

Global Point Prevalence Survey of

Antimicrobial Consumption and Resistance

(GLOBAL-PPS)



PROTOCOL – versie 2

Sponsoring Agent: World HAI Forum – BioMérieux

Funding Authority: BioMérieux

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Timelines:

- **Feasibility survey:** April 2014 (with the support of the Global PPS Steering Group)
- **Pilot survey:** October 2014 (with the support of the Global PPS Coordination Group)
- **Global Survey:** February-April 2015 (with the support of the Global PPS Coordination Group): any hospital from any country worldwide is welcome to participate.

Dissemination:

Preliminary discussion of first results and future plans at 5th HAI Forum: June 2015.

Global dissemination at the (European) Antibiotic Awareness Day/Week: 18 November 2015.

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THE DATA COLLECTION FORMS AND APPENDICES ARE AVAILABLE AS A
SEPARATE DOCUMENT TO THIS PROTOCOL:

FORMS:

- WARD FORM
- PATIENT FORM

APPENDICES:

- APPENDIX I: Combination anti-infective agents
- APPENDIX II : Diagnosis Group Codes
- APPENDIX III : Type of Indication

Print one ward form and all appendices for each different ward.

Print one patient form for each patient on antibiotics. No need to fill in the patient form for patients not on antimicrobial treatment.

BACKGROUND - AIMS

Background

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (**GLOBAL-PPS**) is an ambitious project funded by BioMérieux to develop further on the three point-prevalence surveys (PPS) carried out by the European Surveillance of Antimicrobial Consumption (ESAC) project between 2006 and 2009. The first ESAC PPS started with 20 hospitals from 20 European countries, whilst in the final ESAC PPS there were almost 200 hospitals from 25 European countries. With the coordination of the ESAC Group a number of studies have shown the applicability of this tool across a range of European countries [1-4]. Notably this tool has illustrated many benefits;

- 1] the web based tool is easy to use, requiring minimal training for data entry and analysis and provides rapid feedback;
- 2] there is evidence of consistency and reproducibility with the data entry using this tool;
- 3] the PPS protocol/tool allows to survey performance indicators (e.g., compliance with local antibiotic guidelines) thereby identifying targets for quality improvement;
- 4] participation in the survey has encouraged, thorough engagement and feedback enhancing communication between prescribers and the local infection community.

In summary the use of PPS, can identify problem areas and thereby investigate the introduction of measures that aim at improving prescribing practices. The roll-out of ESAC project has been successful in Europe. Good practice examples exist [5, 6]. The experience from these studies confirms its value, broad adaptability and suitability for a range of health care resource settings.

The ESAC PPS methodology has previously already been adapted for the Antibiotic Resistance and Prescribing in European Children – (ARPEC) work Package 5 (WP5) subproject that focused on paediatric and neonatal patients admitted in European hospitals [7]. The methodology was also modified and adapted for the European Centre for Disease Prevention and Control (ECDC) PPS of healthcare-associated infections and antimicrobial use in acute care hospitals (ECDC-PPS). A pilot survey was conducted in 66 hospitals from 23 European countries in 2010. This survey used the online tool for data entry and feedback [8].

The 4th world HAI forum “Control of Antimicrobial Resistance without borders” took place at the *Fondation Mérieux* in Annecy, France between June 23rd and 25th 2013. The meeting concluded with a consensus that identified 2 key priorities for action. One of these was to undertake a global point prevalent survey of antibiotic use in hospitals (and the community). BioMérieux funds the GLOBAL-PPS because this initiative meets one of the aims of the company and the World HAI Forum to support global initiatives to better control antibiotic resistance through stewardship interventions in a range of resource and geographical settings.

Aims

The GLOBAL-PPS aims to expand the standardised surveillance method of data collection at a global level, in order to monitor rates of antimicrobial prescribing in hospitalised patients. The GLOBAL-PPS will determine the global variation in antibiotic prescribing in hospitalised patients across all continents.

The GLOBAL-PPS should:

1. Identify targets for quality improvement (e.g. duration of peri-operative prophylaxis; compliance with local hospital guidelines; documentation of indication for prescription of antibiotic therapy);
2. Help in designing hospital interventions that aim at promoting prudent use of antimicrobials;
3. Allow to assess the effectiveness of such interventions, through repeat PPS.

