



Global Action in Healthcare Network Antimicrobial Resistance Initiative (GAIHN-AR)

M. Ines Staneloni and Chris Elkins

Centers for Disease Control and Prevention, Atlanta, GA, USA

**Meeting of the Latin American and Caribbean Network for
Antimicrobial Resistance Surveillance (ReLAVRA+)**

July 13, 2023

Background

Module: Global Action Network in Healthcare (GAIHN-AR)

M. Ines Staneloni, MD

RAM and PCI technical advisor

South America Regional Office CDC

Christopher A. Elkins, Ph.D.

Clinical and Environmental Microbiology Branch Chief

Health Care Quality Promotion Section

National Center for Emerging and Zoonotic Infectious Diseases

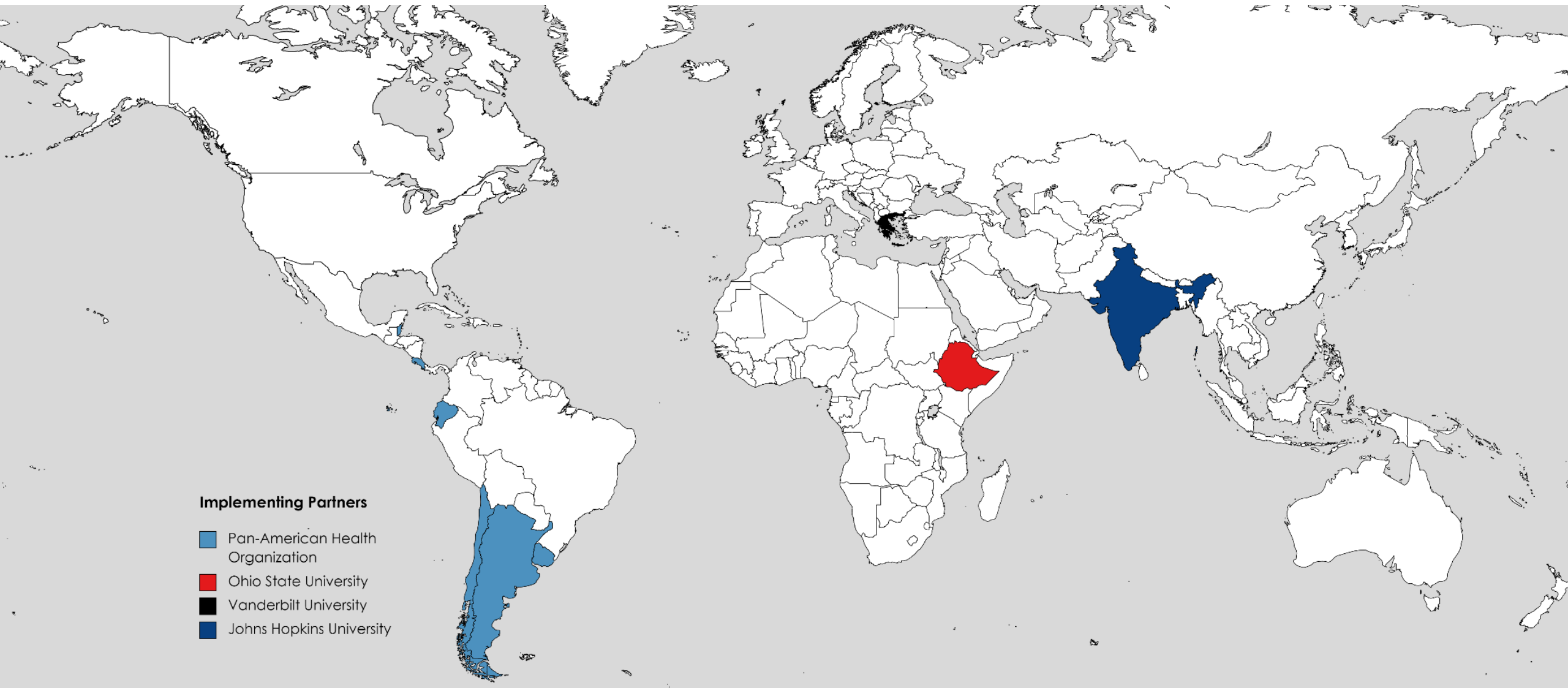


GAIHN-AR: a collaborative global fast action network

- **Network vision:** a global rapid-action network coordinated by CDC
- Comprised of countries, institutions and partners globally working to jointly address the threat of Antimicrobial Resistance (AMR) in healthcare through:
 - Detection
 - Prevention
 - Communication
 - Rapid response to prevent dissemination
- It is not a surveillance project



GAIHN-AR: implementation in more than 20 hospitals in 9 countries through global collaboration.



