Strengthening AMR Surveillance in the Region and connecting to GLASS through enhanced Surveillance in blood stream infections

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Pan American Health Organization
World Health Organization
Regional Office for the Americas

PAHO

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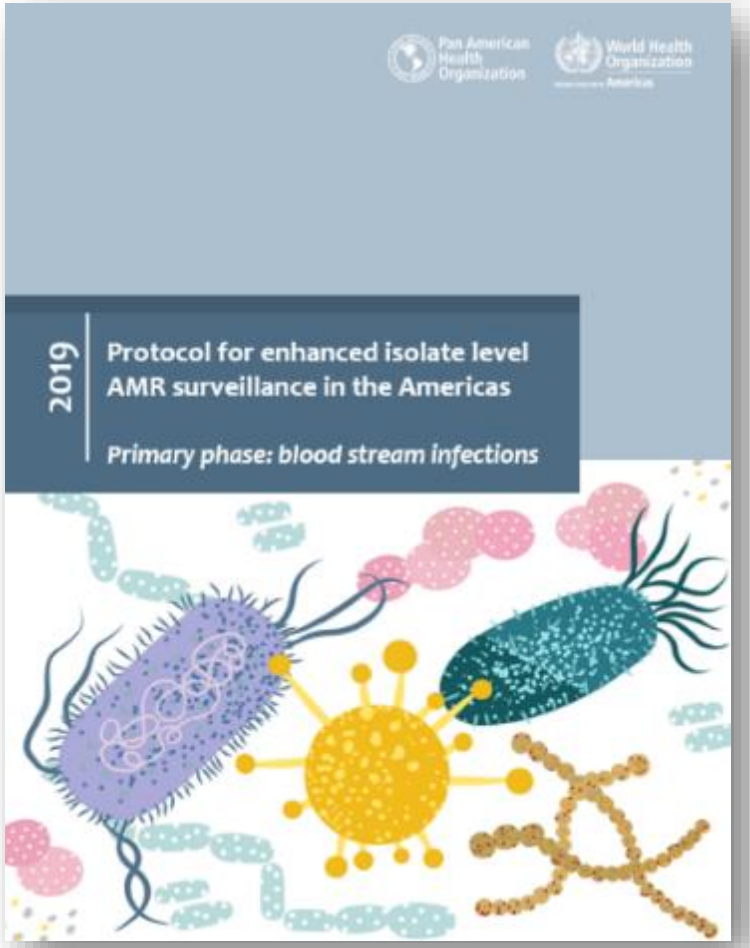
- GLASS
- Rationale new enhanced AMR surveillance initiative
- Description of the draft Enhanced surveillance protocol
  - Organization surveillance components
  - Methodology & data flow
  - Data quality, analysis and visualization
  - Laboratory and Hospital Questionnaire
- Transition period from aggregated to isolate level data
- Suggested next steps for implementation



ReLAVRA and the Caribbean surveillance network

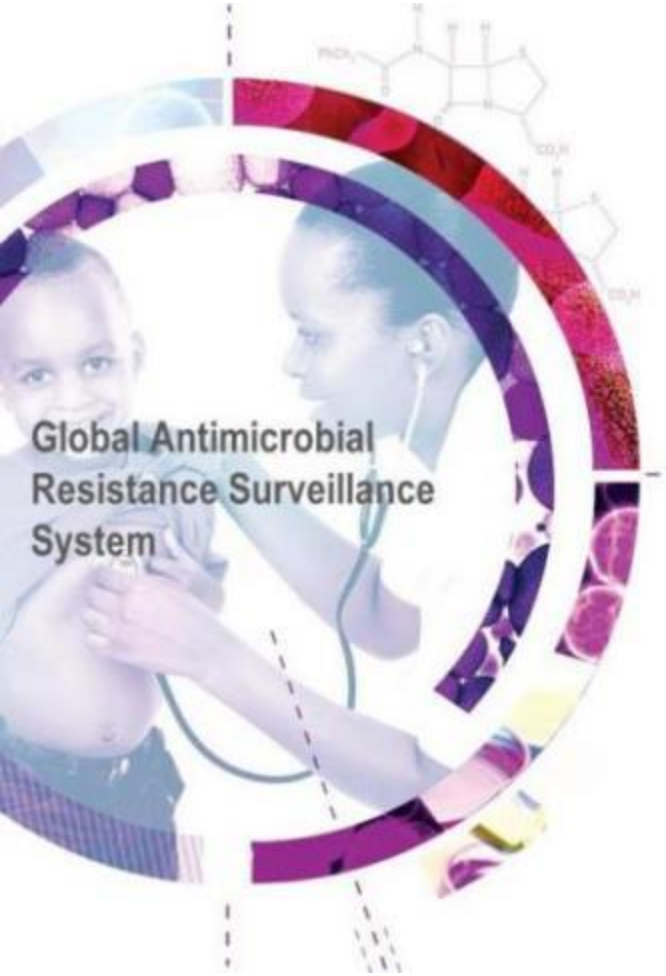
ReLAVRA network

- Since 1996
- Network of National Reference Laboratories
- Currently, 19 countries of the Americas report their resistance data annually
- Network of collaboration, training, EQA, support
- Essential contribution to the laboratory capacity and AMR surveillance in the Region

