



Global antimicrobial resistance surveillance system (GLASS)

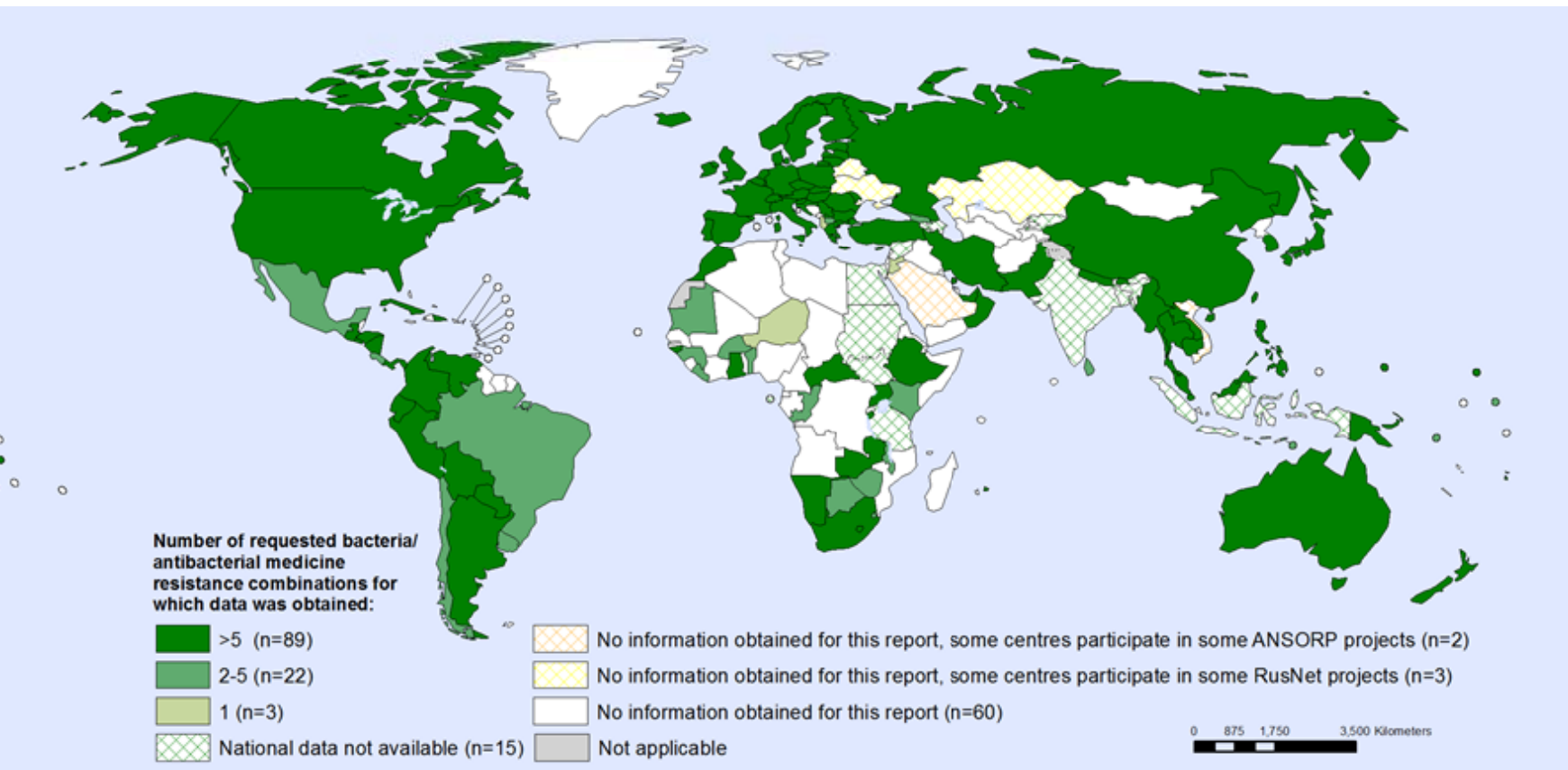
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Acknowledgements