Why was a Project like GAIHN-AR generated?

In the face of the AMR threat:

- Urgent, innovative and collaborative actions are needed, both locally and globally.
- Adapt detection/response strategies to the constant change in AMR.
- Adapt according to available resources
- Sharing experiences and helping everyone to be prepared
- Data to guide efforts and prioritize

Objective:

To prevent and reduce the spread of AMR in healthcare, locally and globally.

DETECT

- Clinical and reference laboratories rapidly detecting prioritized multidrug-resistant organisms

COMMUNICATE

- Laboratories that promptly report detection events to infection prevention and control (ICP) teams

PREVENT/RESPONSE

- Infection prevention and control teams working to prevent transmission through proactive prevention and rapid response

GAIHN-AR: detection, prevention and response of carbapenemases

Resistance Mechanism:

1. Carbapenemases that have been detected previously

- *KPC*
- *IMP*
- *NDM*
- *VIM*
- *Similar to OXA-48*

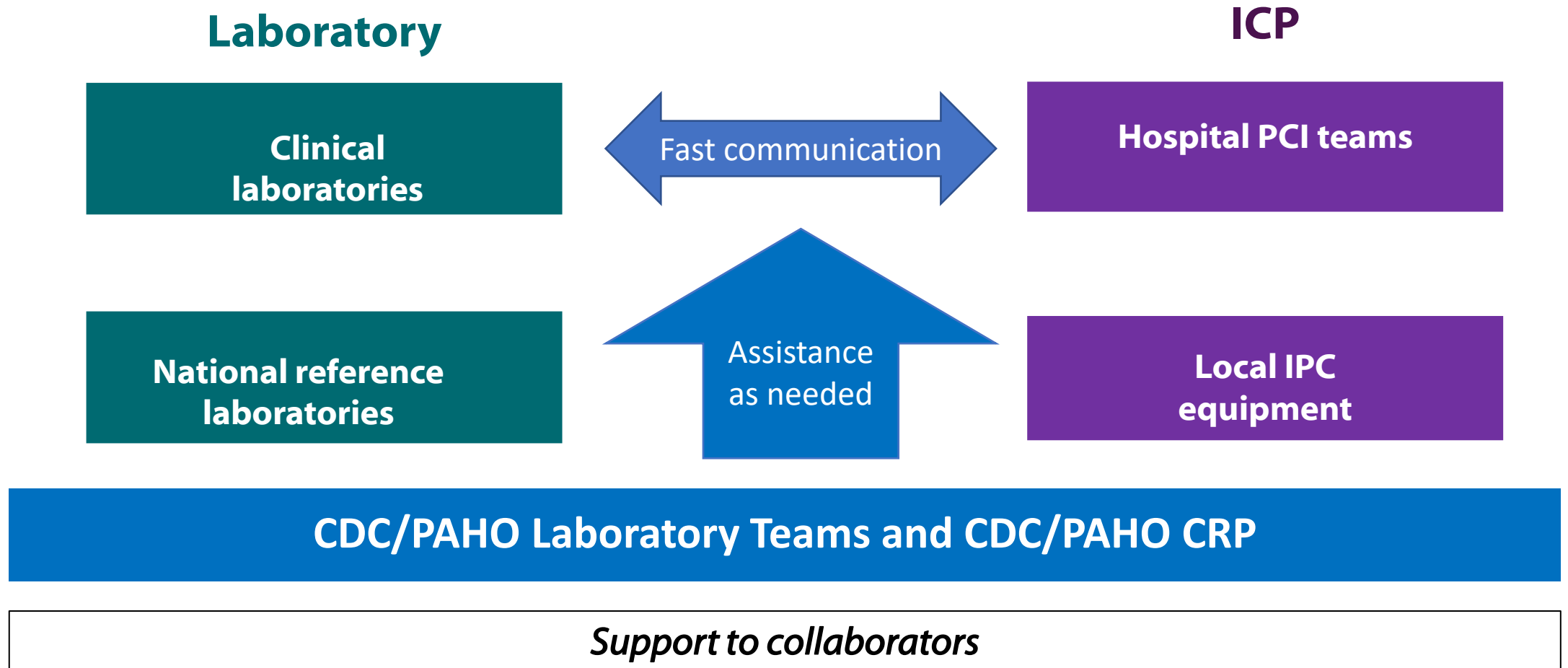
Prioritized microorganisms:

- *Klebsiella (pneumoniae, oxytoca, aerogenes)*
- *Escherichia coli*
- *Enterobacter spp.*

Suspicion of a new carbapenemase

*Microorganisms and/or resistance mechanisms could be added based on local epidemiology and laboratory capacity. E.g. Carbapenem-resistant Acinetobacter (CRAB).

