



UK Health
Security
Agency

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England

Protocol, 2023

Sixth National Point Prevalence Survey on Healthcare Associated Infections and
Third National Point Prevalence Survey on Antimicrobial Use and Quality Indicators in England

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Introduction

Over four million people in Europe acquire a healthcare-associated infection (HAI) every year, of whom approximately 37,000 die as a direct result of the infection. The death toll from HAI is comparable to the number of people who die each year in road traffic accidents. Antimicrobial use (AMU) is a key driver of antimicrobial resistance (AMR); understanding the indications, dose used, and adherence to guidelines is key to reducing antibiotic consumption.

Surveillance of HAI and AMU is an essential component of infection prevention and antimicrobial stewardship. It drives key actions by planning and implementing more effective, evidence based interventions, policies, surveillance and strategies. However, robust comparable data for HAI and AMU (other than mandatory reporting) are not currently available across all inpatient settings in England making it difficult to quantify overall if there have been any changes in NHS trusts' or Independent providers' HAI rates or AMU other than the few (MRSA, MSSA, Gram-negative bacteraemia and *Clostridioides difficile* infections) which are reported on a mandatory basis.

Prevalence surveys are useful in providing data on the proportion of HAI and proportion and types of AMU at any one point (or period) in time in hospitals and give a better understanding of burden of both HAI and community-acquired infection (CAI) treated with antibiotics and AMU.

This point prevalence survey will be the fifth national point prevalence survey on healthcare associated infections and the second national survey on antimicrobial use. The results of previous point prevalence surveys are provided in table 1.

Table 1. Results of previous point prevalence surveys.

Year of Survey	Total patients surveyed	Total number with HAI	HAI Prevalence (%)	Total number on antimicrobials ¹	AMU Prevalence (%)
England 2016	48,312	3,314	6.9	17,884	37.0
England 2011	52,443	3,360	6.4	18,219	34.7
England 2006	58,775	4,812	8.2	NA	NA
UK 1993/4	37,111	3,353	9.0	NA	NA
UK 1980	18,163	1,671	9.2	NA	NA

NA = Not assessed; ¹ Number of patients on at least one antimicrobial (excluding TB, HIV and Hepatitis treatment)

Objectives

The objectives of the point prevalence survey of HAIs and AMU in all NHS and independent acute-care hospitals as well as NHS community and mental health Trusts are:

- to estimate the total burden (prevalence) of HAIs and AMU in acute-care hospitals, community Trust sites and mental health sites.
- to describe patients, invasive procedures, infections (sites, microorganisms including markers of antimicrobial resistance) and antimicrobials prescribed (compounds, indications)
 - by type of patients, specialties or healthcare facilities
- to describe key structures and processes for the prevention of HAIs and antimicrobial resistance at the hospital and ward level in English hospitals;
- to disseminate results to those who need to know at local, regional, national:
 - to raise awareness and development of relevant local and national interventions
 - to train and reinforce surveillance structures and skills;
 - to identify common problems and set up priorities accordingly;
 - to evaluate the effect of strategies and guide policies for the future at the local/national/regional level (repeated PPS);
- to provide a standardised tool for hospitals to identify targets for quality improvement.

Materials

The materials and tools have been developed to assist hospitals in carrying out the PPS and include:

- PPS protocol and data entry forms
- PPS codebook, including case definitions of HAI
- Standardised training material
- Web-based software to enter data (including user guides)

Inclusion/exclusion criteria

Hospitals

All NHS and independent acute-care hospitals, NHS Community and Mental Health Trusts in England are eligible for inclusion. An acute-care hospital is defined according to national definitions. There is no minimal size of hospitals.

Hospitals caring for exclusively day patients are excluded.

For administrative hospital groups (hospital 'mergers' or 'trusts'), data should ideally be collected by hospital site.

Wards

Acute hospitals

All wards of each hospital must be included in acute-care facilities, including, for example, chronic care, rehabilitation and long-term care wards, acute psychiatric wards and neonatal ICUs. The ward specialty is always recorded so that results can be stratified and standardised.

Excluded areas in the hospital are:

- accident & emergency department (except for wards attached to A&E departments where patients are monitored for more than 24 hours).
- day wards (e.g. surgery, medical, haematology/ oncology)
- renal dialysis units
- outpatients
- virtual wards

Community/mental health hospitals/sites

All wards must be included, including, for example, chronic care, rehabilitation and long-term care wards, mental health wards

Excluded areas in the hospital are:

- accident & emergency department (except for wards attached to A&E departments where patients are monitored for more than 24 hours).
- day wards (e.g. surgery, medical, haematology/ oncology)
- renal dialysis units

- outpatients
- virtual wards
- health and justice including forensic and secure services

For Trusts with both community and mental health sites, you can choose to register ONLY your community OR mental health sites OR BOTH community and mental health sites.

If you choose to include only community health units, then all patient and ward data from all community health units in the Trust need to be included. If you choose to include only mental health units, then all patient and ward data from all mental health units in the Trust need to be included. This is to ensure accurate denominator data and to allow accurate benchmarking with peers.

Patients

Include all patients admitted to the ward before or at (\leq) 08:00 and not discharged from the ward at the time of the survey; in practice, this means that patients transferred in/out after 08:00 from/to another ward should not be included (see Figure 1).

Include:

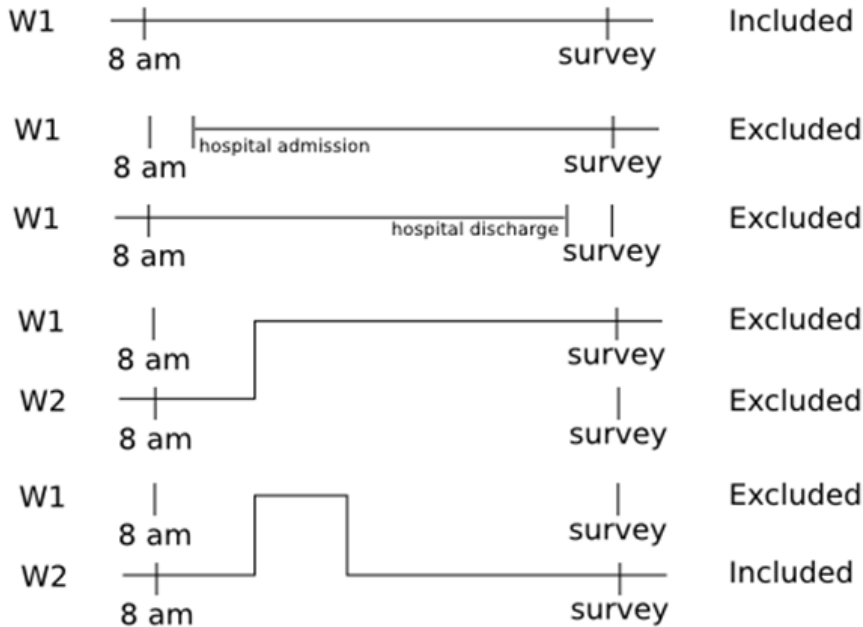
- neonates on maternity and paediatric wards if born before/at 08:00
- patients who are temporarily off from the ward for diagnostic investigations, procedures; if patient does not return to the ward before the end of the PPS day and information about patient is not available at 08:00, please revisit ward.
- patients who are on the patient administration system but at home for a number of hours.

Exclude the following:

- day case patients
- patients undergoing same day treatment or surgery, with the expectation of being discharged before 9pm
- patients seen at outpatient department
- patients in the emergency room
- dialysis patients (ambulatory care/ day attenders)
- patients in virtual wards

Note: Decision to include/exclude patients is based on information available at 8 a.m. on the day of the survey.

Figure 1. Examples of included and excluded patients in the point prevalence survey



Legend. W1: ward 1, W2: ward 2

Note: Include patients who are temporarily off from the ward for diagnostic investigations, procedures; if patient does not return to the ward before the end of the PPS day and information about patient is not available at 8 a.m., please revisit ward.

Include patients who are on the patient administration system but at home for a number of hours.

