EARS-Net
REPORTING PROTOCOL

Version 2, 2012

TABLE OF CONTENTS

1. INTRODUCTION

The surveillance of the antimicrobial resistance within the European Union (EU) is carried out in agreement with Decision No 2119/98/EC on reporting communicable diseases to the Community Network. European data on antimicrobial resistance has been collected since 1998 by the European Antimicrobial Resisatnce Surveillance System (EARSS), a network of national surveillance systems providing European reference data on antimicrobial resistance for public health purposes. EARSS was coordinated by the Dutch National Institute for Public Health and the Environment (RIVM) between 1998 and 2009. The coordination of the network was transferred from RIVM to the European Centre for Diseas Prevention and Control (ECDC) in January 2010, and at the same time the network changed name to EARS-Net. Historical EARSS data covering the period 1998 to 2009 was transferred to The European Surveillance System (TESSy), which is now the single point of entry for Member States to submit and retrieve EARSS/EARS-Net data.

The first EARS-Net Reporting Protocol was published in 2010 and presented methods of data submission and analysis for the antimicrobial resistance surveillance in Europe as agreed in the EARS-Net Coordination Group Meeting in March 2010. It specified the recommended structure for AMR data for reporting to TESSy, and provided a detailed description of data management and analysis.

This second version of the reporting protocol contains minor changes in description of general data collection (deadlines etc) and information on a new variable (variable 37: ReferenceGuidelinesSIR) added to the AMRTEST metadata set and implemented with Metadaset version 25 (May 2012).

1.1 Structure of TESSy

The European Surveillance System (TESSy) is a web-based system for collection, validation, cleaning, analysis and dissemination of data. It is intended to be the single point for Member States (MS) to submit and retrieve data on all communicable diseases that are under EU surveillance.

The TESSy data structures are defined by the *metadaset* which includes the specifications for the variables (fields), the lists of coded values and the validation rules. The list of variables which are collected for a particular surveillance are defined by the RecordType. In the individual case based surveillance each record has a unique identifier, the RecordId. The TESSy metadaset contains technical fields common to the different RecordTypes and other surveillance disease-specific fields that can change across RecordTypes. In effect this metadataset consists of the common variable dataset for reporting all diseases, combined with specific sets for the different RecordTypes.

TESSy includes two datasets for AMR surveillance: one for the isolate-based reports (RecordType *"AMRTEST"*) and the other for the denominator data reports of participating laboratories and hospitals (RecordType *"AMRDENOM"*).

In the TESSy help menu (https://tessy.ecdc.europa.eu/TessyHelp/index.html), an overview of requested variables in the TESSy metadata set is given. TESSy technical specifications (Transport protocols) and the TESSy user manuals can also be downloaded from there.

1.2 Implementation of AMR case definitions for TESSy

Given the typology of data for AMR surveillance, which refers to laboratory isolates rather than to cases of disease, the following case definition has been implemented in the RecordType *"AMRTEST"*, for reporting to TESSy:

- The bacterial species under surveillance are: *Streptococcus pneumoniae* (STRPNE), *Staphylococcus aureus* (STAAUR), *Enterococcus faecalis* (ENCFAE), *Enterococcus faecium* (ENCFAI), *Escherichia coli* (ESCCOL), *Klebsiella pneumoniae* (KLEPNE) and *Pseudomonas aeruginosa* (PSEAER).
- All isolates from blood (STRPNE, STAAUR, ENCFAE, ENCFAI, ESCCOL, KLEPNE, PSEAER) and/or cerebrospinal fluid (STRPNE, ESCCOL, KLEPNE, PSEAER), for which a susceptibility test has been performed, have to be included.
- Duplicates from the same patients should be eliminated taking only the first by date of sample collection and isolate source. The bug/source/drug combinations to be reported are listed in the **following table**. If records referring to additional combinations are uploaded, they will be filtered out by the system (TESSy Filter 1; see paragraph 5.1).

Bug - *"Pathogen"*	**Source - *"Specimen"***	**Drug - *"Antibiotic"***
Streptococcus pneumoniae (STRPNE)	blood (BLOOD); cerebrospinal fluid (CSF)	Penicillin (PEN) Oxacillin (OXA) Ceftriaxone (CRO) Cefotaxime (CTX) Erythromycin (ERY) Clarithromycin (CLR) Azithromycin (AZM) Norfloxacin (NOR) Ciprofloxacin (CIP) Ofloxacin (OFX) Levofloxacin (LVX) Moxifloxacin (MFX)
Staphylococcus aureus (STAAUR)	blood (BLOOD)	Oxacillin (OXA) Methicillin (MET) Flucloxacillin (FLC) Cloxacillin (CLO) Dicloxacillin (DIC) Cefoxitin (FOX) Norfloxacin (NOR) Ciprofloxacin (CIP) Ofloxacin (OFX) Levofloxacin (LVX) Rifampin (RIF) Linezolid (LNZ)
Enterococcus faecalis (ENCFAE)	blood (BLOOD)	Ampicillin (AMP) Amoxicillin (AMX) Gentamicin-High (GEH) Vancomycin (VAN) Teicoplanin (TEC) Linezolid (LNZ)

Bug - *"Pathogen"*	**Source - *"Specimen"***	**Drug - *"Antibiotic"***
Enterococcus faecium (ENCFAI)	blood (BLOOD)	Ampicillin (AMP) Amoxicillin (AMX) Gentamicin-High (GEH) Vancomycin (VAN) Teicoplanin (TEC) Linezolid (LNZ)
Escherichia coli (ESCCOL)	blood (BLOOD); cerebrospinal fluid (CSF)	Ampicillin (AMP) Amoxicillin (AMX) Gentamicin (GEN) Tobramycin (TOB) Amikacin (AMK) Ceftriaxone (CRO) Cefotaxime (CTX) Ceftazidime (CAZ) Ciprofloxacin (CIP) Ofloxacin (OFX) Levofloxacin (LVX) Imipenem (IPM) Meropenem (MEM)
Klebsiella pneumoniae (KLEPNE)	blood (BLOOD); cerebrospinal fluid (CSF)	Gentamicin (GEN) Tobramycin (TOB) Amikacin (AMK) Ceftriaxone (CRO) Cefotaxime (CTX) Ceftazidime (CAZ) Ciprofloxacin (CIP) Ofloxacin (OFX) Levofloxacin (LVX) Imipenem (IPM) Meropenem (MEM)
Pseudomonas aeruginosa (PSEAER)	blood (BLOOD); cerebrospinal fluid (CSF)	Piperacillin (PIP) Piperacillin/Tazobactam (TZP) Ceftazidime (CAZ) Ciprofloxacin (CIP) Levofloxacin (LVX) Gentamicin (GEN) Tobramycin (TOB) Amikacin (AMK) Imipenem (IPM) Meropenem (MEM)

