Tracking Antimicrobial Use in Animals: Building the Foundation for One Health Integrated Surveillance

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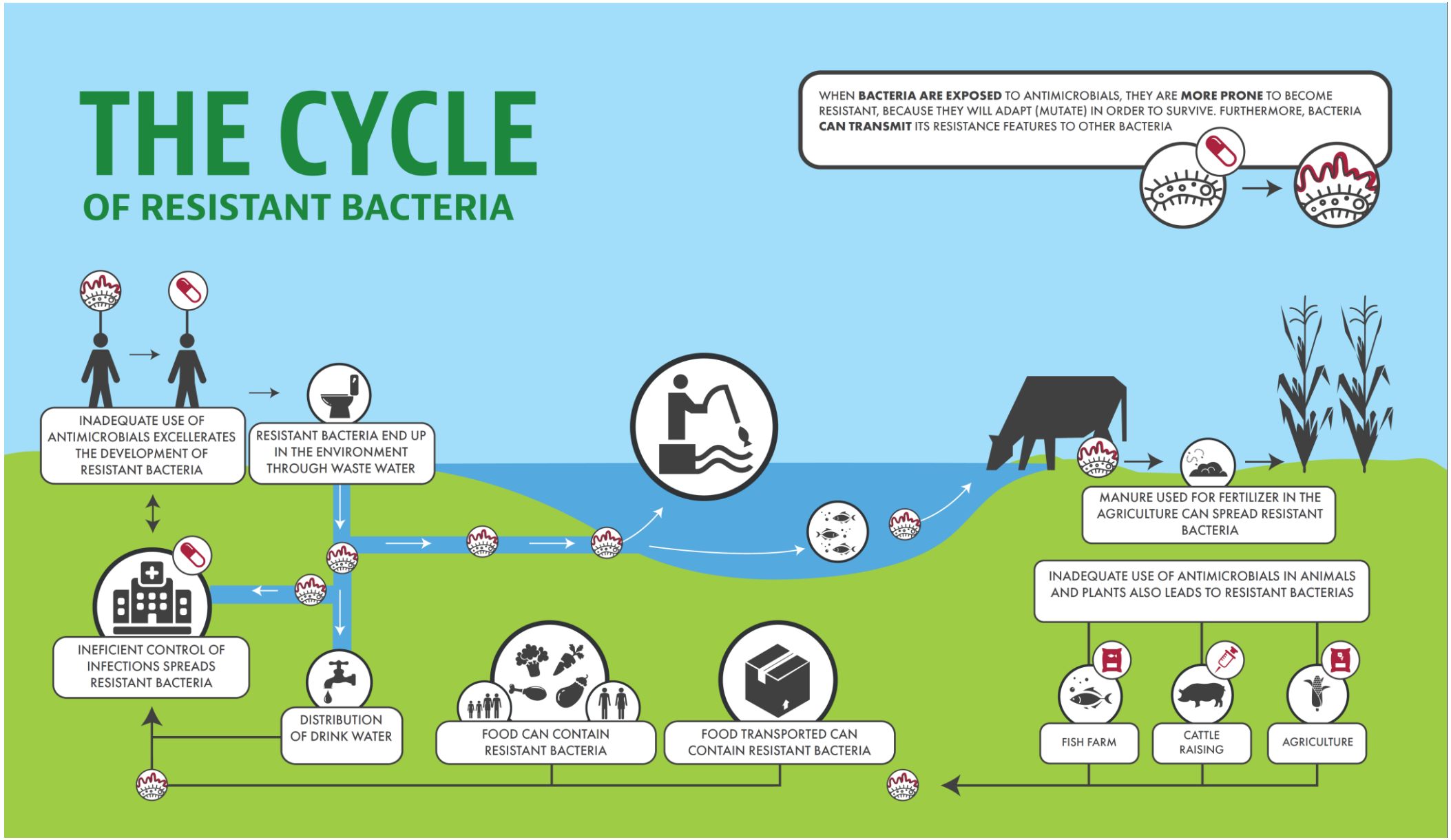
20 November 2025

Accelerating the Operationalisation of the One Health Joint Plan of Action (OHJPA) in Veterinary Services in the European Region
Athens, Greece

World Organisation for Animal Health
Organisation mondiale de la santé animale
Organización Mundial de Sanidad Animal



WORKiNG TOGETHER TO FIGHT ANTiMiCROBiAL RESiSTANCE

Funded by the European Union

PAHO
Pan American Health Organization
World Health Organization Americas

Food and Agriculture Organization of the United Nations

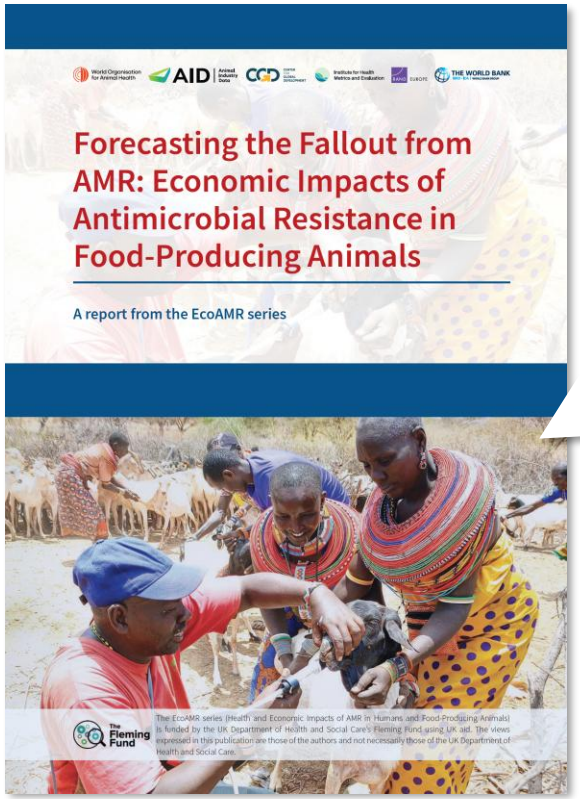
World Organisation for Animal Health

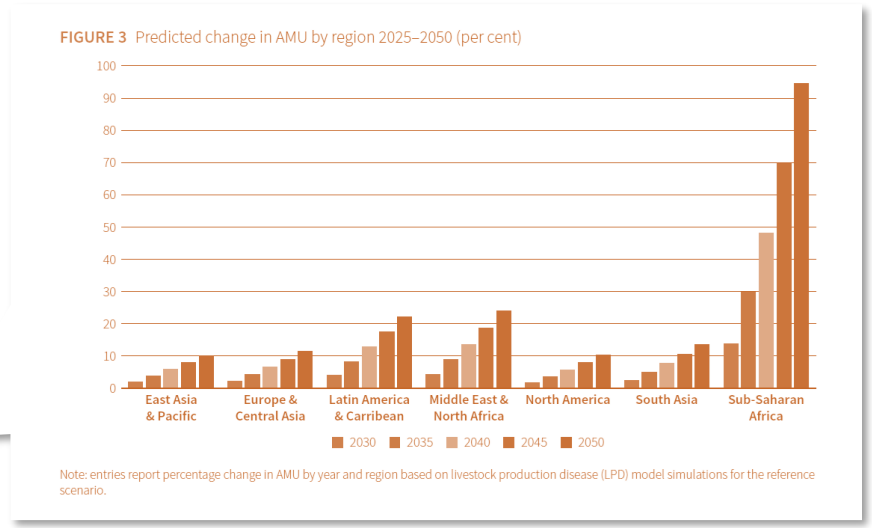
Why integrated surveillance?