Information Governance

UKHSA has permission under section 251 of the National Health Service Act 2006 and its current Regulations, the Health Service (Control of Patient Information) Regulations 2002, as detailed in [NIGB register of approved section 251 applications](#). The NHS Act 2006 and the Regulations enable the common law duty of confidentiality to be temporarily lifted so that confidential patient information can be transferred to an applicant without the discloser being in breach of the common law duty of confidentiality. They must still comply with all other relevant legal obligations e.g. the Data Protection Act 1998. Approval also provides reassurance that the person(s) receiving the information has undergone an independent review of their purposes and governance arrangements.

The original application (HPA) was PIAG 03(c)/2001 “Application for Section 60 support for obtaining patient information for communicable disease surveillance and control”. UKHSA retains the original PIAG approval number and this is reviewed through [CAG](#) annually.

All data held within UKHSA is held on secure encrypted servers. Access is only permitted to those that have completed appropriate information governance training and where patient identifiable information is required to complete the relevant analysis.

Any data (either on paper forms or downloaded from the system) held by the hospital should be used and stored under Caldicott principles.

Data collection

Data collection includes variables at the national, hospital, ward and patient level. The national level data collection is performed by UKHSA. The hospital level data collection may be collected at any point after registration on the data capture system until the end of the survey period. If these data need to be updated, this should be done via email to HCAI_PPS@ukhsa.gov.uk.

Some ward level data needs to be collated in advance of the survey date. This includes ward level activity data of:

- occupied bed-days per ward (from local hospital analysts),
- alcohol hand rub consumption per ward (from hospital procurement department), and
- number of hand hygiene opportunities (audit data of number of staff observed in performing hand hygiene on the ward; from infection prevention and control or audit department).

Denominator data are collected for each patient, hospital and ward. Numerator data are collected for each patient with an active HAI (related to acute-care hospital stay) and/or receiving an antimicrobial drug at the time of the survey.

When?

The remainder of the data should be collected in a single day for each ward/unit. The total time frame for data collection for all wards of a single hospital should not exceed two to three weeks. It is practice in some hospital units to admit additional patients on Mondays for elective procedures; it is therefore recommended to conduct the survey in these units between Tuesday and Friday.

Who will collect the data?

The composition of the team responsible for data collection may vary from one hospital to another. It is recommended to involve hospital infection prevention and control, antimicrobial stewardship clinical microbiology/Infectious disease, and clinical personnel as well as the team in charge of the patients in the process although not all have to be involved in direct data collection.

Training

UKHSA will run training webinars for nominated PPS leads as well as other hospital staff from participating hospitals involved in the data collection prior to the point prevalence survey. Training materials will be made available to hospitals and links will be sent to all registered hospital coordinators via email.

PPS Training days:

- Week beginning 4 September 2023

Data processing

Data processing can occur in one of two ways:

- It can be collected on the forms which will be circulated to registered hospital leads and subsequently be entered onto the web-based data tool by the hospital staff after data verification. An example of the forms can be found in the [appendix](#).
- Alternatively it can be directly entered onto the web-based tool by hospital staff while collecting the data.

Overview of collected data

- National data; collected by UKHSA on administrative data from the NHS.
- Hospital data; one registration form per hospital per PPS.
- Ward data; including structure and process indicators and denominator data for all patients present in the ward at 8a.m. and not discharged at the time of the survey.
- Patient data; one form per patient (for all patients present in the ward at 8 a.m. and not discharged at the time of the survey) collecting risk factors for each patient, infected or not; healthcare-associated infection data (to be collected for all patients with an infection that matches the definition of active healthcare-associated infection) and/or antimicrobial use data (to be collected for all patients receiving an antimicrobial agent) are collected on the same form.

Hospital data

Hospital variables are collected in order to describe results by type and size of healthcare facilities and by the average length of stay in the hospital, a variable which is known to influence prevalence figures because patients with infections are known to stay longer in the hospital than the average hospital population.

The questionnaire also includes Structure and Process Indicators (SPIs) at a hospital level on infection prevention and control and antimicrobial stewardship.

These data are collected at any time during or after the data collection period.

Ward data

Ward variables are collected in order to describe ward size and composition and also capture SPIs at a ward level on infection prevention and control and antimicrobial stewardship.

These data are collected primarily during the data collection period, though some may be collected in advance of the survey date.

Denominator data

Denominator data are collected for all patients admitted before or present at 8:00 AM in the ward and not discharged from the ward at the time of the survey.

- Patient data have to be collected for each patient admitted to the ward at 8 AM on the survey date, infected or not, only excluding day cases (see inclusion criteria)
- Specific issues related to obstetrics:
 - both mother and neonate are counted if present at 8 AM on the survey date, if mother was present before 8 AM but baby not born til after 8 AM, mother is counted but baby is not.
 - Obstetrics: natural birth with no interventions/ procedures/ devices on or after day 3 before HAI; otherwise follows the HAI rule on interventions and proceures
- For neonates:
 - Count all infections after their birth as HAI
 - Register consultant/patient specialty as PEDBAB (healthy neonates) unless specifically under care of PEDNEO/ PEDGEN/ ICUNEO
- For obstetrics and gynaecology wards where mothers and babies stay together, register patient specialty for wards for mothers as GOOBS and babies as PEDBAB. Therefore a ward with 14 mothers and 10 babies who were born before 8am = 24 patients on the ward: 14 GOOBS and 10 PEDBAB. If the babies are on Neonatal ICU then they should be counted as ICUNEO and not counted on the ward.

Antimicrobial use data and HAI data

Only collect information if the patient receives at least one antimicrobial at the time of the survey (surgical prophylaxis: in the 24 hours prior to 8 a.m. on the day of the survey) or if the patient has an active HAI.

The use of antimicrobials will often lead to the detection of a HAI. Some patients may have a HAI that is not treated by an antimicrobial (e.g. viral infections, urinary tract infections), which makes it necessary to consult other sources (see HAI case finding algorithm). In other cases, the physicians may treat an infection which does not match the case definition. Therefore, the diagnosis list for antimicrobial use differs from the HAI case definition list (see codebook) and the indication list mentions treatment intention of an infection. It is not the objective of this survey to relate the use of an antibiotic to the information on HAIs (such as microorganisms). Both types of data are collected separately.

Antimicrobial use data

Surgical prophylaxis should be registered if given the day before the survey (i.e. in the 24 hours prior to 8 a.m. on the day of the survey). For all other antimicrobial use (e.g. treatment, medical prophylaxis), any given or planned (including intermittent treatments, e.g. alternate day) administration of antimicrobials should be registered at the time of the survey only.

The aim is to determine what the physicians think they are treating. In order to do so, we will look at all patient records and may request additional information from nurses, pharmacists or doctors. The appropriateness of prescriptions will not be discussed, no attempts will be made to change prescriptions, and staff should not feel supervised at any time.

Healthcare-associated infection data

An active HAI (associated to acute-care hospital stay) present on the day of the survey is defined as follows:

- Signs and Symptoms
 - An infection is active when signs and symptoms of the infection are present on the survey date

OR

- signs and symptoms were present in the past and the patient is (still) receiving treatment for that infection on the survey date.

