FAO Initiatives on AMR Surveillance in Asia
Areas of the FAO Action Plan on AMR

Initiatives on AMR Surveillance in Asia

1. Development of the Regional Framework for AMR Surveillance
2. Development of Regional Guidelines on AMR Surveillance
3. Strengthening of Laboratory Capacity on AMR Surveillance
4. Assessment of National Capacities related to AMR Surveillance
5. Support to country initiatives on AMR Surveillance
6. Other support to regional work on AMR Surveillance
These ongoing FAO Initiatives on AMR in Asia are supported by:

**OSRO/RAS/502/USA:** Addressing Antimicrobial Usage in Asia’s Livestock, Aquaculture and Crop Production Systems

**GCP/GLO/710/UK** Engaging the food and agriculture sectors in sub-Saharan Africa and South and South-east Asia in the global efforts to combat antimicrobial resistance using a One Health approach

**FMM/RAS/298/MUL** Strengthening capacities, policies and national action plans on prudent and responsible use of antimicrobials in fisheries (aquatic animal health and aquaculture component)
These ongoing FAO Initiatives on AMR in Asia are supported by:

**OSRO/RAS/502/USA:** Addressing Antimicrobial Usage in Asia’s Livestock, Aquaculture and Crop Production Systems

**GCP/GLO/710/UK** Engaging the food and agriculture sectors in sub-Saharan Africa and South and South-east Asia in the global efforts to combat antimicrobial resistance using a One Health approach.

**FMM/RAS/298/MUL** Strengthening capacities, policies and national action plans on prudent and responsible use of antimicrobials in fisheries (aquatic animal health and aquaculture component).
Focus Areas of the FAO Action Plan on AMR

FOCUS AREA 1
IMPROVE AWARENESS ON ANTIMICROBIAL RESISTANCE AND RELATED THREATS

FOCUS AREA 2
DEVELOP CAPACITY FOR SURVEILLANCE AND MONITORING OF ANTIMICROBIAL RESISTANCE AND ANTIMICROBIAL USE IN FOOD AND AGRICULTURE

FOCUS AREA 3
STRENGTHEN GOVERNANCE RELATED TO ANTIMICROBIAL USE AND ANTIMICROBIAL RESISTANCE IN FOOD AND AGRICULTURE

FOCUS AREA 4
PROMOTE GOOD PRACTICES IN FOOD AND AGRICULTURE SYSTEMS AND THE PRUDENT USE OF ANTIMICROBIALS
FOCUS AREA 2
DEVELOP CAPACITY FOR SURVEILLANCE AND MONITORING OF ANTIMICROBIAL RESISTANCE AND ANTIMICROBIAL USE IN AND AGRICULTURE
FAO Initiatives on AMR Surveillance in Asia

ROUTINE AMR SURVEILLANCE IN THE ANIMAL HEALTH SECTOR

“BEGIN WITH THE END IN MIND”
Covey 1989
1. Development of the **Regional Framework for AMR Surveillance**

Consultation Workshop on AMR surveillance
1. Development of the **Regional Framework for AMR Surveillance**
1. Development of the Regional Framework for AMR Surveillance

- Antimicrobial resistance (AMR) in bacterial organisms does not recognize biological, physical, or sectoral boundaries.

- Its potential transmission pathways include broad areas of disciplines are often traditionally segregated agriculture, humans, environment, and wildlife.
1. Development of the **Regional Framework for AMR Surveillance**

**AMR Transmission Pathways**

- **AGRICULTURE**
  - Livestock
  - Manure and slurry
  - Wild birds and insect vectors
  - Fish and shellfish
  - Marine and fresh water
  - Crops and soil
- **HUMANS**
  - Meat and other animal products
  - Faeces
  - Treated and untreated water
  - Manufacturing waste
- **WILDLIFE**
  - Wildlife
- **ENVIRONMENT**
  - Surface and ground water

**THE ANIMAL HEALTH SECTOR**

- Livestock
- Meat and other animal products
- Manure and slurry
- Aquaculture

**WILDLIFE**

**ENVIRONMENT**
1. Development of the Regional Framework for AMR Surveillance
1. Development of the Regional Framework for AMR Surveillance

The collective and coordinated actions across these multiple disciplines can leverage on the strengthened sectoral accountability towards AMR mitigation.