1.3 Objectives for AMR surveillance

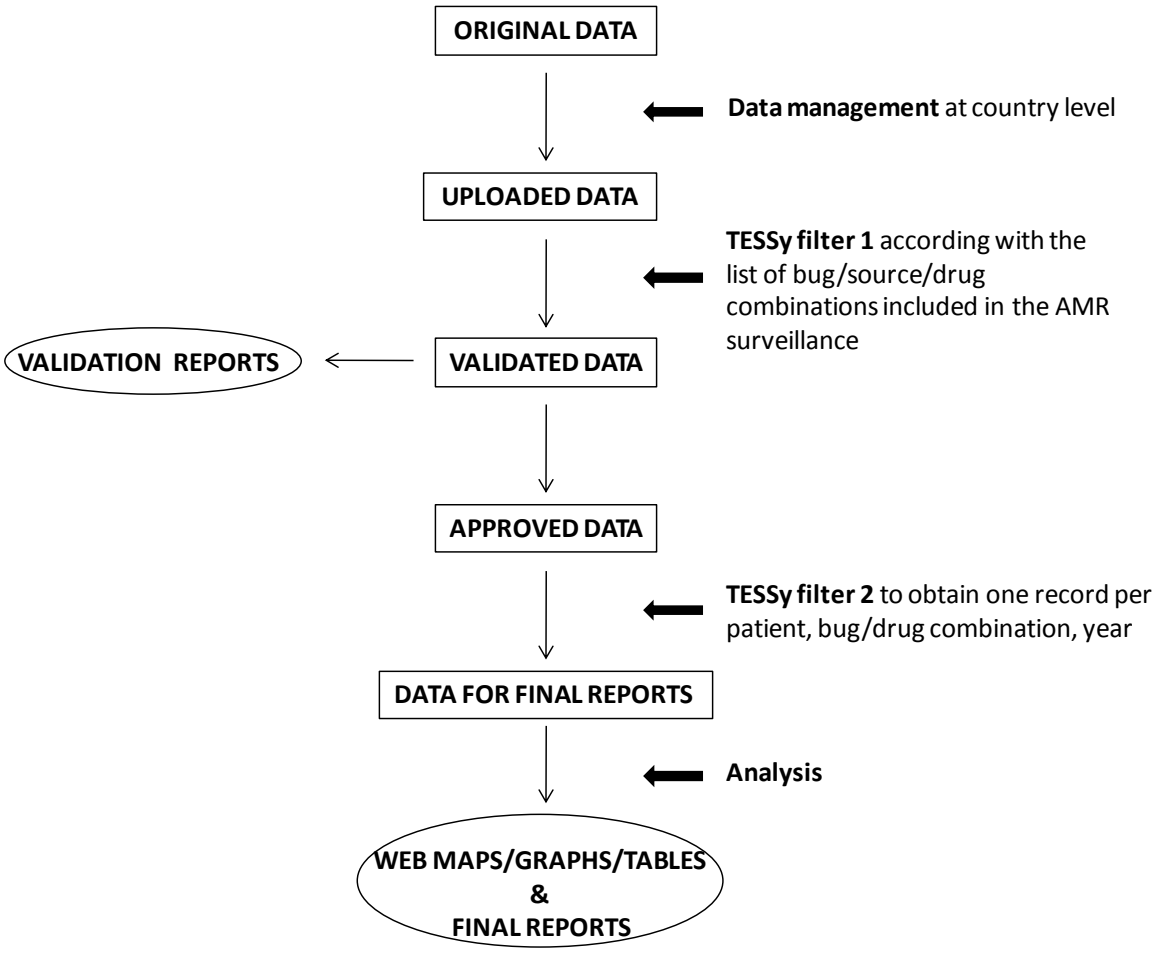
The ECDC strategy for AMR surveillance is in line with the one adopted by the former-EARSS. Therefore the approach is to maintain a comprehensive surveillance system that links national networks and provide comparable and validated data on the prevalence and trends of antimicrobial resistance in a core group of invasive bacteria.

Specific objectives

- collect comparable and validated AMR data;
- analyse trends over time;
- provide timely AMR data that constitute a basis for policy decisions;
- encourage the implementation, maintenance and improvement of national AMR surveillance programmes;
- support national systems in their efforts to improve diagnostic accuracy at every level of the surveillance chain;
- link AMR data to factors influencing the emergence and spread of AMR, such as antibiotic use data
- initiate, foster and complement scientific research in Europe in the field of AMR.

1.4 Overview of the AMR data collection and analysis

DATA FLOW-CHART (RecordType *"AMRTEST"*)



Summary of the data reporting process

- The laboratories send the data to the country data manager.
- The data manager revises and compiles the data.
- The data manager uploads the compiled data in TESSy. The complete uploaded file is saved in a specific environment (out of TESSy data warehouse).
- Records referring to additional bug/drug combination are filtered.
- TESSy provides a validation report before the approval by the country user. The report shows summary statistics of the validated data from the uploaded file. The analysis outputs are obtained using the same methodology that is used for the final reports.
- The country user revises the validation reports and approves or rejects the file. The validated data are approved after agreement with the nominated national epidemiologist for surveillance and the disease specific contact points.
- After approval by the country user the file goes to the data warehouse where it is filtered (filter 2) to obtain one record per patient, bug/drug combination, year. This file is used for the analysis and can be downloaded by the country user. The results of the analysis are used for the web application outputs (maps, graphs and tables) and the final report (annual report).
- The user can download a national summary report (country and lab specific) from the TESSy webpage. The report contains detailed results for the country referring to the bug/drug combinations under surveillance.

2. AMR REPORTING IN TESSy

AMR data should be reported to ECDC annually, but more frequent data submissions are possible. The annual deadline will be the 15th of July (e.g. 2009 data should be submitted by the 15th July, 2010, to be included in the annual report for 2009). It is the responsibility of each MS to decide which data best reflect the AMR situation in their country and therefore which data should be submitted to TESSy.

The data must be submitted in a format supported by the TESSy application: CSV (Comma Separated Value) or XML (eXtensible Markup Language).

During the validation process, the system runs automatic checks for data quality and reports errors, warnings and remarks:

- An error is a severe validation failure, which will cause the batch to be automatically rejected.
- A warning is a minor validation issue. The user who approves the batch decides whether to keep or change the issue. A warning can often set one or more *Fields* to unknown as data cleaning.
- A remark is used in the validation process to indicate an unlikely value or an unlikely combination of values.

2.1 EARS-Net data collection

The collection of AMR surveillance data (RecordType *"AMRTEST" and* RecordType *"AMRDENOM*") by ECDC takes place once years and covers data referring to the previous year. The dates for the data call period will be announced to MS well in advance. The data call period covers one month and during this time the submission of the AMR data will be given priority by the TESSy helpdesk. Data can be uploaded before the data call period, but limited availability of helpdesk may be expected. Data reported after the deadline will not be included in the EARS-Net annual report.

The data collection at laboratory level can be performed both electronically and manually by filling out the corresponding Isolate Records Forms per pathogen (Annex I-VI). In the paper forms it is also requested to collect the variables "Year of birth" and "Patient ID / Code" as in the previous EARSS dataset instead of "Age" and "PatientCounter" which are the new variables of the TESSy metadaset. The creation of "Age" and "PatientCounter", which was covered during the AMR TESSy training (February 2010), should be performed centrally by the Country Data Managers before uploading data in TESSy.

The data collection for EARS-Net is supported by WHONET (Microbiology Laboratory Database Software) which is a useful tool for processing and analysis of antimicrobial resistance data. It provides a routine procedure to perform data entry and to export data in EARS-Net exchange format and can be used locally by participating laboratories and centrally by country data managers. The software and manual can be downloaded from (http://www.who.int/drugresistance/whonetsoftware/en/)

2.2 EARSS historical data (1999-2008)

The original historical EARSS files (data up to and including 2008) was transferred to ECDC from RIVM. The data was converted to the new format and uploaded in the ECDC database. The conversion tables were prepared by the TESSy team in collaboration with the ECDC AMR experts.

Countries can upload files referring to the 1999-2008 period, but in this case, the “replace file” function must be used instead of the “update file” function.

2.3 Update on DataSource information and LaboratoryCode

The variable ‘DataSource’ specifies the AMR surveillance system where the data come from. Countries can log in to TESSy, review and update the information for ‘DataSource. Updates should only be made in agreement with the main national contact point for surveillance, who has the rights for changing this variable.

If a new laboratory joins the surveillance network the country disease specific contact points must communicate the new code of the new laboratory to the Helpdesk by e-mail before uploading data; otherwise the system will not recognise the new code and will reject the entire file.

3. DATASETS FOR AMR SURVEILLANCE

The set of variables for **isolate based AMR reporting** *(RecordType "AMRTEST")* consists of 8 technical variables and 29 epidemiological variables which are further classified in variable at patient/isolate level and variables at AMR test level. The first level includes data referring to the isolate which are repeated in all records reporting the antibiotic susceptibility tests performed for that isolate (See the following table).

The variables used for **reporting laboratory and hospital activity data** *(RecordType "AMRDENOM")* according to aggregated format include: RecordType, RecordTypeVersion, Subject, DataSource, ReportingCountry, DateUsedForStatistics, LaboratoryCode, TownOfLaboratory, LaboratoryZIP, NumPopulationLab, FullYearReported, HospitalId, HospitalType, NumPopulationHosp, NumBedsHosp, NumBedsHospICU, NumPatDaysHosp, NumAnnualOccRateHosp, NumAdmissionsHosp, NumCultureSetsHosp.

The variables of "AMRTEST" and "AMRDENOM" RecordTypes are described in more detail, including the validation rules, in Chapter 6. The table below shows an overview of the set of variables for AMRTEST RecordType (isolate based surveillance) compared to set of variables used in the previous EARSS dataset.

