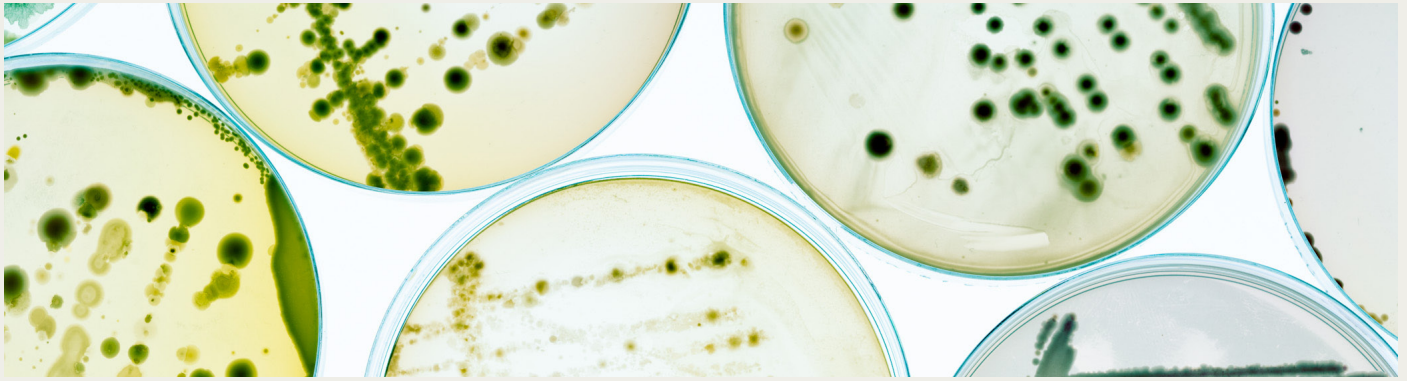


Tackling Antimicrobial Resistance using the One Health approach

The animal health perspective



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Executive Summary

Antimicrobial resistance (AMR) is a global health threat for humans, animals and plants, because it impairs our ability to treat infections. It is associated with misuse of antimicrobials in various sectors, including agrifood systems and human and veterinary medicine [1]. AMR spreads through animal and human populations, plants and the environment and can alter the effectiveness of treatments for animal, human and plant diseases. It is estimated that 1.27 million people died in 2019 from an infection caused by a drug-resistant bacterium. AMR is one of the top ten worldwide health risks to humans and animals, and threatens livelihoods and food security on a global scale [1,2]. If AMR continues unchecked, many more infections will become untreatable and life-threatening [3]. AMR is present in all countries but its burden is disproportionately high in low- and middle-income countries, particularly in Africa, Asia and Latin America [4].

The World Organisation for Animal Health (WOAH) is well placed to lead the fight against AMR in the animal health sector. WOAH collaborates with national Veterinary Services to promote better practices of antimicrobial use, use of alternatives to antimicrobials (e.g. vaccines), biosecurity measures and good animal husbandry practices for the prevention, control and treatment of infectious and zoonotic diseases [1]. To prevent the spread of AMR, WOAH has developed a *Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials*. One of the main objectives is to strengthen knowledge through surveillance, which is put into practice through the global online database on antimicrobial use in animals (ANIMUSE). WOAH integrates a [One Health](#) approach to address AMR comprehensively, as all sectors on the animal–human–environment interface are affected and must collaborate to tackle the global health threat.

The Quadripartite Collaboration on One Health, consisting of the Food and Agriculture Organization of the United Nations (FAO), the United Nations Environment Programme (UNEP), the World Health Organization (WHO) and WOAH, developed the [One Health Joint Plan of Action \(2022–2026\)](#) (OH JPA) to integrate systems and capacity to better tackle health threats collectively. Within Action Track 5, which focuses on AMR, WOAH advocated for policy alignment of the animal health sector.

Key Facts

In 2019, **less than 20%** of antimicrobials used in animals were of highest priority and critical importance for human health [5]. For the 80 Members that reported data to WOAHA from 2017 to 2019, an overall yearly decrease of 13% in the amount used (in mg/kg) was observed.

It is estimated that AMR will cause economic losses of **US\$ 100 trillion** in terms of lost global production by 2050 if no urgent actions are taken [8].

While **70%** of antimicrobial consumption occurs in animals, global antimicrobial use in animals has declined by **13%** from 2017 to 2019 [6,7].