Dr Carmem Lucia Pessoa-
& the GLASS Team at WHO headqua

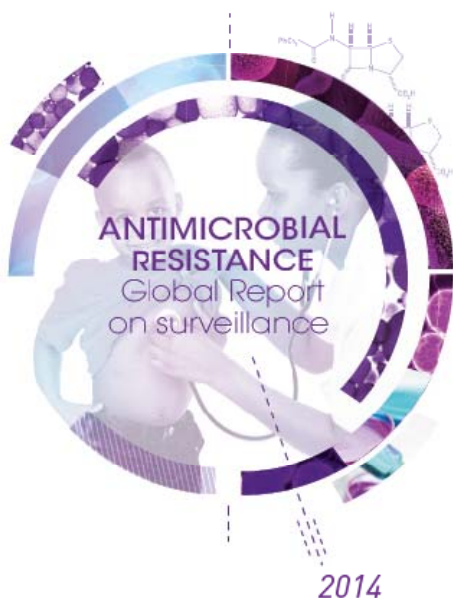
Global report on AMR surveillance



- Widespread high levels of AMR!
- National data available for 17% (22/128) on all 9 bug-drug combinations

National data = obtained from official sources, but may not necessarily be representative for the population or country as a whole

Lessons learnt



- Lack of harmonized standards & coordination
- Country data, when available, not shared with national bodies
- Limited information on impact of antibacterial resistance on humans
 - Most frequent data: %R tested isolates
 - Limited relatedness with infections

Objectives of GLASS



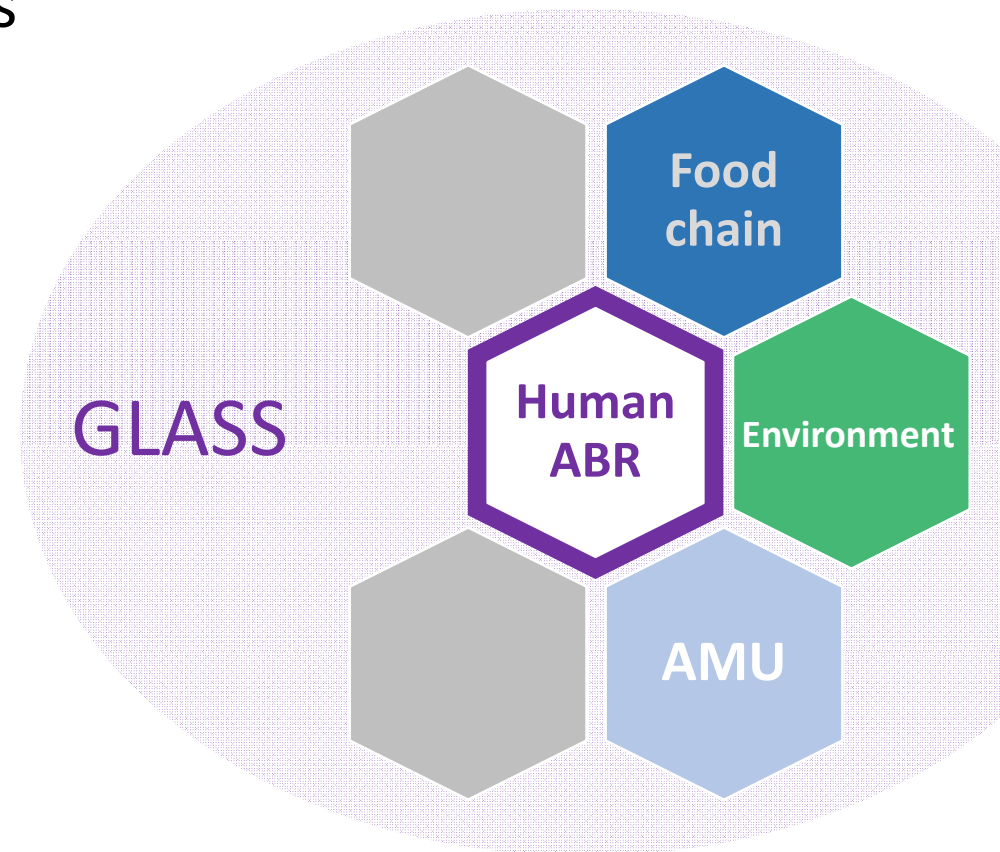
Strengthen national AMR surveillance systems
through harmonized global standards to

