Global Point Prevalence Survey of

Antimicrobial Consumption and Resistance

(2018 GLOBAL-PPS)

PROTOCOL – *version January 2018*

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Timeline 2018 Global Survey: three surveys will be available to allow investigating seasonal variation:

Data should be "collected" within 3 predefined time frames:

- January–April 2018
- May-August 2018
- September-December 2018

Herewith, data collection should be finished within the period it was started. Data-entry onto the Global-PPS tool is also possible after any predefined period.

Any hospital from any country worldwide is welcome to participate. Hospitals can choose one or more appropirate periods of participation.

Changes with respect to the 2017 protocol:

It is now possible to survey all antivirals : beside the neuraminidase inhibitors, also the antivirals for treatment of HIV infections and all other antivirals are added.

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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 antimicrobials. No need to fill in the patient form for patients not on antimicrobial treatment.

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BACKGROUND - AIMS

Background

The Global Point Prevalence Survey of Antimicrobial Consumption and Resistance (**GLOBAL-PPS**) is an ambitious project, funded by BioMérieux, and which was developed based 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 Global-PPS was piloted in 2014. The full survey was conducted in 2015 and 2017. Many countries have been presenting their results during the 2016 ECCMID congress as well as other international conferences. You'll find all information on the Global-PPS website: www.global-pps.com

BioMérieux funds the GLOBAL-PPS because this initiative meets one of the aims of the company to support global initiatives to better control antibiotic resistance through stewardship interventions in a range of resource and geographical settings.

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Aims

The GLOBAL-PPS aims to further 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 aims to expand its network to further determine the global variation in antibiotic prescribing in hospitalised patients across all continents.
The GLOBAL-PPS:

1. Identifies 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. Helps in designing hospital interventions that aim at promoting prudent use of antimicrobials;
3. Allows 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.

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.

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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.

The period of data collection for the 2018 Global Survey is foreseen from **January to December 2018. Data should be collected within three proposed time-frames:**

- January–April 2018
- May-August 2018
- September-December 2018

2. Departments involved

All wards (or units/departments) within the participating hospital must be included if you participate for the very first time. Bigger hospitals who have participated to the 2015 or 2017 survey can ***participate with a number of wards (subsample)*** of the hospital, but they need to include all wards for a certain speciality: for example include all adult ICU wards, all adult surgical wards, all adult pneumology wards or all child medical wards. This is needed to allow the collection of enough data by "type of ward" and subsequently the calculation of valid rates in time by type of ward at hospital level. The different type of wards can be found at page 11-12 of this protocol. For smaller hospitals (± <200 to 250 beds), it remains advisable to survey the whole hospital !

Each ward included into the survey 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 11-12: "Prepare hospital department list").

Surgical Wards (PSW, ASW) **should be surveyed** on the day following the day when most elective surgical interventions usually take place or have been planned; in order to capture information about prophylaxis in the previous 24 hours (see also page 7). (E.g. If a surgical ward mainly has operations planned on Tuesdays then it should be surveyed on Wednesday). NOTE: For Surgical Prophylaxis antibiotic use in the previous 24h is relevant not like the rest of treatment (including Medical Prophylaxis) where the 'snapshot' is 8.00am of the survey day.

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

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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 supplementary NMW (neonatal medical ward).

Note for surgical wards: A surgical ward **should be surveyed** on the day following the day when most interventions have been planned.

For patients receiving surgical prophylaxis, the 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. This means that "only" patients who got the intervention the day 'before' of the PPS, but received the surgical prophylaxis as one dose or one day, will also be included into the survey. For those patients, a patient file (see data collection forms) need to be completed!

Patients who get an intervention after 8am on the day of the PPS are NOT included into the survey (see exclusion criteria).

Include patients on surgical prophylaxis marked in green:

>1 day before PPS	Day before PPS	Day of PPS at 8am	Real Total duration	How to Code
SP	**SP**	**SP**	>1 day	**SP3**
SP	**SP**	/	>1 day	**SP3**
/	**SP**	**SP (not being stopped at 8 am)**	>1 day	**SP3**
SP	/	/	no SP in the previous 24h	**/**
/	**1 dose SP**	/	1 dose	**SP1**
/	**>1 dose SP**	/	1 day	**SP2**
/	**Total doses = 24h cover [part on day before PPS and part on day of PPS] (e.g. 3 doses each 8h or 4 doses each 6h)**		1 day (24h)	**SP2**
/	/	SP started today irrespective of whether there is a stop-date or not	no SP in the previous 24h	**/**

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.

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5. Denominator data

- ***Total number of admitted 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 available 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 ≥ 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 for systemic use***: J05
- ***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 classification[1]. 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.

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 (see IT-manual available at http://www.global-pps.com/documents/).

[1] http://www.whocc.no/atc_ddd_index/

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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). 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, IT-manual, and the “FAQ” section.

Regular backups of the database will guarantee the integrity of data.
The format to export data is Microsoft Excel®.

The software and database are 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.

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« 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:

Hospitals who have participated to the 2015 and/or the 2017 Global-PPS need to login with their existing password which is linked to an email address! Only then you will be able to activate a new survey using the same hospital number as the one which was attributed to you in 2015 or 2017. Only then, you will be able to download a longitudinal feedback including results on previous surveys you conducted.