- The presence of signs and symptoms should be verified until the start of the treatment in order to determine whether the treated infection matches one of the case definitions of HAI.
- Onset
 - The onset of symptoms was on Day 3 or later (day of admission = Day 1) of the current admission

OR

- the patient presents with an infection but has been readmitted less than 48 hours after a previous admission to an acute-care hospital

OR

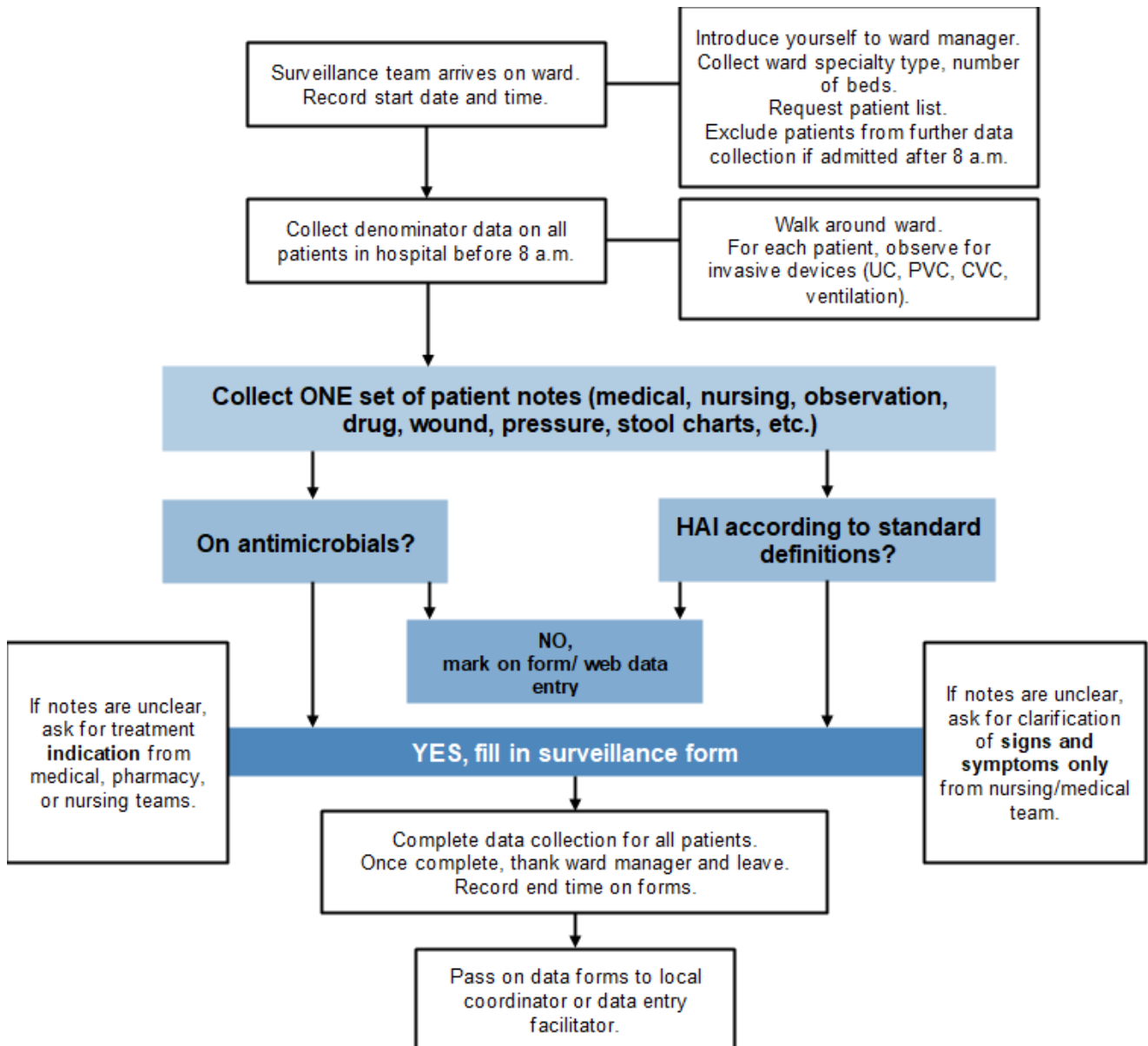
- the patient has been admitted (or develops symptoms within two days) with an infection that meets the case definition of an active surgical site infection (SSI) i.e. the SSI occurred within 30 days of the operation (or in the case of surgery involving an implant, was a deep or organ/space SSI that developed within 90 days of the operation) and the patient either has symptoms that meet the case definition and/or is on antimicrobial treatment for that infection
- Devices
 - an invasive device was placed on Day 1 or Day 2, resulting in an HAI before Day 3.
- Admission
 - The patient has been admitted (or develops symptoms within two days) with *C. difficile* infection less than 28 days after a previous discharge from an acute-care hospital;

Results of tests/examinations that are not yet available on the survey date should neither be completed after the survey date nor taken into account when establishing whether the case definition criteria are fulfilled. This exclusion may cause some cases of HAI to be discarded, but will compensate for the (potentially long) retrospective period preceding the start of the treatment when signs or symptoms are no longer present on the survey date.

Device-associated HAI is an HAI in a patient with a (relevant) device that was used within the 48-hour period before onset of infection (including intermittent use). The term 'device-associated' is only used for pneumonia, bloodstream infection and urinary tract infection. The 'relevant devices' are intubation, vascular (central/peripheral) catheter and urinary catheter, respectively. If the interval is longer than 48 hours, there must be compelling evidence that the infection was associated with device use. For catheter-associated UTI, the indwelling urinary catheter must have been in place within seven days before positive laboratory results or signs and symptoms meeting criteria for UTI were evident. See: Horan *et al.* Definitions of key terms used in the NNIS system. Am J Infect Control 1997; 25:112-6.

A bloodstream infection (BSI and secondary BSI) is always registered as a separate HAI with specification of the source in a separate field (peripheral, arterial or central catheter, other infection site – PUL, UTI, DIG, SSI, SST, OTH); the only exceptions are a CRI3 (catheter-related bloodstream infection with microbiological documentation of the relationship between the vascular catheter and the BSI) and neonatal bloodstream infections. CRI3 and neonatal BSIs should not be reported twice in the point prevalence survey (see case definitions). Microbiologically confirmed catheter-related BSI should be reported as a CRI3. Neonatal bloodstream infections should be reported as NEO-LCBI or NEO-CNSB, together with BSI origin.

Recommended case finding algorithm for healthcare-associated infections



Forms and definitions of data items

Ward form



Point Prevalence Survey 2023: healthcare-associated infections and antimicrobial use

Ward data

Hospital code: _____ Ward name/unit ID¹: _____ Survey date²: ____/____/____

Ward specialty³ PED NEO ICU MED SUR G/O GER PSY YMH AMH OMH RHB LTC OTH MIX

For 2022/2023 financial year (or most recent FY data)

This should be requested from hospital analysts and procurement team and be available before web data entry commences

	Number	Year
Number of patient days in ward*		____/____
Alcohol hand rub (AHR) consumption		____/____
Number of hand hygiene opportunities		____/____

* Provide data for same year as AHR consumption

Is there a formal procedure (external to primary clinical team or ward pharmacy team) to review the appropriateness of an antimicrobial within 72 hours from the initial order in this ward (post-prescription review)?

Yes No Unknown

Comments/observations:

Data to be reported at time of survey	Number
Number of eligible ⁴ patients on ward	
Number of beds in ward	
Number of beds with AHR dispenser at point of care	
Number of HCWs ⁵ on ward at time of PPS	
Number of HCWs ⁵ on ward carrying AHR dispensers	
Number of rooms in ward	
Number of single rooms in ward	
Number of beds occupied at 00:01 on the day of PPS	18

¹ Unique identifier for each unit (abbreviated ward name) within a hospital; this should remain identical between PPS years;

² Patients on the same ward should be included on a single day;

³ Main ward specialty: $\geq 80\%$ of patients belong to this specialty, otherwise choose mixed (see codebook);

⁴ Patients admitted to the ward before or at 8:00 AM and not discharged from the ward at time of survey;

⁵ HCWs = Healthcare workers

Definition of ward data

Hospital code. Hospital identifier/code assigned by UKHSA

Ward name (abbreviated)/unit ID. Unique identifier for each hospital unit (abbreviated ward name); essential for linking between denominator and HAI/AMU data. If hospitals decide to leave their ward names as 1 to 50 (or whatever is the highest number), then they will need to keep a code list locally of those wards to allow translation to local ward names for feedback.

Survey date. Date on which the data were collected in the ward. Data from a single ward should be collected on one day; date dd/mm/yyyy.