GAIHN-AR in Latin America works with a network of laboratories and infection prevention and control (ICP) teams.



Containment Response: Multidrug-resistant microorganisms infrequent in the institution and new pathogens.

DETECTION

**Carbapenemase-producing
Enterobacteriaceae (CPE)**
*With a mechanism of
unusual or new resistance*

All CPEs



ANSWER

Containment

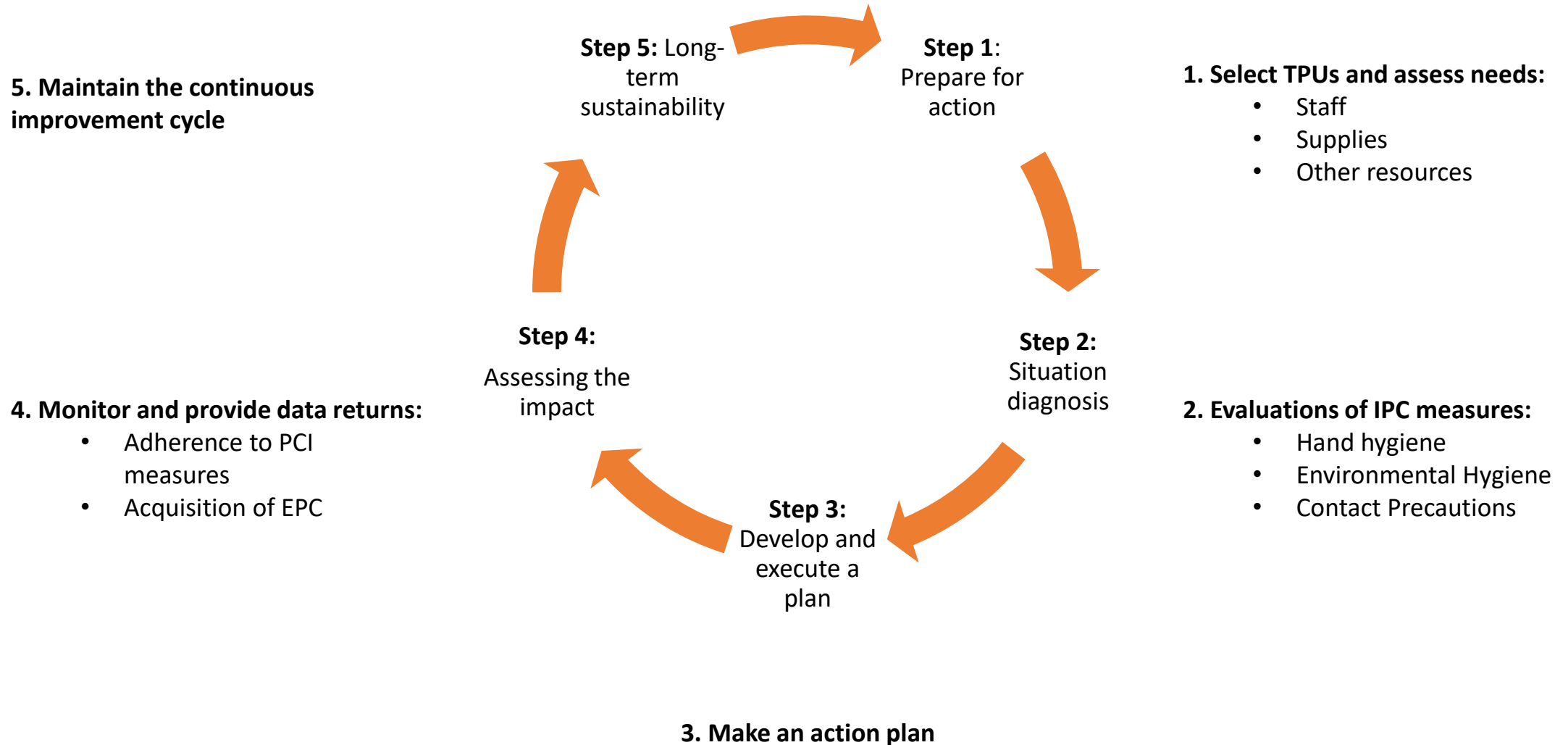
Prevention

PREVENTION - Target prevention units (TPUs)