Monitor AMR trends

Detect emerging resistance

Estimate extent & burden of AMR globally

...to capture and integrate
information needed to inform
strategies to tackle AMR
locally, regionally and globally



GLASS - Guiding Principles



➤ **Foster national AMR surveillance systems**

- Coordinated within the national action plan/strategy for AMR
- Build upon existing surveillance structures

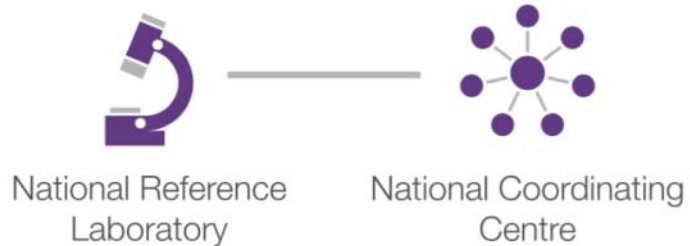
➤ **Collect epidemiological, clinical and microbiological data**

➤ **Stepwise approach to meet local and global priorities**

➤ **GLASS early implementation focus on bacterial pathogens**

- Priority specimens and pathogens from routine samples in humans
- Priority pathogen-antibacterial combinations
- Progressive inclusion of AMR-related surveillance (food, AM use, environment)

Core components for national surveillance systems



NCC to report to the national body in charge of strategies to contain AMR



Which data to be reported to GLASS?



- Progress in implementing national AMR surveillance system
 - Initially, may be only information on national AMR surveillance system
- Aggregated AMR data of priority indicators according to GLASS
 - At least one indicator, progressively add as per national capacity & priorities
- New types of AMR

GLASS – targets for global reporting on AMR



2. Priority specimens and pathogens for surveillance of AMR

Specimen	Laboratory case definition	Surveillance type and sampling setting	Priority pathogens for surveillance
Blood	Isolation of pathogen from blood ^a	Selected sites or national coverage Continuous Patients in hospital and in the community	<i>E. coli</i> <i>K. pneumoniae</i> <i>A. baumannii</i> <i>S. aureus</i> <i>S. pneumoniae</i> <i>Salmonella</i> spp.
Urine	Significant growth in urine specimen ^b	Selected sites or national coverage Continuous Patients in hospital and in the community	<i>E. coli</i> <i>K. pneumoniae</i>
Stools	Isolation of <i>Salmonella</i> spp. ^c or <i>Shigella</i> spp. from stools	Selected sites or national coverage Continuous Patients in hospital and in the community	<i>Salmonella</i> spp. <i>Shigella</i> spp.
Urethral and cervical swabs	Isolation of <i>N. gonorrhoeae</i>	Selected sites or national coverage Continuous Patients in hospital and in the community	<i>N. gonorrhoeae</i>
<i>Acinetobacter baumannii</i>	Tetracyclines Aminoglycosides Carbapenems ^c Polymyxins		Tigecycline or minocycline Gentamicin and amikacin Imipenem, meropenem, ertapenem or doripenem Colistin
<i>Staphylococcus aureus</i>	Penicillinase-stable beta-lactams		Cefoxitin ^d
<i>Streptococcus pneumoniae</i>	Penicillins Sulfonamides and trimethoprim Third-generation cephalosporins		Oxacillin ^e Penicillin G Co-trimoxazole Ceftriaxone or cefotaxime

GLASS early implementation

- **4 sites** (specimen type as proxy for infection type)
- **8 pathogens**, 62 bug-drug combinations
- Stratified – age, sex, origin

Rationale

- Common community and hospital infections
- Indicators used in foodborne AMR surveillance
- Shall be expanded in future