Caribbean surveillance network

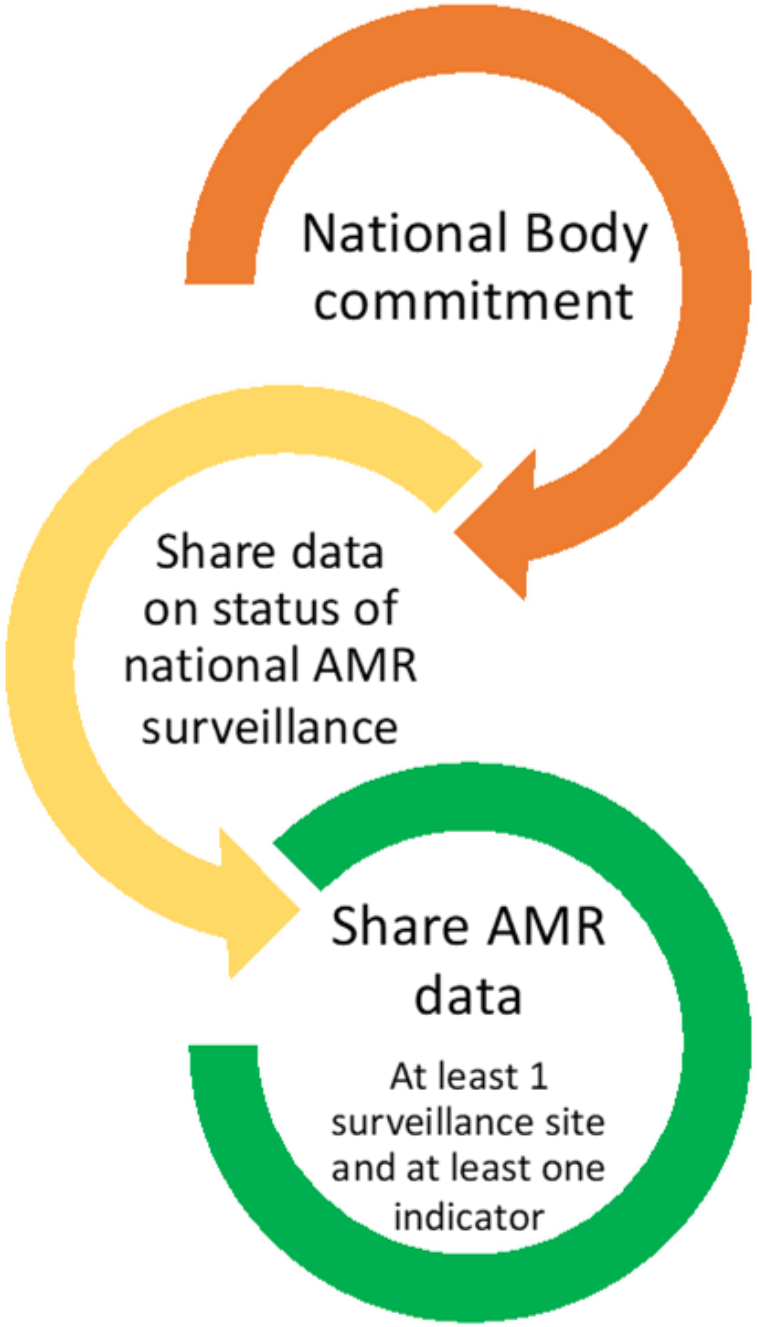
- Early stages of development
- Laboratory capacity building activities
- Collaboration and coordination of AMR activities in the Caribbean region

GLASS



- To support AMR Global Action Plan.
- To foster national AMR surveillance systems through harmonized global standards.
  - Monitor AMR trends
  - Detect emerging resistance
  - Estimate the extent and burden of AMR globally
- Initial focus on human bacterial pathogens
- Includes epidemiological, clinical, and microbiological data
- March 2016: country enrolment started

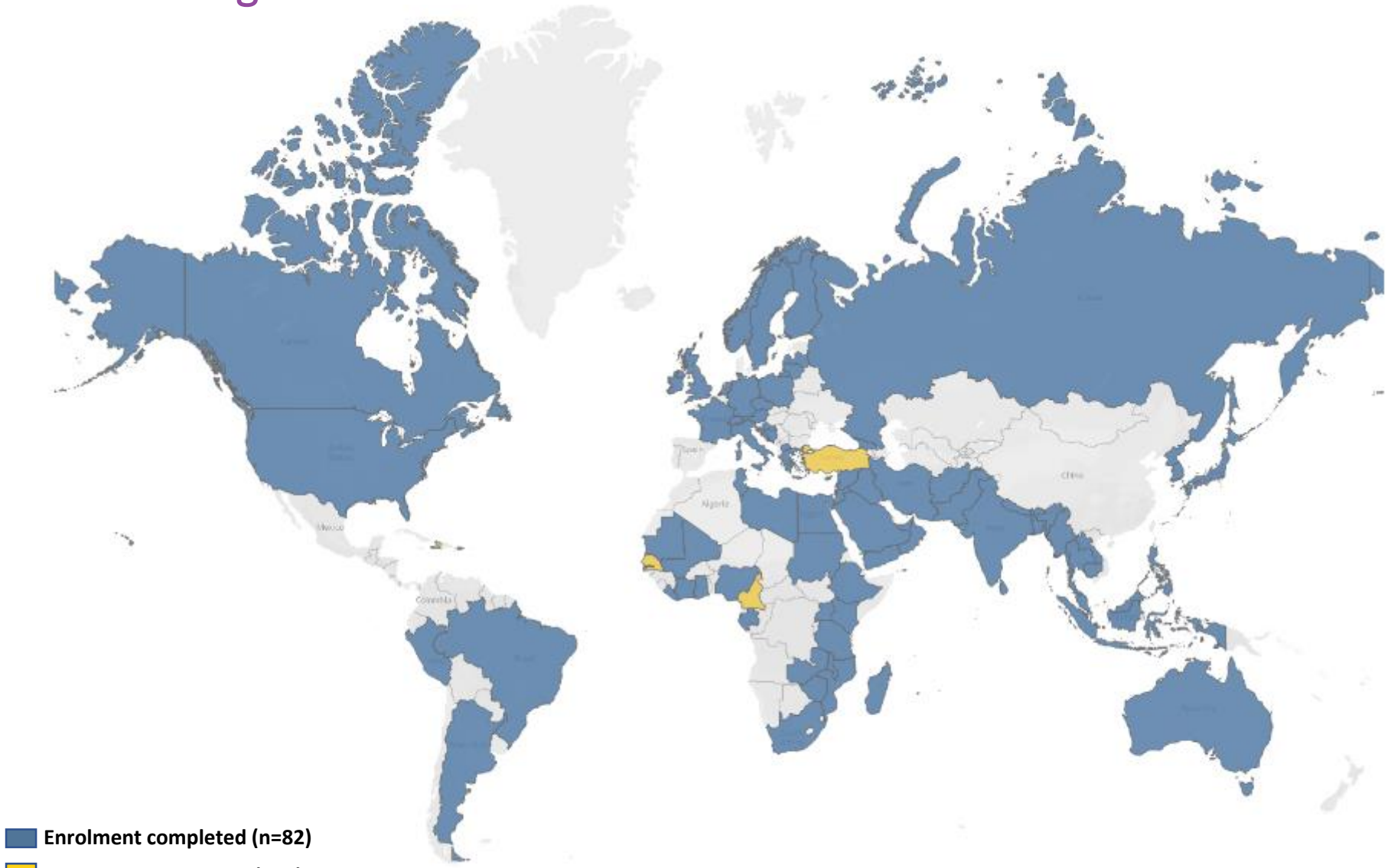
GLASS enrollment



- As of August 2019, 82 countries are enrolled
- Countries enrolled from our region: Argentina, Brazil, Canada, Haiti, Peru, United States
- How to enroll:
  - Submit an expression of interest to glass@who.int
  - Nomination of National Focal Point
  - Registration in the GLASS IT platform to provide country information