Why AMU in animals?

ANIMUSE: A platform with purpose

Integrating animal AMU into One Health surveillance

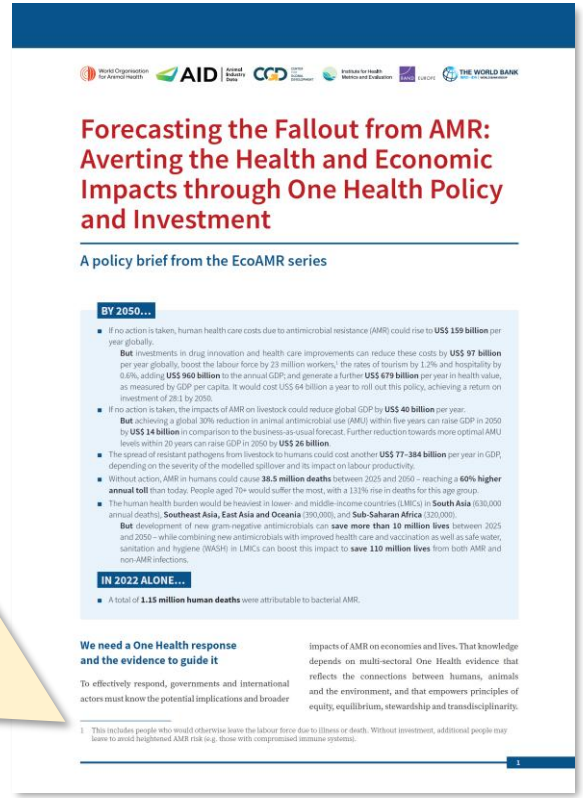




If no action is taken
reduce global GDP by **US$ 40 billion** per year

The spread of resistant pathogens from livestock to humans:
another **US$ 77–384 billion** per year in GDP
(depending on the severity of the modelled spillover and its impact on labour productivity)

30% reduction of AMU within five years raise GDP in 2050 by US$ 14 billion



The value of surveillance is in the **change it drives**, not the database it fills.

AMU → AMR

- Why integrated surveillance?
- Why AMU in animals?
- **ANIMUSE: A platform with purpose**
- Integrating animal AMU into One Health surveillance

https://amu.woah.org/

Purposes

Ch.6.9. Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals

Ch.6.3. Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals

INTERPRETATION

Helping in the interpretation of AMR surveillance data and assisting in responding to problems of antimicrobial resistance in a precise and targeted way

EVOLUTION

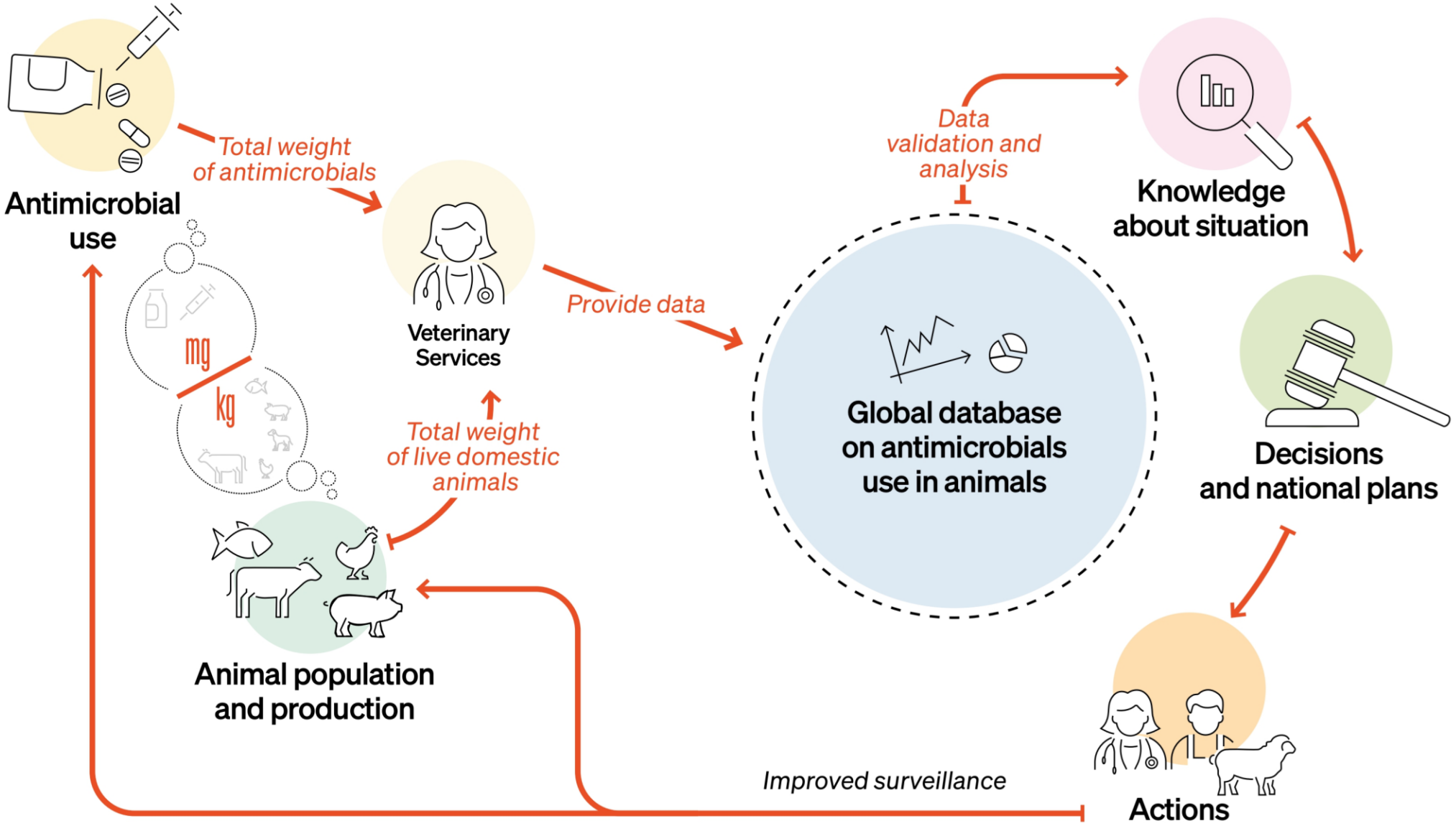
Giving an indication of trends in the use of antimicrobial agents in animals over time and potential associations with AMR in animals

EVALUATION

Assisting in risk management to evaluate the effectiveness of efforts and mitigation strategies.

