Point prevalence survey of healthcare-associated infections and antimicrobial use in European acute care hospitals

Belgian protocol, version 1.0

ECDC PPS 2017
Contents

Abbreviations ................................................................. iv
Objectives ................................................................. 1
Inclusion/exclusion criteria ................................................... 1
  Hospitals .................................................................. 1
  Wards .................................................................. 1
  Patients .................................................................. 1
Data collection ................................................................ 2
  When? .................................................................. 2
  Who will collect the data? ........................................... 2
Overview of collected data .................................................. 2
Hospital data ................................................................... 3
  Definition of hospital data ........................................... 3
Ward data ....................................................................... 8
  Definition of ward data ............................................... 8
Patient data ...................................................................... 10
  Definition of patient data ............................................. 10
Antimicrobial use data and HAI data .................................... 12
  Antimicrobial use data ................................................ 12
  Definitions of antimicrobial use data ............................. 12
Healthcare-associated infection data ................................... 14
  Key terms and notes .................................................... 14
  Definitions of healthcare-associated infection data .......... 14
  Note on case definitions of healthcare-associated infections ......................................................................................................................... 16
  Recommended case-finding algorithm for healthcare-associated infections ................................................................. 17
Data delivery .................................................................... 18
  Software .................................................................. 18
  Deadline for data delivery ............................................ 18
Data analysis and feedback .................................................. 18
Training ......................................................................... 18
Ethical considerations ........................................................ 18
Contact information .......................................................... 19
Annex 1. Forms ................................................................ 20
References ....................................................................... 21

Figures

Figure 1. Examples of included and excluded patients in the point prevalence survey ......................................................... 2
Figure 2. Hospital data (form H1; page 1 of 2) ................................................................. 3
Figure 3. Ward data (form W) ........................................................................ 8
Figure 4. Patient-based risk factors (form A): one form per patient, antimicrobial use and HAI data collected on same form ......................................................................................................................... 10
Figure 5. Recommended case finding algorithm for healthcare-associated infections ................................................................. 17
Abbreviations

A&E  Accidents and emergency
AM  Antimicrobial/antimicrobial agent
AMR  Antimicrobial resistance
ATC  Anatomical Therapeutic Chemical classification system (WHO)
AU  Antimicrobial use
BSI  Bloodstream infection
CDC  Centres for Disease Control and Prevention (Atlanta, USA)
CDI  *Clostridium difficile* infections
CFU  Colony-forming units
CVC  Central vascular catheter
DSN  Dedicated surveillance network
EARS-Net  European Antimicrobial Resistance Surveillance Network (at ECDC)
ECDC  European Centre for Disease Prevention and Control
EEA  European Economic Area
EFTA  European Free Trade Association
ESAC  European Surveillance of Antimicrobial Consumption project
ESBL  Extended-spectrum beta-lactamases
ESCMID  European Society of Clinical Microbiology and Infectious Diseases
ESGARS  ESCMID Study Group on Antimicrobial Resistance Surveillance
ESICM  European Society of Intensive Care Medicine
FTE  Full-time equivalent
HAI  Healthcare-associated infections
HAI-Net  Healthcare-Associated Infection surveillance Network (at ECDC)
HALT  Healthcare-associated infections in long-term care facilities (ECDC-sponsored follow-up project to IPSE WP7)
HCW  Healthcare worker
HELICS  Hospitals in Europe Link for Infection Control through Surveillance project
ICU  Intensive care unit
IPSE  Improving Patient Safety in Europe project
LTCF  Long-term care facility
LRT  Lower respiratory tract
MS  Member States
NHSN  National Healthcare Safety Network (at CDC)
PPS  Point prevalence survey (also used as an abbreviation of the current survey)
PVC  Peripheral vascular catheter
SPI  Structure and process indicator
SSI  Surgical site infection
TESSy  The European Surveillance System (ECDC’s web-based data reporting system for the surveillance of communicable diseases)
TRICE  Training in Infection Control in Europe (ECDC-sponsored follow-up project to IPSE WP1)
WHO  World Health Organization
Objectives

The objectives of the ECDC point prevalence survey (PPS) of healthcare-associated infections (HAIs) and antimicrobial use (AU) in acute care hospitals are as follows:

- to estimate the total burden (prevalence) of HAIs and antimicrobial use in acute care hospitals in the EU
- 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 and
  - by EU country, adjusted or stratified
- to describe key structures and processes for the prevention of HAIs and antimicrobial resistance at the hospital and ward level in EU hospitals
- to disseminate results to those who need to know at local, regional, national and EU level:
  - to raise awareness
  - to enhance surveillance structures and skills
  - to identify common EU 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.

Inclusion/exclusion criteria

Hospitals

All acute care hospitals are eligible for inclusion. An acute care hospital is defined in accordance with national definitions. There is no minimal size of hospitals.

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

Wards

Include all wards in acute care facilities, including, for example, chronic care and long-term care wards, acute psychiatric wards and neonatal ICUs.

Excluded are accident and emergency (A&E) departments (except for wards attached to A&E departments where patients are monitored for more than 24 hours).

The ward specialty is always recorded so that results can be stratified and standardised.