Variable Name	Mandatory	Corresponding variable in the previous EARSS dataset	Consistency with EARSS database
Technical variables			
1. RecordId	**Yes**		*New variable*
2. RecordType	**Yes**		*New variable*
3. RecordTypeVersion			*New variable*
4. Subject	**Yes**		*New variable*
5. DataSource	**Yes**		*New variable*
6. ReportingCountry	**Yes**		*New variable*
7. DateUsedForStatistics	**Yes**	Date of sample collection	*New format*
8. Status			*New variable*
Epidemiological variables at isolate level			
9. LaboratoryCode	**Yes**	Laboratory code	
10. Specimen	**Yes**	Isolate source	*New codes, same categories*
11. PatientCounter	**Yes**	Patient ID / Code	*Must be anonimous. Was a string now it is a number.*
12. Gender		Sex	*New codes*
13. Age			*New variable*
14. IsolateId		Isolate sample number	
15. HospitalId		Hospital code	*New recommended format*
16. PatientType		Origin of patient	*New code, same categories*
17. HospitalUnitType		Hospital department	*New codes, same categories*
18. Pathogen	**Yes**	Pathogen code	*New codes, same categories*
19. DateOfHospitalisation		Date of admission	*New format*
20. ResultPCRmec		PCR mec-gene	*New codes, same categories*
21. ResultPbp2aAggl		PBP2a-agglutination	*New codes, same categories*
22. Serotype		Serotype	

Variable Name	Mandatory	Corresponding variable in the previous EARSS dataset	Consistency with EARSS database
23. ESBL		ESBL present	*New codes, same categories*
24. ResultCarbapenemases			*New variable*
Epidemiological variables at AMR test level			
25. Antibiotic	**Yes**	Antibiotic code	
26. SIR	**Yes**	S/I/R	
27. ResultZoneSign		Zone (> < =)	*New codes*
28. ResultZoneValue		Zone (Value in mm)	*Only Zone diameter in millimetres; in the EARSS Dataset it also could contain the S/I/R results.*
29. ResultZoneSIR			*New variable*
30. ResultMICSign		MIC (> < =)	*New codes*
31. ResultMICValue		MIC (Value in mg/l)	*Only MIC values in mg/l; in the EARSS Dataset it also could contain the S/I/R results.*
32. ResultMICSIR			*New variable*
33. ResultEtestSign		E-test (> < =)	*New codes*
34. ResultEtestValue		E-test (Value in mg/l)	*Only E-test values in mg/l; in the EARSS Dataset it also could contain the S/I/R results.*
35. ResultEtestSIR			*New variable*
36. DiskLoad		Disk load	
37. ReferenceGuidelinesSIR			*New variable 2012*

4. PREPARING NATIONAL DATASETS

This reporting protocol for AMR data submission describes the datasets structure and the variable coding (*for updates check the last version of the Metadataset*). Questions regarding coding, upload of data etc. should be directed to the TESSy helpdesk:

Helpdesk by email: tessy@ecdc.europa.eu

Helpdesk by phone: +46 (0)8 5860 1601

Please note that technical (and TESSy related) questions will be dealt with by the TESSy team and questions regarding the AMR reporting, contents or transfer of variables will be dealt with by the AMR experts.

We suggest that you prepare your datasets and test the uploaded dataset before uploading to TESSy; this will help you in recoding the variables correctly and will facilitate future uploading as well.

If the data collection at laboratory level has been performed manually by filling the Isolate Records Forms (Annex I-VI), the Country Data Manager should create the fields “Age” and “PatientCounter” starting from the available information in the paper forms (“Year of birth” and “Patient ID / Code”). The creation of “Age” and “PatientCounter”, which aims to avoid transferring sensitive data, has been covered during the AMR TESSy training (February 2010).

4.1 Check for duplicate records

Before uploading a file to TESSy, the country data manager has to revise the laboratory data and check for duplicates (records with the same RecordId). If there are duplicates they should be eliminated by merging/selecting records.

Recommendations for merging and selecting records

- In the TESSy Metadaset the recommended format of the RecordId is the combination of the following fields: ReportingCountry; LaboratoryCode; PatientCounter; Pathogen; Specimen; Antibiotic; DateUsedForStatistics.
- If the user tries to upload a file with duplicates (records with the same RecordId) TESSy will reject it. Therefore it is necessary to remove the duplicates.
- **The first proposed step** to deal with this problem is to identify the multiple isolates within the same day (using the field IsolateId when available) and select the first one per day (DateUsedForStatistics).
- If there are still duplicates after the first step, the further merging/selection of records should be done according with the recommended method which is summarized in the **Examples 1, 2 and 3**.

Practical examples for the preparation of new data before uploading

Example 1 – Duplicates: same bug/drug combination but different microbiological tests.

Pathogen	Antibiotic	SIR	ResultZoneSIR	ResultMICValue	ResultMICSIR
STAAUR	OXA	R	R		
STAAUR	OXA	S		0.25	S

- The two records above refer to the same patient and the same bug/drug combination from the same source (blood) in the same day.
- According to the metadataset specifications, they are considered as **duplicates and will generate an error** in the uploading process to TESSy with the subsequent rejection of the entire batch of records.
- To avoid this unsuccessful outcome, it is possible to **merge the reported data in one row**.
- For the final interpretation of the susceptibility test (SIR), according to the microbiological protocol (EARSS Manual 2005), the MIC result will prevail.

Pathogen	Antibiotic	SIR	ResultZoneSIR	ResultMICValue	ResultMICSIR
STAAUR	OXA	S	R	0.25	S

****

Example 2 – Duplicates: same drug/bug combination, same test, different SIR results.

Pathogen	Antibiotic	SIR	ResultZoneSIR	ResultMICValue	ResultMICSIR
STAAUR	OXA	R		4	R
STAAUR	OXA	S		1	S

Select the first in this order R→I→S (therefore the most resistant is selected). This is a rare occurrence and this rule is implemented to have a standard algorithm for filtering the duplicates.

****

Example 3 – Duplicates: same drug/bug combination, same test, same SIR results.

Pathogen	Antibiotic	SIR	ResultZoneSIR	ResultMICValue	ResultMICSIR
STAAUR	OXA	S		1	S
STAAUR	OXA	S		1	S

If the records have the same SIR result (true duplicates) just select one of them, taking into account the completeness of the other variables.

4.2 Metadata set versions

The **metadata set** is the description of the variables of the data to be reported. Updated versions of the metadata set will be made available to TESSy users on a regular basis. The whole set of 'RecordType', 'RecordTypeVersion' and 'Subject' is included in the metadata set. The Metadataset will be versioned to keep track of changes in the record types and to be able to go back to previous reporting structures (record types) if needed. The most recent metadata set will include the most recent record types and subjects. The metadata set includes all RecordTypes for several surveillance systems, not only EARS-Net.Therefore, when there is a new version of the Metadaset, this may not necessarily imply that the variables for AMR surveillance are changed.

5. DATA MANAGEMENT AND ANALYSIS PLAN

5.1 TESSy Filter 1 ("case definition") and validation report

TESSy filters the uploaded records according to the list of Pathogen/Specimen/Antibiotic combinations included in the AMR surveillance (the EARS-Net case definition for TESSy is described in more detail in Paragraph 1.2). Records referring to additional bug/drug combinations are discharged.

Shortly after the data uploading, TESSy provides a validation report which should be assessed by the country user before approval. The report shows summary statistics of the validated data from the uploaded batch. The analysis outputs are obtained using the same methodology that is used for the final reports (see paragraph 5.3).

5.2 TESSy Filter 2 (preparing dataset for analysis)

This filter aims to obtain one record per patient, bug/drug combination, year.

STEP 1	Select all records that belong to the first **date** within the considered YEAR for each **patient/microrganism combination.**	Fields to identify the **date**: • *DateUsedForStatistics* Fields to identify the **patient/microrganism combination:** • *ReportingCountry* • *LaboratoryCode* • *PatientCounter* • *Pathogen*
STEP 2	If more than one **source** (BLOOD, CSF) is reported within the first date, select only one giving priority to the CSF.	Field to identify the **source**: • *Specimen*
STEP 3	If the same **antibiotic** is reported in more than one record within the first date, make a selection giving priority to records with **results coming from E-test^**.	Field to identify the **antibiotic**: • *Antibiotic* Fields to identify **results coming from E-test**: • *ResultEtestSIR** • *ResultEtestVALUE**
STEP 4	If the same antibiotic is still reported in more than one record within the first date, make a selection giving priority to records with **results coming from other MIC tests**.	Fields to identify **results coming from other MIC tests**: • *ResultMICSIR** • *ResultMICVALUE**

STEP 5	If the same antibiotic is still reported in more than one record, make a selection according with the **final interpretation of the susceptibility test** (*priority sequence R→I→S*).	Field to identify the **final interpretation of the susceptibility test**: • SIR
STEP 6	If the same antibiotic is still reported in more than one record, select the first one.	