COMMUNICATION

Ensuring transparency and communicating on the risks (if data published)


Antimicrobial use
Total weight of antimicrobials
mg
kg
Veterinary Services
Provide data
Total weight of live domestic animals
Animal population and production
Data validation and analysis
Global database on antimicrobials use in animals
Knowledge about situation
Decisions and national plans
Actions
Improved surveillance

Data collection

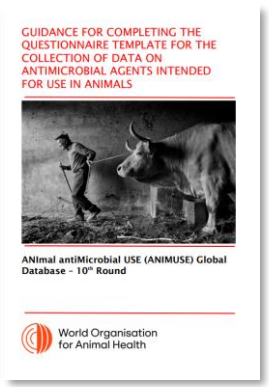
1. Directly input the data in ANIMUSE
2. Send the Excel by email

Questionnaire

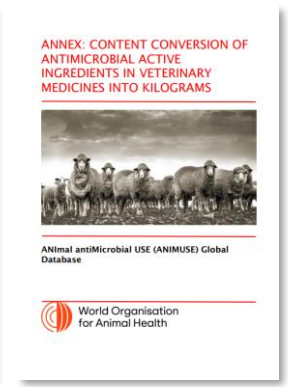
- Qualitative data
- Quantitative data

Optional: Calculation Module

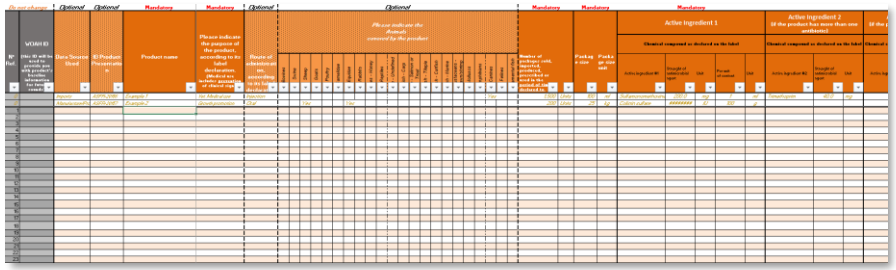
Questionnaire (Excel)



Guidance (PDF)



Annex for **calculations** (PDF)



Calculation Module (Excel)

1. Delegates

A Delegate is appointed by the national government and is most frequently the Member's Chief Veterinary Officer. The World Assembly of 183 Delegates is the highest authority of WOAH.

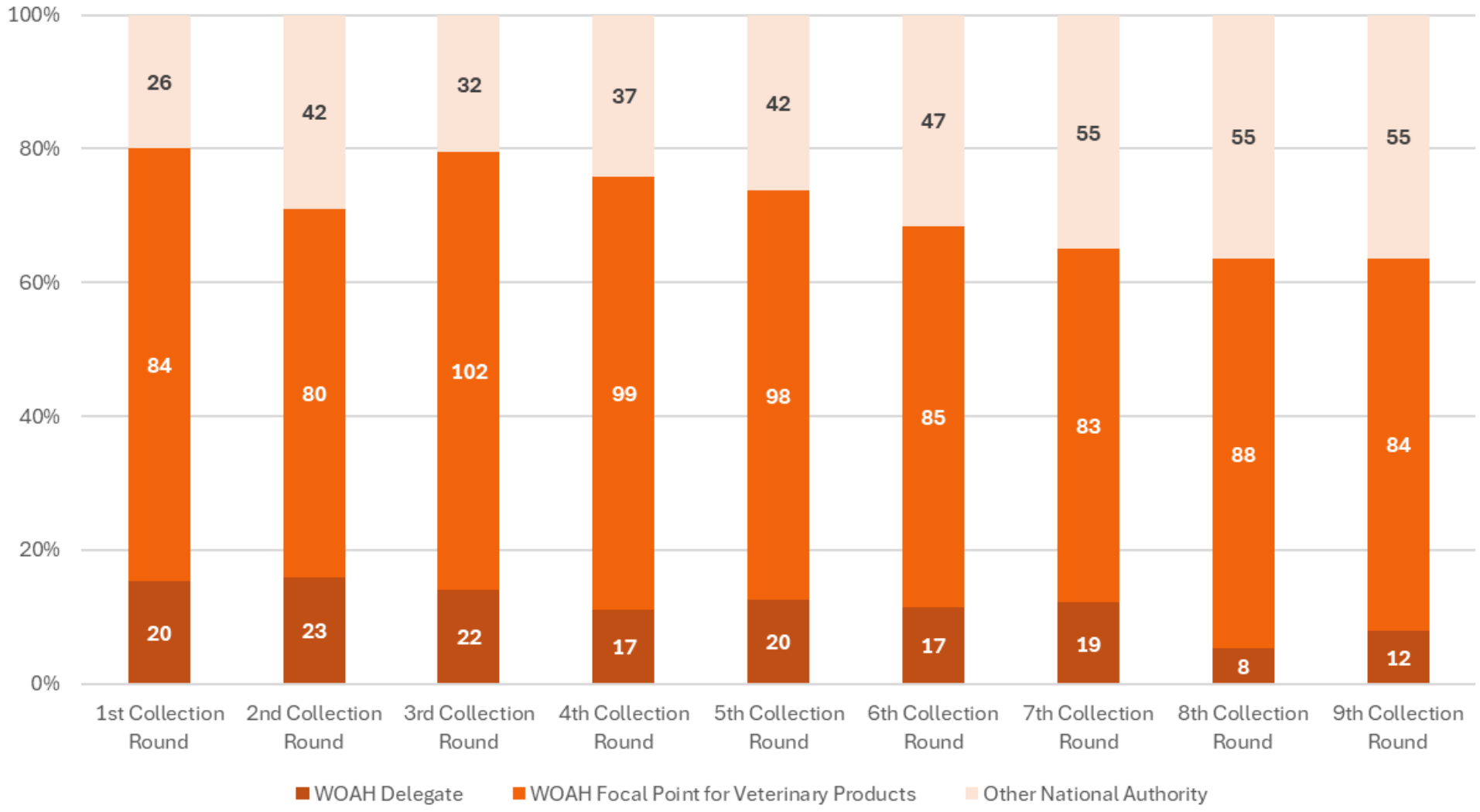
2. Focal Points for Veterinary Products (FPVP)

A Focal Point for Veterinary (FPVP) is appointed by the Delegate and is often the head of the regulatory authority for veterinary products.