This GLOBAL-PPS aims to establish a global network for point prevalence surveys. In order to maximise participation by as many hospitals from as many countries from all continents, certain information requested is simplified in order to facilitate participation from areas with limited resources.

The GLOBAL-PPS research questions are related to the observed variations prescribing patterns and resistance profiles among different:

1. continents
2. countries;
3. indications,
4. ward categories and
5. hospital characteristics

The aim is NOT to perform benchmarking between hospitals, countries, geographical regions or any other form of benchmarking across categories.

<p>In conclusion, the main aim of the GLOBAL-PPS is to help hospitals by developing and providing a tool to identify targets for quality improvement of antimicrobial prescribing, to change practise and to measure impact of interventions.</p>
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GLOBAL-PPS PROTOCOL SPECIFICS

1. Time planning for the PPS

Any participating hospital must complete the Point Prevalence Survey (PPS) within a maximum of *4 consecutive weeks* from the time when the hospital starts data collection.

Two periods of data collection are foreseen:

1. Pilot survey: October 2014.
2. Global survey: February-April 2015.

2. Departments involved

All wards (or units/departments) within the participating hospital must be included. Each ward has to be surveyed only once on a single day in order to calculate correctly the denominator (number of admitted patients). However, different wards can be surveyed on different days.

Each hospital shall decide on which day/s data collection shall take place (depends on the size of the hospital and own organization) as long as it is within the stipulated time-frame.

The departments are grouped into 5 paediatric, 2 neonatal and 6 adult departments (see page 11: "Prepare hospital department list").

Surgical Wards (PSW, ASW) should **NOT** be surveyed **on a day following a weekend day or bank holiday (e.g., not on Monday in Europe; not on Saturday in Islamic countries)**, but on the other days of the week in order to capture information about prophylaxis in the previous 24 hours.

Intensive Care and Medical wards (all other wards) can be surveyed at any weekday except on weekends or bank-holidays. Departments should not be further sub-divided (e.g., Psychiatric, Orthopaedic, etc.)

3. Inclusion criteria

All inpatients admitted on a ward (excluding day admissions such as endoscopy or renal units) **at 8 o'clock** in the morning on the day of survey count in the denominator. All inpatients **"on antimicrobial agents" at 8 o'clock** in the morning on the day of survey are to be included in the numerator (i.e., a patient form is to be filled in for these patients only).

➤ Definition of **"on antimicrobial agents"** :

- A patient receiving an antibiotic e.g. every 48 hours but not receiving this antibiotic on the survey day must be included = ongoing antimicrobial treatment.
- An antibiotic prescribed at one o'clock (during the ward round or when results become available or for surgical prophylaxis) in the afternoon on the day of the survey must **not** be included (not active or ongoing at 8 o'clock in the morning).

➤ Include new-born healthy children on a maternity ward. Encode this ward as a GNMW.

4. Exclusion criteria

- Exclude day hospitalizations and outpatients. These are defined as ambulatory care patients. So, data from “day” surgery and “day” hospital units should be excluded from the survey.
- Exclude admissions admitted after 8 o'clock on the day of the survey even though these would be present by the time the survey is carried out. All patients/wards falling in the exclusion criteria must be excluded from BOTH the nominator and denominator data.

5. Denominator data

- **Total number of eligible inpatients at 8 am** of the ward surveyed. Do not collect data from patients discharged before 8 o'clock and/or patients admitted after that time. In the Ward Form, the denominator refers to the total number of eligible admitted patients on the ward at 8 o'clock.
- **Total number of eligible beds attributed to inpatients at 8 am** of the ward surveyed. This means the number of total inpatient beds at the time of the survey.

Number of beds = total beds in ward (=occupied + empty beds).

N beds should always be \geq N inpatients present at 8 o'clock.

6. Included antimicrobial agents.

- **Antibacterials for systemic use:** J01
- **Antimycotics and antifungals for systemic use:** J02 and D01BA (including griseofulvin and terbinafine)
- **Drugs for treatment of tuberculosis:** J04A (these are the antibiotics as well as all other drugs to treat tuberculosis)
- **Antibiotics used as intestinal anti-infectives:** A07AA
- **Antiprotozoals used as antibacterial agents, nitroimidazole derivatives** (P01AB)
- **Antivirals used for influenza - Neuraminidase inhibitors** (J05AH)
- **Antimalarials:** P01B

Antimicrobials for topical use are excluded from the survey.