^ *In the selection process E-test results should prevail over other MIC results since, in the routine labs activity, the latter are likely to have been obtained through automated systems which are generally considered less reliable than E-test.*
**At least one among the two fields is not missing.*

The TESSy filter includes two additional steps for Methicillin-resistant *Staphylococcus aureus* (between Step 2 and Step 3 of the main algorithm).

Conditions
Pathogen="STAAUR"
AND
(Antibiotic="OXA" OR "MET" OR "FLC" OR "DIC" OR "CLO" OR "FOX")

Additional STEP I	If the same **antibiotic** is reported in more than one record within the first date, make a selection giving priority to records with the **confirmation test results**.	Field to identify the **antibiotic:** • *Antibiotic* Fields to identify the **confirmation test results**: • *ResultPCRmec** • *ResultPbp2aAggl**
Additional STEP II	If the same antibiotic is still reported in more than one record, make a selection according with the confirmation test result (priority to records with a positive result).	

**At least one among the two fields is not missing.*

5.3 Analysis and Web Application Outputs

The Analysis is performed using the file obtained by the Filter 2 (there is only one record per year for each combination patient/bug/drug). Since in many case the proportion of resistance is calculated considering an Antibiotic Group (instead of a single antibiotic) other specifications are needed to perform the analysis. An example of Antibiotic Group is the cephalosporins for *Escherichia Coli* (ESCCOL). This Antibiotic group includes three antibiotics: Ceftriaxone (CRO), Cefotaxime (CTX) and Ceftazidime (CAZ). The full set of bug/antibiotic-group combinations under surveillance is displayed in the following table.

PATHOGEN	**ANTIBIOTIC IN THE GROUP**	**GROUP NAME** (results to be reported)
ENCFAE/ENCFAI	AMX, AMP	Aminopenicillins (I+R)
ENCFAE/ENCFAI	GEH	High level gentamicin (R)
ENCFAE/ENCFAI	VAN	Vancomycin (R)
ENCFAE/ENCFAI	TEC	Teicoplanin (R)
ENCFAE/ENCFAI	LNZ	Linezolid (I+R)
ESCCOL	AMX, AMP	Aminopenicillins (R)
ESCCOL/KLEPNE	CTX, CRO, CAZ	3rd gen. cephalosporins (R; I+R)
ESCCOL/KLEPNE	AMK, GEN, TOB	Aminoglycosides (R)
ESCCOL/KLEPNE	CIP, OFX, LVX	Fluoroquinolones (R; I+R)
ESCCOL/KLEPNE	IPM, MEM	Carbapenems (R; I+R)
PSEAER	PIP, TZP	Piperacillin±taz (R)
PSEAER	CAZ	Ceftazidime (R)
PSEAER	GEN, TOB	Aminoglycosides (R)
PSEAER	AMK	Amikacin (R)
PSEAER	CIP, LVX	Fluoroquinolones (R)
PSEAER	IPM, MEM	Carbapenems (R; I+R)
STAAUR	MET, OXA, FOX, FLC, CLO, DIC	MRSA (R)
STAAUR	CIP, OFX, LVX, NOR	Fluoroquinolones (R)
STAAUR	RIF	Rifampin (R)
STAAUR	LNZ	Linezolid (R)
STRPNE	PEN, OXA	Penicillins (R; I+R)
STRPNE	ERY, CLR, AZM	Macrolides (R; I+R)
STRPNE	CTX, CRO	3rd gen. cephalosporins (R; I+R)
STRPNE	CIP, OFX, LVX, NOR	Fluoroquinolones (R)
STRPNE	MFX	Moxifloxacin (R)

General rule to calculate the proportion of resistance

If two or more antibiotics (records) are reported for the same "bug/antibiotic group" combination, count only one of them; the choice has to be done according with the final interpretations of the susceptibility test (field=SIR; priority sequence R→I→S).

Specific rule for *Streptococcus pneumoniae* and non susceptibility to penicillin

The antibiotic considered for this resistance are penicillin (PEN) and oxacillin (OXA). If both are reported, give priority to penicillin.

Specific rule to define Methicillin-resistant *Staphylococcus aureus* (MRSA)

The antibiotics considered for this resistance are: Oxacillin (OXA), Methicillin (MET), Flucloxacillin (FLC), Cloxacillin (CLO), Dicloxacillin (DIC) and Cefoxitin (FOX). Other tests (equivalents) are also considered as confirmation tests: PCR *mec*A or PBP2a detection.

Hierarchical levels to assess the MRSA	Priority sequence of the results
1. Confirmation test (PCR *mec*A and PBP2a)	POS→NEG
2. E-test (SIR result of OXA, MET, FLC, DIC, CLO)	R→I→S
3. Other MIC tests (SIR result of OXA, MET, FLC, DIC, CLO)	R→I→S
4. Other test (SIR result of OXA, MET, FLC, DIC, CLO, FOX)	R→I→S

The definition of MRSA is based on the following criteria:

I. If at least one between ResultPCRmec and ResultPbp2aAggl is positive then MRSA.
II. If at least one between ResultPCRmec and ResultPbp2aAggl is negative and the other one is not positive then MSSA (Methicillin-sensitive *Staphylococcus aureus*)
III. If both ResultPCRmec and ResultPbp2aAggl are missing then consider SIR to define susceptibility (if SIR=S then MSSA; if SIR=I or R then MRSA)

Rule to produce European maps showing levels of antimicrobial resistance

If less than 10 isolates are reported for a specific bug/drug combination in a country, the results for this country will not be displayed in the Europe maps of the reports

Rule to perform the resistance trend analysis

The temporal trends of antimicrobial resistance by country is calculated for the last four years and reported in the final annual report. The statistical significance of trends is assessed by the Cochrane Armitage test. Countries reporting less than 20 isolates per year or providing data for less than 3 years within the considered period are not included in the analysis. A sensitivity analysis, considering all labs or only those reporting for the full period, is done to exclude bias in assessing the significance of the trends.

Web application outputs

An interactive database function will be available from the ECDC web page providing outputs of the validated and approved data including Europe maps, bar charts and tables. These outputs will be available as soon as data are stored in the TESSy data warehouse and published by the system (shortly after data approval).
A country and lab specific summary report providing detailed results for the country referring to the bug/drug combinations under surveillance will be available to the user.

6. DESCRIPTION OF THE SET OF VARIABLES FOR AMR SURVEILLANCE

In the text the following conventions are used:

VariableName	Literal name of a variable. Does never contain spaces. Case is only used to improve readability.
Code	Code as accepted by the system
'Description of code'	Description of the meaning of a possible value for a specific variable.

Example: The gender of a case is described in the variable **Gender**, that can have the possible values ***M*** for 'Male', ***F*** for 'Female', ***O*** for 'Other' and ***Unk*** for 'Unknown'

6.1. AMR - Isolate-based reporting

The following set of variables applies for isolate-based reporting of AMR. The dataset is sub-divided into a common set of system related variables (Technical variables) and epidemiological variables. The epidemiologic variables can be classified in two levels: isolate and susceptibility test. The first level includes data referring to the specific isolate which are repeated for each antibiotic for which the susceptibility of that isolate has been tested.

The full description of the variables is reported in the following tables.

Variables #1,2,4,5,6,7,9,10,11,18,25,26 are technically mandatory; TESSy will not accept the data submission unless these fields have been completed.

However, if you enter data that does not meet the requested combination of "Pathogen", "Specimen" and "Antibiotic", the record is ignored but the batch is NOT rejected. By ignored, TESSy does not insert the data for this record into the database. The ignored records are kept as original data but are not available for analysis or report.

TESSY informs you with the message "The record has been ignored as it contains a Pathogen - Specimen - Antibiotic combination not requested".