Ward specialty PED=Paediatrics, NEO=Neonatal, ICU=Intensive Care, MED=Medicine, SUR=Surgical, G/O=Gynaecology/Obstetrics, GER=Geriatrics, PSY=Psychiatry, YMH=Young persons mental health, AMH=Adult mental health, OMH=Older persons mental health, RHB=Rehabilitation, LTC=Long-term care, OTH=Other, MIX=Mix;

Neonatal ICU patients should be coded as ward specialty NEO and paediatric ICU patients should be coded as ward specialty PED.

A ward with healthy newborns must either be allocated to GO when it is located in obstetrics, or to PED if it is located in paediatrics.

Number of patient-days in ward. Number of patient-days in one year for current ward (data from previous year if available, specify year in second column; years accepted 2022/2023, 2021/2022, 2020/2021). This should be requested from the hospital analysts/information team and be available before ward data entry commences.

Alcohol hand rub¹ consumption in wards (litres/year). Number of litres of alcohol hand rub delivered to the ward in one year. Provide data for the same year as the number of patient-days in the ward. This should be requested from the hospital procurement team and be available before ward data entry commences. If there are a variety of sizes used; these should be recalculated to litres.

Number of hand hygiene opportunities observed in ward / year. Number of hand hygiene opportunities observed in the current ward in one year. Provide data for previous year if available or the most recent data available (specify year in second column). Report the total number of observed opportunities for hand hygiene, not only the compliant observations.

Total number of eligible patients in ward. Total number of patients admitted to the ward before or at 8 a.m. that were not discharged from the ward at the time of the survey.

Number of beds in ward. Total number of beds in ward on the PPS day. Include 'corridor beds' and neonatal beds.

Number of beds in ward with AHR dispensers at the point of care. Number of beds in the ward with alcohol hand rub (AHR) dispensers available at the point of care as recommended by the 2009 WHO Guidelines on Hand Hygiene in Health Care. *AHR dispensers at the entrance of the patient room only are NOT considered as 'available at the point of care'*. The 'point of care' is the place where three elements come together: the patient, the HCW, and care or treatment involving contact with the patient or his/her surroundings (within the patient zone). The concept embraces the need to perform hand hygiene at recommended moments exactly where care delivery takes place. This requires that a hand hygiene product (e.g. alcohol-based hand rub, if available) be easily

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England accessible and as close as possible – within arm’s reach of where patient care or treatment is taking place. Point-of-care products should be accessible without having to leave the patient zone.

Number of HCWs on ward at time of PPS. Number of healthcare workers (HCWs) on ward at the time of PPS. The purpose of this variable is to measure the denominator of those carrying AHR dispensers. Therefore, this requires a visual inspection of each HCW on the ward and whether they are carrying AHR or not.

Number of HCWs on ward carrying AHR dispensers. Number of HCWs on ward carrying AHR dispensers (e.g. in their pocket).

Number of rooms in ward. Total number of rooms in the ward on the PPS day. A room requires a door that can close it off from the rest of the ward. A ward with 4 bays without any doors closing each bay would have 1 room. A ward with 2 bays with doors, 2 bays without doors, 1 single room without a toilet and 1 single room with individual toilet and shower, would have 5 rooms.

Number of single rooms in ward. Total number of single-bed rooms in the ward on the PPS day. Rooms with more than one bed that are designated for use as single occupancy and isolation rooms (e.g. for infection control purposes) should be included. This includes those with individual toilet and shower and those without individual toilet and shower.

Number of beds occupied at 00:01 on the day of PPS. Number of ward beds occupied at midnight on the day of the PPS - ward teams should be asked to document this for the PPS data collection team to collect on the day.

Consultant/ Patient Specialty. Please see **codebook** for complete list.

~~Note: how to code paediatric patients? Please add a note to the ‘Comments’ section of the form - “this is a paediatric ward” – then code the patient specialty as per adult codes. Paediatric patients will be coded as per age under 16 years or 17 years within paediatric hospitals. For obstetrics and gynaecology wards where mothers and babies stay together, register patient specialty for wards for mothers as GOOBS and babies as PEDBAB.~~

~~**Number of patients in ward by consultant/patient specialty.** Number of patients admitted to the ward before or at 8 a.m. and not discharged from the ward at the time of the survey, recorded separately for each consultant/patient specialty.~~

Post-prescription review of antimicrobials in ward. Is there a formal procedure (external to the clinical team or ward pharmacy team) to review the appropriateness of an antimicrobial within 72 hours from the initial order in this ward (post-prescription review)? It should be documented and the review should take place by individuals who are part of the hospital antimicrobial stewardship team with specific time in their jobs for this role. It should be performed by a person or team other than the treating physician or the ward pharmacist. The procedure should at least address the prescription of broad-spectrum or reserve antimicrobials but can include a review of all antimicrobials.

Comments/observations. Free text field to report e.g. feasibility issues, data quality problems or specific epidemiological information for the current ward.

Patient form (grouped)

Patient forms



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Point Prevalence Survey 2023: healthcare-associated infections and antimicrobial use Patient data, antimicrobial usage

Collect for all eligible patients

NHS number: _____

Hospital number: _____

Date of birth: ___/___/____ (dd/mm/yyyy) **Sex:** M / F / U

Ethnicity: _____ **Postcode:** _____

Date of hospital admission: ___ / ___ / ____ (dd / mm / yyyy)

Consultant/Patient Specialty²: _____

If neonate, birth weight: _____ grams

Surgery since admission (most recent NHSN surgery)?

- No surgery Minimal invasive/non-NHSN surgery
 NHSN surgery -> specify (optional)²: _____ Unknown

McCabe score:

- Non-fatal disease Ultimately fatal disease
 Rapidly fatal disease Unknown

Is the patient vaccinated against COVID-19?

- No Partial Full -> additional doses 1 >=2 Unknown

Presence of any of the following (at time of survey):

- Central vascular catheter: No Yes Unknown
Urinary catheter: No Yes Unknown
Intubation: No Yes Unknown

Does the patient have allergies to any antimicrobial?

- Present Nil known Not documented

Is the patient receiving any antimicrobial(s)³:

- No Yes → if “Yes”, complete antimicrobial usage data (**over page**)

Does the patient have an active HAI⁴?:

- No Yes → if “Yes”, complete HAI data form (**over page**)
(if yes, fill HAI data; if patient has > 3 HAIs, add new form)

Hospital code: _____

Ward name/unit ID¹: _____

Survey date: ___/___/____ (dd/mm/yyyy)

- (1) Unique identifier for each unit (abbreviated ward name) within a hospital;
- (2) See codebook;
- (3) At the time of the survey, except for surgical prophylaxis 24h before 8:00 AM on the day of the survey; if yes, fill antimicrobial use data; if patient receives >4 antimicrobials, add a new form;

(4) Active HAI definition

Meets one or more of these criteria:

Infection with onset ≥ Day 3,
OR SSI criteria met (surgery in previous 30d/90d),
OR discharged/transferred from HCF <48h ago,
OR CDI and discharged from HCF < 28 days ago
OR onset < Day 3 after invasive device/procedure on D1 or D2
OR COVID-19 on day 1 or day 2 and (re-)admission within 48 hours
after stay in HCF of >7 days
OR onset <day 3 after birth in neonates]

AND

Meets one or more of these criteria:

[HAI case criteria met on survey day
OR patient is receiving (any) treatment for HAI AND case criteria
are met between D1 of treatment and survey day];

Definition of patient data

Hospital code. Hospital identifier/code assigned by UKHSA.

Ward name. Abbreviated name of hospital ward: essential for linking between denominator and HAI/AMU data

Survey date. Date on which data were collected in this ward. Data from a single ward should be collected on one day (dd/mm/yyyy). This variable can be omitted from the patient data if ward data are provided. If ward data are not provided, it should be added on the patient form.

Initials. For local use only.

NHS number. 10 digit NHS number. This should be completed for all NHS patients and for independent sector for English residents, especially those who are receiving NHS funded procedures or interventions. For those without an NHS number please enter 9999999999.

Hospital number. Local hospital number to facilitate data entry, validation and checks.

DOB. Date of birth

Sex. Sex of the patient (at time of survey): M (male), F (female), U (Unknown or Other).

Date of hospital admission. Date patient was admitted to the hospital for the current hospitalisation (dd/mm/yyyy).