Emerging AMR Reporting (EAR)



➤ Timely communication of newly detected AMR findings that may influence surveillance and control practices

- Exceptional phenotypes not reported previously, or very rare
- Novel resistance genotypes/mechanisms
 - High public health impact (high potential for spread)
 - Serious challenges in laboratory detection and surveillance

➤ Mapping global spread of new types of AMR



EAR reporting: provisional watch list



- ▶ Pan-drug resistant (PDR) phenotypes (& responsible genes)
- ▶ Pre-defined critical resistance phenotypes (& responsible genes)
- ▶ Extensively drug-resistant (XDR) phenotypes
(not previously detected in a country & responsible genes)
- ▶ Novel genetic determinants of resistance
(not previously reported globally)

Call for enrolment: 21 March 2016



ates

World Health Organization

中文 English Français Русский Español

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Search

Antimicrobial resistance

- Antimicrobial resistance
- Global action plan on AMR
- Research and education
- Surveillance
- Prevention, control and management
- Antimicrobial use
- Investment and financing
- Implementation plans
- Resources and publications

Global Antimicrobial Resistance Surveillance System (GLASS)

Surveillance of antimicrobial resistance

In May 2015, the Sixty-eighth World Health Assembly adopted the global action plan on antimicrobial resistance. One of the five strategic objectives of the action plan is to strengthen the evidence base through enhanced global surveillance and research.

AMR surveillance is the cornerstone for assessing the burden of AMR and for providing the necessary information for action in support of local, national and global strategies. The Global Antimicrobial Resistance Surveillance System (GLASS) is being launched to support a standardized approach to the collection, analysis and sharing of data on AMR at a global level, in order to inform decision-making, drive local, national and regional action, and provide the evidence base for action and advocacy.

GLASS aims to combine clinical, laboratory and epidemiological data on pathogens that pose the greatest threats to health globally. The GLASS manual details the proposed approach for the early implementation of the surveillance system, that will focus on antibiotic-resistant bacteria, and outlines the flexible and incremental development of the system over time that will incorporate lessons learned from the early implementation phase.

Participation in GLASS

Countries can benefit from participation in GLASS through enhanced capacity building, access to training and implementation tools, and support in collecting AMR data at local and national levels. Country participation in GLASS must be with the agreement of the national government.

Call for country enrollment in the Global Antimicrobial Resistance Surveillance System (GLASS) is now open.

Global Antimicrobial Resistance Surveillance System (GLASS) manual

GLASS documents and tools

- Antimicrobial resistance: global report on surveillance 2014
- Related documents
- Regional surveillance networks and software
- Surveillance meetings

Share d

Share status
of national AMR
surveillance

**National
commitment**

GLASSware: the GLASS IT platform



Global Antimicrobial Resistance Surveillance System



⚙ MY ACCOUNT ▾

🚪 LOGOUT

Welcome to the WHO GLASS portal!

This is a platform for global data sharing on antimicrobial resistance worldwide. It has been launched by WHO as part of the implementation of the Global Action Plan on Antimicrobial Resistance (AMR). The data will help to inform national, regional and global decision-making, strategies and advocacy.

GLASS will initially focus on bacterial pathogens in humans. It will also collect information on countries' progress in establishing national AMR surveillance systems. GLASS will then be progressively expanded to include other types of AMR-related surveillance, such as the food chain, the environment and antimicrobial use and will build links with other global surveillance systems.

**Antibacterial
resistance in
humans**


Antimicrobial
consumption

GASP +


EAR



glass.voozanoo.net



Surveillance of antibacterial resistance in humans



HOME

MENU

COUNTRY


LOGOUT

GLASS welcomes the participation of all countries. Countries are invited to provide information on the status of implementation of national AMR surveillance and upload data on ABR, following the definitions provided in the GLASS: Manual for early implementation.