The *WebPPS* program provides the list of all antimicrobials to be surveyed according to the WHO ATC classification¹. This list can be extracted in a Microsoft Excel® file through the GLOBAL-PPS program. The file contains all substances and their route of administration.

In case a drug is not in the provided list, contact Ann Versporten (Global-PPS@uantwerpen.be) who will manually enter the drug into the GLOBAL-PPS program.

For each additional drug, the following information is needed:

- the trade name and/or the ATC name at substance level (ATC level 5) when trade name is not used. This field is mandatory, it will be used in all the pull-down lists of drugs in the GLOBAL-PPS program,
- the ATC code at substance level (7 digit code),
- the route of administration.

¹ http://www.whocc.no/atc_ddd_index/

7. Multidisciplinary team

The hospitals are invited to create a multidisciplinary team of colleagues familiar with reading patient notes and having adequate knowledge on local guidelines (e.g., infectious Disease specialists, microbiologists, pharmacists, infection control specialists, nurses or other healthcare professionals). A local administrator has to be assigned.

The local administrator is responsible for:

- the online registration of the hospital,
- entering patient specific data into the *GLOBAL-PPS* program,
- the data validation and
- the production of the local feedback reports.

Extra hospital users may however be registered with the *GLOBAL-PPS* program in order to help the hospital administrator with data-entry.

8. Data Privacy

A sequence number will be assigned to each hospital after registration to the *GLOBAL-PPS* program. Hospital names will never be revealed in any report or publication.

Patients are completely anonymised in the *GLOBAL-PPS* program. Every patient record will be given a unique not identifiable survey number. This number is automatically generated by the computer program based on several internal codes. This number identifies uniquely the patient in the *GLOBAL-PPS* database.

9. Data ownership

- ✓ Data are the property of their respective hospital.
- ✓ The Coordinating Centre & Technical Support team at the University of Antwerp, Belgium is guardian of the data within the database.
- ✓ The Coordinating Centre & Technical Support team will analyse the data and generate reports. These analyses and reports are property of the *GLOBAL-PPS*.
- ✓ The *GLOBAL-PPS* Coordination Group encourages country specific analyses.

10. Ethical approval

For approval by ethical committee & privacy legislation requirements, the *GLOBAL-PPS* management team can provide, on request, a letter that can be submitted to hospitals ethical committees (contact Global-PPS@uantwerpen.be).

11. Technical support

The Coordinating Centre & Technical Support team at the University of Antwerp will provide the "help desk" for software or any other issues encountered and/or questions during the data collection and data entering (Global-PPS@uantwerpen.be or tel.: +32 32652418 : Monday-Friday 9am-5pm CET). The Coordinating Centre & Technical Support team will continually be available for general queries about the project.

- ✓ Web page layout for the forms will be the similar to the paper version.

The GLOBAL-PPS program http://app.globalpps.uantwerpen.be/globalpps_webpps offers:

1. internal checks in order to avoid invalid or erroneous figures (e.g. for out of ranges values)
 2. boxes popping up in order to guide you to fill out a field
 3. help functions which provides supplementary information on each screen (on top, left side of screen)
 4. Help pages, manuals, and the “FAQ” section.
 5. The easy to follow online training video teaching you to efficiently enter data using the GLOBAL-PPS program (http://app.globalpps.uantwerpen.be/globalpps_webpps)
- ✓ Regular backups of the database will guarantee the integrity of data.
 - ✓ The format to export data is Microsoft Excel®.

The software and database will be hosted at the University of Antwerp in Belgium, Europe.

12. Publication policy

The GLOBAL-PPS Coordination Group should look for opportunities for dissemination and encourage country specific analyses, in conjunction and agreement with the GLOBAL-PPS Development Group. For publications at national or regional level, **participants need to comply with the publication strategy** as designed by the GLOBAL-PPS Development Group. The publication strategy will guide you how to proceed. Please, send email to Global-PPS@uantwerpen.be in order to receive a copy of the publication strategy.

