FAO Initiatives and tools to strengthen laboratory capacity to detect AMR

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Food and Agriculture Organization of the United Nations (FAO)

- UN lead technical agency specialized in food and agriculture
- 194 Member Countries
- Headquarters
- 5 Regional Offices & 11 Sub-regional Offices
- 93 Country Representations with Mandate

Mandate

- Lead international efforts to defeat hunger
- Our goal is to achieve food security for all and make sure that people have regular access to enough high-quality food to lead active, healthy lives.
- Support countries to improve agriculture, forestry and fisheries practices and ensure good nutrition
- Improve food security, livelihoods, sustainable agriculture, and natural resources management
**Why is antimicrobial resistance (AMR) important?**

**AMR is a global health and economic concern**

- Antimicrobials are present everywhere and contribute to the selective pressure for AMR emergence and spread
- Emergence can happen in each sector and spread to the others
- There is nowhere to hide from the impact of AMR

Humans
Animals (terrestrial and aquatic)
Plants
Food (animal and non-animal origin)
Environment

Human deaths attributable to AMR per year by 2050
How does FAO support countries to build capacities to combat AMR?

Supporting innovation and resilience in food and agriculture sectors

Food and agriculture sectors, dependent livelihoods and economies are made resilient to the impacts of AMR
The FAO Action Plan is mostly being implemented;  
- through **12 donor funded projects and six TCPs in 46 countries**  
- primarily funded by FAO’s core funding (e.g. TCPs), UK (Fleming Fund), USA (USAID), Norway (NORAD), the Russian Federation and the European Commission  
- AMR Multi-Partner Trust Fund (MPTF) for Tripartite activities.

**Strengthening surveillance, laboratory and research to support evidence-based decisions to control AMR**
FAO Assessment Tool for Laboratories and AMR Surveillance Systems (FAO-ATLASS)

- Map capacities of laboratories, laboratory networks and AMR surveillance in food and agriculture
- Describe links for multisectoral One Health AMR surveillance
- Help prioritize actions to improve at local, national, regional, and global levels over time

✔ Tool available in English, French, Spanish and Russian
✔ > 180 laboratories and > 50 countries
✔ > 100 FAO-ATLASS assessors trained (missions or self-assessments)

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FAO-ATLASS activities in the region

ATLASS assessments within Europe & Central Asia

• Armenia (October 2018)
• Belarus (December 2018)
• Kazakhstan (April 2022)
• Kyrgyzstan (November 2018)
• Tajikistan (March 2019)
• Ukraine (Nov 2019)

Follow-up activities:

• Training on the use of the FAO-ATLASS Laboratory module to national laboratory focal points for each country to ensure sustainability in the use of the tool over time
• Virtual follow-up assessments to identify improvement made along the project implementation in all countries

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**Laboratory workforce development**

**Trainings (theoretical and practical), since 2018**
- Isolation, identification and characterization of bacterial species (indicator and pathogens)
- Antimicrobial Susceptibility Testing
- Molecular detection of resistant genes

**FAO AMR Laboratory Community of Practices (under development)**
- Easy access to expert advice
- Support for knowledge sharing and troubleshooting
- Stay up-to-date with research findings in the field and laboratory methods
- Networking and personal development

**Face-to-face trainings:**
- Armenia (Sept 2021)
- Tajikistan (Feb 2022)
- Planned for Belarus, Kazakhstan and Kyrgyzstan in 2023

**Virtual trainings** - using the FAO Virtual Learning Centres (VLC)
- AMR surveillance and laboratory testing training in Russian planned for April 2023
- 8-modules, tutored, certified

**Procurement** of necessary reagents and equipment

**External quality assurance (EQA)** - Provide and support the participation of country laboratories to EQA schemes for the identification of bacterial foodborne pathogens relevant for AMR, and antimicrobial susceptibility testing methods
More and more countries and generating evidence on AMR in agri-food systems

Global Database for the Tripartite Antimicrobial Resistance (AMR) Country Self-assessment Survey (TrACSS), survey

7.5.a National surveillance system for antimicrobial resistance (AMR) in animals (terrestrial and aquatic)

- A. National plan for AMR surveillance system
- B. National plan for AMR surveillance in livestock (including laboratory and reporting to testing)
- C. AMR data is collected but a standardised approach is not used. National coordination and/or quality management is lacking
- D. Priority pathogenic commensal bacterial species have been identified for surveillance. Data systematically collected and reported on levels of resistance in at least one of those pathogenic species. Traceability from laboratory to follow quality management processes e.g. proficiency testing
- E. National system of AMR surveillance established in priority animal pathogens. Zoonotic and commensal bacterial species which follow quality assurance processes in line with international standards. Laboratories that report AMR surveillance follow quality assurance processes.

