Strengthening Surveillance and Lab Capacity to Fight Healthcare Associated Infections and Antimicrobial Resistance

Submitted by: Philippines
Strengthening surveillance and lab capacity to fight healthcare associated infections and antimicrobial resistance

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Lecture objective

- To discuss how to strengthen surveillance and laboratory capacity to fight healthcare-associated infections and antimicrobial resistance from the perspective of a LMIC economy
Outline

1. Surveillance as a core component of IPC programs
2. Setting up an AMR surveillance system from the perspective of a LMIC
3. Using information from surveillance to inform domestic strategies to control AMR
Surveillance as a core component of IPC programs

- 1 of core components of IPC programs - Facility-based and domestic level HAI surveillance with timely feedback of results to health care workers & stakeholders & through domestic networks
- Microbiology and laboratory capacity and quality are critical for domestic and hospital-based HAI and AMR surveillance.
- Standardized definitions and lab methods in Microbiology should be used.
- Good quality microbiological support provided by at least one domestic reference lab is a critical factor for an effective domestic IPC surveillance program

Guidelines on Core Components of Infection Prevention and Control Programmes at the National and Acute Health Care Facility Level, WHO, 2016
Proposed steps on how to set up an Antimicrobial Resistance Surveillance System

1. Establish a surveillance coordinating body with a focal point and a data management structure.

2. Define the surveillance objectives to:
   - assist the planning and monitoring of the strategies to control AMR
   - inform global efforts to control AMR.

3. Define a strategy for gradual implementation of surveillance system and participation in GLASS.

4. Establish at least one reference laboratory that participates in an external quality assurance scheme.

5. Identify AMR surveillance sites, that have access to epidemiological support and a microbiology laboratory, and promote diagnostic stewardship.
Proposed steps on how to set up an Antimicrobial Resistance Surveillance System (cont.)

6. Develop or adapt protocols for:
   - data collection (see annexes 2 and 3)
   - laboratory protocols
   - diagnostic stewardship
   - data flow.

7. Disseminate protocols and tools, and train staff in their use.

8. Start collecting data on progress or status of implementation (Annex 4) and on AMR (see section 2 and annexes 2 and 3).

9. Report information on the AMR situation to inform "domestic" strategy, and report aggregated data to GLASS to inform global strategies.

10. Ensure that monitoring and evaluation include pilot-testing of any new surveillance approach, a review of steps, and adjustment of processes as necessary.
Establish a domestic surveillance coordinating body with a focal point & a data management structure, defined surveillance objectives

Specific action points:

1. Lobby with policy makers to obtain a buy-in for the proposed AMR surveillance including provision of resources (i.e. funds, personnel, infrastructure & other resources)

2. Work for issuance of a document establishing a domestic coordinating body

DOH issuance creating ARSP, 1988
Define a strategy for gradual implementation of the domestic surveillance system, est. SS

**LUZON (7)**
- Baguio General Hospital
- Mariano Marcos Memorial and Medical Center
- Cagayan Valley Medical Center
- Jose B. Lingad Memorial Regional Hospital
- Batangas Medical Center
- Bicol Regional Training and Teaching Hospital
- Ospital ng Palawan

**DOMESTIC CAPITAL REGION (8)**
- Lung Center of the Philippines
- National Kidney Institute
- Rizal Medical Center
- San Lazaro Hospital
- Philippine General Hospital
- Sto. Tomas University Hospital
- Far Eastern University Hospital
- Research Institute for Tropical Medicine

**VISAYAS (5)**
- Corazon Locsin Montelibano Memorial Hospital
- Gov. Celestino Gallares Regional Hospital
- Vicente Sotto Memorial Medical Center
- Eastern Visayas Regional Medical Center
- Dr. Rafael S. Tumbokon Memorial Hospital

**MINDANAO (6)**
- Zamboanga City Medical Center
- Zamboanga del Norte Provincial Hospital
- Northern Mindanao Medical Center
- Southern Philippines Medical Center
- Cotabato Medical Center
- Caraga Regional Hospital

Sentinel sites were established over 26 years due to lack of resources.
Sentinel sites

- 1 sentinel site for each of economy’s 17 political regions
- Assessment visits to representative microbiology laboratories/region prior to selection
- Agreement with Chief of Hospital that training at RITM for at least 1 month, one year’s lab supplies, monitoring visits for the next 6 months will be provided BUT hospital should take over procurement of said supplies AFTER 1 year
Define a strategy for gradual implementation of the domestic surveillance system, est. SS

- Reference for lab methods


EUCAST guidelines for detection of resistance mechanisms and specific resistances of clinical and/or epidemiological importance. European Committee on Antimicrobial Susceptibility Testing; 2015 (http://www.eucast.org). At time of publication of this manual, EUCAST is available free of charge. National committees for disc diffusion testing in Europe, and an increasing number of countries outside of Europe, now endorse the EUCAST guidelines.
Information to be collected routinely from AMR surveillance