Units with increased likelihood of transmission of multidrug-resistant microorganisms (MOR) due to the care of patients with one or more of the following:

- Increased risk of MOR and/or transmission (e.g., ICUs).
- Extended stay
- Previous identification of MOR or outbreak

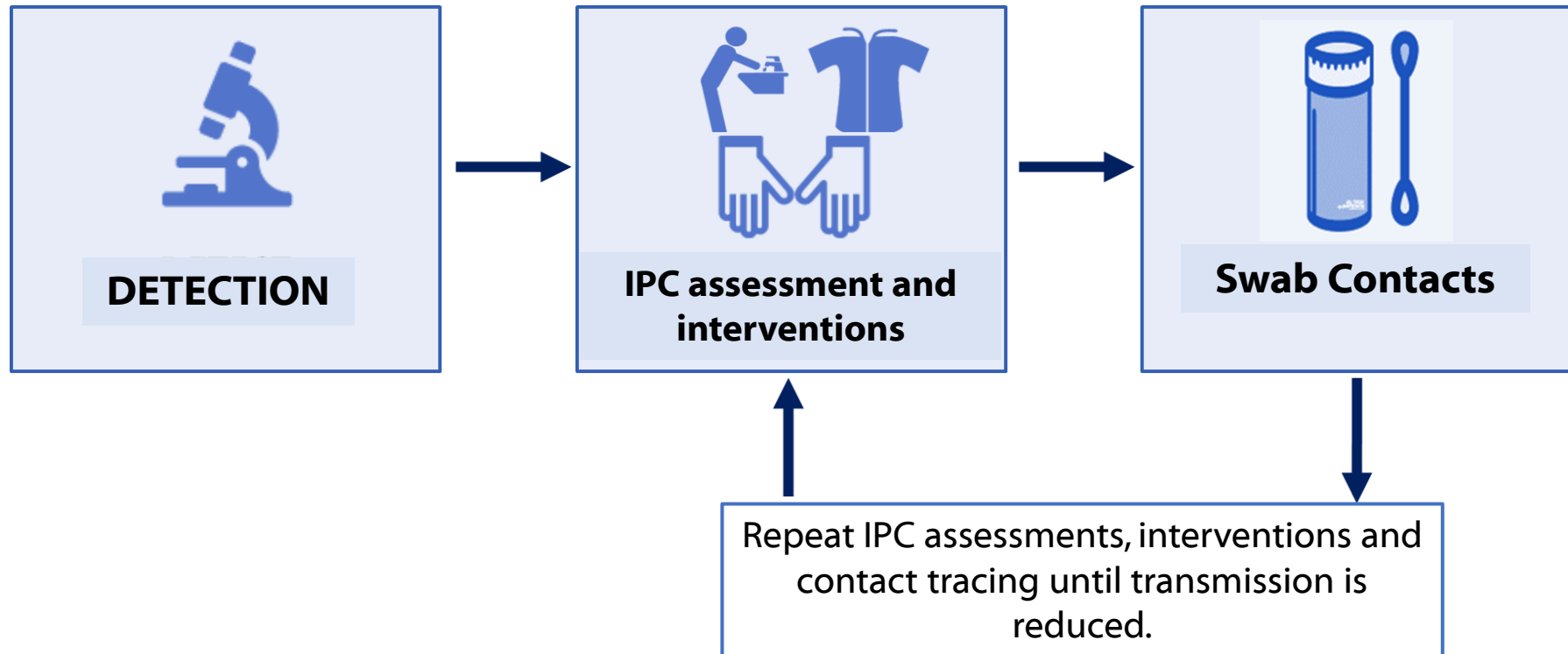
PREVENTION - Cycle of continuous improvement in UPTs



