Global antimicrobial resistance surveillance system (GLASS)

Dr Anuj Sharma
Technical Officer – AMR | Laboratories
WHO Country Office for India

Acknowledgements
Dr Carmem Lucia Pessoa & the GLASS Team at WHO headquarters
Global report on AMR surveillance

Widespread high levels of AMR!

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

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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

http://www.who.int/drugresistance/documents/surveillance/en/
Objectives of GLASS

- Foster 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)
More 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

**GLASS early implementation**

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

**Rationale**

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

<table>
<thead>
<tr>
<th>Specimen</th>
<th>Laboratory case definition</th>
<th>Surveillance type and sampling setting</th>
<th>Priority pathogens for surveillance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blood</td>
<td>Isolation of pathogens from blood</td>
<td>Selected sites or national coverage Continuous Patients in hospital and in the community</td>
<td>E. coli K. pneumoniae A. baumannii S. aureus S. pneumoniae Salmonella spp.</td>
</tr>
<tr>
<td>Urine</td>
<td>Significant growth in urine specimen</td>
<td>Selected sites or national coverage Continuous Patients in hospital and in the community</td>
<td>E. coli K. pneumoniae</td>
</tr>
<tr>
<td>Stools</td>
<td>Isolation of Salmonella spp. or Shigella spp. from stools</td>
<td>Selected sites or national coverage Continuous Patients in hospital and in the community</td>
<td>Salmonella spp. Shigella spp.</td>
</tr>
<tr>
<td>Cerebrospinal fluid</td>
<td>Isolation of <em>N. gonorrhoeae</em></td>
<td>Selected sites or national coverage Continuous Patients in hospital and in the community</td>
<td><em>N. gonorrhoeae</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>Important Combinations</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acinetobacter baumannii</em></td>
<td>Tetracyclines, Aminoglycosides, Carbapenems, Polymyxins</td>
<td>Tigecycline or minocycline, Gentamicin and amikacin, Imipenem, meropenem, ertapenem or doripenem, Colistin</td>
</tr>
<tr>
<td><em>Staphylococcus aureus</em></td>
<td>Penicillinase-stable beta-lactams</td>
<td>Cefoxitin</td>
</tr>
<tr>
<td><em>Streptococcus pneumoniae</em></td>
<td>Penicillins, Sulfonamides and trimethoprim, Third-generation cephalosporins</td>
<td>Oxacillin, Penicillin G, Co-trimoxazole, Ceftriaxone or cefotaxime</td>
</tr>
</tbody>
</table>
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

Antimicrobial resistance

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 enrolment in the Global Antimicrobial Resistance Surveillance (GLASS) is now open.
GLASS enrolment

end July 2017*

Enrolment complete (n=51)
Enrolment in progress (n=9)
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.
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: upload, validation and analysis

Individual AMR data: direct entry or upload of data files, validation and analysis
Data validation and submission

**Aggregated data**

- **Surveillance of antibacterial resistance in humans**
- **4 data validation steps**
  - File format
  - Missing data
  - Invalid codes
  - Invalid format

**Individual data**

- **Consistency checks**
- **Validation & submission**
Reports available on GLASSware
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
GLASS Early Implementation

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

2015
- Tools: IT platform, software (WHONET), capacity building materials

2016
- Data management tools, implementation manual, diagnostic stewardship manual
- Country enrolment started

2017-2018
- Review lessons from early implementation and adapt the standard
- 2nd GLASS Report

Consultation
Modules: individual data, AMR, transmission, enhanced GASP, GLASS-EAR
- Resistance in TB, malaria, HIV, environment
Thank you