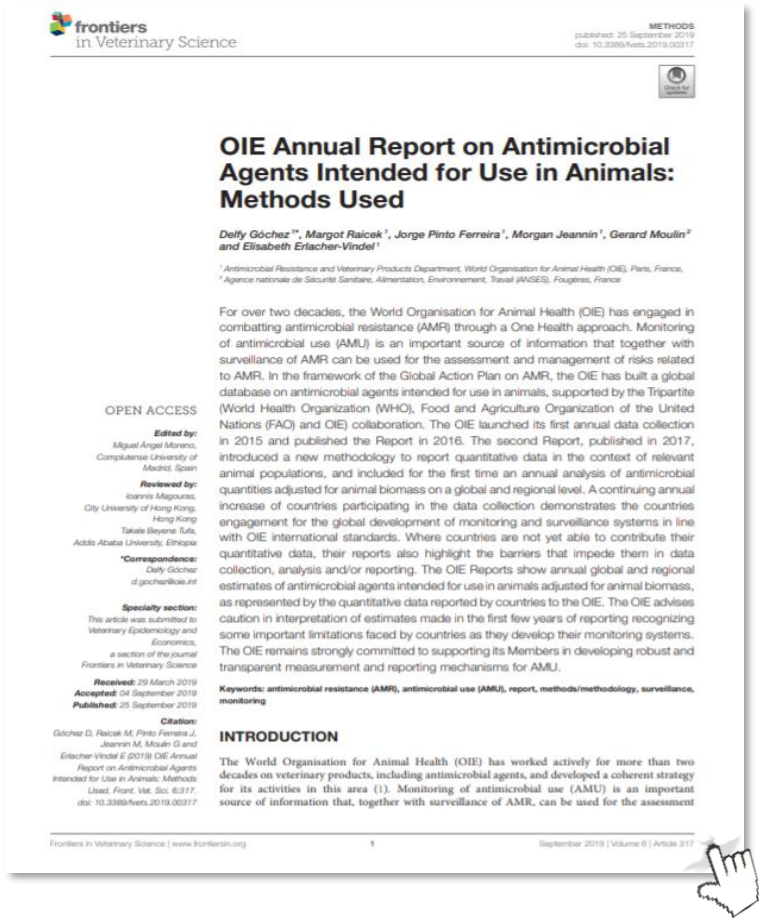
3. Other National Authority (ONA)

Appointed by the FPVP with the Delegate's approval, usually works within the FPVP's team or under the regulatory authority for veterinary products if the FPVP is not part of that agency.

Data collection



Methods



frontiers in Veterinary Science

METHODS

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doi: 10.3389/fvets.2019.00317

OIE Annual Report on Antimicrobial Agents Intended for Use in Animals: Methods Used

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For over two decades, the World Organisation for Animal Health (OIE) has engaged in combatting antimicrobial resistance (AMR) through a One Health approach. Monitoring of antimicrobial use (AMU) is an important source of information that together with surveillance of AMR can be used for the assessment and management of risks related to AMR. In the framework of the Global Action Plan on AMR, the OIE has built a global database on antimicrobial agents intended for use in animals, supported by the Tripartite (World Health Organization (WHO), Food and Agriculture Organization of the United Nations (FAO) and OIE) collaboration. The OIE launched its first annual data collection in 2015 and published the Report in 2016. The second Report, published in 2017, introduced a new methodology to report quantitative data in the context of relevant animal populations, and included for the first time an annual analysis of antimicrobial quantities adjusted for animal biomass on a global and regional level. A continuing annual increase of countries participating in the data collection demonstrates the countries engagement for the global development of monitoring and surveillance systems in line with OIE international standards. Where countries are not yet able to contribute their quantitative data, their reports also highlight the barriers that impede them in data collection, analysis and/or reporting. The OIE Reports show annual global and regional estimates of antimicrobial agents intended for use in animals adjusted for animal biomass, as represented by the quantitative data reported by countries to the OIE. The OIE advises caution in interpretation of estimates made in the first few years of reporting recognizing some important limitations faced by countries as they develop their monitoring systems. The OIE remains strongly committed to supporting its Members in developing robust and transparent measurement and reporting mechanisms for AMU.

Keywords: antimicrobial resistance (AMR), antimicrobial use (AMU), report, methods/methodology, surveillance, monitoring

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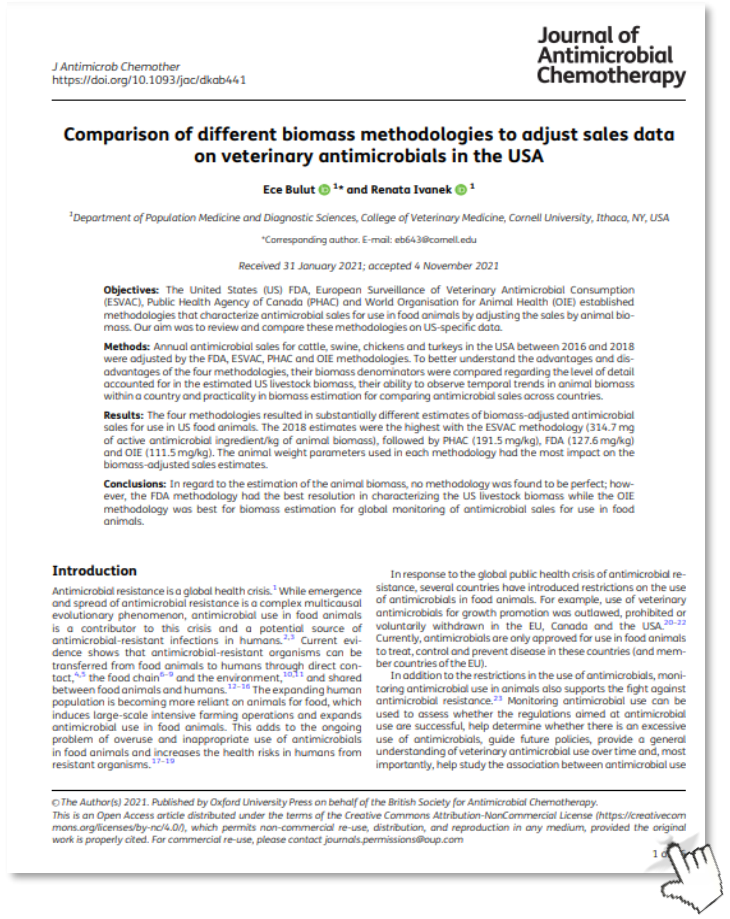
INTRODUCTION

The World Organisation for Animal Health (OIE) has worked actively for more than two decades on veterinary products, including antimicrobial agents, and developed a coherent strategy for its activities in this area (1). Monitoring of antimicrobial use (AMU) is an important source of information that, together with surveillance of AMR, can be used for the assessment

https://doi.org/10.3389/fvets.2019.00317



J Antimicrob Chemother
https://doi.org/10.1093/jac/dkab441

Journal of Antimicrobial Chemotherapy

Comparison of different biomass methodologies to adjust sales data on veterinary antimicrobials in the USA

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Objectives: The United States (US) FDA, European Surveillance of Veterinary Antimicrobial Consumption (ESVAC), Public Health Agency of Canada (PHAC) and World Organisation for Animal Health (OIE) established methodologies that characterize antimicrobial sales for use in food animals by adjusting the sales by animal biomass. Our aim was to review and compare these methodologies on US-specific data.