Status of countries enrolled in GLASS

As of 29 August 2019*



Enrolment completed (n=82)

Enrolment in progress (n=4)

* Call for country enrolment issued on 21 March 2016

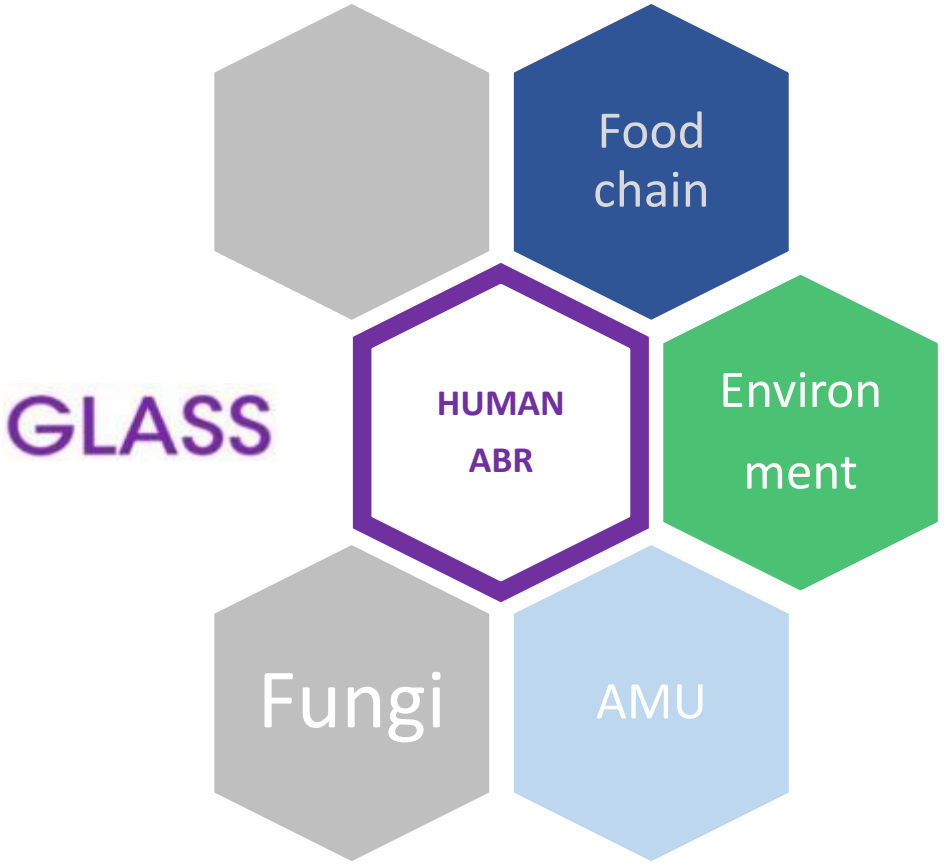
GLASS Manual for Early Implementation

Table 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	*E. coli* *K. pneumoniae* *A. baumannii* *S. aureus* *S. pneumoniae* *Salmonella* spp.
Urine	Significant growth in urine specimen[b]	Selected sites or national coverage Continuous Patients in hospital and in the community	*E. coli* *K. pneumoniae*
Faeces	Isolation of *Salmonella* spp.[c] or *Shigella* spp. from stools	Selected sites or national coverage Continuous Patients in hospital and in the community	*Salmonella* spp. *Shigella* spp.
Urethral and cervical swabs	Isolation of *N. gonorrhoeae*	Selected sites or national coverage Continuous Patients in hospital and in the community	*N. gonorrhoeae*

a Any pathogen isolated from a blood culture may be significant for surveillance locally and nationally; only the prioritized pathogens for global surveillance are listed here.
b Pure culture according to local laboratory practice. Catheter samples should be excluded if possible.
c Diarrhoeal surveillance is for non-typhoid salmonella species; for local clinical purposes, typhoid and paratyphoid should be included.

Future of GLASS



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

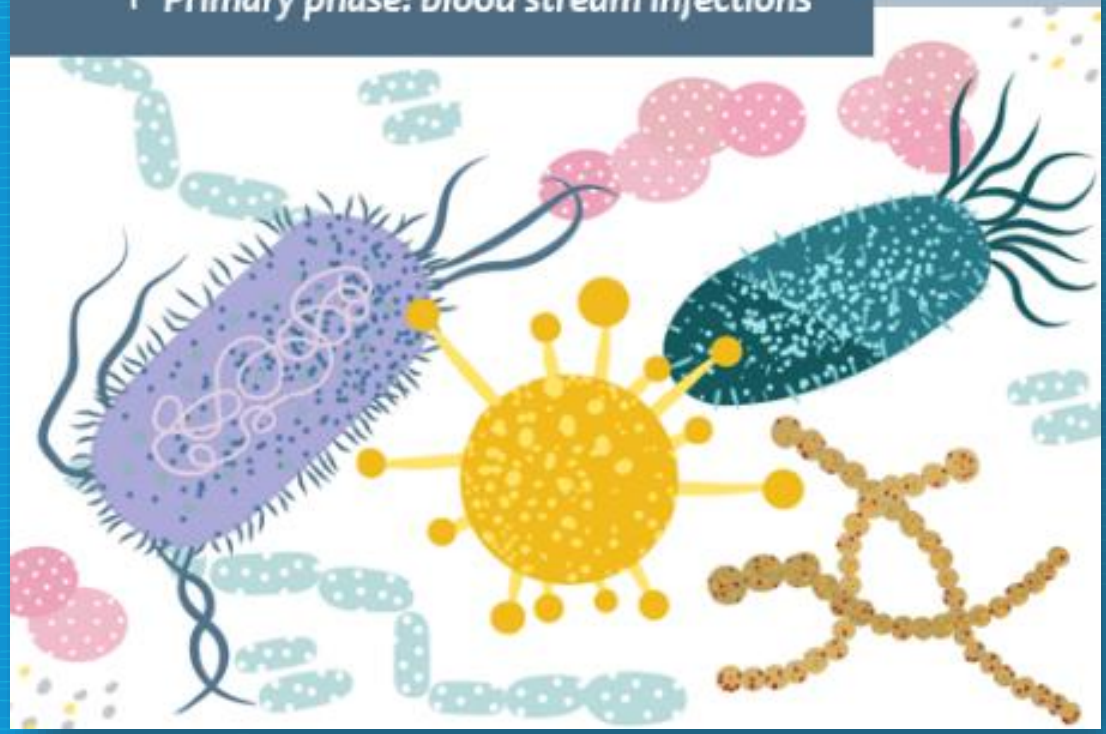
Pan American Health Organization

World Health Organization Americas

2019

Protocol for enhanced isolate level AMR surveillance in the Americas

Primary phase: blood stream infections



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Rationale new enhanced AMR surveillance initiative