Technical Variables

VariableName	**1 – RecordID**
Description	Unique anonymised identifier for each record within and across the national surveillance system and subject – MS selected and generated. Recommended format: "[ReportingCountry][LaboratoryCode] [Patient Counter][Pathogen] [Specimen][Antibiotic][DateUsedForStatistics]"
Required (what happens if not submitted)	Yes (Error)
Data type	String (Max length: 80)
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**2 - RecordType**
Description	Structure and format of the data.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	AMRTEST
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**3 – RecordTypeVersion**
Description	There may be more than one version of a recordType. This element indicates which version the sender uses when generating the message. Required when no metadata set is provided at upload.
Required	No
Data type	Numeric
Code	See Metadaset *(i.e. 1)*
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**4 - Subject**
Description	Subject of the data to report.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	AMR

Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**5 - DataSource**
Description	The data source (surveillance system) that the record originates from.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	See Metadaset
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**6 - ReportingCountry**
Description	The country reporting the record.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	See Metadaset
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**7 - DateUsedForStatistics**
Description	The reference date used for standard reports that is compared to the reporting period. Recommended: Date when sample was taken.
Required (what happens if not submitted)	Yes (Error)
Data type	Date
Code	Exact date only, “YYYY-MM-DD”
Corresponding variable in the previous EARSS Dataset *(notes)*	Date of sample collection *(new format)*

VariableName	**8 - Status**
Description	Status of reporting NEW/UPDATE or DELETE (inactivate). Default if left out: NEW/UPDATE. If set to DELETE, the record with the given recordId will be deleted from the TESSy database (or better stated, invalidated). If set to NEW/UPDATE or left empty, the record is newly entered into the database.
Required	No
Data type	Coded Value
Code	NEW/UPDATE OR DELETE

Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

The **metadata set** is the most recent description of how data should be reported. It will be made available to TESSy users on a regular basis. The whole set of 'RecordType', 'RecordTypeVersion', 'Subject' is included in this Metadataset. The Metadataset will be versioned as well to keep track of changes in the record types and to be able to go back to previous reporting structures (record types) if needed. The most recent Metadataset will include the most recent record types and subjects.

Epidemiological variables at isolate level

VariableName	**9 - LaboratoryCode**
Description	Laboratory code unique for each laboratory within the country.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	See Metadaset If a country has a need for additional codes in the list, they must contact TESSy Helpdesk to get the code added. Recomended format: [ReportingCountry]-[code of three characters]
Corresponding variable in the previous EARSS Dataset	Laboratory code

VariableName	**10 - Specimen**
Description	Isolate source The source of the isolate (i.e. blood)
Required	Yes (Ignore): data entry is required. However, if you enter data that does not meet the requested combination of “Pathogen”, “Specimen” and “Antibiotic” , the record is ignored but the batch is NOT rejected. By ignored, we mean that TESSy does not insert the data for this record into the database. The ignored records are kept as original data but are not available for analysis or report.
Data type	Coded Value
Code	BLOOD = blood CSF = Cerebrospinal fluid
Corresponding variable in the previous EARSS Dataset *(notes)*	Isolate source *(new codes)*

VariableName	**11 - PatientCounter**
Description	Numeric Code for each patient, unique within lab. Anonymous code by lab to specify patient.
Required (what happens if not submitted)	Yes (Error)
Data type	Numeric
Code	Require that the labs anonymize the PatientCounter.
Corresponding variable in the previous EARSS Dataset *(notes)*	Patient ID / Code *(it must be anonimous. It was a string now it is a number.)*

VariableName	**12 - Gender**
Description	Gender
Required (what happens if not submitted)	Yes (Warning)

Data type	Coded Value
Code	M = Male F = Female O = Other UNK = Unknown
Corresponding variable in the previous EARSS Dataset *(notes)*	Sex *(new codes)*

VariableName	**13 - Age**
Description	Age of the patient when the sample was taken.
Required (what happens if not submitted)	Yes (Warning)
Data type	Numeric
Code	Integer
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**14 - IsolateId**
Description	Isolate ID; Code for each isolate, unique within lab and year Text code assigned by lab to specify isolate
Required (what happens if not submitted)	Yes (Warning)
Data type	Text
Corresponding variable in the previous EARSS Dataset	Isolate sample number

VariableName	**15 - HospitalId**
Description	Unique identifier for the hospital within each laboratory.
Required (what happens if not submitted)	Yes (Warning)
Data type	Text
Code	Unique identifier for the hospital within each laboratory. Recommended format: [LaboratoryCode]-[letter assigned to a hospital – starting from A, B, C etc.]
Corresponding variable in the previous EARSS Dataset *(notes)*	Hospital code *(new recommended format)*

VariableName	**16 - PatientType**

Description	Origin of patient. Is the patient at the moment the isolate is taken admitted in a hospital (inpatient), or not. Patients that go to the hospital for Dialysis, other Day Hospital Care and to Emergency room should be classified as "O" for the field "PatientType". All other patient that are admitted in the hospital as inpatients should be classified as "INPAT".
Required (what happens if not submitted)	Yes (Warning)
Data type	Coded Value
Code	INPAT= Admitted (Inpatient) OUTPAT= Outpatient O =Other (e.g. emergency room) UNK=Unknown
Corresponding variable in the previous EARSS Dataset *(notes)*	Origin of patient *(new codes)*

VariableName	**17 - HospitalUnitType**
Description	Hospital department (at sample collection)
Required (what happens if not submitted)	Yes (Warning)
Data type	Coded Value
Code	INTMED =Internal Medicine PEDS =Pediatrics/neonatal PEDSICU=Pediatrics/neonatal ICU SURG =Surgery ONCOL=Haematology/Oncology OBGYN=Obstetrics/Gynecology ICU=Intensive Care Unit ED=Emergency Department URO=Urology Ward INFECT=Infectious Disease Ward O =Other UNK=Unknown
Corresponding variable in the previous EARSS Dataset *(notes)*	Hospital department *(new codes)*

VariableName	**18 - Pathogen**
Description	Pathogen Species and genus of the pathogen which has been isolated from the sample.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	STRPNE=Streptococcus pneumoniae; STAAUR=Staphylococcus aureus; ENCFAE=Enterococcus faecalis;

	ENCFAI=Enterococcus faecium; ESCCOL=Escherichia coli; KLEPNE=Klebsiella pneumoniae; PSEAER=Pseudomonas aeruginosa
Corresponding variable in the previous EARSS Dataset *(notes)*	Pathogen code *(new codes)*

VariableName	**19 - DateOfHospitalisation**
Description	Date of admission in hospital
Required	No
Data type	Date
Code	Exact date only, "YYYY-MM-DD"
Corresponding variable in the previous EARSS Dataset *(notes)*	Date of admission *(new format)*

VariableName	**20 - ResultPCRmec**
Description	Detection of PCR mecA-gene
Required	No
Data type	Coded Value
Code	POS=positive NEG=negative UNK=unknown
Corresponding variable in the previous EARSS Dataset *(notes)*	PCR mec-gene *(new codes)*
Validation rule	To be reported only if Pathogen=STAAUR.

VariableName	**21 - ResultPbp2aAggl**
Description	Detection of PBP2a-agglutination
Required	No
Data type	Coded Value
Code	POS=positive; NEG=negative; UNK=unknown
Corresponding variable in the previous EARSS Dataset *(notes)*	PBP2a-agglutination *(new codes)*
Validation rule	To be reported only if Pathogen=STAAUR.

VariableName	**22 - Serotype**

Description	Serotype/group of the pathogen isolated from the sample. Reference: Danish Kauffman-Lund scheme from the WHO Collaborating Centre for Reference and Research on Pneumococci at the Danish Serum Institute.
Required	No
Data type	Coded Value
Code	See Annex VII Updates to the scheme are multiple times a year – TESSy would need to update this CV list regularly.
Corresponding variable in the previous EARSS Dataset *(notes)*	Serotype
Validation rule	To be reported only if Pathogen=STRPNE.

VariableName	**23 - ESBL**
Description	Detection of ESBL
Required	No
Data type	Coded Value
Code	POS=positive NEG=negative UNK=unknown
Corresponding variable in the previous EARSS Dataset *(notes)*	ESBL present *(new codes)*
Validation rule	To be reported only if Pathogen= ESCCOL or KLEPNE.

VariableName	**24 - ResultCarbapenemases**
Description	Detection of Carbapenemases. This refers to phenotypic test for carbapenemase activity (e.g. the Modified Hodge Test - MHT).
Required	No
Data type	Coded Value
Code	POS=positive NEG=negative UNK=unknown
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*
Validation rule	To be reported only if Pathogen= ESCCOL or KLEPNE or PSEAER.