« WEBPPS STEP BY STEP PROCEDURE »
ALL THE FOLLOWING STEPS MUST BE COMPLETED
BEFORE ENTRY OF ANY PATIENT DATA

Before the hospital submits any patient data to the WebPPS, the following steps must be completed:

1. Register the hospital on the Global-PPS website :

http://app.globalpps.uantwerpen.be/globalpps_webpps

- First participation to the GLOBAL-PPS: also if the hospital was registered with previous WebPPS (ESAC, ARPEC, ECDC-PPS), please register as a new hospital.
- Second and subsequent participations to GLOBAL-PPS: If the hospital has already been registered with the GLOBAL-PPS, maybe by a colleague or after having participated in a Pilot GLOBAL-PPS, the hospital has to use the existing login (username) and password. If this information has been lost, please contact Ann Versporten (Global-PPS@uantwerpen.be) providing your respective contact details (hospital name and country).
- First time participants, must click on the tab ‘register’ in the menu on top of the home page. Information about the hospital and the local *GLOBAL-PPS* administrator will need to be inputted. Fields with * are mandatory.
 - Name of the institution*
 - Code* : Fill in CAPTCHA (this is a registration code to avoid spam registration)
 - Hospital type* : Primary, Secondary, Tertiary, Specialized hospital²
 - Teaching hospital*: Yes or No
 - Generic Email* (could also be the administrator’s email address)
 - Postal Address
 - Country / County / District*. If County and district are not used please fill in the country.
 - Name* function and email address* of the local *WebPPS* administrator
 - Login and password*: to be chosen by local *WebPPS* administrator

Press FINISH to confirm registration.

² **Primary level:** often referred to as a district hospital or first-level referral. The hospital has few specialities, mainly internal medicine, obstetrics-gynaecology, paediatrics, and general surgery, or only general practice; limited laboratory services are available for general, but not for specialized pathological analysis. Often corresponds to general hospital without teaching function. **Secondary level:** often referred to as provincial hospital. A hospital highly differentiated by function with five to ten clinical specialities including some haematology, oncology, renal and ICU beds; takes some referrals from other (Primary) hospitals. Often corresponds to general hospital with teaching function. **Tertiary level:** often referred to as central, regional or tertiary-level hospital. A hospital with highly specialized staff and technical equipment, e.g., ICU, Haematology, Transplantation, cardio-thoracic surgery, neurosurgery and specialized imaging units; clinical services are highly differentiated by function; provides regional services and regularly takes referrals from other (primary and secondary) hospitals. Often correspond to University hospital. **Specialized hospital:** Single clinical specialty, possibly with sub-specialties; highly specialized staff and technical equipment. E.g. paediatric hospital, infectious diseases hospital

- After a successful registration, the local administrator will be able to login to the *GLOBAL-PPS* program having access to all its functionalities.
- The local administrator can add a contact in order to give a supplementary person the rights to enter data as well. This additional person, however, will only be able to add new and/or amend patient data. Only the local administrator will be granted rights to add or change departments, extract data into an excel file, validate the data and generate reports.

2. **Prepare the hospital department list.**

After login, one first needs to define ALL the hospital's wards (units/departments) as these will afterwards appear in the drop down lists when entering patient information.

The definition of a department follows a hierarchical structure. For each department, the following information is needed:

- The **NAME** of the department. This field is mandatory; it will be used in the department drop down lists in the *GLOBAL-PPS* program. For example, for the category "general medical ward" various different wards may exist. If these wards have particular/appropriate names, write them down accordingly (e.g. Medical Ward 1 through Medical ward 'N' including the Neuromedical Ward and other wards such as Psychiatric wards'. **All** inpatient adult, paediatric and neonatal departments must be included (i.e., no hospital sampling).
- Code and description = optional
- The **TYPE** of department. Mandatory field, provided by the *GLOBAL-PPS* program. Choose between the following thirteen major types:

Paediatric departments:

- ☐ PMW (Paediatric Medical Ward)
- ☐ HO-PMW (Haematology-Oncology PMW)
- ☐ T-PMW (Transplant (BMT/Solid) PMW)
- ☐ PSW (Paediatric Surgical Ward)
- ☐ PICU (Paediatric Intensive Care Unit)

Neonatal departments:

- ☐ NMW (Neonatal Medical Ward).
- ☐ NICU (Neonatal Intensive Care Unit)

Adult departments:

- ☐ AMW (Adult Medical Ward)
- ☐ HO-AMW (Haematology-Oncology AMW)
- ☐ T-AMW (Transplant (BMT/solid) AMW)
- ☐ P-AMW (Pneumology AMW)
- ☐ ASW (Adult Surgical Ward)
- ☐ AICU ([Adult] Intensive Care Unit)

Examples of difficult cases:

- A mixed PICU and NICU department should be split up if the number of NICU and PICU assigned beds for the mixed NICU-PICU ward is reasonably stable. Thus, define the ward into 2 different wards (a PICU and NICU ward).
- The **ACTIVITY** for a department (**Medicine, Surgery, Intensive Care**) is automatically assigned by the software based on the selected type of department. This is the “MAIN” attributed activity of a certain department. This main activity can never be changed or deactivated. Besides the “main” activity of a department, it is still possible to define the department as a mixed department on the day of the survey (if on the day some of the patients are from a different activity). This has to be done when entering the denominator data (see ‘the Ward form’, in the separate ‘Forms’ document).

The different departments are **manually** entered into the GLOBAL-PPS program.

3. Select appropriate survey

Select the appropriate survey online: *go to Survey*

4. Complete denominators for ALL wards surveyed

See data collection forms – “Ward form”

*One needs to complete denominator data (=N patients and N beds) for wards surveyed “**before**” entering the first patient.*

ONLY after all the above mentioned steps have been carried out, one can start to enter patient data.

Teach yourself how to register the hospital, to define the departments, to activate a survey and to add patient data. Go to the online training sessions available at (videos are available in English, Spanish, Russian):

http://app.globalpps.uantwerpen.be/globalpps_webpps

DATA COLLECTION FORMS

To facilitate the data collection, one paper ward form and the corresponding appendices should be printed for each ward. The number of 'patient forms' shall depend on the number of patients on the ward who are on antimicrobial therapy. The forms correspond to the online web forms.

- ❖ Ward form
- ❖ Patient form

After data collection for each ward, attach to the ward form all the individual patient forms (for those patients with antimicrobial treatment (including prophylaxis)).

❖ **The WARD form**

Date of survey – The date the department/ward is surveyed: DDWWYYYY.

Auditor code – Code (numeric or alphanumeric) of the auditor. It should be unique within the hospital. The code is used to track possible bias linked to the auditor.

Hospital – The hospital name.

Ward – The name and optionally code of the department/ward.

Department Type – The official ward type (e.g. if a surgical ward is taking overflow from Medicine it is still to be listed as Surgery)

A special case: a mixed department with mixed activity: In hospitals with shared beds and mixed wards the denominator is difficult to measure. In fact, there are two separate issues: i) wards which occasionally take patients from a different specialty than their 'official' department and ii) permanently mixed wards with no available data on number of beds for each speciality.

For that reason, during data entry and when necessary, it is possible to define a department as mixed department. In this case, the different **activities** encountered at the day of survey should be specified, as well as the total number of admitted patients and total number of beds for each activity according to the defined activity. If needed, the auditor should ask a ward healthcare worker if any patients belonging to another department are present, before starting the ward survey.

In summary, a mixed department will be defined based on the activity level.

Mixed department – If the department is mixed, tick the Y case, if not, tick the N case.

Activity – Select all the encountered activities (Medicine, Surgery, Intensive Care) based on the activity on the day of the survey. A supplementary ward activity may be defined

besides the “main” activity (main activity is automatically attributed by the GLOBAL-PPS program during the department list preparation (see “*Prepare the hospital department list.*”). (e.g. if a surgical ward is taking overflow from Medicine it is still to be listed as Surgery: Define here a mixed department by ticking the box medicine beside the surgery main activity, which will already be marked in the GLOBAL-PPS program.)

Denominators -

1. **Total number of admitted inpatients at 8 am** on the day of the PPS should be entered in the column of the corresponding activity. In case of mixed department, the number of admitted patients corresponding to each of the encountered activities should be entered. Reminder: Do not count patients discharged before 8 o'clock and/or patients with admission planned after that time.
2. **Total number of “eligible” beds for inpatients in the department at 8 am** on the day of the PPS. In case of mixed department, fill the total number of beds corresponding to each of the encountered activities.

Number of beds = total beds in ward (=occupied + empty beds). N beds is always \geq N inpatients present at 8 am.

Examples of challenging denominator attribution:

- Mixed department surgical-medical: fill in N surgical and medical patients and, when not exactly defined following formal hospital listing, distribute surgical and medical empty beds proportionally (or evenly) in N surgical and medical beds.
- An overbooked department: provide information of the “actual real situation” on the day of the PPS providing e.g. the total number of patients admitted and total N beds on the day of the survey.
- There are more patients than beds on the ward: fill in the total number of inpatients for the total number of beds. As such, N beds = N inpatients present at 8 am on the day of the PPS.