Patients

Include all patients admitted to the ward before or at 8 a.m. and not discharged from the ward at the time of the survey; in practice, this means that patients transferred in/out after 8 a.m. from/to another ward should not be included (see Figure 1). Include neonates on maternity and paediatric wards if born before/at 8 a.m. (see also under neonates).

Exclude day cases:

- patients undergoing same day treatment or surgery;
- patients seen at outpatient department;
- patients in the emergency room;
- dialysis patients (outpatients).

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

When?

The PPS will be organized **between 1 September 2017 and 30 November 2017** in Belgium.

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 that hospital infection control personnel, members of the antibiotic policy control group as well as the team in charge of the patients are involved.

Overview of collected data

Data are collected at the hospital level using ECDC's standard (patient-based) protocol.

- **Hospital data** (*forms H1–H2*): one form per hospital per PPS.
- **Ward data** (*form W*): one form per ward, including structure and process indicators and denominator data for all patients present in the ward at 8 a.m. and not discharged at the time of the survey.
- **Patient data** (*form A*): 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 eligible patient, with or without an HAI or antimicrobial; 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 the hospital level in the context of Council Recommendation 2009/C 151/01 of 9 June 2009 on patient safety, including the prevention and control of healthcare-associated infections [1].

**Figure 2. Hospital data (form H1; page 1 of 2)**

![Form H1: Hospital data](image)

**Definition of hospital data**

**Hospital code.** Hospital identifier/code assigned by national PPS coordinating centre; unique code per surveillance/PPS network; should remain the same for all PPS periods/years.

**Survey dates.** Start and end date for the PPS in the entire hospital; the end date is the date the data were collected in the last ward.

**Hospital size.** Total number of beds in the hospital. Include all beds that may generate (in)patient-days and admissions/discharges. Exclude beds which are exclusively used for day cases (e.g. day-care wards).

**Number of acute care beds.** Number of acute care beds in the hospital (in accordance with to national definition)

**Number of ICU beds.** Number of intensive care unit beds in the hospital. No ICU=0
**Ward exclusion.** Were any wards excluded for the PPS in your hospital? Yes/No.

**Specify excluded wards.** Specify which wards where excluded, if any; free text; please use specialty codes if possible.

**Total number of beds in included wards.** Sum of the number of beds in wards that were included in the PPS.

**Total number of patients included in PPS.** Sum of the number of patients included in the PPS; variable used to double-check the exhaustiveness of reported data, i.e. the total number of individual patients in the standard protocol option.

**Hospital type.** Hospital type – PRIM: primary, SEC: secondary, TERT: tertiary, SPEC: specialised (definitions see below), missing=UNK; include specialisation if applicable; report the hospital type of the hospital site (single hospital) here; the type of the administrative hospital group/trust (if applicable) is reported in a separate variable (see variable 'Administrative hospital group type' below).

1 Primary
   - Often referred to as ‘district hospital’ or ‘first-level referral’.
   - Few specialties (mainly internal medicine, obstetrics-gynaecology, paediatrics, general surgery or only general practice).
   - Limited laboratory services are available for general, but not for specialised pathological analysis.
   - Often corresponds to general hospital without teaching function.

2 Secondary
   - Often referred to as ‘provincial hospital’.
   - Hospital is highly differentiated by function with five to ten clinical specialities, such as haematology, oncology, nephrology, ICU.
   - Takes some referrals from other (primary) hospitals.
   - Often corresponds to general hospital with teaching function.

3 Tertiary
   - Often referred to as ‘central’, ‘regional’ or ‘tertiary-level’ hospital.
   - Highly specialised staff and technical equipment (ICU, haematology, transplantation, cardio-thoracic surgery, neurosurgery).
   - Clinical services are highly differentiated by function.
   - Specialised imaging units.
   - Provides regional services and regularly takes referrals from other (primary and secondary) hospitals.
   - Often a university hospital or associated to a university.

4 Specialised hospital
   - Single clinical specialty, possibly with sub-specialties.
   - Highly specialised staff and technical equipment.
   - Specify (e.g. paediatric hospital, infectious diseases hospital).

**Hospital specialisation type.** Free text. Include hospital specialty if specialised hospital (e.g. paediatric, infectious diseases, etc.); please use specialty codes if possible

**Hospital ownership.** Hospital ownership as defined by WHO Regional Office for Europe [2], Eurostat [3] and OECD [4]: PUB: Public, PRIVNFP: private, not-for-profit, PRIVFP: private, for profit, OTHUNK: other or unknown

- Public: Hospitals that are owned or controlled by a government unit or a public corporation (where control is defined as the ability to determine the general corporate policy).
- Private, not for profit: Hospitals that are legal or social entities created for the purpose of producing goods and services, whose status does not permit them to be a source of income, profit, or other financial gain for the unit(s) that establish, control or finance them.
- Private, for profit: Hospitals that are legal entities set up for the purpose of producing goods and services and are capable of generating a profit or other financial gain for their owners.
- Other or unknown: Hospital ownership cannot be categorised as one of one of the above, or hospital ownership is unknown.

**Note:** If applicable, prioritise ‘for profit’ over ownership of the building, e.g. if a hospital building is state-owned but the management is private (for profit), select ‘private, for-profit’.