Consultant/patient specialty. Specialty of physician in charge of the patient or main specialty for which the patient was admitted to the hospital. If the consultant specialty differs from the patient specialty, give priority to the patient specialty. For healthy babies with mothers on obstetric and gynaecology ward, they should be coded as PEDBAB; the patient specialty for mothers on obstetric and gynaecology ward should be GOOBS. For paediatric patients on a PED ward, code the patient specialty as per adult codes using the subspecialty (MEDGEN, MEDSUR etc); exceptions are PEDGEN (Paediatrics general, not specialised) and ICUPED (paediatric ICU). Please note that long-term care is award specialty and should only exceptionally be used as a patient/consultant specialty.

Birth weight: birth weight in grams, to be provided for infants less than three months old or those on NICU; the birth weight is the weight of the infant at the time of birth and should not be changed as the infant gains or loses weight.

Surgery since admission. Patient has undergone surgery during current hospitalisation. Surgery is defined as a procedure performed primarily for therapeutic reasons where an incision is made (not just a needle puncture), with breach of mucosa and/or skin – not necessarily in the operating theatre. Answer categories: No surgery; yes, minimally invasive/non-NHSN surgery (examples see annex); yes, NHSN surgery – specify NHSN surgery code (ICD-9-CM code of the intervention is listed for the surveillance of surgical site infections in the NHSN system, see codebook); unknown. *Where multiple procedures have taken place record the most recent NHSN surgery.*

McCabe score. Classification of the severity of underlying medical conditions. Disregard the influence of acute infections, e.g. if the patient has an active HAI, estimate the score the patient had before the infection. Answer categories: Non-fatal disease (expected survival at least five years); ultimately fatal disease (expected survival between one and five years); rapidly fatal disease (expected death within one year); unknown.

Although the prognosis of diseases varies in time and between hospitals due to changes in treatment options and their availability, using McCabe scores can still be helpful. Some examples of disease and different McCabe score categories are given [below](#).

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England

These examples, in particular those of the second (ultimately fatal) category, are not meant to be exhaustive but rather to serve as a guidance tool for the current protocol.

Central vascular catheter. Patient has central vascular catheter in place on survey date; yes/no/unknown (includes temporary and longer term CVC including Hickman, portocath, vascath, PICC). It does not include temporary or permanent pacing wires, where fluid is not put in or blood withdrawn.

Peripheral vascular catheter. Patient has peripheral vascular (venous or arterial catheter) in place; yes/no/unknown.

Urinary catheter. Patient has indwelling urinary catheter in place at the date of the survey; yes/no/unknown.

Intubation. Patient is under intubation with or without mechanical ventilation (endotracheal tube or tracheostomy) on survey date; yes/no/unknown.

Is the patient receiving any antimicrobials? Patient receives at least one systemic antimicrobial agent on the date of the survey (given or planned treatment, including intermittent treatments, e.g. alternate day; or medical prophylaxis); for surgical antimicrobial prophylaxis, check whether any surgical prophylaxis was given in the 24 hours prior to 8 a.m. on the day of the survey. If patient is receiving ≥ 1 antimicrobial, collect antimicrobial use data.

How many antimicrobials is the patient receiving? (data-capture system only) Specify the number of antimicrobial agents the patient is receiving on the date of the survey (from 1 to 8) as per definitions above. This will permit collection of antimicrobial use data for each antimicrobial agent the patient is receiving on the date of the survey.

Does the patient have an active HAI? Patient has an active healthcare-associated infection on survey date. If patient has ≥ 1 active HAI, collect HAI data.

How many active HAIs does the patient have? (data-capture system only) Specify the number of HAIs the patient has on the date of the survey (from 1 to 4) as per definition above. This will permit collection of HAI data for each HAI the patient has on the date of the survey.

Examples of diseases for different McCabe score categories:

Rapidly fatal: less than one year

- End-state haematological malignancies (unsuitable for transplant, or relapsed), heart failure (EF <25%) and end-stage liver disease (unsuitable for transplant with recalcitrant ascites, encephalopathy or varices)
- Multiple organ failure on intensive care unit – APACHE II score >30, SAPS II score >70
- Pulmonary disease with cor pulmonale

Ultimately fatal: one year to four years

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England

- Chronic leukaemias, myelomas, lymphomas, metastatic carcinoma, end-stage kidney disease (without transplant)
- Motor neuron disease, multiple sclerosis non-responsive to treatment
- Alzheimer's disease/dementia
- Diabetes requiring amputation or post amputation

Nonfatal: >five years

- Diabetes
- Carcinoma/haematological malignancy with >80% five-year survival
- Inflammatory disorders
- Chronic GI, GU conditions
- Obstetrics
- Infections (including HIV, HCV, HBV – unless in above categories)
- All other diseases



UK Health
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Point Prevalence Survey 2023: healthcare-associated infections and antimicrobial use

Antimicrobial usage data¹

Hospital code: _____ Ward name/unit ID²: _____ Survey date: ____/____/____

NHS number: _____ Hospital number: _____ Date of birth: ____/____/____ Gender: _____

¹ See next page for response options for these questions

² Unique identifier for each unit (abbreviated ward name) within a hospital

Antimicrobial (AM) (generic name)	Route	Number of doses / day	Indication (CI, HI, LI, SP1, SP2, SP3, MP, O, UI)	Diagnosis (site) (only for CI, HI, LI)	Reason for AM in notes (Y/N)	Date this AM started (dd/mm/yyyy)	Antibiotic Review? (within 72h after start)	AM Changed? (+ reason)
						/ /		
						/ /		
						/ /		
						/ /		
						/ /		

Optional														
Number missed doses	Reason missed doses	Course length or stop date documented? (Y/N)	Guidance compliance (1-6)	Surgical prophylaxis for more than 24 hours (Y/N/NA)	Allergy mismatch (Y/N/ND/UNK)	Microbiology mismatch (Y/N/S/P/S)	Indication does not require ANY antimicrobials (Y/N/UNK)	Incorrect route (Y/N/UNK)	Incorrect dose/frequency	Incorrect duration	Spectrum too broad (Y/N/UNK)	Spectrum too narrow (Y/N/UNK)	If AM restricted, approval given (Y/N/UNK)	Appropriateness (1-5)

Optional notes

Were appropriate microbiology samples collected?

Yes Partially* Not applicable No Not assessable

Record the specimen type, organism, and susceptibilities if relevant

*If more than one indication or microbiological sample is required

Clinical notes or comments

Renal replacement therapy given with previous 24 hours (e.g. dialysis)



Point Prevalence Survey 2023: healthcare-associated infections and antimicrobial use

Antimicrobial usage data

RESPONSES

Route: P=parenteral, O=oral, R=rectal, I=inhalation;

Number of doses / day: OD=once a day, BD=twice a day, TDS=3 times a day, QDS=4 times a day, 18hrly, QOD=alternate day; three times/week; weekly

Indication: treatment intention for community (CI), long-term care (LI) or acute hospital (HI) infection; surgical prophylaxis: SP1: single dose, SP2: one day, SP3: >1 day; MP: medical prophylaxis; O: other; UI: Unknown indication/reason (verified during PPS), UNK: Unknown/missing, information on indication was not verified during PPS

Diagnosis: see site list, only for CI-LI-HI; Otherwise code as not applicable (NA).

Reason in notes: Y/N;

Date this AM started (dd/mm/yyyy): Start date of the current antimicrobial. If the patient received the antimicrobial on admission, record the date of admission.

Antibiotic Review (within 72 hours after start of each antibiotic; not from the start of the indication): Y=Yes, N=No, UNK =Unknown; NA=Not applicable (start less than 72h ago);

AM Changed? (+ reason): Was the antimicrobial (or the route of administration) changed for this indication, and if so, what was the reason? N=no change, E=escalation, D=De-escalation, S=switch IV to oral, A=adverse effects, O=OPAT, OU=changed, other/unknown reason, U=unknown;

Number missed doses: From start date of current antibiotic treatment until the date of the survey. If no doses missed, report as 0. If unknown, leave field empty.