Methods: Annual antimicrobial sales for cattle, swine, chickens and turkeys in the USA between 2016 and 2018 were adjusted by the FDA, ESVAC, PHAC and OIE methodologies. To better understand the advantages and disadvantages of the four methodologies, their biomass denominators were compared regarding the level of detail accounted for in the estimated US livestock biomass, their ability to observe temporal trends in animal biomass within a country and practicality in biomass estimation for comparing antimicrobial sales across countries.

Results: The four methodologies resulted in substantially different estimates of biomass-adjusted antimicrobial sales for use in US food animals. The 2018 estimates were the highest with the ESVAC methodology (314.7 mg of active antimicrobial ingredient/kg of animal biomass), followed by PHAC (191.5 mg/kg), FDA (127.6 mg/kg) and OIE (111.5 mg/kg). The animal weight parameters used in each methodology had the most impact on the biomass-adjusted sales estimates.

Conclusions: In regard to the estimation of the animal biomass, no methodology was found to be perfect; however, the FDA methodology had the best resolution in characterizing the US livestock biomass while the OIE methodology was best for biomass estimation for global monitoring of antimicrobial sales for use in food animals.

Introduction

Antimicrobial resistance is a global health crisis.[1] While emergence and spread of antimicrobial resistance is a complex multicausal evolutionary phenomenon, antimicrobial use in food animals is a contributor to this crisis and a potential source of antimicrobial-resistant infections in humans.[2,3] Current evidence shows that antimicrobial-resistant organisms can be transferred from food animals to humans through direct contact,[4,5] the food chain[6–9] and the environment,[10,11] and shared between food animals and humans.[12–16] The expanding human population is becoming more reliant on animals for food, which induces large-scale intensive farming operations and expands antimicrobial use in food animals. This adds to the ongoing problem of overuse and inappropriate use of antimicrobials in food animals and increases the health risks in humans from resistant organisms.[17–19]

In response to the global public health crisis of antimicrobial resistance, several countries have introduced restrictions on the use of antimicrobials in food animals. For example, use of veterinary antimicrobials for growth promotion was outlawed, prohibited or voluntarily withdrawn in the EU, Canada and the USA.[20–22] Currently, antimicrobials are only approved for use in food animals to treat, control and prevent disease in these countries (and member countries of the EU).

In addition to the restrictions in the use of antimicrobials, monitoring antimicrobial use in animals also supports the fight against antimicrobial resistance.[23] Monitoring antimicrobial use can be used to assess whether the regulations aimed at antimicrobial use are successful, help determine whether there is an excessive use of antimicrobials, guide future policies, provide a general understanding of veterinary antimicrobial use over time and, most importantly, help study the association between antimicrobial use

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JAC Antimicrob Resist
https://doi.org/10.1093/jacamr/dlac017

JAC-Antimicrobial Resistance

From OIE standards to responsible and prudent use of antimicrobials: supporting stewardship for the use of antimicrobial agents in animals

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The global action plan (GAP) on antimicrobial resistance (AMR) advocated the development of national action plans on AMR and the implementation of plans aimed at preventing, combating and monitoring AMR. The World Organisation for Animal Health (OIE)'s strategy on AMR and the prudent use of antimicrobials is aligned with the GAP and recognizes the importance of a One Health approach. This paper reviews the goals, tools and strategies that the OIE has in place to support its Members, envisioning an increased awareness of them and ultimately an increased implementation of the OIE standards. The OIE standards are endorsed by vote of all the 182 Members and are recognized by the World Trade Organization (WTO). The OIE List of Antimicrobial Agents of Veterinary Importance, which includes specific recommendations on the use of antimicrobial agents, is also of particular importance for antimicrobial stewardship. OIE's antimicrobial use (AMU) data collection started in 2015 and has been developed in particular to measure trends in AMU. An annual report is published as an output of this data collection. An AMU IT database system is being developed. The OIE provides assistance to its 182 Members to strengthen the implementation of OIE standards via its support of good governance, the Performance of Veterinary Services (PVS) Pathway, PVS Veterinary Legislation Support Program and training of veterinarians and veterinary paraprofessionals. In parallel, the OIE Observatory is a recent initiative, specifically targeting the monitoring of the implementation of the OIE standards. Cooperation agreements between the OIE and intergovernmental organizations and non-governmental organizations are instrumental for the increase of the dissemination and implementation of the OIE standards and guidelines.

1. Introduction

In the framework of the global action plan on antimicrobial resistance (GAP) adopted in 2015, all countries, through the decisions of the WHO World Health Assembly, the FAO Conference and the World Assembly of OIE Delegates, agreed to support the development of national action plans (NAPs) on antimicrobial resistance (AMR) in line with the GAP and to implement policies and plans aimed at preventing, combating and monitoring AMR.[1–3]

Harmonization, through the implementation of international standards, provides a common approach[4] and a point of reference for more consistent development and decision-making,[5] and enables reporting on progress while achieving the objectives of the GAP.

While recognizing the importance of and need for animal disease prevention, the focus of this paper is on the World Organisation for Animal Health (OIE) support for implementation of stewardship by Members regarding the responsible and prudent use of antimicrobials. It was written as part of the authors' routine work with the purpose of describing a summary of the standards, tools and activities that the OIE makes available for its Members regarding AMR and antimicrobial use (AMU). The overall goal is to provide a higher awareness of them, and ultimately an increased implementation of the OIE AMR/AMU standards, envisioning a better stewardship of antimicrobials, as a common global good.