Epidemiological variables at AMR test level

VariableName	**25 - Antibiotic**
Description	Antibiotic code
Required	Yes (Ignore): data entry is required. However, if you enter data that does not meet the requested combination of “Pathogen”, “Specimen” and “Antibiotic” , the record is ignored but the batch is NOT rejected. By ignored, we mean that TESSy does not insert the data for this record into the database. The ignored records are kept as original data but are not available for analysis or report.
Data type	Coded Value
Code	See paragraph 1.1 “Implementation of AMR case definitions for TESSy”
Corresponding variable in the previous EARSS Dataset	Antibiotic code

VariableName	**26 - SIR**
Description	Final interpretation result of all different susceptibility tests performed
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	S=susceptible; I=intermediate; R=resistant
Corresponding variable in the previous EARSS Dataset	S/I/R

VariableName	**27 - ResultZoneSign**
Description	Zone (> < =) This field can indicate if a value of the zone diameter of the disk test is"less than" (<); “equal to or less than” (< =); "equal to" (=); “equal to or greater than” (>=); or "greater than" (>) the value indicated in the following field.
Required	No
Data type	Coded Value
Code	< <= = >= >
Corresponding variable in the previous EARSS Dataset *(notes)*	Zone (> < =) *(new codes)*

VariableName	**28 - ResultZoneValue**

Description	Zone (Value in mm)
Required	No
Data type	Numeric
Code	Integer
Corresponding variable in the previous EARSS Dataset *(notes)*	Zone (Value in mm) *(only Zone diameter in millimetres;*

VariableName	**29 - ResultZoneSIR**
Description	Interpretation of the zone test.
Required	No
Data type	Coded Value
Code	S=susceptible; I=intermediate; R=resistant
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**30 - ResultMICSign**
Description	MIC (> < =) This field can indicate if a value of the zone diameter of the MIC test is"less than" (<); “equal to or less than” (< =); "equal to" (=); “equal to or greater than” (>=); or "greater than" (>) the value indicated in the following field.
Required	No
Data type	Coded Value
Code	< <= = >= >
Corresponding variable in the previous EARSS Dataset *(notes)*	MIC (> < =) *(new codes)*

VariableName	**31 - ResultMICValue**
Description	MIC (Value in mg/l)
Required	No
Data type	Text
Code	If <1 then float, if >=1 then integer
Corresponding variable in the previous EARSS Dataset *(notes)*	MIC (Value in mg/l) *(only MIC values in mg/l; in the EARSS Dataset it also could contain the S/I/R results)*

VariableName	**32 - ResultMICSIR**
Description	Interpretation of the MIC test.
Required	No
Data type	Coded Value
Code	S=susceptible; I=intermediate; R=resistant
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**33 - ResultEtestSign**
Description	E-test (> < =) This field can indicate if a value of the zone diameter of the E-test is"less than" (<); “equal to or less than” (< =); "equal to" (=); “equal to or greater than” (>=); or "greater than" (>) the value indicated in the following field.
Required	No
Data type	Coded Value
Code	< <= = >= >
Corresponding variable in the previous EARSS Dataset *(notes)*	E-test (> < =) *(new codes)*

VariableName	**34 - ResultEtestValue**
Description	E-test (Value in mg/l)
Required	No
Data type	Text
Code	If <1 then float, if >=1 then integer. The value 1.5 is also allowed.
Corresponding variable in the previous EARSS Dataset *(notes)*	E-test (Value in mg/l) *(only E-test values in mg/l; in the EARSS Dataset it also could contain the S/I/R results)*

VariableName	**35 - ResultEtestSIR**
Description	Interpretation of the Etest test.
Required	No
Data type	Coded Value
Code	S=susceptible;

	I=intermediate; R=resistant
Corresponding variable in the previous EARSS Dataset *(notes)*	*(new variable)*

VariableName	**36 - DiskLoad**
Description	Disk content (only if Zone) This field can be used to mention the load of the antibiotic disk used. Please mention the value and the Units (e.g. mcg, Units or IU).
Required	No
Data type	Text
Code	Value and units: i.e. UI, mcg.
Corresponding variable in the previous EARSS Dataset	Disk load

VariableName	**37 - ReferenceGuidelinesSIR**
Description	To differentiate use of CSLI and EUCAST guidelines for breakpoints
Required	No
Data type	Coded value
Code	EUCAST = European Committee on Antimicrobial Susceptibility Testing CLSI = Clinical and Laboratory Standards Institute NAT = National O = Other
Corresponding variable in the previous EARSS Dataset	New variable 2012

6.2. Laboratory and hospital activity – Denominator data

The following set of variables applies to reporting of denominator data from laboratory and hospital activity. The dataset is sub-divided into a common set of system related variables (technical variables) and epidemiological variables. The epidemiologic variables can be classified in two levels: laboratory and hospital. The first level includes data referring to the laboratory which are repeated for each hospital served by that laboratory.

The full description of the variables can be found in the following tables.

Variables #1,3,4,5,6,7,8,10,11,14 are technically mandatory; TESSy will not accept the data submission unless these fields have been completed.

Technical variables

VariableName	**1 - RecordType**
Description	Structure and format of the data.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	AMRDENOM

VariableName	**2 - RecordTypeVersion**
Description	There may be more than one version of a recordType. This element indicates which version the sender uses when generating the message. Required when no metadata set is provided at upload.
Required	No
Data type	Numeric
Code	See Metadaset *(i.e. 1)*

VariableName	**3 - Subject**
Description	Subject of the data to report.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	AMRDENOM

VariableName	**4 - DataSource**
Description	The data source (surveillance system) that the record originates from.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	See Metadaset

VariableName	**5 - ReportingCountry**
Description	The country reporting the record.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	See Metadaset

Variables at Laboratory level

VariableName	**6 - LaboratoryCode**
Description	Laboratory code unique for each laboratory within the country.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	In Excel annex to definition. If a country has a need for additional codes in the list, they must contact TESSy Helpdesk to get the code added. Recomended format: [ReportingCountry]-[code of three characters]
VariableName	**7 - TownOfLaboratory**
Description	Town/City where the lab is located.
Required (what happens if not submitted)	Yes (Error)
Data type	Text
VariableName	**8 - LaboratoryZIP**
Description	Postal code of the place where the Lab is located.
Required (what happens if not submitted)	Yes (Error)
Data type	Text
VariableName	**9 - NumPopulationLab**
Description	Estimated catchment population for the laboratory (n. of people)
Required (what happens if not submitted)	Yes (Warning)
Data type	Numeric

Variables at Hospital level

VariableName	**10 - FullYearReported**
Description	Does the reported numbers represent the full year? If reporting for only the first quarter or first half year, indicate No.
Required (what happens if not submitted)	Yes (Error)
Data type	Coded Value
Code	Y=Yes N=No
VariableName	**11 - HospitalId**
Description	Unique identifier for the hospital within each laboratory.
Required (what happens if not submitted)	Yes (Error)
Data type	Text
Code	Unique identifier for the hospital within each laboratory. Recomended format: [LaboratoryCode]-[letter assigned to a hospital – starting from A, B, C etc.]
VariableName	**12 - HospitalType**
Description	Type of the hospital (at sample collection). Primary level = Often referred to as a district hospital or first-level referral. Have few specialities, mainly internal medicine, obstetrics-gynecology, pediatrics, and general surgery, or only general practice; limited laboratory services are available for general, but not for specialized pathological analysis; bed capacity ranges from 30 to 200 beds. Secondary level = Often referred to as provincial hospital. Highly differentiated by function with five to ten clinical specialities; bed capacity ranging from 200-800 beds. Tertiary level = Often referred to as central, regional or tertiary-level hospital. Highly specialized staff and technical equipment, e.g., cardiology, ICU and specialized imaging units; clinical services are highly differentiated by function; may have teaching activities; bed capacity ranges from 300 to 1,500 beds.
Required (what happens if not submitted)	Yes (Warning)
Data type	Coded Value
Code	PRIM= Primary level; SEC= Secondary level; TERT= Tertiary level; SPEC=specialist-other; UNK=unknown
VariableName	**13 – NumPopulationHosp**
Description	Estimated catchment population for the hospital (n. of people)
Required (what happens if not submitted)	Yes (Warning)
Data type	Numeric

VariableName	**14 – NumBedsHosp**
Description	Number of hospital beds
Required (what happens if not submitted)	Yes (Error)
Data type	Numeric

VariableName	**15 – NumBedsHospICU**
Description	Number of hospital intensive care beds
Required (what happens if not submitted)	Yes (Warning)
Data type	Numeric

VariableName	**16 - NumPatDaysHosp**
Description	Number of hospital patient-days
Required (what happens if not submitted)	No
Data type	Numeric

VariableName	**17 – NumAnnualOccRateHosp**
Description	Hospital annual occupancy rate of beds
Required (what happens if not submitted)	Yes (Warning)
Data type	Text
Code	It is a proportion (number between 0 and 1)

VariableName	**18 – NumAdmissionsHosp**
Description	Number of hospital admissions
Required (what happens if not submitted)	No
Data type	Numeric

VariableName	**19 – NumCultureSetsHosp**
Description	Number of blood colture sets performed in the hospital
Required (what happens if not submitted)	Yes (Warning)
Data type	Numeric

Annex I. Isolate Record Form *S. pneumoniae*

To be filled out by laboratory

Instructions: Please send data of the first **blood and/or cerebrospinal fluid (CSF) -** isolate of every patient with an invasive *S. pneumoniae* infection. Send data on resistant and susceptible isolates; use 1 form per isolate.