Reason missed doses: S=due to stock out, P=patient could not purchase, D=patient declined/refused, O=other reason, M=multiple reasons, UNK=unknown.

Course length or stop date documented? Y=Yes, N=No;

Guidance compliance: Was the antimicrobial prescription compliant with guidelines? 1=Compliant with National Guidelines, 2=Compliant with locally endorsed guidelines (select 1=National guidelines if local guidelines are the same), 3=Non-compliant with guidelines, 4=Directed therapy, 5=No guidelines available, 6=Not assessable (see accompanying criteria);

Surgical prophylaxis for more than 24 hours: Y=Yes, N=No, NA=Not applicable (e.g. surgical prophylaxis not administered)

Allergy mismatch: Y=Yes, N=No, ND=Not documented, UNK=unknown;

Microbiology mismatch: Is there a mismatch in relation to susceptibility testing. Y=Yes, N=No, NS=specimen not sent, P=result pending, S=susceptibility testing not performed;

Indication does not require ANY antimicrobials: Y=Yes, N=No, UNK=Unknown;

Incorrect route: Y=Yes, N=No, UNK=Unknown;

Incorrect dose/frequency: No, dose and frequency were correct; H=Yes, dose or frequency too high, L=Yes, dose or frequency too low;

Incorrect duration: N=No, duration correct, TL= Yes, duration too long, TS= Yes, duration too short;

Spectrum too broad/ Spectrum too narrow: Y=Yes, N=No, UNK=Unknown;

If AM restricted, approval given: if local policy restricts a certain antimicrobial for specialist approval or pre-authorization. Y=Yes, N=No, UNK=Unknown;

Appropriateness: 1=Optimal, 2=Adequate, 3=Suboptimal, 4=Inadequate, 5=Not assessable (see accompanying guidance)



Point Prevalence Survey 2023: healthcare-associated infections and antimicrobial use

Compliance with guidelines assessment criteria (adapted from Australian National Antimicrobial Prescribing Survey¹)

Compliance with guidelines (only choose one of the following five criteria)

Compliant with National Guidelines²	<ul style="list-style-type: none"> • The prescription complies with the current National Guidelines², including: <ul style="list-style-type: none"> ○ route, does, frequency AND <ul style="list-style-type: none"> ○ takes into account acceptable alterations due to age, weight, renal function, allergies, other prescribed medications etc.
Compliant with locally endorsed guidelines³	<ul style="list-style-type: none"> • The prescription complies with an officially endorsed local guideline, including: <ul style="list-style-type: none"> ○ route, does, frequency AND <ul style="list-style-type: none"> ○ takes into account acceptable alterations due to age, weight, renal function, allergies, other prescribed medications etc. • This does not include individual, departmental or historical guidelines that do not have executive or drug and therapeutic committee approval • If the local guidelines are based exactly on the National Guidelines², then choose the 'National Guidelines' in preference to 'Local Guidelines'
Non-compliant with guidelines	<ul style="list-style-type: none"> • There is non-compliance with both National Guidelines² and local guidelines. <p>UNLESS</p> <p>the prescription takes into account acceptable alterations due to age, weight, renal function, allergies, other prescribed medications etc.</p>
Directed therapy	<ul style="list-style-type: none"> • The prescription has changed from empiric to directed therapy with microbiology culture or susceptibility results available
No guidelines available	<ul style="list-style-type: none"> • There are no guidelines available for the documented or presumed indication
Not assessable	<ul style="list-style-type: none"> • The medical records are not comprehensive enough to determine a documented or presumed indication <p>OR</p> <ul style="list-style-type: none"> • It is difficult to assess if there is compliance

¹ Royal Melbourne Hospital and the National Centre for Antimicrobial Stewardship. Antimicrobial prescribing practice in Australian hospitals. Results of the 2020 Hospital National Antimicrobial Prescribing Survey Canberra: Department of Health and Aged Care; 2023. <https://www.ncas-australia.org/ncas-publications> date accessed: 02/08/2023

² [National Institute for Health and Care Excellence guidelines on antimicrobial stewardship \(including prescribing\)](#)

³ Local guidelines must be authorised and readily available on wards or on the hospital intranet. They cannot be a web link to international guidelines or other non-approved sites. Exceptions include paediatric and neonatal guidelines from an English children's hospital and links to other guidelines within a hospital's network



Point Prevalence Survey 2023: healthcare-associated infections and antimicrobial use: Appropriateness definitions (adapted from Australian National Antimicrobial Prescribing Survey¹)

		If endorsed guidelines are <u>present</u>	If endorsed guidelines are <u>absent</u>
Appropriate	1	Optimal²	Antimicrobial prescription follows either the National Guidelines ³ or endorsed local guidelines optimally , including antimicrobial choice, dosage, route and duration ⁴ The antimicrobial prescription has been reviewed and endorsed by an infectious diseases clinician or clinical microbiologist OR The prescribed antimicrobial will cover the likely causative or cultured pathogens and there is not a narrower spectrum or more appropriate antimicrobial choice, dosage, route or duration ⁴ available
	2	Adequate	Antimicrobial prescription does not optimally follow the National Guidelines ³ or endorsed local guidelines, including antimicrobial choice, dosage, route and duration ⁴ , however, is a reasonable alternative choice for the likely causative or cultured pathogens OR For surgical prophylaxis, as above and duration ⁴ is less than 24 hours Antimicrobial prescription including antimicrobial choice, dosage, route and duration ⁴ is not the most optimal, however, is a reasonable alternative choice for the likely causative or cultured pathogens OR For surgical prophylaxis, as above and duration ⁴ is less than 24 hours
Inappropriate	3	Suboptimal	There may be a mild or non-life-threatening allergy mismatch OR Antimicrobial prescription including antimicrobial choice, dosage, route and duration ⁴ , is an unreasonable choice for the likely causative or cultured pathogens, including: <ul style="list-style-type: none"> • spectrum excessively broad, unnecessary overlap in spectrum of activity, dosage excessively high or duration excessively long • Failure to appropriately de-escalate with microbiological results
	4	Inadequate	Antimicrobial prescription including antimicrobial choice, dosage, route and duration ⁴ , is unlikely to treat the likely causative or cultured pathogens OR The documented or presumed indication does not require any antimicrobial treatment OR There may be a severe or possibly life-threatening allergy mismatch, or the potential risk of toxicity due to drug interaction OR For surgical prophylaxis, the duration ⁴ is greater than 24 hours (except where local guidelines endorse this)
	5	Not assessable	The indication is not documented and unable to be determined from the notes OR The notes are not comprehensive enough to assess appropriateness OR The patient is too complex, due to multiple co-morbidities, allergies or microbiology results, etc

¹ Rodney James and others, The feasibility and generalizability of assessing the appropriateness of antimicrobial prescribing in hospitals: a review of the Australian National Antimicrobial Prescribing Survey, JAC-Antimicrobial Resistance, <https://doi.org/10.1093/jacamr/dlac012>

² Taking into account acceptable changes due to the patient's weight, allergy status, renal or hepatic function, or relevant drug interactions (if this information is available)

³ National Institute for Health and Care Excellence guidelines on antimicrobial stewardship (including prescribing)

⁴ Duration should only be assessed if the guidelines state a recommended duration and the antimicrobial has already been dispensed for longer than this, or there is a clear planned 'end date' documented



Point Prevalence Survey 2023: healthcare-associated infections and antimicrobial use

HAI data

Hospital code: _____ Ward name/unit ID¹: _____ Survey date: ____/____/____

NHS number: _____ Hospital number: _____ Date of birth: ____/____/____ Gender: _____