RESPONSE

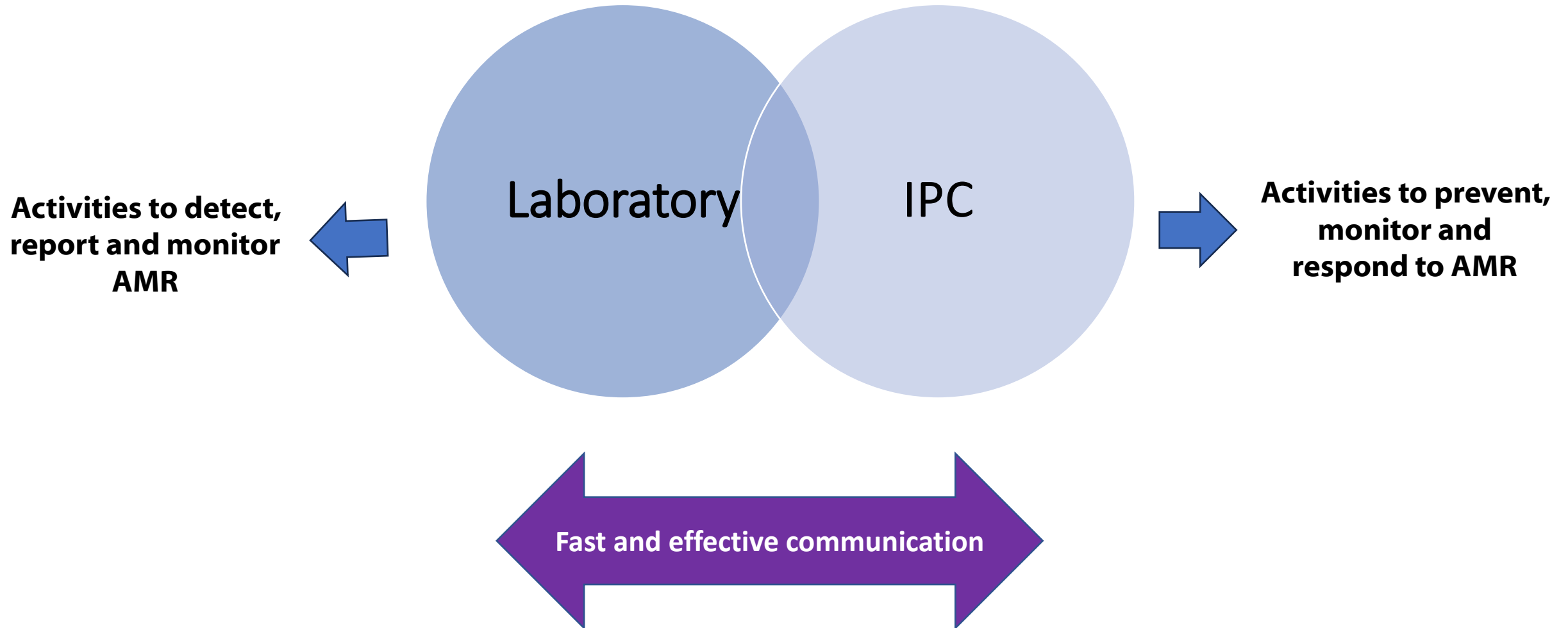
Isolation and contact for CPE patients

Response:



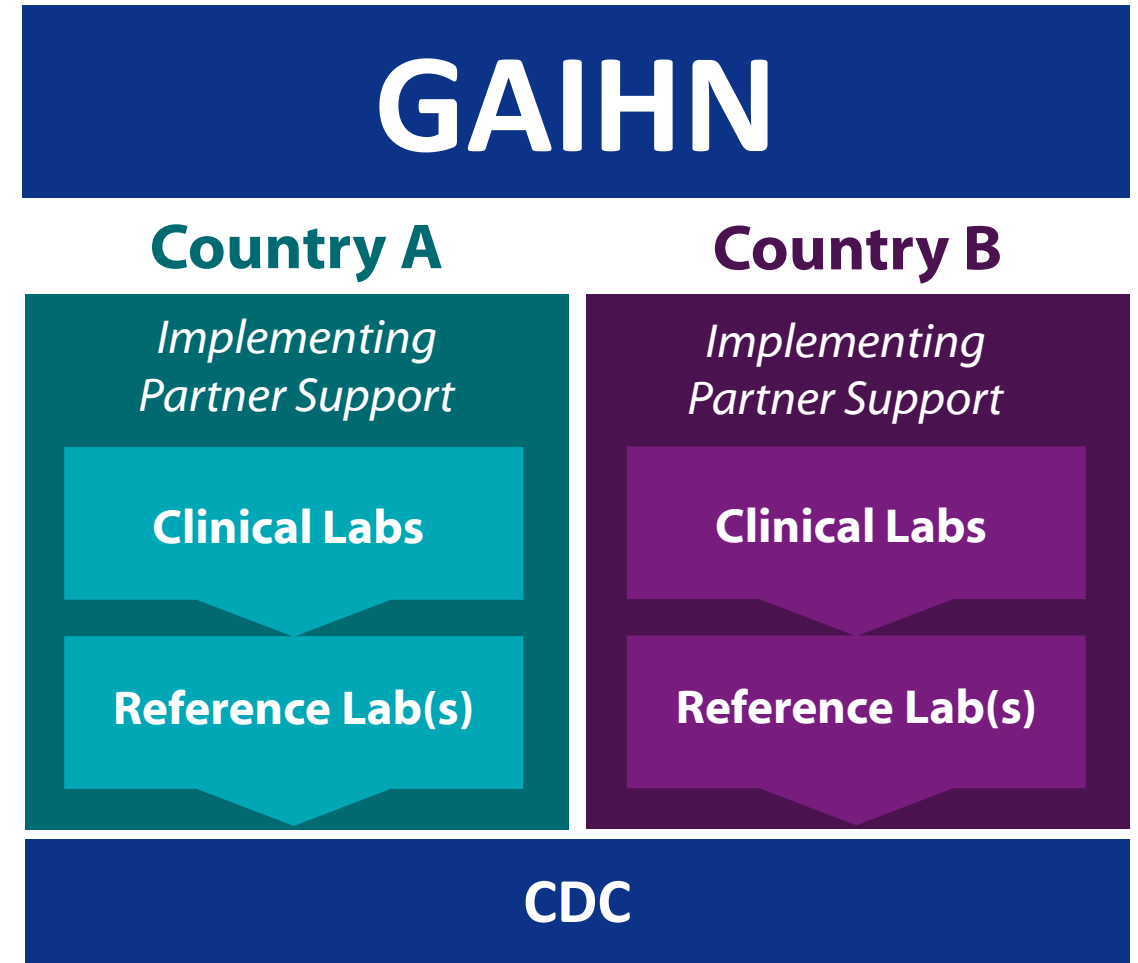
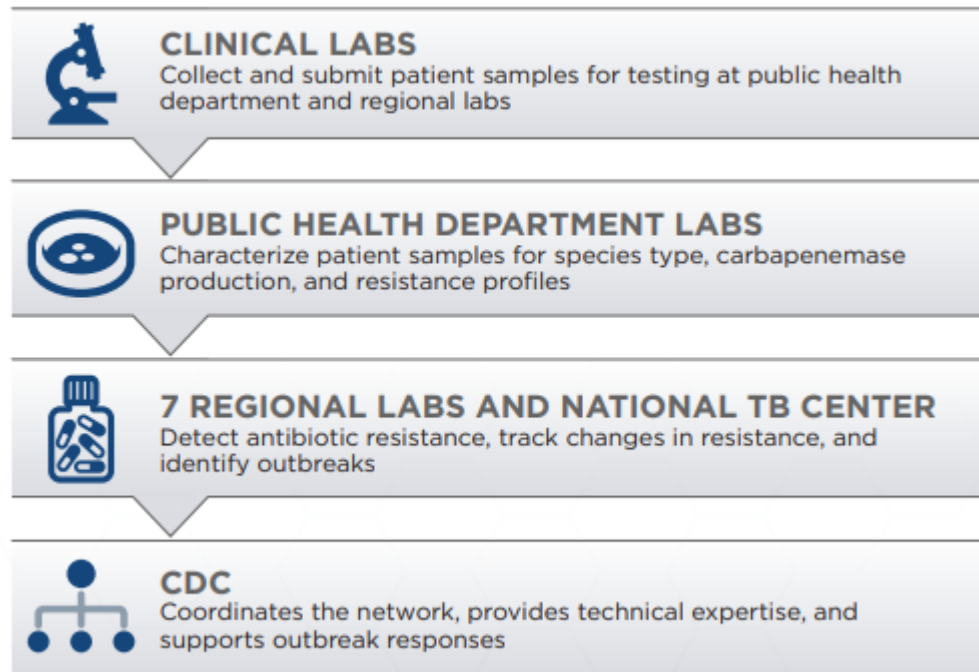
Communication: Laboratory and IPC