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Global AMR/AMU integrated surveillance architecture

- AMR
- AMU
- World Health Organization
- Food and Agriculture Organization of the United Nations

Global Integrated System for Surveillance of AMR/AMU

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Understanding antimicrobial use (AMU) the region

Mapping AMU at country level, export, import, use at subnational level, value chains and fake antimicrobials (planned)

Mapping AMU in the livestock sector through KAP surveys
- Focus: Farmers of priority livestock production systems, veterinarians, veterinary pharmacies and feed mills
- Under implementation (different stages) in Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kosovo, Kyrgyzstan, Montenegro, North Macedonia, Tajikistan, Serbia and Ukraine.
- Linked to sampling for AMR testing to better understand the links between AMU and AMR (Armenia, Kazakhstan, Kyrgyzstan, and Tajikistan)
Understanding AMR in the region

To get AMR baseline in priority livestock species
• In Armenia (finalized), Kazakhstan, Kyrgyzstan, and Tajikistan (finalized)

Guidance materials provided:
• On-farm sampling protocols, e.g. pooling
• Protocols and videos for sample preservation (fecal and milk)
• Testing protocols
• Data recording templates

Data analysis:
• AMR results
• Risk factors (from AMU survey)

<table>
<thead>
<tr>
<th>Country</th>
<th># milk samples</th>
<th># faecal samples</th>
<th>Production systems</th>
</tr>
</thead>
</table>

The International FAO Antimicrobial Resistance Monitoring (InFARM) data platform

Systematic AMR monitoring and surveillance
Contextual information
Pilot AMR monitoring and surveillance

DATA collection analysis visualize interpret

PRIVATE INTERFACE

PUBLIC INTERFACE

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## FAO Reference Centers on AMR

- Veterinary Medicines Directorate, Centre for Environment Fisheries and Aquaculture Science, Animal and Plant Health Agency, United Kingdom
- National Food Institute, Technical University of Denmark, Denmark
- Department of Veterinary Medicine, Free University Berlin, Germany
- Department of Veterinary Public Health, Faculty of Veterinary Science, Chulalongkorn University, Thailand
- Infectious Diseases Institute of the Ohio State University (OSU), United States
- French agency for Food, Environmental and Occupational Health and Safety (ANSES), France
- Integral Unit of Services, Diagnosis and Verification (UISDC), National Service for Agrifood Health, Safety and Quality (SENASICA), Secretariat of Agriculture and Rural development (SADER), Mexico
- Fondation Institut Pasteur de Dakar, Senegal
- FBIS CRIE, Russian Federation, is about to be designated soon

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## Regional AMR/AMU Monitoring and Surveillance Guidelines (and auxiliary tools)

**Vol. 1: Monitoring and surveillance of antimicrobial resistance in bacteria from healthy food animals intended for consumption**

- AMR data management template
- AMR surveillance planning template
- AMR surveillance implementation review

### Laboratory Network Consultation Meeting | 05-06 December 2022
Upcoming activities to integrate AMR surveillance and lab work at national and regional levels

Development of integrated AMR surveillance systems (human-animal-environment interface)
- National network meeting to convey all stakeholders of different sectors
- National consultation to prioritize animal pathogens for AMR surveillance in diseased animals

Establishment of national laboratory networks on AMR surveillance for food and agriculture
- Post-ATLASS workshop to assist the implementation of ATLASS recommendations
- Identification of relevant labs, draft plan, define TORs, role and responsibilities
- Support their operationalization, i.e. centralize information, national AMR focal points (food, agriculture and public health)

Establishment of a regional laboratory network (Consultation Meeting, Dec 2023)

Regional workshop to discuss AMR information sharing at regional level

Thank you

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