**Hospital is part of administrative hospital group (AHG):** The hospital is part of an administrative group of hospitals (AHG, including entities referred to as ‘trusts’, ‘mergers’, ‘fusions’, ‘boards’, ‘chains’, etc.). Yes/No
Data apply to single hospital site or to AHG/trust. If the hospital is part of an administrative hospital group (AHG), data apply to a single hospital (hospital with a single address, or a hospital site belonging to a trust) (S) or to an administrative group of hospitals (T).

AHG code. Unique code/identifier for the administrative hospital group (AHG); text allowed; please ensure that the AHG code/identifier is identical for all hospital sites belonging to that AHG. Code is selected and generated by the national PPS coordinating centre (see contact).

Administrative hospital group type. If the hospital is part of an AHG, what is the hospital type, e.g. PRIM: primary, SEC: secondary, TERT: tertiary, SPEC: specialised (see above for definition of hospital type). Report the highest level of care, e.g. ‘tertiary’ if a group with three sites contains one specialised, one primary, one secondary and one tertiary hospital. The combined services of the hospital sites belonging to a hospital group may also change the level of care (e.g. combination of the clinical specialties of primary and/or specialised hospitals may result in the AHG matching the definition of a secondary hospital).

Total number of beds in administrative hospital group. Total number of beds of the administrative hospital group.

Number of acute care beds in administrative hospital group. Total number of acute care beds of the administrative hospital group.

Hospital indicators:

Number of discharges/admissions. Number of hospital discharges in a given year (data from previous year if available, specify year in second column), use number of admissions if discharges are not available; provide the number for the included wards only (if not available, provide number for entire hospital; specify ‘included wards only’ OR ‘total for hospital’ in last column).

Number of patient-days. Number of hospital patient-days in a given year (data from previous year if available, specify year in second column). Provide data for the same year and wards (included wards only OR total for hospital) as for the number of discharges/admissions.

Alcohol hand rub consumption. Total number of litres of alcoholic hand rub used in a given year (data from previous year if available, specify year in second column); provide the number for the included wards only (if available, otherwise provide number for the entire hospital; specify ‘included wards only’ OR ‘total for hospital’ in last column).

Number of observed hand hygiene opportunities. Number of observed hand hygiene opportunities performed in the previous year (or the most recent available year). Report the total number of observed opportunities for hand hygiene, not only the compliant observations.

Number of blood cultures per year. Number of inpatient blood culture sets received and incubated by the microbiological laboratory for the current hospital over the period of one year. Provide data for the previous year or report the most recent available data (specify year data in a separate variable). If the number of blood culture sets is not available, estimate by dividing the [total number of blood culture bottles processed] by the [total number of bottles per blood culture request]. Count all blood culture sets per patient, not the number of patients for whom ≥1 set was processed. Count the number of blood culture sets actually received and incubated, not the number sent to the laboratory for analysis.

Number of stool tests for CDI per year. Number of inpatient stool tests performed for Clostridium difficile infections (CDI) per year. Provide data for previous year or the most recent available data (specify year data in a separate variable). Count all stool specimens per patient, not the number of patients for whom ≥1 test was performed. Count the number of stool specimens actually processed by the laboratory (= at least one test for CDI was performed on the sample), not the number sent to the laboratory for analysis.

Number of FTE infection control nurses. Number of full-time equivalent (FTE) infection control nurses in the hospital; infection control nurse=nurse with specialised training in infection control/hospital hygiene and usually responsible for infection control/hospital hygiene tasks such as training of hospital employees in infection control, elaboration and implementation of infection control procedures, management (implementation, follow-up, evaluation) of an infection control work plan and projects, audits and evaluation of performance, procedures for disinfection of medical devices etc. Specify year of data collection (current year if available) and whether the number of FTE infection control nurses is provided for the entire hospital or only for the included wards.

Number of FTE infection control doctors. Number of full-time equivalent (FTE) infection control doctors (or pharmacists, hospital epidemiologists, etc.) in the hospital with specialised training in infection control/hospital hygiene and usually responsible for infection control/hospital hygiene tasks such as identification and investigation of outbreaks, analysis and feedback of infection control data, elaboration of an infection control work plan and projects, design and management of surveillance systems, elaboration of infection control procedures etc. Please
ensure that the reported number was collected for the same year and wards (included wards only OR total for hospital) as the number of FTE infection control nurses.

**Number of FTE antimicrobial stewardship consultants.** Number of full-time equivalent antimicrobial stewardship consultants in the hospital. FTE antimicrobial stewardship refers to the dedicated time of a consultant (or pharmacist) employed by the hospital and specifically paid for antimicrobial stewardship tasks (e.g. antimicrobial stewardship activities mentioned as part of his/her job description), not the time spent by treating physicians on antimicrobial stewardship activities (e.g. post-prescription review) as part of their daily practice. Deduct FTE from FTE infection control doctor if same person: in case antimicrobial stewardship tasks are an integral part of the job description/daily activities of the infection control doctor (or equivalent), the estimated FTE (proportion of his/her time) spent on antimicrobial stewardship activities should be deduced from the FTE infection control doctors and be reported separately.