If you lost your login or you are a new participant/member for a hospital who participated in 2015 or 2017, contact Ann at global-pps@uantwerpen.be

Applicable for hospitals who participate for the very first time:

1. *Register yourself and the hospital on the Global-PPS website* :

First time participants **for "hospitals who never participated" to the Global-PPS** need to register themselves onto http://app.globalpps.uantwerpen.be/globalpps_webpps/register. They will receive an email to confirm their email address (in order to avoid spam registration). Thereafter they can login onto the Global-PPS tool (do not forget to tick the captcha): http://app.globalpps.uantwerpen.be/globalpps_webpps/login.

Thereafter the participant need to **register the hospital onto the Global-PPS tool** (see IT manual available online: http://www.global-pps.com/documents/). The person who registers the hospital for the very first time will be the local administrator. He/she has access to all functionalities of the program.

- The local administrator can add an extra users in order to give other person(s) the rights to enter data as well for his hospital (see IT manual available online: http://www.global-pps.com/documents/).

Applicable for hospitals who participated to the 2015 or 2017 Global-PPS:

Second and subsequent participations to GLOBAL-PPS when the hospital has already been registered with the GLOBAL-PPS:

- The already registered and known participant need to use its existing login (username) and password ! If this information has been lost, please contact Ann Versporten (Global-PPS@uantwerpen.be)

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- New participants for a hospital who participated before need to contact the local administrator of the hospital. If the local administrator is not working any more at the hospital, please contact Ann Versporten (Global-PPS@uantwerpen.be). She will do the necessary to link you up with the existing hospital. Important, do not create a new hospital (with another ID number) as you will then not be able to download a longitudinal feedback report.

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

Hospitals who participated before need to review the hospital department list and make necessary updates if needed (eg. Adding a new department, change the name of the department)

New participating hospitals:

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. 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)

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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 data collection forms).

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

3. Select appropriate survey

Select the appropriate survey online*: go to Surveys/ available surveys and* ***select the appropriate 2018 survey following the appropriate time-frame (Jan-Apr; May-Aug; Sept-Dec).***

4. Complete denominators for ALL wards surveyed

See data collection forms – "Ward form"

*One needs to complete denominator data (=N admitted 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.

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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 (those patients with antimicrobial treatment (including prophylaxis)).

❖ ***The WARD form***

Date of survey – The date the department/ward is surveyed: dd/mm/yyyy.

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 and description 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

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main activity, which will already be marked in the GLOBAL-PPS program.)

Denominators -

1. **Total number of admitted inpatients in the department 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.

   An admitted inpatient is a patient occupying a bed at 8am on the day of the PPS. It **includes all patients on antimicrobials + all patients NOT on antimicrobials at 8am on the day of the PPS**.

2. **Total number of "available" 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.

   Total number of beds = total beds in ward (=**occupied + empty beds**). N beds is always ≥ 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***

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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 for systemic use: J05
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_ddds_combined_products/

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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 over 24 hours) or >1 day. A patient who got the intervention the day 'before' of the PPS, but received the surgical prophylaxis as one dose or one day, will also be included into the survey. For those patients, a patient file (see data collection forms) need to be completed!

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".
- Note: If the choice of drug agrees only partially with guideline this should be classified as non-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

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when confirmation of positive blood culture day after survey).The field is not mandatory for medical prophylaxis (MP) or surgical prophylaxis (SP).

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'. It 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'. It 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.
- **Treatment based on biomarker data** – Tick 'Yes' or 'No'. It refers to whether or not biomarker results are used to define the treatment. If yes, next lines should also be completed.

Treatment based on use of biomarker data – 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

Type of biological fluid sample: choose between Blood, Urine or Other.
Most relevant value of biomarker on the day of the PPS: complete if available on the day of the PPS the appropriate value (numeric optional field) in mg/l, µg/L, ng/L, mg/dL, ng/dL, ng/mL, µg/mL, nmol/L.
For conversion calculator see: http://unitslab.com/node/67 (CRP) and http://unitslab.com/node/103 (procalcitonin).

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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 (denominator) and patient (numerator) data. It allows the user/s to verify own data (correctness and completeness of data). It also enables hospitals to perform analysis on 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 report.

The validation process identifies small, basic issues, warnings or errors in the survey (see IT manual available online: http://www.global-pps.com/documents/

For example:

- ✓ Surveys without data entry gives an error
- ✓ Incomplete departments (missing values, denominator values) gives an error
- ✓ Patient data without antibiotic treatments or with duplicated antibiotics gives an error
- ✓ Warnings about extremely high values.
- ✓ Check on consistency between the diagnostic code and the indication (therapeutic versus prophylactic use): gives a warning
- ✓ Check on Targeted prescribing for surgical prophylaxis (an error will be shown) and medical prophylaxis (a warning will be shown)

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. Hospitals participating a second time or more will be able to download a longitudinal feedback report.

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)

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DEVELOPMENT OF AN EDUCATIONAL RESOURCE SYSTEM

Education and awareness on antimicrobial resistance and antibiotic use is an important pillar in supporting the antimicrobial resistance challenge.
For that reason, a short e-learning educational resource for PPS has been developed by the British Society for Antimicrobial Chemotherapy (BSAC). It provides amongst other, information on 'why we need to measure antibiotic consumption quantity and quality' , 'what can a PPS do', 'Limitations and challenges', etc. The format will be text narrative supported by multi-media resources (supporting interactive PDFs, narrated PPT presentations, podcasts, video-interviews and illustrated case studies). See: https://www.futurelearn.com/courses/point-prevalence-surveys/1

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