An estimated **4.95 million** human deaths were associated with drug-resistant bacteria in 2019 [3].

Research and development for AMR in animal health is significantly underfunded, with only **9%** of total investments dedicated to the animal sector [9].

The use of antimicrobials for growth promotion was still practised in **26%** WOAHA Member Countries in 2021, reported by 41 Members, compared with 55 Members in 2016, and at least **50%** of the reporting Members have no regulatory framework in place [7].

The global burden of animal diseases due to AMR is unknown because no data are available.

Definition of Terms

Antimicrobials

Medicines, including antibiotics, antivirals, antifungals and antiparasitic agents, used to prevent and treat infections in humans, animals and plants. Antimicrobials can kill or inhibit the growth of microorganisms [1].

Antimicrobial resistance

AMR occurs when bacteria, viruses, fungi, or parasites adapt over time and stop responding to antimicrobials, making infections more difficult to treat. As a result, medicines become ineffective, raising the risk of serious illness and death [1].

The importance of reducing the risk of AMR

Antimicrobial medicines are becoming increasingly ineffective as resistant microbes spread. This enhances the difficulty of treating infections in animals and humans. There is a lack of investment in the animal sector to conduct comprehensive surveillance of AMR and to develop diagnostic tools, new drugs, alternatives to antimicrobials and regulatory frameworks. As a result, options for medicines are becoming increasingly limited. In low- and middle-income countries, preventing AMR is especially challenging because there are limited resources to tackle AMR, difficulties with supply chains, and regulatory frameworks are often lacking or not enforced, leading to the problem of counterfeit products [4,10]. Importantly, new antimicrobials will suffer the same fate as the current ones and become ineffective if more responsible practices for the use of antimicrobials are not adopted now [2].

AMR in animals causes prolonged treatment duration, increased treatment failures, more severe infections, and mortality [11]. It can lead to significant economic losses in terrestrial and aquatic animal production, food insecurity and loss of livelihoods [12]. Companion animals can also be affected by drug-resistant pathogens, jeopardising animal health and affecting the human–animal bond by impacting the health and wellbeing of both [13]. The use of products of critical importance for companion animals is also of concern, with penicillin use more commonly reported for non-food-producing animals.

AMR can circulate among humans, livestock and wildlife via direct contact and contaminated food, feed, water and soil [14]. Antimicrobials used in food-producing animals can cause AMR in zoonotic foodborne pathogens including bacteria such as *Salmonella spp.*,

Campylobacter spp., *Enterococcus spp.* and *Escherichia coli*. There can be environmental spillover of resistant microbes from animals and humans due to poor sanitation, inefficient wastewater treatment plants, and waste derived from hospitals, pharmaceutical factories and farms [12].

Veterinary Services have a crucial role in tackling AMR because they are responsible for providing animal health care, and for regulating the manufacture, authorisation, sales and use of veterinary medicinal products. They provide farmers and animal owners with expert advice on disease prevention, control measures and the responsible use of antimicrobials and have a role in enhancing the understanding of livestock producers, those involved in food production, relevant stakeholders, policymakers, the public and media, in order to address AMR [15]. The One Health approach can help to coordinate actions and collaboration across sectors (see Figure 1).