Complete denominator data (=N patients and N beds) for wards surveyed “before” entering the first patient.

❖ The PATIENT form

Ward (Name/code)– This is the **name** of the ward studied. This name is selected using the drop down list in the *Global-PPS* program, as this department name has been defined during the preparation of the hospital department list (see step “prepare the hospital department list”, page 11)

Activity – When the ward is a **mixed department**, the activity to which the patient belongs must be specified (M: Medicine, S: Surgery, ICU: Intensive Care).

Full Patient Identifier – This is a unique number allowing local tracing to the patient level for eventual clarifications. (For example the clinical record/note number, hospital number, etc.) This information will not be reported or submitted in the *GLOBAL-PPS* database.

Survey Number – It's a unique non identifiable number generated by the GLOBAL-PPS for each patient record. Please ensure that the person entering the data online **writes down this number immediately when it is generated by the program as it will not be displayed again**. This number identifies uniquely the patient in the GLOBAL-PPS database.

Age – Three fields, one for the year, one for the month and one for the days are available. **It is important to remember that only one of these fields is to be used as follows:**

- If less than 30 days old write the exact numbers of days completed.
- For patients older than 1 month and younger than 2 years fill in month field. (e.g. 19 months)
- If the patient is at least 2 years old then only the year field is to be inputted.

Weight – Write the current weight in Kg with two decimal numbers. Optional field.

Gender – M (Male), F (Female)

Drug Name – This is the generic name (e.g. amoxicillin+clavulanate and not Augmentin®). Antimicrobials for *topical use* applied on the skin/eye/ear etc are not included. Oral topical use however is included in the PPS (e.g. oral vancomycin). The antimicrobial data are recorded automatically using the ATC classification by the WHO Collaborating Centre for Drug Statistics (http://www.whocc.no/atc_ddd_index/).

Prescribed antimicrobials included in the survey are:

1. All antimicrobials for systemic use: J01
2. Antimycotics and antifungals: J02 and D01BA (including griseovulvine and terbinafine)
3. **Drugs for treatment of tuberculosis:** J04A (these are the antibiotics as well as all other drugs to treat tuberculosis)
4. Antibiotics used as intestinal anti-infectives: A07AA
5. Antiprotozoals used as antibacterial agents, nitroimidazole derivatives (P01AB)
6. Antivirals used for influenza - Neuraminidase inhibitors (J05AH)
7. Antimalarials: P01B

Administered “Single Unit Dose” and “Unit” of Dose – Administered dose is the actual prescribed single unit dose per administration, expressed in mg or IU. Milligram is the default unit measure. (e.g., note down 400mg of amoxicillin in 457mg of co-amoxiclav; provide number of times/day given in next variable). NOTE: this must still be listed as co-amoxiclav and NOT amoxicillin.

- For combinations with two or more active ingredients like co-trimoxazole the total content should be entered in GLOBAL-PPS. For example sulfamethoxazole 200 mg/ trimethoprim 40 mg will be recorded as 240 mg.
- For combination with one active ingredient as the main antimicrobial agent, like penicillins with enzyme inhibitors, only the content of active ingredient should be entered in GLOBAL-PPS. For example co-amoxiclav 125/31 (amoxicillin 125 mg and clavulanic acid 31 mg as potassium salt) should be entered as 125 mg.

Other combinations of an antibiotic and an enzyme inhibitor:

J01CR01 Ampicillin and enzyme inhibitor: report only ampicillin dose
J01CR02 Amoxicillin and enzyme inhibitor: report only amoxicillin dose
J01CR03 Ticarcillin and enzyme inhibitor: report only ticarcillin dose
J01CR05 Piperacillin and enzyme inhibitor: report only piperacillin dose

Examples can be found on: http://www.whocc.no/ddd/list_of_ddd_combined_products/

Times per Day – This refers to the number of actual prescribed doses per 24 hours. For example every 6 hours = 4; every 8h = 3, every 12h = 2, every 16h = 1.5, every 36h = 0.67, and every 48h = 0.5 doses per day.

Route – Route of Administration.

Four routes of administration are included: Parenteral (P), Oral (O), Rectal (R), Inhalation (I).