The activities and outputs of international organizations are sometimes not well known by different stakeholders. To counteract this, our paper outlines the OIE AMR/AMU standards, what they mean and how they can support Members to quantify their AMU and control AMR. It then provides a brief explanation on how the OIE evaluates the performance of veterinary services. The final sections focus on the OIE Observatory (on the implementation of the standards), and finally on the OIE List of Antimicrobial Agents of Veterinary Importance, and its recommendations—important stewardship guidance. The final section features some of the positive consequences that can take place

https://doi.org/10.1093/jacamr/dlac017

Data processing

Qualitative Data
(Part A & B of the Baseline Information sheet)

All countries can answer

+

Quantitative Data
(Part C of the Baseline Information sheet)

Only countries reporting antimicrobial quantities can answer

→ **Total antimicrobial use (kg)**

Adjusted by biomass (mg/kg)

Type of use:
- veterinary medical use
- growth promotion

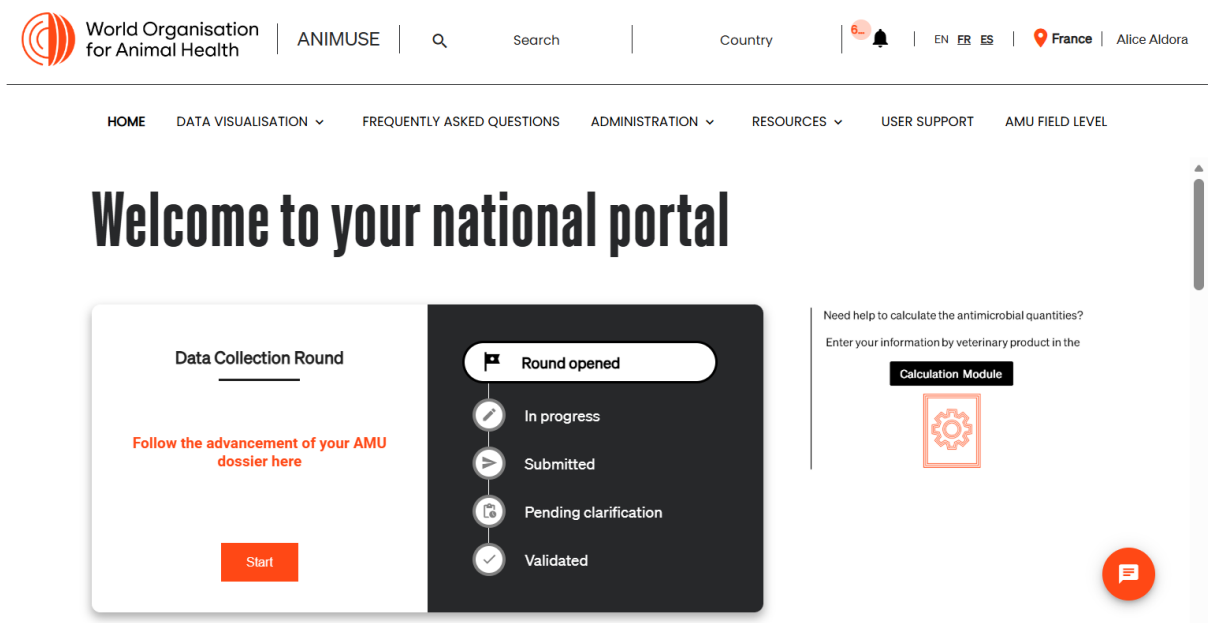
For the purposes of the WOAH database, **animal groups** means:
- terrestrial food-producing animals
- aquatic food-producing animals
- non-food-producing animals

Reporting Option 1	✓ Antimicrobial classes ✓ Type of use
Reporting Option 2	✓ Antimicrobial classes ✓ Type of use ✓ **Animal groups**
Reporting Option 3	✓ Antimicrobial classes ✓ Type of use ✓ Animal groups ✓ **Routes of administration**
Reporting Option 4 *(to be launched in September 2026)*	✓ Antimicrobial classes ✓ Type of use ✓ Animal groups ✓ Routes of administration ✓ ***Animal species***

Portals

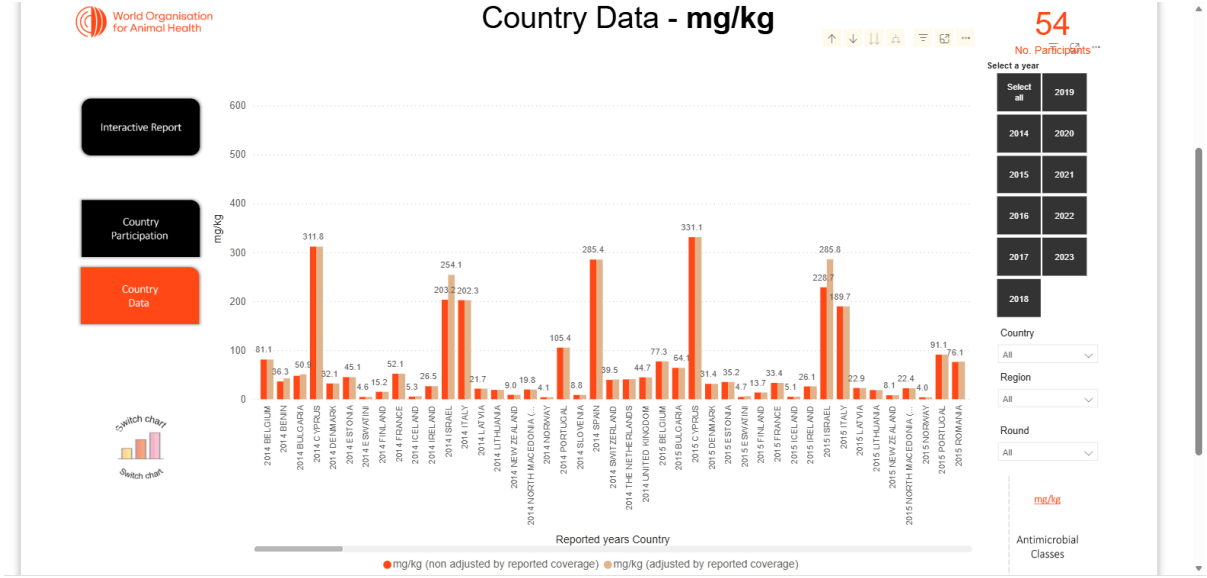
Country Portal
(launched Sept 2022)

- Visuals at country level (for country only)
- Data aggregated by classes
- Data at molecule level (only for those using the Calculation Module)



Public Portal
(launched May 2023)

- Visuals at global level
- Visuals at regional level
- Visuals at country level (only those that decided to be public)



The inventory

Recommendation n°4

2nd OIE (WOAH) Global Conference on Antimicrobial Resistance

October 2018

> To further develop the OIE data collection on Antimicrobial Agents Intended for Use in Animals, converting the current spreadsheet format to a database system, able to accommodate data submissions by animal species, and its connection to the World Animal Health Information System (WAHIS) **and also allowing addition of data from field studies.**

Ensure that National authorities have **access** to the information on projects conducted in their countries.

Have a better **understanding** of the situation of AMU field level monitoring projects globally.

Complement imports and sales data and empower National authorities for informed decision making.

Better understanding **methodologies** of in-countries projects for providing better support in collecting data.