- **Bring together** AMR surveillance in Latin America and the Caribbean as one region through standardized, comparable and validated data collection at all levels in the surveillance chain.
- Support National AMR Surveillance Systems in its **continuous efforts to improve** the accuracy and quality of diagnosis.
- Through isolate level data collection collect epidemiological, clinical, and microbiological data to **optimize patient care**
  - Enhanced analysis: specimen type, age gender, MDR, XDR and PDR*, ICU/non-ICU, HAI/CAI
  - Automated feedback from regional level supporting national AMR surveillance: summary reports and unusual resistance table for validation and confirmation
  - Interactive database online
- **Streamline reporting to GLASS** and reduce additional burden to GLASS reporting countries in the Region

**Pearson et al.* Pan American Journal of Public Health. 2019 Aug.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6705331/

Development of the draft Enhanced surveillance protocol

13 Countries participated in the development of the protocol:

- Nomination of focal points
- Country specific and group Webex sessions
- Extensive Review of protocol
- Standard WHONET configuration development and WHONET manual

PAHO

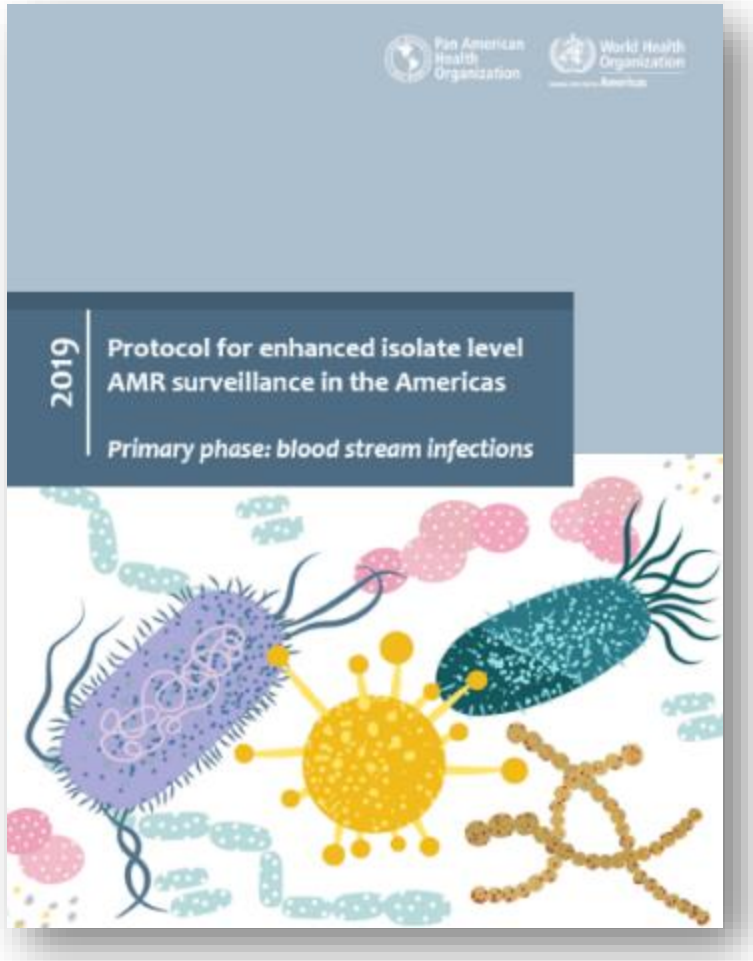
What can you find in the protocol?

- Introduction, Goals & Objectives

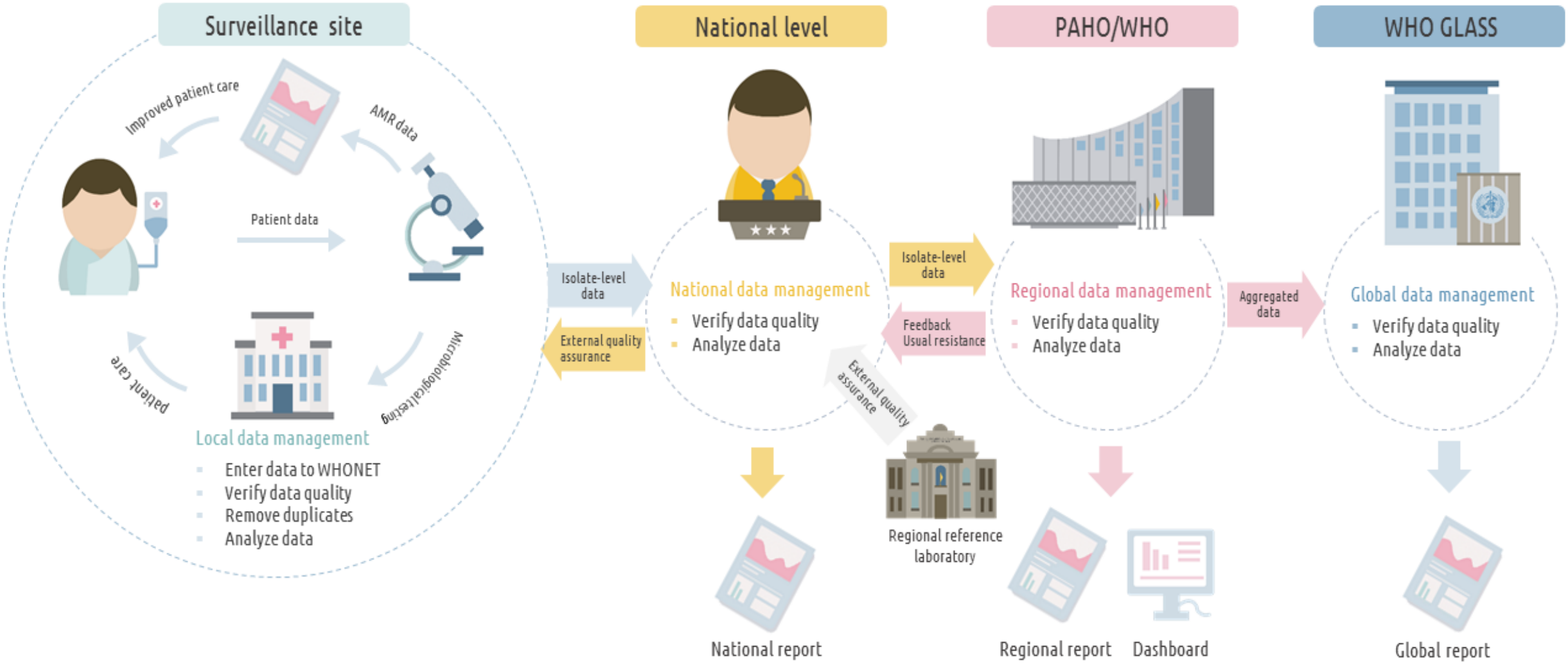
1. Organization of a national AMR surveillance system
2. Methodology
3. Data quality, analysis and visualization