Diagnosis – This is the reason to treat the patient (list available within ‘forms’ document, appendix II). Select ONLY ONE of the possibilities. If more categories are possible, write the one most applicable. Request additional information from doctors, nurses, or pharmacists if needed!

Type of indication – The indication for treatment can be found in the records and/or obtained from ward staff. This section should be completed using the indication codes as provided within ‘forms’ document, appendix III.

- For **surgical patients**, administration of antimicrobial prophylaxis **should be checked in the previous 24 hours** in order to encode the duration of prophylaxis as either one dose, one day (=multiple doses given in one day) or >1 day.

Reason in notes – “Yes” or “No”. Depends on whether the indication is documented in medical records.

It refers to whether or not a diagnosis or indication for treatment was recorded in the notes when antimicrobial treatment started. As a key quality measure, it is important that this information is collected in a unique and consistent manner: based on the information available in the notes on the day of the audit. It should be completed without asking anyone or looking in the records another day. It refers only to time of the audit and should be derived from records only.

Guideline compliance – This depends on whether the antibiotic choice is in compliance with local guidelines Y: Yes (compliant with local policy or infection specialist advice); N: No; NA: Not Assessable (no local guidelines for the specific indication); NI: No Information (because indication is unknown). Thus, appropriateness refers EXCLUSIVELY to drug choice, not the dose, route, or duration, as this is more contentious. NOTE: Therapy directed by an infection specialist is “Yes-compliant”.

Is a stop/review date documented? “Yes” or “No”. This has to be filled-in for all included antibiotics even if it is long term medical prophylaxis where a stop/review day is unlikely.

Type of treatment – E versus T

- Empirical treatment (E) = empiric – when the antibiotic is being used as per a local guideline – as a best guess - treatment by means which experience has proved to be beneficial
- Targeted treatment (T) = based upon microbiological result. Microbiology result can be any culture and/or sensitivity result from a relevant clinical (e.g., blood, sputum, etc.) [BUT not screening] specimen as well as any other microbiology result like for example Legionella Urinary Antigen.

Note down the information which is available at the time of survey (e.g. empirical even when confirmation of positive blood culture day after survey)

Treatment based on biomarker data – ‘Yes’ versus ‘No’

It refers to whether or not biomarker results are used to define the treatment. If yes, next line should be filled in with the biomarker.

Treatment based on use of biomarker data – CRP or PCT or Other

Three answers are possible:

- **CRP** = in case the treatment is based on results of the biomarker CRP (*C-reactive protein*)
- **PCT** = in case the treatment is based on results of the biomarker PCT (*procalcitonin*)
- **Other** = in case the empirical treatment is based on results of another lab-based biomarker than CRP or PCT

When treatment choice is based on microbiological data (treatment=targeted), the fields below should be filled in. NOTE: Microbiology data refers to any culture and sensitivity result from a relevant clinical (not screening) sample as well as any other microbiology result like for example Legionella Urinary Antigen.

Targeted treatment against MRSA – ‘Yes’ versus ‘No’

It refers to whether or not the chosen drug is targeting methicillin-resistant *Staphylococcus aureus*..

Targeted treatment against MRCoNS – ‘Yes’ versus ‘No’. It refers to whether or not the chosen drug is targeting methicillin-resistant coagulase-negative staphylococci.

Targeted treatment against VRE – ‘Yes’ versus ‘No’

It refers to whether or not the chosen drug is targeting vancomycin-resistant enterococci.

Targeted treatment against ESBL-producing Enterobacteriaceae – ‘Yes’ versus ‘No’

It refers to whether or not the chosen drug is targeting Enterobacteriaceae producing extended-spectrum beta-lactamase.

Targeted treatment 3rd generation cephalosporin resistant Enterobacteriaceae non-ESBL producing or ESBL status unknown – ‘Yes’ versus ‘No’

This refers to whether or not the chosen drug is targeting Enterobacteriaceae and either the ESBL status is unknown or another resistance mechanism is present.

Targeted treatment against Carbapenem-resistant Enterobacteriaceae – ‘Yes’ or ‘No’

This refers to whether or not the chosen drug is targeting Carbapenem-resistant Enterobacteriaceae.

Targeted treatment against ESBL-producing nonfermenter Gram-negative bacilli – ‘Yes’ versus ‘No’.

It refers to whether or not the chosen drug is targeting nonfermenters (*Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Burkholderia* spp., *Stenotrophomonas maltophilia*) producing extended-spectrum beta-lactamase.