The inventory

A Survey *(Microsoft Form)*

Contextual information on the project

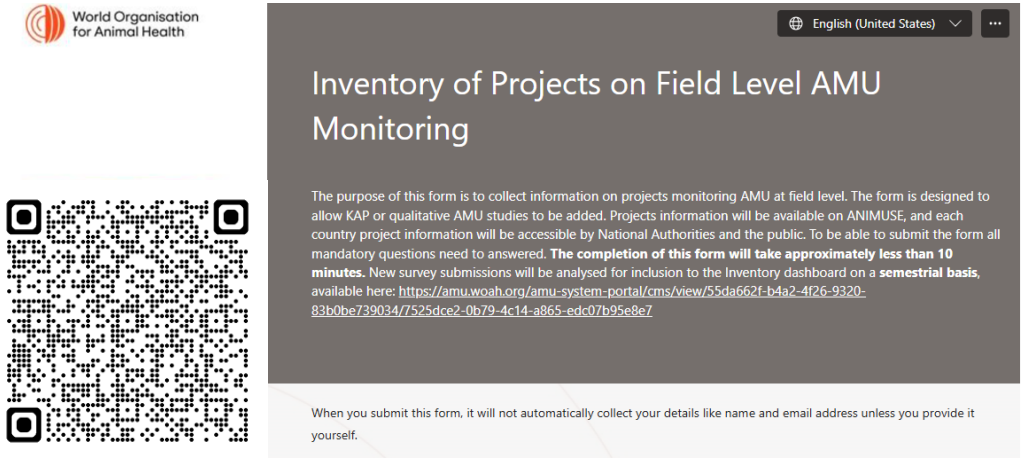
- Publicly accessible on ANIMUSE
- To be filled by countries and relevant stakeholders

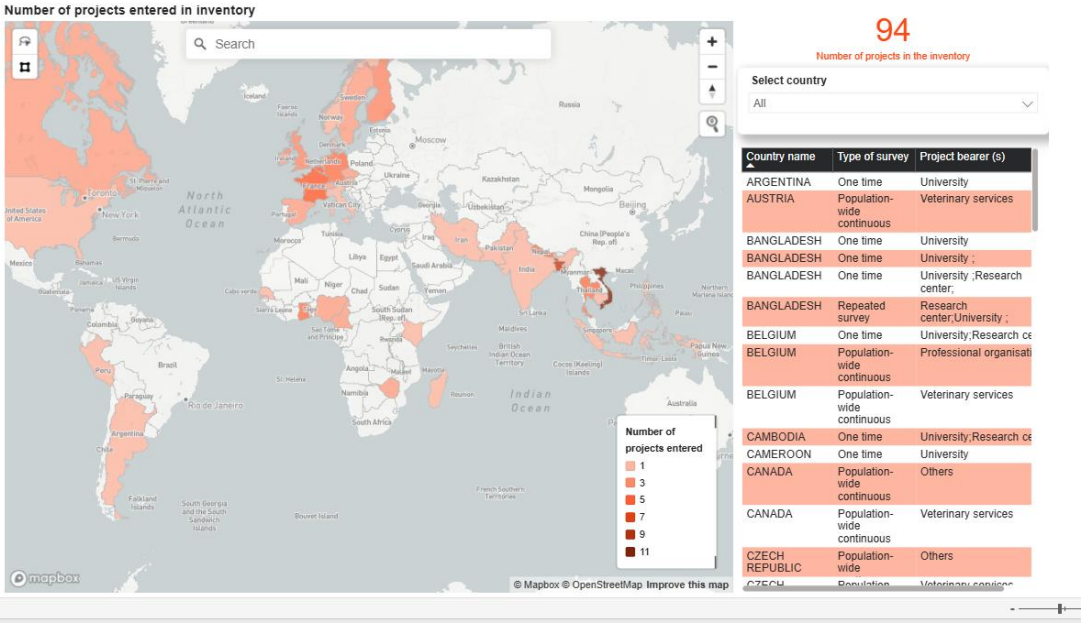
3 sections - 26 questions
General Information | Data Information
Use of data: data reporting and communication

Semestrial review of entries

Inventory

All information accessible on ANIMUSE through Dashboards





- Why integrated surveillance?
- Why AMU in animals?
- ANIMUSE: A platform with purpose
- **Integrating animal AMU into One Health surveillance**

Quadripartite Global Systems

1 Human System

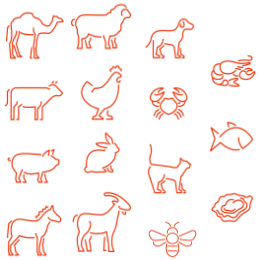
World Health Organization

GLASS
Global Antimicrobial Resistance and Use Surveillance System

AMR/AMU
in human

2 Animal and Agricultural System

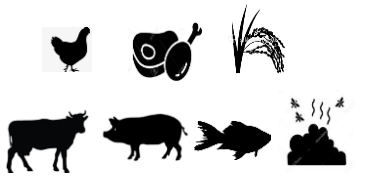
World Organisation for Animal Health



ANIMUSE Global Database

AMU
in animals

Food and Agriculture Organization of the United Nations



InFARM The International FAO Antimicrobial Resistance Monitoring System

AMR
in animals and food

AMU
in plant production and protection

3 Environmental Health

UN environment programme

AMR
in environment and residues

Global Integrated Surveillance for AMR and AMU (GISSA)

2016: Initial meeting FAO, WHO, WOAH

2017: TISSA concept approved by Tripartite

2018: TISSA business plan approved

2019: TISSA needs assessment conducted

2020: Development of TISSA approved by Tripartite

2024: Stage 0

2025: Stage 1

Initial Development
Stage 0: 2020-2024

- Mapping and convergence of data models (ANIMUSE, GLASS, InFARM)
- Develop the GISSA database
- Develop webpage for dissemination of data and information on AMR and AMU in animal and human sectors
- Develop online interactive reports/visualizations
- Develop the test version GISSA platform

GISSA Consolidation
Stage 1: 2025-2027

- Global interface
- Integrate GISSA reporting in ANIMUSE, GLASS, InFARM systems
- Upgrade data models
- Improve GISSA online reports/visualizations
- Integrate environment (UNEP) and plants (FAO) in GISSA
- Public release of GISSA
- platform with visualizations

GISSA Expansion
Stage 2: 2028-2030

- Country level interfaces
- Enable a selected number of countries to download their multi-sectorial AMR and AMU data
- Expand the online reports to provide country level reports/visualizations

Fully Functional & Integrated
Stage 3: 2031-2035

- Train countries on integrated analysis of AMR and AMU data from GISSA
- Global, regional integrated analyses are provided by GISSA for policy makers to establish strategies and actions
- Regular QPT integrated surveillance reports are published on GISSA

Food and Agriculture Organization of the United Nations
UN environment programme
World Health Organization
World Organisation for Animal Health

GISSA Stage 1 Consolidation (2025-2027)

Data Model	• Review and update the data model, reflecting changes since Stage 0
	  ○ incorporate evolutions from GLASS and ANIMUSE
	  ○ integrate feedback from InFARM from the first data collection

Portal (Global interface)	• Define data manager(s), data upload frequency to GISSA, and data validation. • Re-test data in pre-production (testing) and production environments.
Visuals	• Agree on visuals for integrated AMU/AMR charts. • Validate data and map visualisations. • Develop basic instructional materials.