	HAI 1				HAI 2				HAI 3						
Case definition code															
Invasive device²	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown						
Present on admission	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown						
Date of onset³	/ /				/ /				/ /						
Origin of infection	<input type="checkbox"/> Current hospital <input type="checkbox"/> Other acute care hospital <input type="checkbox"/> LTCF <input type="checkbox"/> Other community/mental health hospital <input type="checkbox"/> Other/ unknown				<input type="checkbox"/> Current hospital <input type="checkbox"/> Other acute care hospital <input type="checkbox"/> LTCF <input type="checkbox"/> Other community/mental health hospital <input type="checkbox"/> Other/ unknown				<input type="checkbox"/> Current hospital <input type="checkbox"/> Other acute care hospital <input type="checkbox"/> LTCF <input type="checkbox"/> Other community/mental health hospital <input type="checkbox"/> Other/ unknown						
HAI associated to current ward	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown				<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown						
If BSI: source⁴															
	MO code	Spec type ⁵	AMR		PDR	MO code	Spec type ⁵	AMR		PDR	MO code	Spec type ⁵	AMR		PDR
			AB ⁶	SIR				AB ⁶	SIR				AB ⁶	SIR	
Microorganism 1															
Microorganism 2															
Microorganism 3															

¹ Unique identifier for each unit (abbreviated ward name) within a hospital

² Relevant invasive device present (even intermittently) 48 hours before onset infection; intubation for pneumonia (PN); CVC/PVC for BSI; urinary catheter for UTI

³ Only for infections not present/active on admission (dd/mm/yyyy)

⁴ C-CVC (central venous catheter), C-PVC (peripheral venous catheter), S-PUL (pulmonary infection), S-UTI (urinary tract infection), S-DIG (digestive tract infection), S-SSI (surgical site infection), S-SST (skin/soft tissue infection), S-OTH (other), UO (none of the above, BSI of unknown origin, clinically asserted), UNK (unknown)

⁵ Specimen type: B=Blood, CSF=Cerebrospinal fluid, U=urine, S=sputum, T=tissue, SB=swab, O=Other fluid, BAL = Bronchoalveolar Lavage

⁶ AB: tested antibiotic(s): *S. aureus*: OXA (includes oxacillin or other marker for MRSA such as ceftazidime, ceftazidime-avopivoxil, ceftazidime-meropenem, ceftazidime-tazobactam, ceftazidime-meropenem, ceftazidime-meropenem, ceftazidime-meropenem, ceftazidime-meropenem) and GLY; Enterococci: GLY; Enterobacterales: C3G and CAR; *P. aeruginosa* and *Acinetobacter* spp.: CAR; SIR: S=susceptible, standard, I=susceptible, increased exp, R=resistant, U=unknown; PDR: Pan-drug resistant; N=No, P=Possible, C=Confirmed, U=Unknown

Antimicrobial use section

Antimicrobial generic name. Allowed are, for example, amoxicillin; include ATC codes (ATC 2nd level: J01, antibacterials for system use; J02 antifungals for systemic use; ATC 4th level: A07AA, P01AB, D01BA; ATC 5th Level: J04AB02). Treatment for tuberculosis is excluded but antituberculosis drugs are included when used for treatment of mycobacteria other than tuberculosis (MOTT) or as reserve treatment for multidrug-resistant bacteria. See codebook for included antimicrobial agents.

Route. Route of administration of the antimicrobial agent; **P**=parenteral; **O**=oral; **R**=rectal; **I**=inhalation.

Dosage per day. OD=once a day, BD=twice a day, TDS=3 times a day, QDS=4 times a day, 18hrly, QOD=alternate day; three times/week; weekly

The main objective of this variable is to provide information to 1) enable comparisons of antimicrobial consumption nationally and internationally, and 2) enable updating the defined daily doses (DDD) values by the WHO Collaboration Centre for Drug Statistics Methodology (Norwegian Institute of Public Health, www.whocc.no).

Indication for antimicrobial use. Patient receives systemic antimicrobials for :

- treatment intention: **CI**: community-acquired infection; **LI**: infection acquired in long-term care facility (e.g. nursing home) or chronic-care hospital; **HI**: acute-hospital-acquired infection.
- surgical prophylaxis: **SP1**: single dose; **SP2**: one day; **SP3**: > 1 day: check if given in the 24 hours prior to 8 a.m. on the day of the survey – if yes, check if given on the day before yesterday or on the day of the survey in order to determine duration.
- **MP**. Medical prophylaxis.
- **O**. Other indication (e.g. erythromycin use as a prokinetic agent).
- **UI**. Unknown indication/reason (verified during PPS).
- **UNK**. Unknown/missing, information on indication was not verified during PPS.

If the antimicrobial use is intended for treatment of an infection (CI, LI or HI), fill in site of infection (diagnosis). Otherwise code NA (not applicable).

Diagnosis (Infection site). Diagnosis group by anatomical site: see infection (site) code list for antimicrobial use. Should only be recorded when the indication is 'intention to treat an infection'; not recorded for prophylaxis or other indications (use code NA=not applicable).

Reason in notes: yes/no. Yes if the reason for antimicrobial use was documented in the patient chart/notes.

Start date current antimicrobial. Start date of the current antimicrobial. If the patient received the antimicrobial on admission, record the date of admission.

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England

Antibiotic Review? (less than 72 hours after start of each antibiotic; not from the start of the indication) Y=Yes, N=No, UNK=Unknown, not documented; NA=not applicable (i.e. treatment with this antibiotic is less than 72 hours)

Antimicrobial changed? (+ reason). Was the antimicrobial (or the route of administration) changed for this indication, and if so, what was the reason? If the antimicrobial was changed more than once for the current indication, report the reason of the last change. The term “indication” in this context should be interpreted as the entire treatment regimen for the infection episode.

N=no change, antimicrobial was not changed.

E=escalation: antimicrobial was escalated (or other antimicrobial was added) on microbiological and/or clinical grounds, i.e. the isolated microorganism was not susceptible to the previous antimicrobial and/or lack of clinical effect of previous antimicrobial; includes switch from oral to parenteral for the same antimicrobial.

D=De-escalation: antimicrobial was de-escalated on microbiological and/or clinical grounds, i.e. the isolated microorganism was susceptible to more narrow-spectrum or first-line antimicrobials than the previous antimicrobial and/or the clinical situation of the patient allows changing to a more narrow-spectrum or to a first-line antimicrobial. If other antimicrobials given for the same indication were stopped at the time of the survey, report de-escalation for the remaining antimicrobial(s).

S=switch IV to oral; route of administration of same antimicrobial was changed from parenteral to oral. A switch can also occur between antimicrobials belonging to the same antimicrobial class, e.g. IV co-amoxiclav to oral co-amoxiclav or IV levofloxacin to oral ciprofloxacin or IV ceftriazone to oral cefixime.

A=adverse effects; antimicrobial was changed because of observed or expected side or adverse effects of the antimicrobial.

OPAT=Outpatient parenteral antibiotic therapy service

OU=change for other or unknown reason: the antimicrobial for that indication was changed for another reason or the antimicrobial was changed but the reason why could not be determined by the surveyor.

U=unknown: no information on whether the antimicrobial was changed or not.

The following questions are optional but organisations participating in surveys in Australia and England that use these indicators have found the outputs informative for antimicrobial stewardship. Many of the questions have been adapted from the Australian National Antimicrobial Prescribing Survey.

Number missed doses: From start date of current antibiotic treatment until the date of the survey. If no doses missed, report as 0. If unknown, leave field empty.

Reason missed doses: S=due to stock out, P=patient could not purchase, D=patient declined/refused, O=other reason, M=multiple reasons, UNK=unknown.

Course length or stop date documented? Y=Yes, N=No;

Guidance compliance: Was the antimicrobial prescription compliant with guidelines? 1=Compliant with National Guidelines, 2=Compliant with locally endorsed guidelines (select 1=National guidelines if local guidelines are the same), 3=Non-compliant with guidelines, 4=Directed therapy, 5=No guidelines available, 6=Not assessable (see accompanying criteria);

Surgical prophylaxis for more than 24 hours: Y=Yes, N=No, NA=Not applicable (e.g. surgical prophylaxis not administered)

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England

Allergy mismatch: Was there a mismatch between the allergy information for the patient and the prescribed antimicrobial agent?