This ensures that the efforts of nations to address this global issue will benefit from the respective expertise of each sector, and that actions are also well-recognized by their respective mandates.
1. Development of the Regional Framework for AMR Surveillance

MR surveillance in **food-borne microorganisms from healthy animals** intended for food consumption;

MR surveillance in **animal pathogens recovered from clinically or sub-clinically seased livestock**;

MR surveillance in **aquaculture in both healthy and clinical cases** which will primarily involve the fisheries sector, in coordination with the environmental sector;

MR monitoring in **farm settings** (eg., manure and slurry) in coordination w/ the environmental sector;
1. Development of the Regional Framework for AMR Surveillance

- PRED PRACTICES
- Livestock
- Meat and other animal products
- PROTECTION OF PUBLIC
- UNDERSTANDING
- Manure and slurry
- IMPROVED PRACTICES
- Aquaculture

ENCE-BASED ACTIONS IN THE ANIMAL HEALTH SECTOR TOWARDS AMR MITIGATION
1. Development of the Regional Framework for AMR Surveillance

- **JOINT RISK ASSESSMENT**
- **HUMAN HEALTH**
  - REGULATIONS
  - COMPLIANCE/AWARENESS
  - PRUDENT USE OF ANTIBIOTICS
  - GOOD PRODUCTION PRACTICES
- **AGRICULTURE + ANIMAL SURVEILLANCE DATABASE**
- **LABORATORY DATABASE**
- **LABORATORY TESTING**
- **ANTIBIOGRAM**
- **DIAGNOSTIC SAMPLES**
  - Clinical samples
  - Pets
  - Livestock that require treatment
  - Aquaculture
- **SAMPLES FROM THE SLAUGHTERHOUSE, FIELD, ENVIRONMENT ETC.**
  - Sampling along supply chains of food and agriculture system
- **ACTIVE SURVEILLANCE**
  - Information on supply chain of food and agriculture system + antibiotic use (AMU) along the chains
Development of Regional Guidelines on AMR Surveillance
2. Development of Regional Guidelines on AMR Surveillance

REGIONALLY-HARMONIZED GUIDELINES FOR:

MR surveillance in **food-borne microorganisms from healthy animals** intended for food consumption;

MR surveillance in **animal pathogens recovered from clinically or sub-clinically diseased livestock**;

MR surveillance in **aquaculture in both healthy and clinical cases** which will primarily involve the fisheries sector, in coordination with the environmental sector;

MR monitoring in **farm settings** (eg., manure and slurry) in coordination with the environmental sector;
2. Development of Regional Guidelines on AMR Surveillance

Efforts of Member Countries working to contribute to this global drive benefit from having a **regional guideline** that is:

- anchored on existing international standards
- taking well into account the unique settings in the region
- regionally-harmonized
2. Development of Regional Guidelines on AMR Surveillance

- **2017**: Prepare to develop guideline
- **2018**: Develop and finalize guideline
- **2019**: Guideline is applied and used
- **2020**: Related capacity building
2. Development of Regional Guidelines on AMR Surveillance

Regionally-harmonized guidelines will:

- Help Member States in preparing to carry out their respective national AMR surveillance
- Help obtain a cohesive body of regional information
2. Development of Regional Guidelines on AMR Surveillance

DEAL: All countries in the Region ensure AMR surveillance in all critical sectors.

REALITY: Countries need progressive improvement of relevant capacities for:

- Designing
- Planning
- Implementation

A national AMR surveillance program in the Animal Health Sector is needed.
3. Strengthening Laboratory capacity on AMR Surveillance

Training on Standardized and Harmonized Methods for AMR Surveillance in Food Animals in South-East Asia

12-15 June 2017; 21-24 August 2017
3. Strengthening **Laboratory capacity on AMR Surveillance**
4. Assessment of national capacities on AMR Surveillance

Pilot Missions using ATLASS (Assessment Tool for Laboratory and AMR Surveillance Systems)
March to May 2017: Thailand, Indonesia, Myanmar, Vietnam, Lao PDR
4. Assessment of national capacities on AMR Surveillance
5. Support to country initiatives on AMR Surveillance

Various national pilot projects on AMR Surveillance

Planning * Training * Field implementation * Others
5. Support to country initiatives on AMR Surveillance

2. HOW MANY SAMPLES WILL BE COLLECTED?

A consultation with national experts was organized to determine the sampling approach. The group agreed to use the following conditions:

- 90% CONFIDENCE LEVEL
- 5% DEGREE OF PRECISION
- 50% ESTIMATED PREVALENCE

\[ n = \frac{Z^2 \times p \times (1-p)}{E^2} \]

\[ n = \frac{1.96^2 \times 0.5 \times (1-0.5)}{0.05^2} = 270 \]

Since it was agreed at the national level that all of the DCCs will be involved in the National AMR Surveillance, the technical working group opted for proportionates stratified sampling including all the 8 regional laboratories (DNCs) in Indonesia. The number of samples from each DCC will be proportionate to the broiler poultry population in their respective DCCs.

3. WHERE WILL THE SAMPLES COME FROM?

- SPECIMEN COLLECTION
- BACTERIAL ISOLATION
- IDENTIFICATION

Specimen collection, bacterial isolation, and identification will be done at the DCCs. All broilers will then be sent to the national laboratories (BPMH: for food animal products) and BPMCH (for specimens obtained from farms) for a harmonized approach to antibiotic susceptibility testing.

4. WHAT WILL BE THE ROLE OF THE LABS?

The role of the laboratories includes:

- Specimen collection
- Bacterial isolation
- Identification

In this project, the laboratories will provide the necessary infrastructure and expertise to support the implementation of the surveillance program.

5. HOW WILL THE SAMPLES FROM THE ABATTOIRS BE SELECTED?

- a. List all slaughterhouses (PUP/TUP/TPH) in each district in the region (or at the minimum, in places that comprise at least 80% of the total broiler population).
- b. Calculate the number of samples needed from each district, proportionate to the no. of slaughterhouses in the area.
- c. Randomly select slaughterhouses in the area (PUP/TUP/TPH).
- d. For randomly selected slaughterhouses (PUP/TUP/TPH), where farm sources of birds are not known...
  - Collect three pooled samples per slaughterhouse.
- e. For randomly selected slaughterhouses (PUP/TUP/TPH), where farm sources of birds are known...
  - Collect one pooled sample from each farm source or the slaughterhouse.

While this was the agreed basis to be taken for the next year, the implementation for 2017 was linked with the ongoing national arrangements which has started to roll out earlier in the year. Nonetheless, to determine the feasibility, a pilot implementation was agreed that at least one DCC (Subang) will be piloted for 2017 following the overarching design.
6. Other reinforcements to regional efforts on AMR Surveillance

There are more people living in this circle than outside of it.
6. Other reinforcements to regional efforts on AMR Surveillance

SURVEILLANCE IN THE ANIMAL HEALTH SECTOR IN THE REGION

Global resistance (AMR) in bacterial infections does not recognize biological or sectoral boundaries. Its potential vectors/ pathways include broad areas and places that are often traditionally under the jurisdiction of agriculture, humans, wildlife, and water, and this makes it very difficult to address as a whole. For this reason, AMR needs to be addressed from a cross-sectorial lens and by taking an OIE Health approach.

In the recent past, we observed a host of coordinated actions to tackle multiple challenges that had an impact on the strengthened sectoral ability towards AMR mitigation. This has highlighted the need to address AMR more effectively in the future.

The AMR transmission pathways to the multi-sectoral interface (Figure 3) are as follows:

1. AMR transmission pathways to the multi-sectoral interface (Figure 3). The health sector within the agriculture management is the main vector. Other vectors include the veterinary sector, the human health sector, and the public health sector.
2. The AMR pathways within the veterinary sector need to be monitored and managed to reduce the risk of transmission.
3. AMR monitoring and surveillance should be carried out in these areas of concern.

The other challenges that need to be addressed are:

1. The need for public health surveillance to be expanded to include foodborne pathogens from feed of animal origin, particularly in vulnerable regions.
2. The need for coordinated action between the food, human, and animal health sectors to address the problem of AMR.
3. The need for research and development of new antimicrobial agents.
4. The need for international cooperation and collaboration to address the global challenge of AMR.

In conclusion, it is clear that the problem of AMR is complex and requires a multi-sectoral approach to address it effectively. The regional efforts on AMR surveillance need to be strengthened to ensure that the region is able to respond to the challenge of AMR effectively.
Thank you.

www.fao.org/antimicrobial-resistance
Antimicrobial-Resistance@fao.org