- Annexes:
  4. Laboratory and Hospital questionnaire
  - Pathogen-antibiotic combinations
  - Detailed data fields
  - Resistant phenotypes recommended for characterization

Protocol is accompanied with a Standard WHONET configuration and WHONET manual



1. Organization surveillance components



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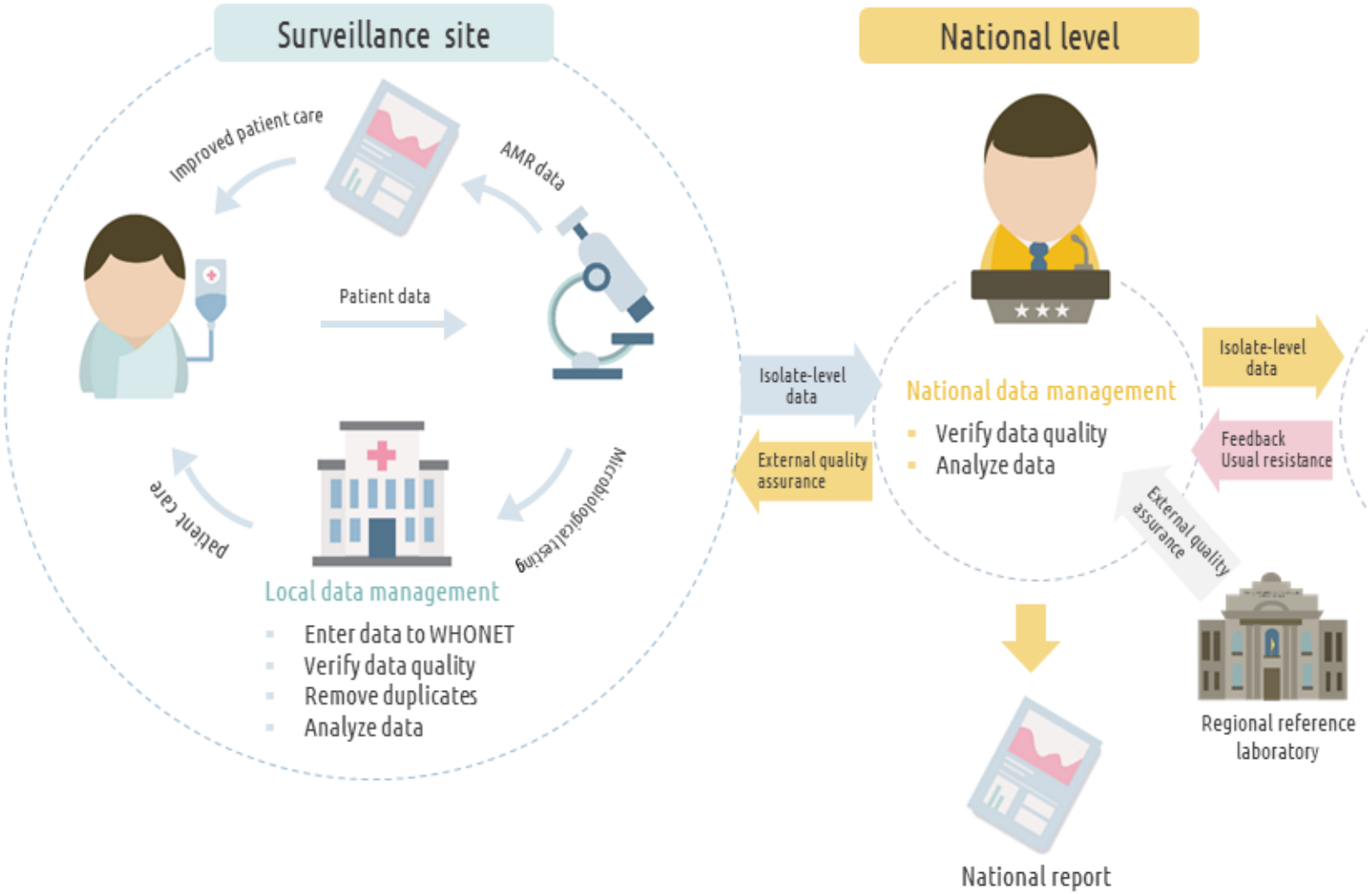
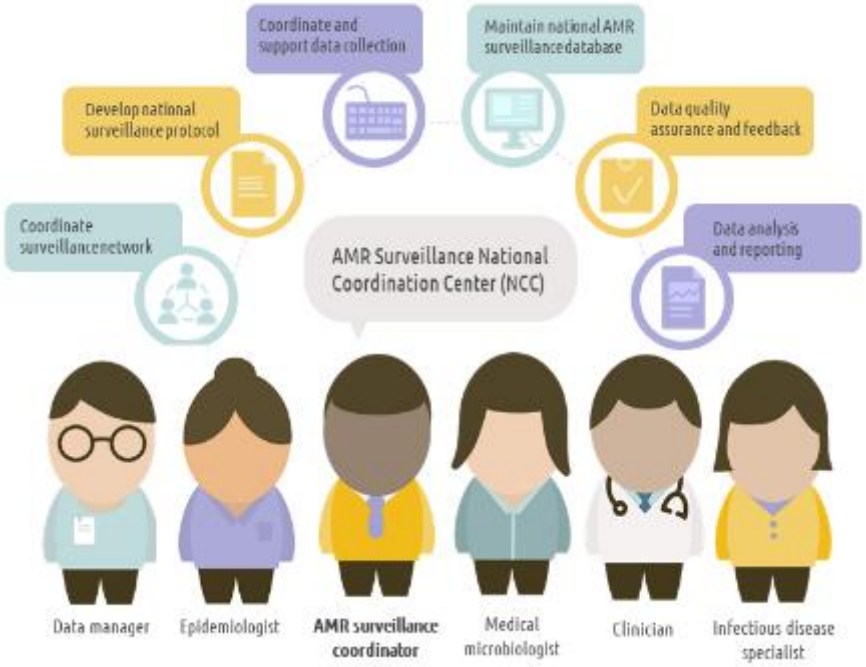
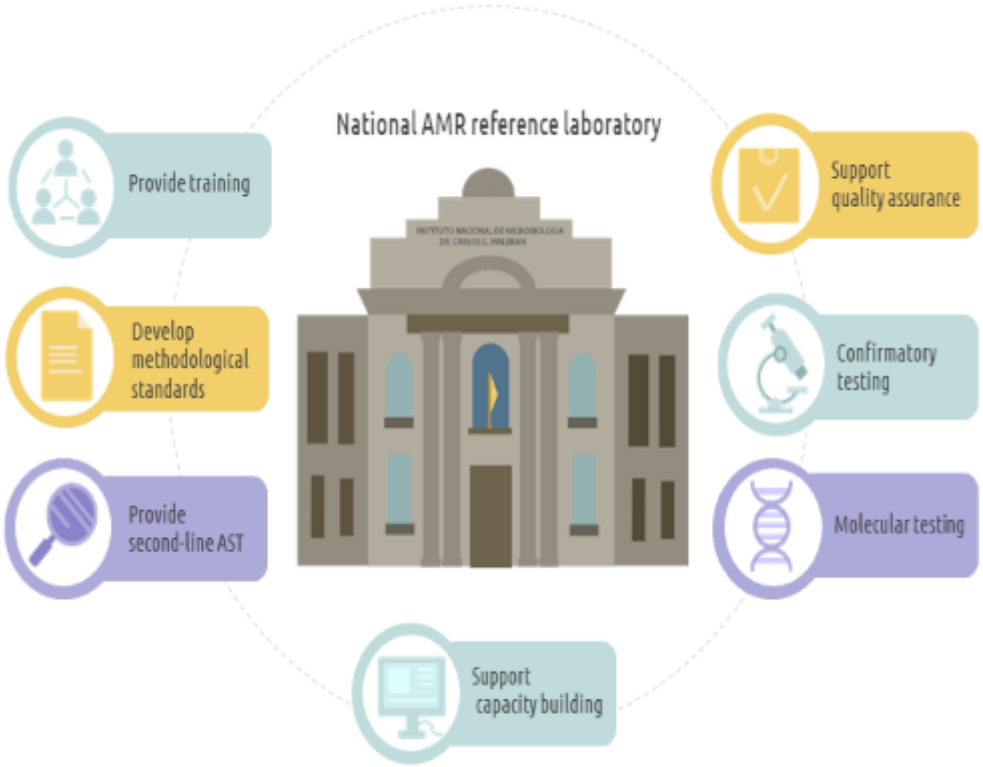