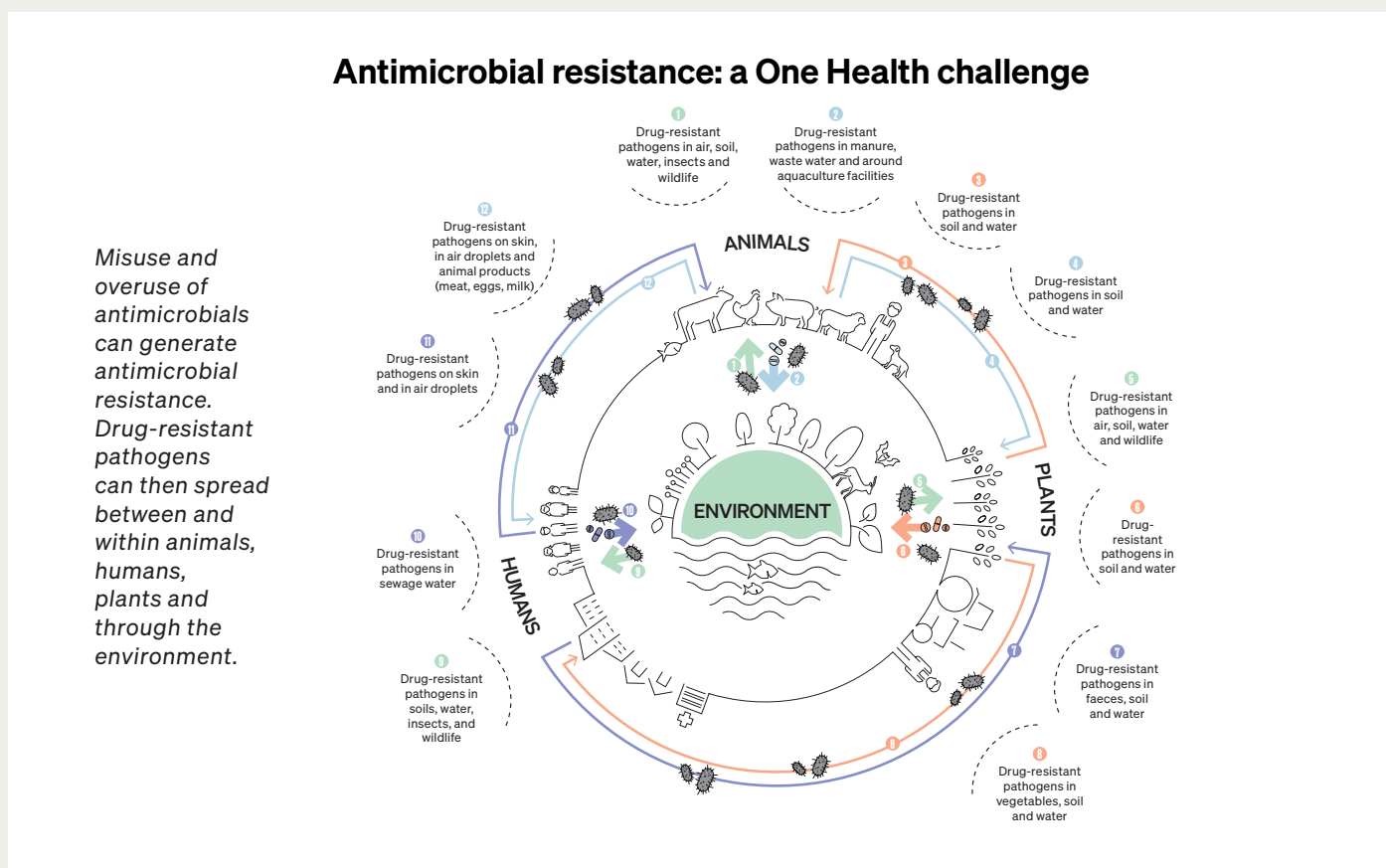


Figure 1: Implementing One Health to fight AMR, ensuring cooperation among animal health, public health, environment, agriculture, finance and the private sector, as well as non-governmental organisations and civil society.

WOAH Work to Address AMR

WOAH works at global, regional and national levels, providing leadership in animal health governance and supporting AMR related activities. The following sections contain selected examples of WOAHP efforts at global, regional and national levels.

Global initiatives:

The WOAHP Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials is aligned with the WHO Global Action Plan on AMR and is based on four pillars (see Figure 2):

- Improve AMR awareness and understanding.
- Strengthen knowledge through surveillance and research.
- Support good governance and capacity building.
- Encourage implementation of international standards.