INTEGRATION AT GAIHN

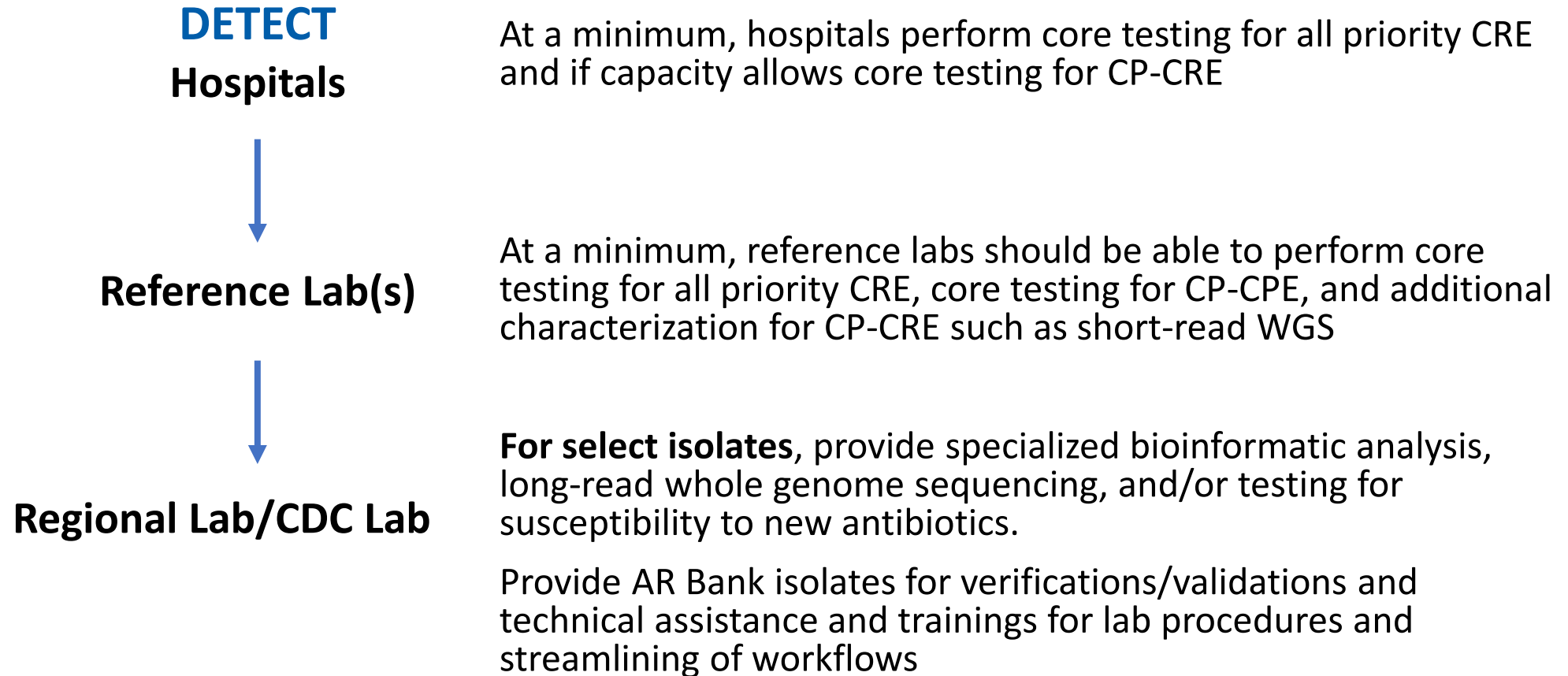


Laboratory Testing Structure and Priorities

GAIHN-AR will utilize a network of laboratories similar to the domestic AR Lab Network.



Laboratory Referral Network



Core Testing for Priority CRE

Core GAIHN-AR testing includes:

- Organism identification, including speciation as able
- Antimicrobial susceptibility testing (AST)
- Broad phenotypic testing for detection of carbapenemase production (e.g., mCIM, CarbaNP) performed concurrently with AST or within 24 hours of CRE detection.

Core Testing for CP-CRE

All GAIHN-AR priority CP-CRE organisms recovered from clinical cultures should be tested for all targeted carbapenemases, including at least KPC, NDM, VIM, IMP, and OXA-48-like. (Additional carbapenemases may be included per local or country priorities and capacities.)