**Number of FTE registered nurses.** Number of full-time equivalent registered (graduated, qualified) nurses in the hospital. A 'registered nurse' is a nurse who has graduated from a college's nursing programme or from a school of nursing and has passed a national licensing exam to obtain a nursing license. Also include 'agency nurses', 'bank nurses', 'interim nurses' or other registered nurses who are not permanently employed for that position in the hospital. Students are not included. Provide current situation if possible, or the situation for the earliest available year (specify year) and specify if the number of FTEs is given for the entire hospital or for the included wards only.

**Number of FTE nursing assistants.** Number of full-time equivalent nursing assistants in the hospital. A 'nursing assistant' is also referred to as 'nurses' aide', 'healthcare assistant', 'nursing auxiliary', 'auxiliary nurse', 'patient care assistant' or similar terms. Also include nursing assistants who are not permanently employed for that position in the hospital. Nursing assistants work under the supervision of nurses or physicians to address the most fundamental elements of a patient’s care. In general, they feed, dress, bathe and groom patients, but they can also perform more medically oriented but basic duties such as measuring and recording temperature, blood pressure, and other vital signs. Other licensed health professionals such as dieticians, physiotherapists or speech or occupational therapists, logistic personnel, students of any kind or volunteers who provide basic patient care without pay should not be included. Provide current situation if possible, or the situation for the earliest available year (specify year) and specify if the number of FTEs is given for the entire hospital or for the included wards only.

**Number of FTE registered nurses in ICU.** Number of full-time equivalent registered (graduated, qualified) nurses in intensive care unit(s). A 'registered nurse' is a nurse who has graduated from a college's nursing programme or from a school of nursing and has passed a national licensing exam to obtain a nursing license. Also include 'agency nurses', 'bank nurses', 'interim nurses' or other registered nurses who are not permanently employed for that position in the hospital. Students are not included. Provide current situation if possible, or the situation for the earliest available year (specify year) and specify if the number of FTEs is given for the entire hospital or for the included wards only.

**Number of FTE nursing assistants in ICU.** Number of full-time equivalent nursing assistants in in intensive care unit(s). A 'nursing assistant' is also referred to as 'nurses’ aide', 'healthcare assistant', 'nursing auxiliary', 'auxiliary nurse', 'patient care assistant' or similar terms. Also include nursing assistants who are not permanently employed for that position in the hospital. Nursing assistants work under the supervision of nurses or physicians to address the most fundamental elements of a patient's care. In general, they feed, dress, bathe and groom patients, but they can also perform more medically oriented but basic duties such as measuring and recording temperature, blood pressure, and other vital signs. Other licensed health professionals such as dieticians, physiotherapists or speech or occupational therapists, logistic personnel, students of any kind or volunteers who provide basic patient care without pay should not be included. Provide current situation if possible, or the situation for the earliest available year (specify year) and specify if the number of FTEs is given for the entire hospital or for the included wards only.

**Number of airborne infection isolation rooms.** Number of airborne infection isolation rooms in the hospital. An airborne infection isolation room is defined as a hospital room provided with negative pressure and an anteroom.

**Annual IPC plan, approved by CEO.** Is there an annual infection prevention and control (IPC) plan and if so, was it approved by the hospital Chief Executive Officer (CEO, managing director) or by a senior executive officer? Yes/No.

**Annual IPC report, approved by CEO.** Is there an annual infection prevention and control (IPC) report and if so, was it approved by the hospital Chief Executive Officer (CEO, managing director) or by a senior executive officer? Yes/No.

**Participation in surveillance networks.** Indicate (Yes/No) if your hospital participates in a national or regional surveillance network for each of following surveillance modules: surveillance of surgical site infections (SSI), surveillance of HAIs in intensive care (ICU), surveillance of *C. difficile* infections (CDI), surveillance of antimicrobial resistance in accordance with the EARS-Net protocol (surveillance of antimicrobial resistance in invasive isolates of *S. pneumoniae*, *S. aureus*, *Enterococcus* spp., *E. coli*, *K. pneumoniae*, *P. aeruginosa* and/or *A. baumannii*),...
surveillance of antimicrobial consumption in the hospital (surveillance at 5th ATC level in defined daily dose (DDD) per 1 000 patient-days) and other HAI or AMR surveillance modules (national/regional protocols for which a European/ECDC protocol does not exist). Local surveillance without transmission of data to a national or regional surveillance coordination centre for comparative analysis and feedback is not sufficient.

Other surveillance networks specification. Free text. Specify which other surveillance networks the hospital participates in (free text).

Microbiological laboratory performance during weekends. At weekends, can clinicians request routine microbiological tests and receive back results within the standard turnaround time? Report yes/no/unknown separately for Saturdays and Sundays for clinical tests and screening tests, respectively.

Does your hospital have the following in place for HAI prevention or antimicrobial stewardship? Indicate for each of the main HAI types and for antimicrobial stewardship which components of a multimodal strategy are available at the hospital-wide level and specifically in intensive care (presence in at least one adult, paediatric or neonatal ICU). Each cell of the table is a Yes/No/Unknown variable (28 variables hospital-wide/other non-ICU wards): mark Y=Yes, N=No or U=Unknown or ‘not assessed’ in each cell.

A multimodal strategy is defined as an intervention aiming at improving practice and offering education and training at multiple levels (e.g. written information, leaflets, posters, bedside teaching, workshops, focus groups, knowledge tests, competency assessments, surveillance and feedback, audits, checklists). The strategy must be underpinned by written guidelines. Simple information sessions (e.g. for new staff), updating guidelines, or target setting alone (even if communicated to staff but without combining it with education and training) are not multimodal strategies.