3 core components:

- The AMR surveillance national coordinating center (NCC);
- The AMR national reference laboratory (NRL);
- The AMR local surveillance sites (LSS)

1. Organization national surveillance components





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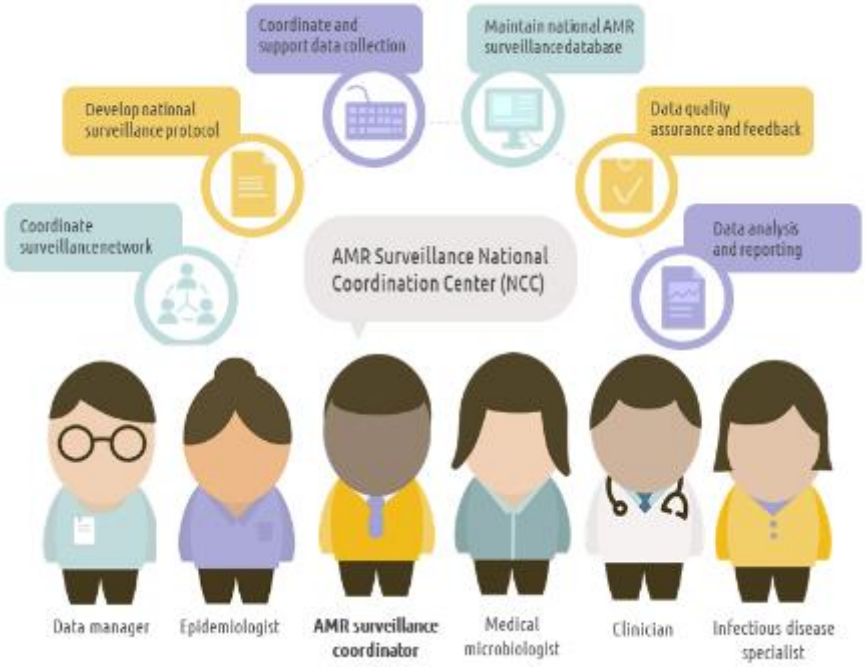

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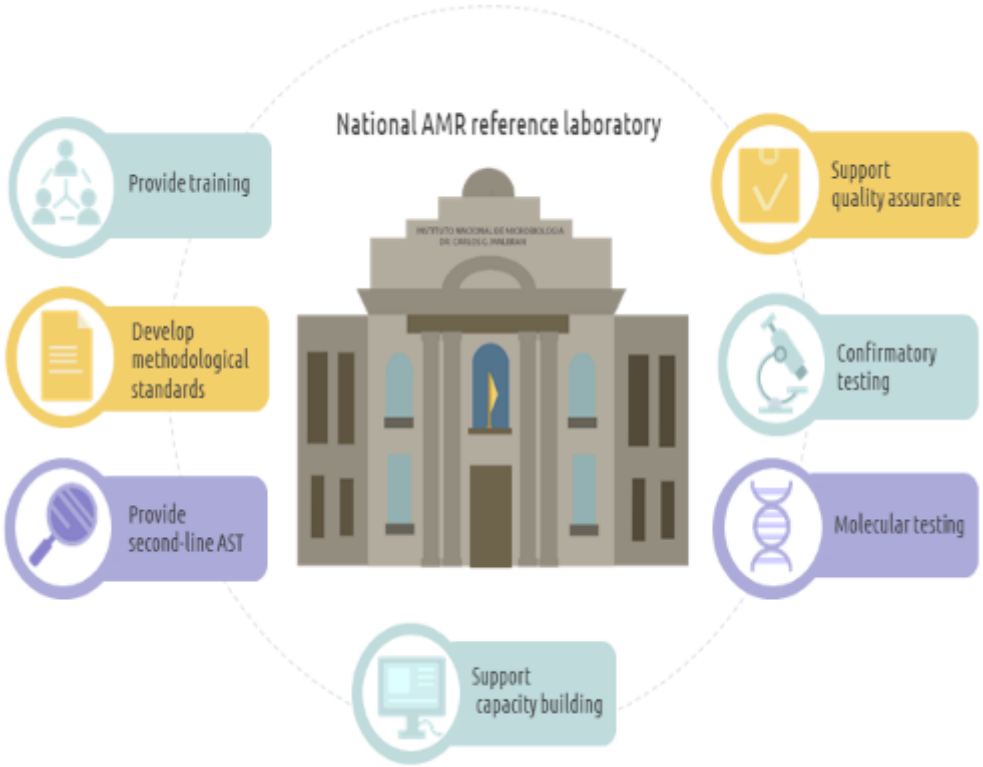

