundation Trust
South East	Oxford University Hospitals NHS Foundation Trust

South East	University Hospital Southampton NHS Foundation Trust
South West	University Hospitals Bristol and Weston NHS Foundation Trust

Neonates

East Of England	Bedfordshire Hospitals NHS Trust
East Of England	Cambridge University Hospitals NHS Foundation Trust
East Of England	East And North Hertfordshire NHS Trust
East Of England	East Suffolk And North Essex NHS Foundation Trust
East Of England	James Paget University Hospitals NHS Foundation Trust
East Of England	Mid and South Essex NHS Foundation Trust
East Of England	Milton Keynes University Hospital NHS Foundation Trust
East Of England	Norfolk And Norwich University Hospitals NHS Foundation Trust
East Of England	North West Anglia NHS Foundation Trust
East Of England	The Princess Alexandra Hospital NHS Trust
East Of England	The Queen Elizabeth Hospital, King's Lynn, NHS Foundation Trust
East Of England	West Hertfordshire Hospitals NHS Trust
East Of England	West Suffolk NHS Foundation Trust
London	Barking, Havering And Redbridge University Hospitals NHS Trust
London	Barts Health NHS Trust
London	Chelsea And Westminster Hospital NHS Foundation Trust
London	Croydon Health Services NHS Trust
London	Epsom And St Helier University Hospitals NHS Trust
London	Great Ormond Street Hospital For Children NHS Foundation Trust
London	Guy's And St Thomas' NHS Foundation Trust
London	Homerton University Hospital NHS Foundation Trust
London	Imperial College Healthcare NHS Trust
London	King's College Hospital NHS Foundation Trust

London	Kingston Hospital NHS Foundation Trust
London	Lewisham And Greenwich NHS Trust
London	London North West University Healthcare NHS Trust
London	North Middlesex University Hospital NHS Trust
London	Royal Free London NHS Foundation Trust
London	St George's University Hospitals NHS Foundation Trust
London	The Hillingdon Hospitals NHS Foundation Trust
London	University College London Hospitals NHS Foundation Trust
London	Whittington Health NHS Trust
Midlands	Birmingham Women's And Children's NHS Foundation Trust
Midlands	Chesterfield Royal Hospital NHS Foundation Trust
Midlands	Kettering General Hospital NHS Foundation Trust
Midlands	Northampton General Hospital NHS Trust
Midlands	Nottingham University Hospitals NHS Trust
Midlands	Sandwell And West Birmingham Hospitals NHS Trust
Midlands	Sherwood Forest Hospitals NHS Foundation Trust
Midlands	Shrewsbury And Telford Hospital NHS Trust
Midlands	The Dudley Group NHS Foundation Trust
Midlands	The Royal Wolverhampton NHS Trust
Midlands	United Lincolnshire Hospitals NHS Trust
Midlands	University Hospitals Birmingham NHS Foundation Trust
Midlands	University Hospitals Coventry And Warwickshire NHS Trust
Midlands	University Hospitals Of Derby And Burton NHS Foundation Trust
Midlands	University Hospitals Of Leicester NHS Trust
Midlands	University Hospitals Of North Midlands NHS Trust
Midlands	Walsall Healthcare NHS Trust
Midlands	Worcestershire Acute Hospitals NHS Trust
Midlands	Wye Valley NHS Trust

North East And Yorkshire	Airedale NHS Foundation Trust
North East And Yorkshire	Barnsley Hospital NHS Foundation Trust
North East And Yorkshire	Bradford Teaching Hospitals NHS Foundation Trust
North East And Yorkshire	Calderdale And Huddersfield NHS Foundation Trust
North East And Yorkshire	Hull University Teaching Hospitals NHS Trust
North East And Yorkshire	Leeds Teaching Hospitals NHS Trust
North East And Yorkshire	Mid Yorkshire Hospitals NHS Trust
North East And Yorkshire	Northern Lincolnshire And Goole NHS Foundation Trust
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North East And Yorkshire	The Newcastle Upon Tyne Hospitals NHS Foundation Trust
North East And Yorkshire	The Rotherham NHS Foundation Trust
North East And Yorkshire	York Teaching Hospital NHS Foundation Trust
North West	Blackpool Teaching Hospitals NHS Foundation Trust
North West	Bolton NHS Foundation Trust
North West	East Cheshire NHS Trust
North West	East Lancashire Hospitals NHS Trust
North West	Lancashire Teaching Hospitals NHS Foundation Trust

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North West	University Hospitals Of Morecambe Bay NHS Foundation Trust
North West	Warrington And Halton Hospitals NHS Foundation Trust
North West	Wirral University Teaching Hospital NHS Foundation Trust
South East	Ashford And St Peter's Hospitals NHS Foundation Trust
South East	Brighton And Sussex University Hospitals NHS Trust
South East	Buckinghamshire Healthcare NHS Trust
South East	East Kent Hospitals University NHS Foundation Trust
South East	Frimley Health NHS Foundation Trust
South East	Hampshire Hospitals NHS Foundation Trust
South East	Medway NHS Foundation Trust
South East	Oxford University Hospitals NHS Foundation Trust
South East	Portsmouth Hospitals NHS Trust
South East	Royal Berkshire NHS Foundation Trust
South East	Royal Surrey County Hospital NHS Foundation Trust
South East	Surrey And Sussex Healthcare NHS Trust
South East	University Hospital Southampton NHS Foundation Trust
South East	Western Sussex Hospitals NHS Foundation Trust
South West	Gloucestershire Hospitals NHS Foundation Trust
South West	Great Western Hospitals NHS Foundation Trust
South West	North Bristol NHS Trust
South West	Northern Devon Healthcare NHS Trust
South West	Royal Cornwall Hospitals NHS Trust
South West	Royal Devon And Exeter NHS Foundation Trust

South West	Royal United Hospitals Bath NHS Foundation Trust
South West	Salisbury NHS Foundation Trust
South West	Somerset NHS Foundation Trust
South West	University Hospitals Bristol and Weston NHS Foundation Trust
South West	University Hospitals Dorset NHS Trust
South West	University Hospitals Plymouth NHS Trust

About the UK Health Security Agency

The UK Health Security Agency is an executive agency, sponsored by the Department of Health and Social Care.

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Version 1.0

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Published: April 2022