Core CP-CRE testing includes:

- Molecular test (RT-PCR preferred) to identify targeted carbapenemase genes
OR
- Immunochromatography test (ICT) to identify targeted carbapenemase enzymes

Additional Characterization for Select CP-CRE

CP-CRE isolates suspected of pan-resistance* or suspected to have novel or rare carbapenemase genes may undergo additional characterization, including:

- AST for antimicrobials not routinely tested at the submitting clinical laboratory
- PCR for additional rare carbapenemases, if available
- Whole genome sequencing (WGS) to detect and identify novel carbapenemases

* For GAIHN-AR, a pan-resistant organism is resistant to all relevant antibiotics tested at the clinical laboratory that serves the healthcare facility. Relevant antibiotics for CP-CRE are those that have activity against Enterobacterales and are available for treatment in the healthcare facility.

Other Considerations

All participating laboratories must ensure quality:

- Participation in an external quality assessment program with proficiency testing for all methods used for CP-CRE detection from clinical isolates and colonization screening specimens
- Implementation of internal quality control programs
- Assay validation or verifications

Laboratory Assistance Provided through GAIHN-AR

- Development and Distribution of Laboratory Tools and Guidance
- Sharing of Laboratory Protocols
- Lab Testing Guidance
- In-country Travel with Deliverables
- In-person Trainings
- CDC/FDA AR Bank ([CDC & FDA Antibiotic Resistance Isolate Bank | CDC](#))

GAIHN-AR Data Systems and Reporting

Information for global awareness and decision making

- Information sharing is integral to GAIHN-AR
 - Decision-making through close coordination with partners
 - Improving understanding of AR organisms and mechanisms locally and globally.
- Empower partners to use data locally and facilitate GAIHN-AR data sharing globally
 - Support and build upon existing laboratory and response data systems
 - Collaboratively determine the most feasible and appropriate data to share with CDC and implementing partners

Four Key Reporting and Data Sharing Requirements

1. Local communication or notification after the detection of CP-CRE or other pertinent antimicrobial resistant organisms
2. Progress and impact measures reported to US CDC every 6 months
3. Confirmed novel or rare organisms with non-targeted carbapenemase mechanism reported to US CDC within 24 hours of detection
4. Routine submission of deidentified isolate or specimen-level data or US CDC-guided analysis of these data

Importance of isolate-level data

- Monitoring for emerging AR threats
- Developing and validating new detection assays for emerging AR
- Identifying profiles associated with targeted and emerging resistance
- Identifying resources needed to support detection of AR threats
- Understanding of sequence types, gene variants, plasmid types
- Shaping global and local response and prevention strategies

Successes and Challenges

Successes: Argentina & Chile

- Argentina
 - Verified 4 methods at hospital level and Malbran verification/validation procedures updated
 - Streamlined workflows for clinical isolates implemented in November
 - Launching alerts and containment modules on national informatics platform
- Chile
 - Finalized verification/validation for use of GeneXpert in participating hospitals
 - Initiated prevalence surveys in the hospitals to evaluate the baseline prevalence of target organisms in target prevention units



Challenges

GAIHN-AR began during the COVID-19 pandemic

Developing communication and coordination between Laboratory and IPC activities

Wide variety of capacities across sites

Next Steps

Sharing of GAIHN-AR tools to support implementation

Sustaining long-term GAIHN-AR activities, such as

- Maintaining IPC prevention and response capacity
- Implementing cost-effective laboratory methods for identification of CP-CRE

Creating additional opportunities for network building across GAIHN-AR partners

Acknowledgements

- **Ministries of Health and healthcare facilities (leadership and staff) participating in GAIHN-AR**
- **GAIHN-AR Implementing partners:**
 - Pan American Health Organization (PAHO)
 - The Ohio State University (OSU)
 - Vanderbilt University
 - Johns Hopkins University
- **CDC's Division of Healthcare Quality and Promotion:**
 - International Infection Control Program
 - Clinical and Environmental Microbiology Branch
 - Prevention and Response Branch
 - Antibiotic Resistance Coordination and Strategy Unit

[U.S. & Global Antimicrobial Resistance Lab Networks - CDC](#)
[GAIHN AR | Global Safe Healthcare | CDC | Infection Control | CDC](#)
[GAIHN HAI | Global Safe Healthcare | CDC | Infection Control | CDC](#)

For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

Thank you!