Targets for multimodal strategies:

- Pneumonia: prevention of healthcare-associated pneumonia. You should tick the box for pneumonia, even if the components of your multimodal strategy only refer to device-associated pneumonia.
- Bloodstream infections (BSIs): prevention of healthcare-associated BSIs. You should tick the box for bloodstream infections, even if the components of your multimodal strategy only refer to catheter-associated/rerelated BSIs.
- Surgical site infections (SSIs): prevention of SSIs. You should tick the box for surgical site infections, even if the components of your multimodal strategy only refer to specific types of surgery.
  
  Note: Prevention of SSIs in the ICU is assumed to be part of the hospital-wide SSI prevention strategy.
- Urinary tract infections (UTIs): prevention of UTIs. You should tick the box for urinary tract infections, even if the components of your multimodal strategy only refer to catheter-associated/rerelated UTIs.
- Antimicrobial use/stewardship: Antimicrobial stewardship refers to a coordinated programme that implements interventions to ensure appropriate antimicrobial prescribing in order to improve clinical efficacy of antimicrobial treatment, to limit AMR and to prevent *Clostridium difficile* infections. Antimicrobial stewardship contributes to high quality and effective healthcare through decreasing unnecessary antimicrobial-related morbidity and mortality and limiting selective pressure to minimise development of resistance to currently effective antibiotics.

Multimodal strategy components: only report the existence of any of following components when evidence can be presented, e.g. printed copies or electronic documents or tools.

- Guideline: written guideline document available on the ward
- Care bundle: a care bundle is a structured way of improving the processes of care and patient outcomes: a small, straightforward set of evidence-based practices — generally three to five — that, when performed collectively and reliably, have been proven to improve patient outcomes [1]. Should be implemented as part of a formally endorsed hospital programme.
- Training: regular training, courses or other forms of education. Should be organised at least once per year.
- Checklist: checklist is filled in by the healthcare workers (HCWs), as opposed to an audit (see directly below).
- Audit: evaluation of the implementation of prevention practices (process evaluation, observations, etc.) by another person than the one/those who are supposed to implement the practices. An audit is a process during which a practice is measured against a standard such as VAP/CLABSI prevention or antimicrobial stewardship guidelines (e.g. intubation/catheterisation, tube care/catheter care). Includes giving verbal feedback, e.g. between two clinicians. Formal feedback of printed/written results should be reported separately under ‘feedback’.
- Surveillance: surveillance of HAI type on a periodical or continuous basis, also including local surveillance (not only as part of a surveillance network)
Feedback of surveillance and/or audit results to frontline HCWs. Only report ‘yes’ in the case of (yearly or more frequently) written feedback, e.g. as part of an institutional infection prevention and control report. Verbal feedback as part of an audit is not sufficient.

Ward data

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

Figure 3. Ward data (form W)

ECDC point prevalence survey of healthcare-associated infections and antimicrobial use
Form W. Ward data

Hospital code [_________] Ward name (abbr.) /Unit ID [_________] Survey date: ___ / ___ / __________

Ward specialty: ☐ PED ☐ NEO ☐ ICU ☐ MED ☐ SUR ☐ GO ☐ GER ☐ PSY ☐ RHB ☐ LTC ☐ OTH ☐ MIX

Total number of patients in ward: [__________]

Is there a formal procedure to review the appropriateness of an antimicrobial within 72 hours from the initial order in this ward (post-prescription review)? ☐ Yes ☐ No

Number of patients by consultant/patient specialty (LIGHT option only):

<table>
<thead>
<tr>
<th>Consultant/patient Specialty</th>
<th>Number of patients in ward</th>
</tr>
</thead>
</table>

Comments/observations:

Definition of ward data

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.

Hospital code. Hospital identifier/code assigned by national PPS coordinating centre; unique code per surveillance/PPS network, should remain the same in different PPS periods/years.

Ward name (abbreviated)/unit ID. Unique identifier for each hospital unit (abbreviated ward name); essential for linking between denominator and HAI/AU data; should be used consistently on all forms and should remain the same in different PPS periods/years.

Ward specialty. Main ward specialty (≥ 80% of patients requiring this specialty). If fewer than 80%, report ‘mixed ward’ (MIX). PED=Paediatrics, NEO=Neonatal, ICU=Intensive Care, MED=Medicine, SUR=Surgery, GO=Gynaecology/Obstetrics, GER=Geriatrics, PSY=Psychiatry, RHB=Rehabilitation, LTC=Long-term care, OTH=Other, MIX=Mixed.

As a rule, the ward specialty code is composed of the three first letters of the main consultant/patient specialty, with two exceptions: code ICUNE (NICU) as ward specialty NEO and ICUPED (PICU) as ward specialty PED. The ward specialty can be combined with patient specialty to refine specialties, e.g. in paediatrics: ward specialty PED
+ patient specialty: ICUPE = paediatric ICU, PED + SURCARD = paediatric cardiac surgery, PED + MEDONCO = paediatric oncology.