Laboratory Data

Laboratory Code "LaboratoryCode" * CC000 _ _ _ _ _

Isolate Data

Isolate sample number "IsolateId" max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Isolate source "Specimen" *tick box* □Blood □□CSF

Date of sample collection "DateUsedForStatistics" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Patient Data

Patient ID / Code max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Gender *tick box* □Male□ □Female□ □Other □□Unknown

Year of birth yyyy _ _ _ _

Hospital Data

Code of hospital "HospitalId"** [LaboratoryCode- - letter assigned to the hospital- starting from A, B, C etc. E.g. NL001A _ _ _ _ _

Origin of patient "PatientType" *tick box* □Admitted□ □Outpatient □□Other□ □Unknown

Date of admission "DateOfHospitalisation" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Hospital Department "HospitalUnitType"

tick box □Internal Medicine□ □Pediatrics/neonatal□ □Pediatric/neonatal ICU □Surgery□ □Haematology/oncology□ □Ob/Gyn □□ICU□ □Emergency□ □Urology □Infectious diseases□ □Other□ □Unknown

Antibiotic susceptibility testing (S/I/R, zone and/or MIC)

Antibiotic	**SIR** (final interpretation result of all different susceptibnility test performed) *Fill in S, I or R*	**Zone diameter** (ResultZoneValue) *(mm)*	**Zone diameter interpretation** (ResultZoneSIR) *Fill in S, I or R*	**MIC** (ResultMICValue) *(mg/l)*	**MIC interpretation** (ResultMICSIR) *Fill in S, I or R*	**E-test** (ResultEtestValue) *(mg/l)*	**E-test interpretation** (ResultEtestSIR) *Fill in S, I or R*
□Oxacillin Disk load _ _ _ _ _ _ _	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Penicillin	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Erythromycin *AND/OR*	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Clarithromycin *AND/OR*	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Azithromycin	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Cefotaxime *AND/OR*	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
Ceftriaxone	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Norfloxacin Disk load _ _ _ _ _ _ _	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ciprofloxacin *AND/OR*	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ofloxacin *AND/OR*	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Levofloxacin	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Moxifloxacin	|_|	|_||_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|

---

* The national co-ordinators provide the laboratory code, consisting of a Country Code (CC) followed by 3 numbers.
** Consists of the laboratory code, followed by a sequence number identifying the hospital.
Send this form to: ……..…….. (Name/Institute)
Adress: ……..…… Tel: …….. Fax: …… E-mail: ……..

Annex II. Isolate Record Form *S. aureus*

To be filled out by laboratory

Instructions: Please send data of the first **blood** isolate of every patient with an invasive *S. aureus* infection. Send data on resistant and susceptible isolates; use 1 form per isolate.

Laboratory Data

Laboratory Code "LaboratoryCode" * CC000 _ _ _ _ _

Isolate Data

Isolate sample number "IsolateId" max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Isolate source "Specimen" *tick box* □Blood □□CSF

Date of sample collection "DateUsedForStatistics" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Patient Data

Patient ID / Code max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Gender *tick box* □Male□ □Female□ □Other □□Unknown

Year of birth yyyy _ _ _ _

Hospital Data

Code of hospital "HospitalId"** [LaboratoryCode- - letter assigned to the hospital- starting from A, B, C etc. E.g. NL001A _ _ _ _ _

Origin of patient "PatientType" *tick box* □Admitted□ □Outpatient □□Other□ □Unknown

Date of admission "DateOfHospitalisation" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Hospital Department "HospitalUnitType"

tick box □Internal Medicine□ □Pediatrics/neonatal□ □Pediatric/neonatal ICU □Surgery□ □Haematology/oncology□ □Ob/Gyn □□ICU□ □Emergency□ □Urology □Infectious diseases□ □Other□ □Unknown

Antibiotic susceptibility testing (S/I/R, zone and/or MIC)

Antibiotic	**SIR** (final interpretation result of all different susceptibnility test performed) *Fill in S, I or R*	**Zone diameter** (ResultZoneValue) *(mm)*	**Zone diameter interpretation** (ResultZoneSIR) *Fill in S, I or R*	**MIC** (ResultMICValue) *(mg/l)*	**MIC interpretation** (ResultMICSIR) *Fill in S, I or R*	**E-test** (ResultEtestValue) *(mg/l)*	**E-test interpretation** (ResultEtestSIR) *Fill in S, I or R*
□Cefoxitin Disk load _ _ _ _ _ _ _	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Oxacillin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Methicillin AND/OR	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Flucloxacillin AND/OR	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Cloxacillin AND/OR	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Dicloxacillin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ciprofloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Norfloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ofloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Levofloxacin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Rifampin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Linezolid	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|

Other tests

PCR mecA-gene *tick box* □Positive□ □Negative □□Unknown

PBP2a agglutination *tick box* □Positive □□Negative □□Unknown

---

* The national co-ordinators provide the laboratory code, consisting of a Country Code (CC) followed by 3 numbers.
** Consists of the laboratory code, followed by a sequence number identifying the hospital.
Send this form to: …….. (Name/Institute)
Adress: …….. Tel: …….. Fax: …….. E-mail: ……..

Annex III. Isolate Record Form *E. coli*

To be filled out by laboratory

Instructions: Please send data of the first **blood and/or cerebrospinal fluid (CSF) -** isolate of every patient with an invasive *E. coli* infection. Send data on resistant and susceptible isolates; use 1 form per isolate.

Laboratory Data

Laboratory Code "LaboratoryCode" * CC000 _ _ _ _ _

Isolate Data

Isolate sample number "IsolateId" max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Isolate source "Specimen" *tick box* □Blood □□CSF

Date of sample collection "DateUsedForStatistics" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Patient Data

Patient ID / Code max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Gender *tick box* □Male□ □Female□ □Other □□Unknown

Year of birth yyyy _ _ _ _

Hospital Data

Code of hospital "HospitalId"** [LaboratoryCode- - letter assigned to the hospital- starting from A, B, C etc. E.g. NL001A _ _ _ _ _

Origin of patient "PatientType" *tick box* □Admitted□ □Outpatient □□Other□ □Unknown

Date of admission "DateOfHospitalisation" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Hospital Department "HospitalUnitType"

tick box □Internal Medicine□ □Pediatrics/neonatal□ □Pediatric/neonatal ICU □Surgery□ □Haematology/oncology□ □Ob/Gyn □□ICU□ □Emergency□ □Urology □Infectious diseases□ □Other□ □Unknown

Antibiotic susceptibility testing (S/I/R, zone and/or MIC)

Antibiotic	**SIR** (final interpretation result of all different susceptibnility test performed) *Fill in S, I or R*	**Zone diameter** (ResultZoneValue) *(mm)*	**Zone diameter interpretation** (ResultZoneSIR) *Fill in S, I or R*	**MIC** (ResultMICValue) *(mg/l)*	**MIC interpretation** (ResultMICSIR) *Fill in S, I or R*	**E-test** (ResultEtestValue) *(mg/l)*	**E-test interpretation** (ResultEtestSIR) *Fill in S, I or R*
□ Amoxicillin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
Ampicillin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Gentamicin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Tobramycin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Amikacin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ciprofloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ofloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Levofloxacin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Cefotaxime *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ceftriaxone *AND*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ceftazidime	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Imipenem *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Meropenem	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|

Other tests

ESBL *tick box* □Positive□ □Negative □□Unknown

Carbapenemases "ResultCarbapenemases" *tick box* □Positive □□Negative □□Unknown

---

* The national co-ordinators provide the laboratory code, consisting of a Country Code (CC) followed by 3 numbers.
** Consists of the laboratory code, followed by a sequence number identifying the hospital.
Send this form to: ……..…… (Name/Institute)
Adress: ……..…… Tel: …….. Fax: …… E-mail: ……..

Annex IV. Isolate Record Form *K. pneumoniae*

To be filled out by laboratory

Instructions: Please send data of the first **blood and/or cerebrospinal fluid (CSF) -** isolate of every patient with an invasive *K. pneumoniae* infection. Send data on resistant and susceptible isolates; use 1 form per isolate.