This database enables to:

- upload, manage and submit data
- access upload history
- access and download previously submitted data
- generate data reports

To continue, please read [Terms of Use](#) and complete the following information:



Country information




GLASS implementation questionnaire


GLASS Implementation questionnaire (*.pdf)
Questions related to the use of web-based internet GLASS platform should be sent to the email address: glass@who.int

Aggregated AMR data


Call for data on antimicrobial resistance will be open from July 1st 2016 to June 30th 2017




Data upload




Upload history



AMR data base




Denominator Questionnaire




Reports


Individual AMR data




Add an isolate




Data upload




Upload history



AMR data base



Denominator Questionnaire



Reports

For further information: glass@who.int

Antibacterial resistance in humans

- ➡ GLASS focal points registration and submission of data on implementation of national AMR surveillance programme
- ➡ Aggregated AMR data: upload, validation and analysis
- ➡ Individual AMR data: direct entry or upload of data files, validation and analysis

Data validation and submission

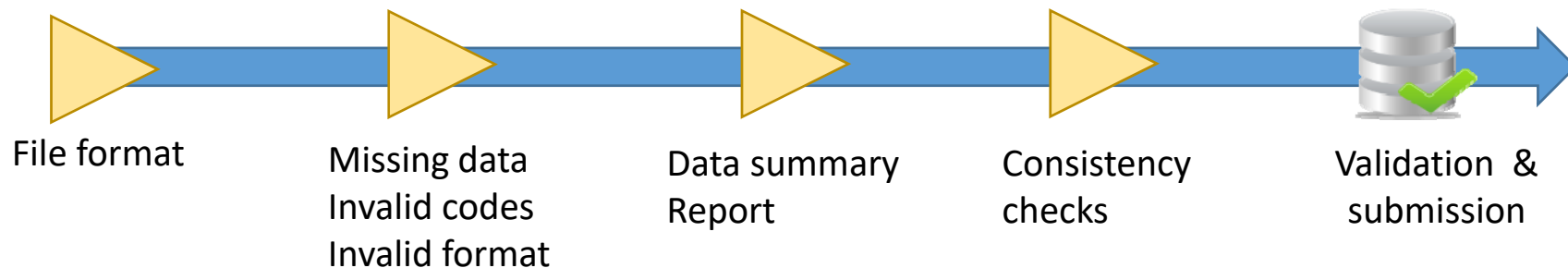
Aggregated data

The screenshot shows the 'Aggregated data' upload page. At the top, it says 'Surveillance of antibacterial resistance in humans' with the WHO logo. A navigation bar includes 'HOME', 'MENU', 'COUNTRY', and 'LOGOUT'. Below this, instructions state: 'To upload your data files please follow the steps below: 1. Indicate which file you are going to upload (RIS or Sample file) 2. Indicate the period of submission (January to December by default) 3. Indicate the specimen(s) included in your data file 4. Upload your file 5. Click on "Load"'. The main form has fields for 'File type' (set to RIS), 'Country' (Bahrain), 'Year' (2009), 'Batch ID' (Data Set 1), and 'Specimen' (Blood, Genital, Stool, Urine). It also has 'Start' and 'End' date pickers (January to December). A 'File' section shows 'Choose File' and 'no file selected'. A 'Load' button is at the bottom.

Individual data

The screenshot shows the 'Individual data' entry form. It has the same header and navigation bar as the aggregated data page. The form is divided into sections: 'Isolate', 'Patient information', 'Isolate information', and 'Results'. The 'Isolate' section has fields for 'Reporting Country', 'Laboratory', and 'Hospital'. The 'Patient information' section has fields for 'Hospital link type', 'Patient number', 'Age', 'Gender', 'Patient type', and 'Date of hospitalisation'. The 'Isolate information' section has fields for 'Isolate ID', 'Specimen type', 'Date of Sample', 'Pathogen', and 'Serotype / Genotype'. The 'Results' section has a table with columns for 'antibiotic' and 'MIC'. A 'Cancel' button is at the bottom left, and 'Save and Exit' and 'Add another isolate' buttons are at the bottom right.