Food and Agriculture Organization of the United Nations
UN environment programme
World Health Organization
World Organisation for Animal Health

GISSA Stage 1 Consolidation (2025-2027)

World Health Organization

Human Sector

AMR | AMU

GLASS Global Antimicrobial Resistance and Use Surveillance System

177 countries providing data

World Organisation for Animal Health

Animal Sector

AMU

ANIMUSE Global Database

130 countries providing data with 53 countries potentially shared in GISSA

Food and Agriculture Organization of the United Nations

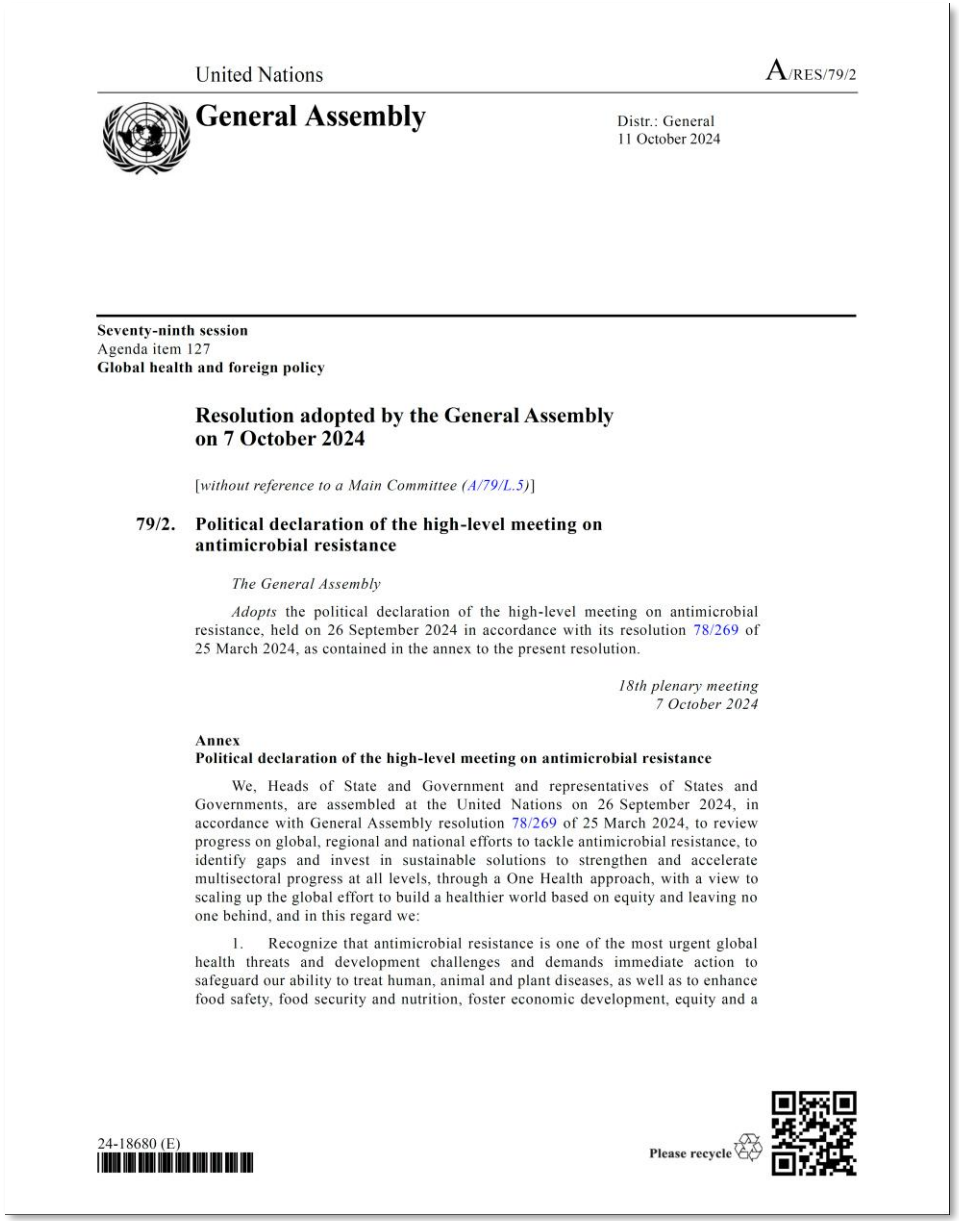
Plants & Crops | Animal & Food

AMR | AMU

InFARM The International FAO Antimicrobial Resistance Monitoring System

Projected 2025: 40 countries providing data

GISSA Platform



United Nations A/RES/79/2

General Assembly

Distr.: General
11 October 2024

Seventy-ninth session
Agenda item 127
Global health and foreign policy

Resolution adopted by the General Assembly on 7 October 2024

[*without reference to a Main Committee (A/79/L.5)*]

79/2. Political declaration of the high-level meeting on antimicrobial resistance

The General Assembly

Adopts the political declaration of the high-level meeting on antimicrobial resistance, held on 26 September 2024 in accordance with its resolution 78/269 of 25 March 2024, as contained in the annex to the present resolution.

18th plenary meeting
7 October 2024

Annex
Political declaration of the high-level meeting on antimicrobial resistance

We, Heads of State and Government and representatives of States and Governments, are assembled at the United Nations on 26 September 2024, in accordance with General Assembly resolution 78/269 of 25 March 2024, to review progress on global, regional and national efforts to tackle antimicrobial resistance, to identify gaps and invest in sustainable solutions to strengthen and accelerate multisectoral progress at all levels, through a One Health approach, with a view to scaling up the global effort to build a healthier world based on equity and leaving no one behind, and in this regard we:

1. Recognize that antimicrobial resistance is one of the most urgent global health threats and development challenges and demands immediate action to safeguard our ability to treat human, animal and plant diseases, as well as to enhance food safety, food security and nutrition, foster economic development, equity and a

24-18680 (E)

Please recycle

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Encourage all countries to report quality surveillance data on antimicrobial resistance and antimicrobial use by 2030, through existing global surveillance systems, including the Global Antimicrobial Resistance and Use Surveillance System (GLASS), the Global Database on Antimicrobial Use in Animals (ANIMUSE) and the International FAO Antimicrobial Resistance Monitoring (InFARM) platform, for use in the **Quadripartite Global Integrated System for Surveillance of Antimicrobial Resistance and Antimicrobial Usage (GISSA);**

Data is not the end, it’s the beginning.

Thank you!

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World Organisation for Animal Health
Organisation mondiale de la santé animale
Organización Mundial de Sanidad Animal