Laboratory Data

Laboratory Code "LaboratoryCode" * CC000 _ _ _ _ _

Isolate Data

Isolate sample number "IsolateId" max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Isolate source "Specimen" *tick box* □Blood □□CSF

Date of sample collection "DateUsedForStatistics" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Patient Data

Patient ID / Code max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Gender *tick box* □Male□ □Female□ □Other □□Unknown

Year of birth yyyy _ _ _ _

Hospital Data

Code of hospital "HospitalId"** [LaboratoryCode- - letter assigned to the hospital- starting from A, B, C etc. E.g. NL001A _ _ _ _ _

Origin of patient "PatientType" *tick box* □Admitted□ □Outpatient □□Other□ □Unknown

Date of admission "DateOfHospitalisation" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Hospital Department "HospitalUnitType"

tick box □Internal Medicine□ □Pediatrics/neonatal□ □Pediatric/neonatal ICU □Surgery□ □Haematology/oncology□ □Ob/Gyn □□ICU□ □Emergency□ □Urology □Infectious diseases□ □Other□ □Unknown

Antibiotic susceptibility testing (S/I/R, zone and/or MIC)

Antibiotic	**SIR** (final interpretation result of all different susceptibnility test performed) *Fill in S, I or R*	**Zone diameter** (ResultZoneValue) *(mm)*	**Zone diameter interpretation** (ResultZoneSIR) *Fill in S, I or R*	**MIC** (ResultMICValue) *(mg/l)*	**MIC interpretation** (ResultMICSIR) *Fill in S, I or R*	**E-test** (ResultEtestValue) *(mg/l)*	**E-test interpretation** (ResultEtestSIR) *Fill in S, I or R*
□Gentamicin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Tobramycin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Amikacin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ciprofloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ofloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Levofloxacin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Cefotaxime *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ceftriaxone *AND*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ceftazidime	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Imipenem *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Meropenem	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|

Other tests

ESBL *tick box* □Positive□ □Negative □□Unknown

Carbapenemases "ResultCarbapenemases" *tick box* □Positive □□Negative □□Unknown

---

* The national co-ordinators provide the laboratory code, consisting of a Country Code (CC) followed by 3 numbers.
** Consists of the laboratory code, followed by a sequence number identifying the hospital.
Send this form to: …….…….. (Name/Institute)
Adress: ……..…… Tel: …….. Fax: …… E-mail: ……..

Annex V. Isolate Record Form *E. faecium/faecalis*

To be filled out by laboratory

Instructions: Please send data of the first **blood** isolate of every patient with an invasive *E. faecium/faecalis* infection. Send data on resistant and susceptible isolates; use 1 form per isolate.

Laboratory Data

Laboratory Code "LaboratoryCode" * CC000 _ _ _ _ _

Isolate Data

Isolate sample number "IsolateId" max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Isolate source "Specimen" *tick box* □Blood □□CSF

Date of sample collection "DateUsedForStatistics" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Patient Data

Patient ID / Code max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Gender *tick box* □Male□ □Female□ □Other □□Unknown

Year of birth yyyy _ _ _ _

Hospital Data

Code of hospital "HospitalId"** [LaboratoryCode- - letter assigned to the hospital- starting from A, B, C etc. E.g. NL001A _ _ _ _ _

Origin of patient "PatientType" *tick box* □Admitted□ □Outpatient □□Other□ □Unknown

Date of admission "DateOfHospitalisation" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Hospital Department "HospitalUnitType"

tick box □Internal Medicine□ □Pediatrics/neonatal□ □Pediatric/neonatal ICU □Surgery□ □Haematology/oncology□ □Ob/Gyn □□ICU□ □Emergency□ □Urology □Infectious diseases□ □Other□ □Unknown

Antibiotic susceptibility testing (S/I/R, zone and/or MIC)

Antibiotic	**SIR** (final interpretation result of all different susceptibnility test performed) *Fill in S, I or R*	**Zone diameter** (ResultZoneValue) *(mm)*	**Zone diameter interpretation** (ResultZoneSIR) *Fill in S, I or R*	**MIC** (ResultMICValue) *(mg/l)*	**MIC interpretation** (ResultMICSIR) *Fill in S, I or R*	**E-test** (ResultEtestValue) *(mg/l)*	**E-test interpretation** (ResultEtestSIR) *Fill in S, I or R*
□ Amoxicillin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
Ampicillin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Gentamicin HIGH Disk load _ _ _ _ _ _ _	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Vancomicin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Teicoplanin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Linezolid	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|

---

* The national co-ordinators provide the laboratory code, consisting of a Country Code (CC) followed by 3 numbers.
** Consists of the laboratory code, followed by a sequence number identifying the hospital.
Send this form to: …….. (Name/Institute)
Adress: ……..…… Tel: …….. Fax: …… E-mail: ……..

Annex VI. Isolate Record Form *P. aeruginosa*

To be filled out by laboratory

Instructions: Please send data of the first **blood and/or cerebrospinal fluid (CSF) -** isolate of every patient with an invasive *P. aeruginosa* infection. Send data on resistant and susceptible isolates; use 1 form per isolate.

Laboratory Data

Laboratory Code "LaboratoryCode" * CC000 _ _ _ _ _

Isolate Data

Isolate sample number "IsolateId" max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Isolate source "Specimen" *tick box* □Blood □□CSF

Date of sample collection "DateUsedForStatistics" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Patient Data

Patient ID / Code max. 12 characters _ _ _ _ _ _ _ _ _ _ _ _

Gender *tick box* □Male□ □Female□ □Other □□Unknown

Year of birth yyyy _ _ _ _

Hospital Data

Code of hospital "HospitalId"** [LaboratoryCode- - letter assigned to the hospital- starting from A, B, C etc. E.g. NL001A _ _ _ _ _

Origin of patient "PatientType" *tick box* □Admitted□ □Outpatient □□Other□ □Unknown

Date of admission "DateOfHospitalisation" yyyy-mm-dd _ _ _ _ - _ _ - _ _

Hospital Department "HospitalUnitType"

tick box □Internal Medicine□ □Pediatrics/neonatal□ □Pediatric/neonatal ICU □Surgery□ □Haematology/oncology□ □Ob/Gyn □□ICU□ □Emergency□ □Urology □Infectious diseases□ □Other□ □Unknown

Antibiotic susceptibility testing (S/I/R, zone and/or MIC)

Antibiotic	**SIR** (final interpretation result of all different susceptibnility test performed) *Fill in S, I or R*	**Zone diameter** (ResultZoneValue) *(mm)*	**Zone diameter interpretation** (ResultZoneSIR) *Fill in S, I or R*	**MIC** (ResultMICValue) *(mg/l)*	**MIC interpretation** (ResultMICSIR) *Fill in S, I or R*	**E-test** (ResultEtestValue) *(mg/l)*	**E-test interpretation** (ResultEtestSIR) *Fill in S, I or R*
□Piperacillin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Pieracillin-tazobactam	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Gentamicin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Tobramycin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Amikacin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ciprofloxacin *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Levofloxacin	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□Ceftazidime	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Imipenem *AND/OR*	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|
□ Meropenem	|_|	|_|_|	|_|	_ _ _ _ _ _ _	|_|	_ _ _ _ _ _ _	|_|

Other tests

Carbapenemases "ResultCarbapenemases" *tick box* □Positive □□Negative □□Unknown

---

* The national co-ordinators provide the laboratory code, consisting of a Country Code (CC) followed by 3 numbers.
** Consists of the laboratory code, followed by a sequence number identifying the hospital.
Send this form to: …….…….. (Name/Institute)
Adress: ……..…… Tel: …….. Fax: …….. E-mail: ……..

Annex VII – List of *S. pneumoniae* Serogroups/Serotypes

1	16	33B
2	16A	33C
3	16F	33D
4	17	33F
5	17A	34
6	17F	35
6A	18	35A
6B	18A	35B
6C	18B	35C
6D	18C	35F
7	18F	36
7A	19	37
7B	19A	38
7C	19B	39
7F	19C	40
8	19F	41
9	20	41A
9A	21	41F
9L	22	42
9N	22A	43
9V	22F	44
10	23	45
10A	23A	46
10B	23B	47
10C	23F	47A
10F	24	47F
11	24A	48
11A	24B	
11B	24F	
11C	25	
11D	25A	
11F	25F	
12	27	
12A	28	
12B	28A	
12F	28F	
13	29	
14	31	
15	32	
15A	32A	
15B	32F	
15C	33	
15F	33A	