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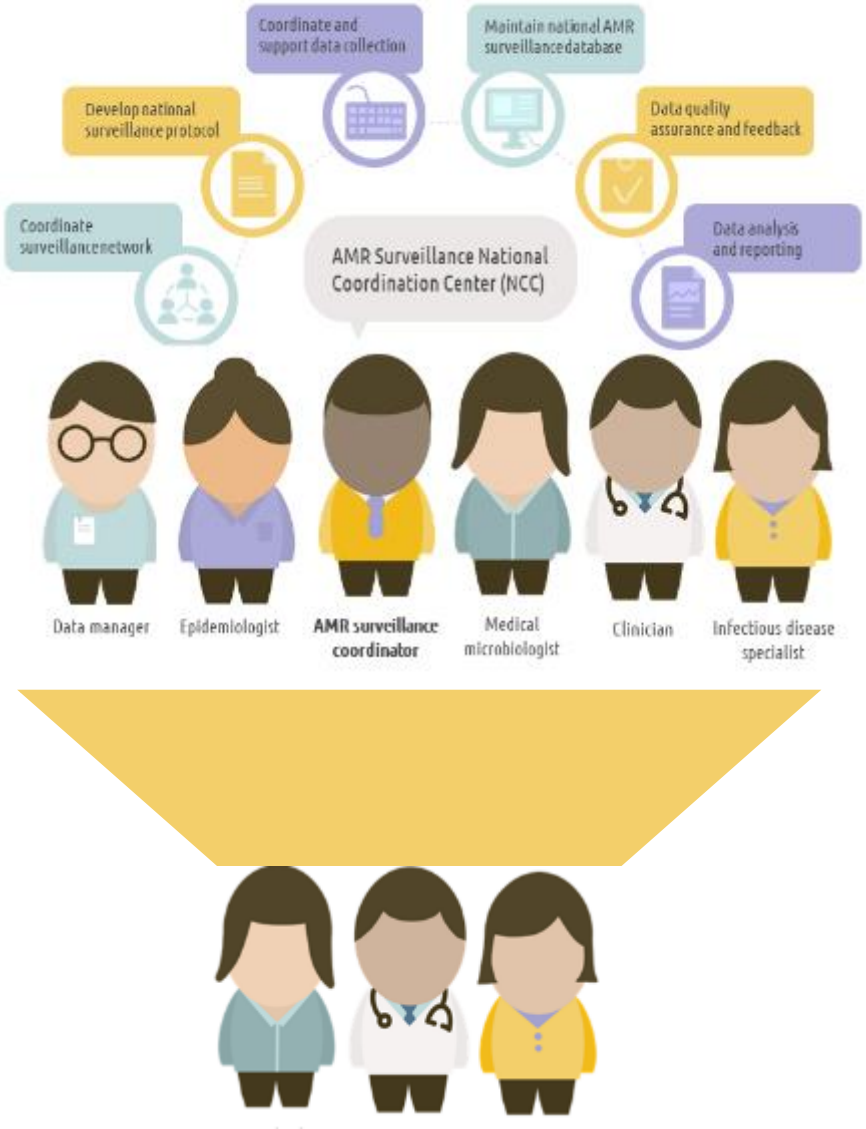


Sub-regional or regional AMR reference laboratory

2. Methodology

Pathogens identified from Blood Stream Infections (BSIs)

Pathogen	WHO priority pathogen list	Part of GLASS
Acinetobacter baumannii	Priority 1: critical (carbapenem-resistant)	Yes
Escherichia coli	Priority 1: critical (carbapenem-resistant and 3rd generation cephalosporin-resistant)	Yes
Enterococcus spp	Priority 2: high (vancomycin-resistant)	No
Klebsiella pneumoniae	Priority 1: critical (carbapenem-resistant and 3rd generation cephalosporin-resistant)	Yes
Enterobacteriaceae (other)	Priority 1: critical (carbapenem-resistant and 3rd generation cephalosporin-resistant)	No
Pseudomonas aeruginosa	Priority 1: critical (carbapenem-resistant)	No
Salmonella species (spp.)	Priority 2: high (fluoroquinolone-resistant)	Yes
Staphylococcus spp.	Priority 2: high (methicillin-resistant, vancomycin intermediate and resistant)	Yes*
Streptococcus pneumoniae	Priority 3: medium (penicillin-non-susceptible)	Yes

Remarks:

- Since initial focus on blood isolates, *Neisseria gonorrhoeae* and *Shigella* spp are not included
- GLASS Early implementation protocol for inclusion of *Candida* spp is available online: https://apps.who.int/iris/bitstream/handle/10665/326926/WHO-WSI-AMR-2019.4-eng.pdf?sequence=1&isAllowed=y

* *S.aureus* only

2. Methodology

Defined set of **data fields**

Remarks:

[1]minimally required fields to enable data upload

[2]mandatory fields for optimal analysis and use of data

Annex with detailed description of data field

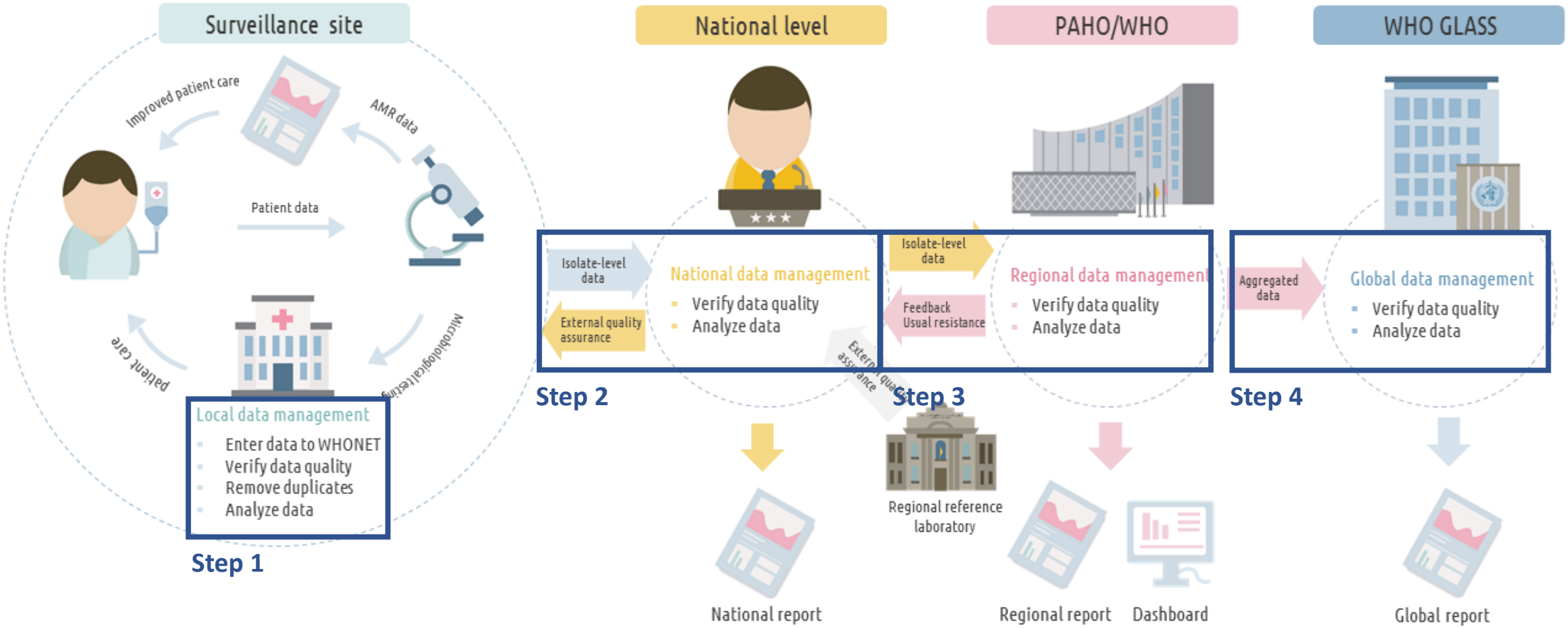
- Data encryption of patient ID (WHONET functionality) and the Local surveillance site (at the national level) before sharing data with PAHO
- Datafield 'Ward' is used to generate the Standardized datafield 'Department'
- HAI/CAI and challenges collecting 'Data of Admission'

Protocol is accompanied with a Standard WHONET configuration an a WHONET manual

1.	Country[1]	13.	Specimen number
2.	Surveillance site (Hospital ID)[1]	14.	Specimen date[1]
3.	Patient ID[1]	15.	Specimen type[1]
4.	Sex[2]	16.	Organism[1]
5.	Date of birth	17.	ESBL present
6.	Age[2]	18.	Carbapenemases results
7.	Ward	19.	Inducible clindamycin
8.	Patient origin	20.	Antibiotic[1]
9.	Department	21.	Interpretation of susceptibility[1]
10.	mis…on	22.	Zone value (mm)
	…ed infection (HAI) or …uired infection (CAI)[2]	23.	MIC (mg/l)

Combining bacteremia and candida!

2. Methodology – data flow



3. Data quality, analysis and visualization

Quality check at national level by the NCC/NRL to assess:

- Completeness/missing values
- Microbiological quality
- Adherence to local/national guidelines
- Consistency with CLSI/EUCAST
- Deduplication to ensure that **only the first isolate per microorganism per person per year will be included for analysis**
- Data encryption of patient ID and LSS

3. Data quality, analysis and visualization

Quality check at regional/PAHO level:

- Once the data is successfully uploaded in the database a feedback report to the NCC/NRL is generated
  - Number of records received, rejected and accepted;
  - Overview of unusual results;
  - Number of isolates per pathogen, per laboratory, and in total;
  - Number and laboratory codes of laboratories that tested less than 75% of isolates for the antibiotics of interest;
  - Demographic and clinical patient information, by pathogen and in total;
  - Resistance percentages of the pathogen-antibiotic combinations and multidrug resistance divided into Multidrug-resistant, MDR; Extensively drug-resistant, XDR; and Pan-resistant, PDR.

3. Data quality, analysis and visualization

Analysis and Visualization at PAHO level

- Automated regional interactive database - PLISA Health Information Platform for the Americas
  - Online data upload (2020)
  - Automated feedback form for data validation and confirmation
  - Data analysis and visualization (Dashboard)
    - Grouping of antibiotics
    - Calculating multidrug resistance
  - Provide aggregated AMR data to GLASS upon country request

4. Laboratory and Hospital questionnaire

NEW!

Laboratory questionnaire

- Total number of blood culture requests (sets) per year

One request/set consists of any number of blood culture bottles that are taken from one patient on a single occasion for diagnostic purposes

If not available calculate by:

$$\frac{\text{total number of blood culture bottles processed}}{\text{total number of bottles per blood culture request.}}$$

To facilitate interpretation of the data and assess accuracy and representativeness of the data

Sampling habits:

Determine the average rate of blood samples taken for culture per 1000 patient-days

4. Laboratory and Hospital questionnaire

NEW!

Hospital questionnaire

- Level of care of the hospital primary/secondary/tertiary/diff
- Best estimate catchment population of the hospital
- Hospital size in beds/# ICU beds
- Total number patient admissions
- Total number of patient days*

*Average occupancy rate is patient days not available

Understanding the patient population and country representativeness

To estimate the number of blood stream infections per 1000 patients per year that are caused by:

- MDR resistant pathogens
- Carbapenemase resistant organisms

Transition period from aggregated to isolate level data

Aggregated ReLAVRA data	Isolate level AMR surveillance for the Americas
• Excel datasheet via email • All isolates (no distinction)	• WHONET file to be uploaded through PLISA • Starting with BSI and expanding to GLASS specimens
Transition period 2019-2020-2021	
• All Latin American countries are requested to share their 2018 & 2019 data via the Excel datasheet	• Pilot countries (and all countries that are able) are requested to share the isolate level WHONET file for 2018 and 2019 data • Create connection with PLISA and develop automated system at Regional level • Set evaluation points/milestones!

The transition will result in an interruption of the trend line, as we cannot distinguish specimens from the aggregated data collected. However, many countries can make this distinction at national level, to estimate the impact of change.

Next steps for implementation

- Incorporate agreed changes for the **finalization of the protocol** – Dec 2019 (Eng/Spanish version)
  - Interactive session to discuss main points & final session on Day 3 to reach consensus on next steps
- Make **WHONET configuration and manual** available for pilot/early implementation – Oct 2019 (Eng/Spanish)
- Provide **WebEx sessions** to provide guidance/explanation for the WHONET configuration – November 2019 (Eng/Spanish)
- **Share WHONET data file and Lab/Hosp Questionnaire** with PAHO (when able) as part of the pilot/early implementation – 2019/2020
- **Individual country follow up**/support
- Integration of AMR surveillance for LA into **PLISA** – 2019/2020

Thank you!