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

**Note:** How to code paediatric patients: Use the ward code PED for paediatric wards. If the ward specialty code is PED, then patients should be coded as per consultant/patient specialty MEDGEN, MEDSUR, etc. The consultant/patient specialty PEDGEN should normally only be used for paediatric patients on adult wards.

**Total number of 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.

**Post-prescription review of antimicrobials in ward.** Is there a formal procedure to review the appropriateness of an antimicrobial within 72 hours from the initial order in this ward (post-prescription review)? A formal post-prescription review procedure should be documented and adopted by the hospital management and should be performed by a person or team other than the treating physician. The procedure should at least address the prescription of broad-spectrum or reserve antimicrobials. Yes/no

**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).

**Alcohol hand rub 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.

**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 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.

**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 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, HCWs should not be included if there is no information on the carriage of alcohol hand rub dispensers.

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

**Number of rooms in ward.** Total number of rooms in the ward on the PPS day.

**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.

**Number of single rooms with individual toilet and shower.** Total number of single-bed rooms with individual toilet and shower in the ward. Rooms which have toilet and shower in a communal area should not be counted. An individual toilet alone or a commode (toilet chair) is not sufficient to qualify for this indicator.

**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 (can also be measured at midnight after the PPS took place).

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

Demographic data and risk factors are collected for each patient present at/admitted to the ward before or at 8 a.m. and not discharged from the ward at the time of the survey (including patients not receiving an antimicrobial and not presenting a healthcare-associated infection).

**Figure 4. Patient-based risk factors (form A): one form per patient, antimicrobial use and HAI data collected on same form**

### Definition of patient data

**Hospital code.** Hospital identifier/code assigned by national PPS coordinating centre; unique code per surveillance/PPS network.

**Ward name.** Abbreviated name of hospital ward: essential for linking between denominator and HAI/AU data; should be used consistently on all forms and should remain the same in different PPS periods/years.

**Ward specialty.** Main ward specialty (≥ 80% of patients requiring this specialty). If fewer than 80%, choose mixed ward (MIX). See more details under ward data and specialty code list. This variable can be omitted if ward data are provided. If ward data are not provided, it should be added on the patient form.

**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 if ward data are provided. If ward data are not provided, it should be added on the patient form.

**Patient counter.** Number: anonymised patient number makes it possible to establish a link between patient data and HAI or antimicrobial use data. Not the actual patient identifier.

**Age in years.** Patient age in years.

**Age in months.** Patient age in months if the patient is less than two years old.

**Sex.** Gender of the patient: M (male), F (female), or UNK (unknown).

**Date of hospital admission.** Date on which the 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 paediatric patients on a PED ward, use the subspecialty (MEDGEN, MEDSUR, etc.) (see ward specialty). Please note that long-term care is a ward specialty and should only exceptionally be used as a patient/consultant specialty.

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—optionally specify NHSN surgery code (ICD-9-CM code of the intervention is listed for the surveillance of surgical site infections in the NHSN system, examples see annexes); unknown.

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 diseases and their different McCabe score categories are given below. 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.

Examples of diseases for different McCabe score categories:

Rapidly fatal: < one year
- End-stage 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
- 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

Non fatal: > 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

Birth weight: birth weight in grams, to be provided for neonates (infants less than one month old); 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.

Central vascular catheter. Patient has central vascular catheter in place on survey date; yes/no/unknown.

A central vascular catheter is defined by the CDC as an:
- intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring. The following are considered great vessels for the purpose of reporting central-line BSI and counting central-line days in the NHSN system: Aorta, pulmonary artery, superior vena cava, inferior vena cava, brachiocephalic veins, internal jugular veins, subclavian veins, external iliac veins, common iliac veins, femoral veins, and in neonates, the umbilical artery/vein.

Notes: Neither the insertion site nor the type of device may be used to determine if a line qualifies as a central line. The device must terminate in one of these vessels or in or near the heart to qualify as a central line.

An introducer is considered an intravascular catheter, and depending on the location of its tip and use, may be a central line.
Pacemaker wires and other non-lumened devices inserted into central blood vessels or the heart are not considered central lines, because fluids are not infused, pushed, nor withdrawn through such devices.


Peripheral vascular catheter. Patient has indwelling 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.

Patient receives antimicrobial(s). Patient receives at least one systemic antimicrobial agent at 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; yes/no. If yes, collect antimicrobial use data.

Patient has active HAI. Patient has an active healthcare-associated infection on survey date; yes/no. If yes, collect HAI data.

Notes:

Patient data have to be collected for each patient admitted to the ward at 8 a.m. on the survey date, infected or not, only excluding day cases (see inclusion criteria).

Maternity: both mother and neonate are counted if present at 8 a.m. on the day of the survey.

Neonates:
- Count all infections after their birth.
- Register consultant/patient specialty for healthy neonates as either GOBAB or PEDBAB.
- Obstetrics: in the case of natural birth with no interventions/procedures/devices, a maternal infection is only considered as an HAI if the date of onset is on day 3 or later.

Antimicrobial use data and HAI data

Only collect information if the patient receives at least one antimicrobial at the time of the survey (except in the 24 hours prior to 8 a.m. on the day of the survey for surgical prophylaxis) or if the patient has an active infection associated to an acute care hospital stay (current or another hospital).