4 data validation steps



Reports available on GLASSware



ics	Data overview by specimen type	AST by Antibiotic Class	AST by age, gender and origin	Percentile Distribution
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Region *	<ul style="list-style-type: none"> ✓ Resistant proportion excluding unknown Resistant proportion including unknown Resistant rates per 1000 patients with samples taken
Year *	<ul style="list-style-type: none"> Susceptible proportion excluding unknown Susceptible proportion including unknown Susceptible rates per 1000 patients with samples taken
Specimens	<ul style="list-style-type: none"> Non-susceptible proportion including unknown Non-susceptible proportion excluding unknown
Metric *	<ul style="list-style-type: none"> Non-susceptible rates per 1000 patients with samples taken Proportion of isolates with unknown susceptibility Proportion of isolates with antimicrobial susceptibility test reported Number of susceptible isolates Number of non-susceptible isolates Number of resistant isolates Number of all isolates reported Number of isolates with antimicrobial susceptibility test data reported Number of isolates with unknown susceptibility

Klebsiella pneumoniae pathogen, Origin : All, Gender : All, Age group : All, Batch Id : All, Metric : Proportion excluding unknown

	Susceptible	Intermediate	Resistant	S+H+R	Unknown
Susceptible					
Cefotaxime	ND	ND	ND	ND	ND
Ceftazidime	3118	25	135	3278	536
	95.1 %	0.8 %	4.1 %	85.9 %	14.1 %
Ceftriaxone	3095	3	109	3207	550
	96.5 %	0.1 %	3.4 %	85.4 %	14.6 %
3rd-generation cephalosporins	6213	28	244	6485	1086
	95.8 %	0.4 %	3.8 %	85.7 %	14.3 %
Non-susceptible					
Cefepime	ND	ND	ND	ND	ND
4th-generation cephalosporins	ND	ND	ND	ND	ND
Doripenem					
Doripenem	ND	ND	ND	ND	ND
Ertapenem	ND	ND	ND	ND	ND
Imipenem	ND	ND	ND	ND	ND
Meropenem	3773	0	2	3775	558
	99.9 %	0 %	0 %	87.1 %	12.9 %
Carbapenems	3773	0	2	3775	558
	99.9 %	0 %	0 %	87.1 %	12.9 %
Sulfonamides and trimethoprim					
Co-trimoxazole	3383	20	760	4163	502
	81.3 %	0.5 %	18.3 %	89.2 %	10.8 %
Sulfonamides and trimethoprim	3383	20	760	4163	502

For further information: glass@who.int

1st GLASS data call: MS participation



- 1 April – 8 July 2017

- Data on status of national AMR surveillance: 38

- AMR data: 24

GLASS in 2016-17



Done

- IT platform: aggregated and individual data
- WHONET adapted for GLASS
- Implementation package (focus on low-income countries)
 - Implementation manual
 - Assessment tool
 - Guidance on diagnostic stewardship
 - GLASS data management guides
- Guidelines on integrated surveillance for foodborne AMR (led by WHO/FOS)

On-going

- AM consumption survey & AM use methods (led by WHO/EMP)
- Enhanced GASP (led by WHO/STI)
- ESBL - *E. coli*: environment, humans, food, animals (led by WHO/FOS)
- AMR in leprosy (led by GLP)
- Links to AMR surveillance systems in humans (TB, HIV, malaria)
- GLASS-EAR
- Laboratory capacities
- IT tools for LMIC



Technical support to countries



- Draft global surveillance standards
- 1st Global Report on AMR
- 1st MS Consultation

GLASS Early Implementation

2015

- Technical development of global standards: Surveillance Manual
- Tools: IT platform, software (WHONET), capacity building materials

2016

- Data management tools, implementation manual, diagnostic stewardship manual
- Country enrolment started

2017-
2018

consultation

modules: individual data, AM
nption, enhanced GASP, GLASS-EAR
o resistance in TB, malaria, HIV, environment
SS Report

2019

- Review lessons
early implement
and adapt the s
- 2nd GLASS Report

World High Level Technical Meeting on Surveillance of
Antimicrobial Resistance for Local and Global Actions



Thank you