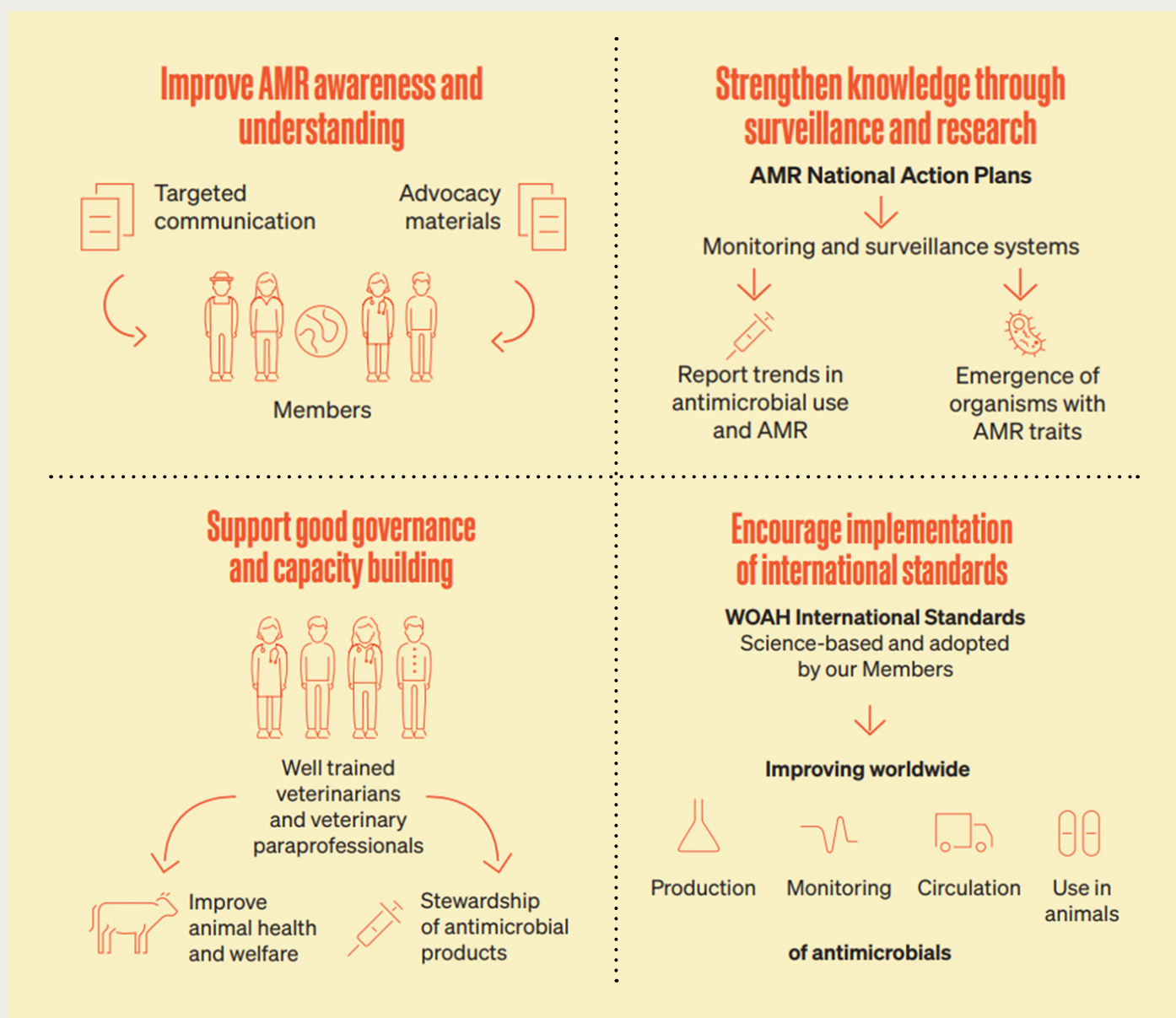


Figure 2: The four objectives of the WOAHP Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials.

WOAH collects information through its global database on animal antimicrobial use in animals (ANIMUSE), contributing to evidence-based guidance for decision-making at the national and regional levels through visualising data, facilitating reporting, data analysis and communication, and monitoring the effectiveness of interventions and implementation of National Action Plans (see Figure 3). WOAH international standards provide guidance for Members regarding the responsible and prudent use of antimicrobial agents in veterinary medicine [15,16]. Further, every year from the 18 to the 24 November, the Quadripartite is engaged in the global campaign ‘World AMR Awareness Week’.

In the One Health Joint Plan of Action (2022–2026), the Quadripartite tackles AMR within

Action Track 5. The goal is to preserve antimicrobial efficacy and ensure sustainable, fair access to antimicrobials across all sectors, promoting responsible and prudent usage. To bolster decision-making and prompt political action on AMR, the Quadripartite actively supports the Global Leaders Group on AMR [17] and provides guidance for the monitoring and evaluation of national action plans on AMR, along with the Tripartite overseeing the global action plan on AMR [18,19]. In addition, the Tripartite Integrated Surveillance System on Antimicrobial Resistance and Use (TISSA) is a global web-based repository of published AMR and antimicrobial use data across human, animal, plant, food systems and environmental sectors [20].