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, etc.), 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. If the antimicrobial agent given for treatment or medical prophylaxis was changed on the day of the survey, only record the last antimicrobial agent at the time of the survey.

Note: 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. Also, no attempts will be made to change prescriptions. At no time the staff should feel supervised.

Definitions of antimicrobial use data

Antimicrobial generic or brand name. Allowed are, for example, amoxicillin, but also national brand names; include ATC codes (ATC2: J01 antibacterials, J02 antifungals; ATC4: A07AA, P01AB, D01BA; ATC5: 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. Brand names or drug names should be converted into ATC5 codes. See codebook for included antimicrobial agents.
**Route.** Route of administration of the antimicrobial agent; **P**=parenteral; **O**=oral; **R**=rectal; **I**=inhalation.

**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, fill in site of infection (diagnosis). Otherwise code NA (not applicable).

**Diagnosis (site).** Diagnosis group by anatomical site: see diagnosis (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.

**Date start antimicrobial.** Day on which the first dose of the current antimicrobial was administered. If the patient received the antimicrobial on admission, record the date of admission.

**Antimicrobial changed? (+ reason).** Was the antimicrobial (or the route of administration) changed for this infection episode, and if so, what was the reason? If the antimicrobial was changed more than once for the current infection episode, report the reason of the last change. Changes should be considered for the entire treatment regimen for one infection episode.

- **N**=no change, antimicrobial was not changed.
- **E**=escalation: antimicrobial was escalated (or another 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 ampicillin/subbactam to oral amoxicillin/clavulanate or IV ceftriaxone to oral cefuroxime axetil.
- **A**=adverse effects; antimicrobial was changed because of observed or expected side or adverse effects of the antimicrobial.
- **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 could not be determined by the surveyor.
- **U**=unknown: no information on whether the antimicrobial was changed or not.

**Date start first antimicrobial (if change):** If the current antimicrobial replaces a previous one: date on which the first dose of the first antimicrobial given for the same infection episode was administered. Leave blank if there was no change (or if there is no information available). If the antimicrobial was changed more than once for the current indication, report the start date of the first (not the previous) antimicrobial. If the patient received the first antimicrobial on admission, record the date of admission. The main objectives of collecting this variable are 1) estimation of the total annual number of patients receiving antimicrobials in acute care hospitals (prevalence to incidence conversion) and 2) proxy validation of the prevalence of HAIs.

**Dosage per day.** Number and strength (in milligrams, grams, IU or MU) of doses of the current antimicrobial given per day. Report as, for example, ’4 x 1 g per day’ (three variables: number of doses, strength of one dose, unit of one dose). When one dose of an antimicrobial is given every other day, report the number of doses as 0.5 (e.g. 0.5 x 1 g/day). The main objectives for collecting this variable are to provide information to 1) enable comparisons of antimicrobial consumption between Europe and the US, and 2) enable updating the defined daily doses (DDD) values as set by the WHO Collaboration Centre for Drug Statistics Methodology (Norwegian Institute of Public Health, www.whocc.no). Report dosage as written in the patient records. Recoding (e.g. to inform DDD updates) will be done in the analysis phase if needed (e.g. for combined products).
Healthcare-associated infection data

Key terms and notes

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

- 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 symptoms and signs should be verified until the start of the treatment in order to determine whether the treated infection matches one of the case definitions of healthcare-associated infection.

AND

- 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; or
- 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; or
- An invasive device was placed on Day 1 or Day 2, resulting in an HAI before Day 3.

Note: 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 will probably cause some actual cases of HAI to be discarded, but this can be seen as compensation for the (potentially long) retrospective period preceding the start of the treatment when no more signs or symptoms are 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 (even intermittently). 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 or central catheter, other infection site – S-PUL, S-UTI, S-DIG, S-SSI, S-SST, S-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.

Definitions of healthcare-associated infection data

Case definition code. HAI case definition codes: specify subcategory, e.g. PN4, CVS-VASC (see code lists, overview and HAI case definitions in Annex 2). 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> PM4> 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 a 48-hour time period (seven days for UTIs) before onset of the infection, i.e. intubation for pneumonia, central/peripheral vascular catheter for bloodstream infections, urinary catheter for UTI; Unk=unknown; used to apply CDC definition of device-associated infection (see Horan TC, et al. Definitions of key terms used in the NNIS system. Am J Infect Control 1997; 25:112-6).

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, 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.

**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, for example, for infections with an onset after day 2 of the current hospitalisation (= HAI by definition) which the surveyor does not consider to be 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 discharge 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 placement of an invasive device in 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). Specify up to three isolated microorganisms using six-letter microorganism codes (e.g. STAAUR=Staphylococcus aureus); see codebook.

**Antimicrobial resistance phenotype.** Specify susceptibility to selected antimicrobial resistance (AMR) marker depending on microorganism.

Report S (susceptible), I (intermediate), R (resistant) or UNK (unknown) for the antimicrobial group (preferred) or depending on microorganism. Reporting group susceptibility requires that at least one antimicrobial belonging to the group is tested.

If 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).