Y=Yes, N=No, ND=Not documented, UNK=unknown;

Microbiology mismatch: Is there a mismatch in relation to susceptibility testing and the prescribed antimicrobial agent? Y=Yes, N=No, NS=specimen not sent, P=result pending, S=susceptibility testing not performed;

Indication does not require ANY antimicrobials: Y=Yes, N=No, UNK=Unknown;

Incorrect route: Was the route of administration incorrect? Y=Yes, N=No, UNK=Unknown; Yes if the route was incorrect.

Incorrect dose/frequency: N=No, dose and frequency were correct; H=Yes, dose or frequency too high, L=Yes, dose or frequency too low;

Specify H if the dose or frequency are incorrect and too high and L if the dose or frequency are incorrect and too low.

Incorrect duration: N=No, duration correct, TL= Yes, duration too long, TS= Yes, duration too short;

Spectrum too broad: Y=Yes, N=No, UNK=Unknown; Yes if the spectrum was too broad

Spectrum too narrow: Y=Yes, N=No, UNK=Unknown; Yes if the spectrum was too narrow

If AM restricted, approval given: if local policy restricts a certain antimicrobial for specialist approval or pre-authorization. Y=Yes, N=No, UNK=Unknown;

Appropriateness: 1=Optimal, 2=Adequate, 3=Suboptimal, 4=Inadequate, 5=Not assessable (see accompanying guidance)

The assessment of appropriateness is adapted from the Australian National Antimicrobial Prescribing Survey.

Healthcare-associated infection data

Case definition code. HAI case definition codes: see codebook. A single-case definition code should only be provided once per patient (no different infection episodes). For pneumonia and urinary tract infections, only fill in one subcategory (priority pneumonia: PN1> PN2> PN3> PN4> PN5; urinary tract infections: UTI-A> UTI-B). For laboratory-confirmed bloodstream infections, provide only one of BSI, CRI3 (priority CRI3> BSI), NEO-LCBI or NEO-CNSB (priority NEO-LCBI> NEO-CNSB [> BSI]). All signs and symptoms since the onset of the infection until the time of the survey should be considered to categorise the HAI.

Relevant device in situ: yes/no/unknown. To be specified for PN, BSI, NEO-LCBI, NEO-CNSB and UTI only. Answer 'Yes' if a relevant invasive device was in situ (even intermittently) for any amount of time within 48 hours for PVC/ CVC (for BSI/ CRI/ CVS-VASC), Intubation (PN) and seven days for UC for UTI before onset of the infection.

Infection present at admission: yes/no. Signs and symptoms of the infection were present at admission to the hospital; if not, provide date onset of infection.

Date of onset. Date of onset of the infection (dd/mm/yyyy). Not to be recorded if signs/symptoms are present at admission (tick the N/A response box), but mandatory if onset during current hospitalisation. Record the date of first signs or symptoms of the infection; if unknown, record the date treatment was started for this infection or the date the first diagnostic sample was taken. If no treatment or sample, please estimate.

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England

Origin of the infection. Infection is associated with (1) current hospital; (2) another acute care hospital; (3) other origin or unknown. Infections present at admission may be associated with a previous stay in your hospital or a transfer from another acute care facility. The category 'other origin or unknown' can be used e.g. for infections with an onset after day 2 of the current hospitalisation (= HAI by definition), for which the surveyor does not agree that it is associated with the current hospital stay. However, the category should not be used for long-term care-facility/nursing-home-associated infections, since only HAI associated with acute care hospital stays are recorded in the ECDC PPS.

HAI associated to current ward. An HAI is associated with the current ward if the infection started on day 3 or later after admission to the current ward (where the date of admission to the ward is day 1) OR if the infection started on day 1 or 2 after a placement of an invasive device on the current ward OR if the patient was readmitted with an HAI present on admission associated to a previous stay in the same ward, within 30 days after operation for surgical site infections (or 90 days for deep and organ/space SSI after implant surgery), less than 28 days after discharge for *C. difficile* infections, less than 48 hours (two calendar days) after discharge for other HAIs.

If BSI: source. If lab-confirmed bloodstream infection, specify the origin: catheter-related (central: **C-CVC**, peripheral **C-PVC**), secondary to another infection: pulmonary (**S-PUL**), urinary tract (**S-UTI**), digestive tract (**S-DIG**), surgical site infection (**S-SSI**), skin and soft tissue infection (**S-SST**), other infection (**S-OTH**), or BSI of (confirmed) unknown origin (**UO**); missing data, no information available=UNK; Secondary BSI reported as separate HAI, in addition to the primary infection if it matches the case definition.

Microorganisms. Collect microbiological results available on the survey date (do not wait for results not available on the survey date).

Antimicrobial resistance phenotype. Specify susceptibility to selected antimicrobial resistance (AMR) marker depending on microorganism. Report S (susceptible), I (intermediate), R (resistant) or U (unknown) for the antimicrobial group (preferred) or for tested antimicrobials within the group. When group susceptibility is reported and several antibiotics within the group were tested (e.g. carbapenems (CAR)), report the least susceptible result for the group (e.g. meropenem R + imipenem I = CAR R; Ertapenem is not coded.). When AMR markers are collected according to the PPS I protocol methodology (susceptible vs non-susceptible), report S (susceptible), IR (non-susceptible) or U (unknown), except for MRSA, report non-susceptibility to oxacillin (or equivalent) as R (resistant).

Staphylococcus aureus: OXA, GLY

- MRSA: Susceptibility to oxacillin (OXA) or other marker of methicillin-resistant *S. aureus* (MRSA), such as ceftazidime (FOX), cloxacillin (CLO), dicloxacillin (DIC), flucloxacillin (FLC), methicillin (MET)
- VISA, VRSA: Susceptibility to glycopeptides (GLY): vancomycin (VAN) or teicoplanin (TEC), report the most resistant isolate

Enterococcus spp.: GLY

- VRE: Susceptibility to glycopeptides (GLY): vancomycin (VAN) or teicoplanin (TEC)

Point Prevalence Survey on Healthcare Associated Infections, Antimicrobial Use and Antimicrobial Stewardship in England

Enterobacteriaceae (*Escherichia coli*, *Klebsiella* spp., *Enterobacter* spp., *Proteus* spp., *Citrobacter* spp., *Serratia* spp., *Morganella* spp.): C3G, CAR

- Third-generation cephalosporins (C3G): cefotaxime (CTX), ceftriaxone (CRO), ceftazidime (CAZ), report consistent with the most resistant MIC
- Carbapenems (CAR): imipenem (IPM), meropenem (MEM), doripenem (DOR)

Pseudomonas aeruginosa : CAR

- Carbapenems (CAR): imipenem (IPM), meropenem (MEM), doripenem (DOR)

Acinetobacter spp. : CAR

- Carbapenems (CAR): imipenem (IPM), meropenem (MEM), doripenem (DOR)

Pandrug resistance (PDR). Microorganism is pandrug-resistant. No PDR =N (susceptible to at least one antimicrobial), Possible PDR = P (I/R to all antimicrobials tested in hospital), Confirmed PDR = C (I/R to all antimicrobials confirmed by reference laboratory), U=Unknown. Source Clin Microbiol Infect. 2012 Mar;18(3):268-81.

Abbreviations (also see codebook)

A&E:	Accident and Emergency
AM:	Antimicrobial / antimicrobial agent
AMR:	Antimicrobial resistance
AU:	Antimicrobial use
BSI:	Bloodstream Infection
CQC	Care Quality Commission
CVC:	Central vascular catheter
ECDC:	European Centre for Disease Prevention and Control
HAI:	Healthcare-associated infections
ICU:	Intensive Care Units
NEO-CNSB	Laboratory-confirmed bloodstream infection with coagulase-negative staphylococci in neonates
NEO-LCBI	Laboratory-confirmed bloodstream infection in neonates, non-CNS
NNIS	National Nosocomial Infections Surveillance
PPS:	Point Prevalence Survey
PVC:	Peripheral vascular catheter
SPI:	Structure and process indicators
SSI:	Surgical Site Infections
SST	Skin and Soft Tissue
UTI	Urinary Tract Infection

About the UK Health Security Agency

UKHSA 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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