Targeted treatment against carbapenem-resistant non fermenter Gram-negative bacilli – ‘Yes’ versus ‘No’

It refers to whether or not the chosen drug is targeting carbapenem-resistant nonfermenters (*Pseudomonas aeruginosa*, *Acinetobacter baumannii*, *Burkholderia* spp., *Stenotrophomonas maltophilia*).

Targeted treatment against MDR organisms – ‘Yes’ versus ‘No’

It refers to whether or not the chosen drug is targeting multi-drug resistant organisms, other than the ones listed above.

EXPORT YOUR DATA

Data can be exported into a Microsoft Excel® file. One can do this at any time during the process of data entry. It contains the raw recorded department and patient data. It allows the user/s to verify own data (correctness and completeness of data). It also enables hospitals to perform analysis for own data.

VALIDATION PROCESS

After the denominator data and all patient data have been entered into the GLOBAL-PPS program, the “local administrator” needs to complete the validation process in order to be able to generate a feedback presentation.

The validation process identifies small, basic issues, warnings or errors in the survey, for example:

- ✓ Surveys without data entry
- ✓ Incomplete departments (missing values for auditor code, denominator values)
- ✓ Departments without patient data
- ✓ Patient data without antibiotic treatments or with duplicated antibiotics
- ✓ Warnings about extremely high values.

The validation process in the GLOBAL-PPS program

FEEDBACK

The software is designed to produce an automated feedback for each participating hospital. We anticipate sending data back in a simple, easy to use feedback, with own data ready to use for local presentations. The feedback compares hospital data to i] National (if N≥3 institutions) and ii] Continental results.

Feedback reports can only be produced after the data entry/validation time-window has been closed AND only if the hospital data have been validated. This delay is needed in order to produce reliable antimicrobial use rates at country and continental level (at the end of the survey). The feedback report shall include various tables (and charts) on the prevalence of antimicrobial use and resistance.

**In case of questions or difficulties:
contact Ann Versporten (Global-PPS@uantwerpen.be)**

REFERENCES

1. Willemsen I, Groenhuijzen A, Bogaers D, Stuurman A, van Keulen P, Kluytmans J. Appropriateness of antimicrobial therapy measured by repeated prevalence surveys. *Antimicrob Agents Chemother* 2007, 51:864-867.
2. Zarb P, Amadeo B, Muller A, Drapier N, Vankerckhoven V, Davey P, Goossens H. Identification of targets for quality improvement in antimicrobial prescribing “ the web-based ESAC Point Prevalence Survey”. *J Antimicrob Chemother* 2011, 66:443-449.
3. Ansari F, Erntell M, Goossens H, Davey P. The European Surveillance of Antimicrobial Consumption (ESAC) point prevalence survey of antibacterial use in 20 European hospitals in 2006. *Clin Infect Dis* 2009, 49:1496-1504.
4. Seaton RA, Nathwani D, Burton P, McLaughlin C, MacKenzie AR, Dundas S, Ziglam H, Gourlay Y, Beard K, Douglas E. Point prevalence survey of antibiotic use in Scottish hospitals utilising the Glasgow Antimicrobial Audit Tool (GAAT). *Int J Antimicrob Agents* 2007, 29:693-699.
5. Malcolm W, Nathwani D et al From intermittent antibiotic point prevalence surveys to quality improvement: experience in Scottish hospitals. *Antimicrobial Resistance and Infection Control* 2013, 2:3 doi:10.1186/2047-2994-2-3.
6. Pristas I et al. PPS on antibiotic use in a Croatian Infectious Disease Hospital. *J of Chemotherapy* 2013 Aug;25(4):222-8. doi: 10.1179/1973947812Y.0000000065.
7. Versporten A, Sharland M, Bielicki J, Drapier N, Vankerckhoven V, Goossens H. The antibiotic resistance and prescribing in European Children project: a neonatal and pediatric antimicrobial web-based point prevalence survey in 73 hospitals worldwide. *Pediatr Infect Dis J* 2013;32(6):e242-e253.
8. Zarb P, Coignard B, Griskeviciene J, Muller A, Vankerckhoven V, Weist K, et al. The European Centre for Disease Prevention and Control (ECDC) pilot point prevalence survey of healthcare-associated infections and antimicrobial use. *Euro Surveill.* 2012;17(46)