If AMR markers are collected in accordance with the PPS I protocol methodology (still allowed but not recommended), 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: Resistant to oxacillin (OXA) or other markers of meticillin-resistant S. aureus (MRSA), such as cefoxitin (FOX), cloxacillin (CLO), dicloxacillin (DIC), flucloxacillin (FLC), methicillin (MET)
- VRS: Resistant to glycopeptides (GLY): vancomycin (VAN) or teicoplanin (TEC)
- VISA: Intermediate to glycopeptides (GLY): vancomycin (VAN) or teicoplanin (TEC)

**Enterococcus spp.: GLY**
- VRE: Resistant to glycopeptides (GLY): vancomycin (VAN) or teicoplanin (TEC)

- Third-generation cephalosporins (C3G): cefotaxime (CTX), ceftriaxone (CRO), ceftazidime (CAZ)
- 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-resistant (PDR).** Microorganism is pandrug resistant. Not 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), UNK=Unknown.
Note on case definitions of healthcare-associated infections

As recommended by the joint expert group in January 2009 and confirmed during the PPS expert meetings in 2009 and 2010, the ECDC PPS protocol uses existing European case definitions [5-9] and complements them by case definitions from the Centers for Disease Control and Prevention (CDC), as used by CDC’s National Healthcare Safety Network (NHSN, formerly NNIS)[10]. The concordance between US/CDC and EU/HELICS case definitions was assessed by Hansen et al [11].

The European case definitions used in the ECDC PPS are:

HELICS/IPSE case definitions
- Surgical site infection
- Pneumonia
- Bloodstream infection
- Central vascular catheter related infection
- Urinary tract infections

Clostridium difficile infection

Specific neonatal definitions, as established by the KISS network:
- Clinically suspected bloodstream infections (clinical sepsis)
- Laboratory-confirmed bloodstream infection
- Laboratory-confirmed bloodstream infection with coagulase-negative staphylococci
- Pneumonia in neonates
- Necrotising enterocolitis

Note: The CDC HAI case definitions in neonates were replaced by case definitions used in the Neo-KISS system. These definitions were not established at the EU level, but they were preferred by the EU-PPS expert group.

All other case definitions are CDC/NHSN case definitions.
Recommended case-finding algorithm for healthcare-associated infections

Figure 5. Recommended case finding algorithm for healthcare-associated infections

Surveillance team arrives on ward. Record start date and time

Introduce yourself to ward manager. Collect ward specialty type, number of beds. Request patient list. Exclude patients from further data collection if admitted after 8 a.m.

Collect denominator data on all patients in hospital before 8 a.m.

Walk around ward. For each patient, observe for invasive devices (UC, PVC, CVC, ventilation)

Collect ONE set of patient notes (medical, nursing, observation, drug, wound, pressure, stool charts, etc.)

On antimicrobials?

If notes are unclear, ask for treatment indication from medical, pharmacy, or nursing teams.

NO, mark on form*

HAI according to standard definitions?

If notes are unclear, ask for clarification of signs and symptoms only from nursing/medical team

YES, fill in surveillance form*

Complete data collection for all patients. Once complete, thank ward manager and leave. Record end time on forms

Pass on data forms to local coordinator or data entry facilitator.

UC=urinary catheter; PVC=peripheral vascular catheter; CVC=central vascular catheter
Data delivery

Software

HelicsWin.Net is software program developed by ECDC for the manual entry of data of the Healthcare-Associated Infections surveillance Network (HAI-Net). The program includes a HAI-Net PPS module. HelicsWin.Net enables local users in the hospital to collect data at hospital and ward level.

Data are stored in an .mdb (Microsoft Access) file. This file is stored on the computer on which HelicsWin.Net is installed. Data can be exported to other application in a variety of formats, including formats compatible with Microsoft Access and Microsoft Excel.


Once all data of the hospital are entered into the software a quality check can help to correct any data errors before exporting data. HelicsWin.Net exports the original database to an Access format (as a zipped Access.mdb file) or in TESSy CSV format.

Deadline for data delivery

The data have to be exported to Access format and to send to the national PPS coordinating centre. The deadline for data delivery is Friday 15 December 2017.

Data analysis and feedback

The hospital databases will be checked for errors and inconsistencies by national PPS coordinating centre and by ECDC. Individual feedback reports (in English) will be generated for each participating hospital.

A European report will be prepared by ECDC using aggregated results, sent to national PPS coordinating centres from each participating country for verification and subsequently published on the ECDC website.

The national PPS coordinating centre might use national aggregated data for presentations, reports and/or publications.

Training

Half-day training workshops will be organized at the beginning of the surveillance period (end of August – beginning of September 2017) in Brussels. All participating hospitals will be invited to participate to the workshop (at least one representative per hospital). Dates and meeting venue will be communicated by e-mail.

Ethical considerations

Hospitals require approval from their local ethics committee. The national PPS coordinating centre will help the hospital in obtaining this ethical approval if needed.

Confidentiality of hospital and patient data is assured by:

- the national PPS coordinating centre attributing a hospital identifier/code to each participating LTCF. The participating hospitals will not be identifiable by other hospitals/persons since all reports and presentations will only use hospital identifier/code and never hospital names.
- the hospital allocating a unique survey number to each patient.

Data collected within the framework of this survey will not be used for purposes other than those described in the objectives of the present protocol.

**Contact information**

For questions relating to use of this protocol, please contact the national coordinating centre:

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Annex 1. Forms

A PowerPoint file with all forms is available as a separate download.
References