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<td><strong>a. Unique identification number</strong></td>
<td><strong>Gender:</strong></td>
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| **b. Name: (family name, given name(s))**     | Male ☐  
|                                                | Female ☐ |
| **Date of birth: (yyyy/mm/dd)**               |  |
| **Years**                                      | **Months (if < 1 year)** |
| **Specimen information:**                      |  |
| ☐ Blood                                        | ☐ Urine  
| ☐ Faeces                                       | ☐ Urethral secretion  
| ☐ Other                                        | ☐ Cervical secretion |
| **Date of specimen collection:**               |  |
| (yyyy/mm/dd)                                   | **Had the patient been hospitalized for more than 2 calendar days at the time for sampling?** |
|                                                | ☐ Yes  
|                                                | ☐ No |

### PATIENT INFORMATION

**Patient No.** 707173  
**Patient Name** RAYAN ANJONG HANGNGDAI  
**Date of birth** 01/02/2016  
**Age** 8M  
**Date of Admission** 25/10/2016  
**Nosocomial (y/n)** y  
**Diagnosis** CAPSTECAPTES

### ISOLATE INFORMATION

**Ward** PMD  
**Specimen Number** 423  
**Specimen Date** 27/10/2016  
**Growth** Urine colony count  
**Organism** ABA  
**Serotype**  
**Reason for referral** Unusual J13

### PHENOTYPIC TESTS

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### ANTIBIOTIC TEST RESULT

- **Legend:** Beta-Lact — Beta-Lactamase; CARB — Carbapenemase; ESBL — Extended Spectrum Beta-Lactamase; ICR — Inducible Clindamycin Resistance; MBL — Metallo Beta Lactamase; MR — Methicillin Resistance
- **MIC** — Minimum Inhibitory Concentration; R/I/S — Resistant/Intermediate/Susceptible

**Comments:**
Define a strategy for gradual implementation of the domestic surveillance system, est. SS, domestic lab & data management protocols

- **Isolate collection and reporting** – ex. all aerobic bacterial isolates from aerobic CS but reports focus on organisms of public health importance
- **Method of isolate identification & AST** – standardized using a common protocol, CLSI for AST, EQAS, on-site visits
- **ARSRL participation in international EQAS** – ex. WHO Global Foodborne Infections Network EQAS, WHO Gonococcal ASP (GASP) EQAS, etc.
- **Specialized testing at the ARS Reference Lab at RITM**
  1. **alert organism notification** (ex. confirmation of the economy’s “unusual” bacterial strains first FQ resistant *Neisseria gonorrhoeae* first gram negative isolate producing NDM-1 carbapenemase)
  2. **molecular and epidemiological studies of priority pathogens** (ex. MRSA, ESBL producers).
The Antimicrobial Resistance Surveillance Program (ARSP)

- **Summary reports** – ARSP Annual Report (28 annual reports since 1988), www.arsp.com.ph

- **Performance indicators** since approximately 5 years ago
Performance Indicators, ARSP
2015 Target

| 1. On time submission of regular data                                      | 90% |
| 2. % of forms have complete demographic data                              | 95% |
| 3. Submission by sites of isolates with unusual susceptibility pattern to ARSRL for confirmation | 90% |
| 4. Concordance in identification: Genus                                   | 95% |
| 5. Concordance in identification: species                                 | 85% |
| 6. Critical AST deviations                                                | ≤5% |
| 7. Total AST deviations                                                   | ≤10% |
Train staff in use of protocols

Trainees from Sentinel Sites

Lab postgraduate workshop on MDRO
Establish at least one domestic reference lab that participates in an EQA
Data management software

WHONET - free software developed by the WHO Collaborating Centre for Surveillance of Antimicrobial Resistance for laboratory-based surveillance of infectious diseases and antimicrobial resistance.
What can WHONET do?

Data entry and clinical reporting

• WHONET allows the routine entry of susceptibility test results as well as the retrieval, correction and printing of clinical records.

• WHONET can provide immediate feedback to technicians on important strain phenotypes.
WHONET - Data entry and clinical reporting
What can WHONET do?

Data analysis

- WHONET has a user-friendly interface permitting many types of analysis.
- Options include:
  - isolate line-listings and summaries such as organism frequencies over time,
  - antimicrobial susceptibility test statistics,
  - zone diameter and MIC histograms,
  - antibiotic scatterplots and regression curves
  - antibiotic resistance profile line-listings and summaries.
- WHONET also has a number of alert features which permit the detection of unlikely or important results as well as possible hospital or community outbreaks of bacterial or non-bacterial species.
CLSI Recommendations on preparing a report to guide clinicians

• Analyze and present a cumulative antibiogram report at least annually
• Include only final, verified test result
• Include only species with testing data for >= 30 isolates
• Include only diagnostic isolates
CLSI Recommendations on preparing a report to guide clinicians

- Eliminate duplicates by including only the first isolates of a species/patient/analysis period, irrespective of body site or AST profile
- Include only antimicrobial agents routinely tested and calculate the percent susceptible (%S) from results reported
Figure 1. Schematic view of information flow

Examples of Surveillance data for action

1. Description of status of infections associated with health care (ex. Incidence, type, etiology)
2. Relevant AMR patterns
3. Identification of high-risk populations
4. Detection of clusters and outbreaks
5. Evaluation of the impact of interventions

Guidelines on Infection Prevention, Control, HAI surveillance, WHO, 2016
Report information on AMR situation to inform domestic strategies
Antimicrobial Resistance Surveillance Program Annual Meeting