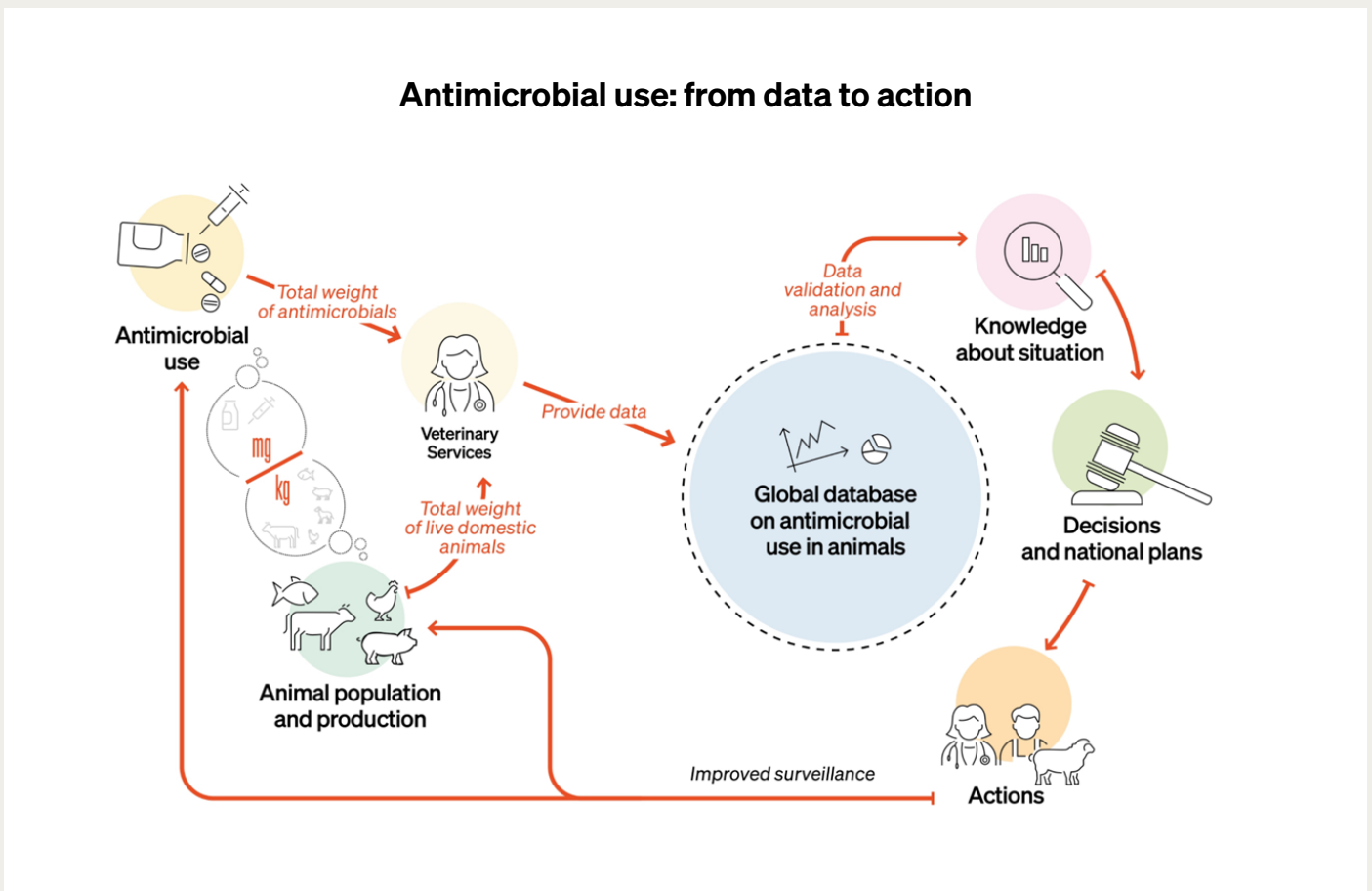


Figure 3: Data collection process of ANIMUSE, Reporting data on antimicrobial use, animal populations and production. Steps are taken from analysis and decision-making to actions.

Regional initiatives:

Some of WOA's regional AMR initiatives are listed below:

- The American Committee for Veterinary Medicines (CAMEVET) project, which facilitates the harmonisation of standards, records and control of veterinary medicines [21].
- In Africa, WOA and the West African Economic and Monetary Union (WAEMU) coordinate and review legislation, registration and quality control for veterinary medicinal products in WAEMU member countries [22].
- WOA, FAO and WHO implement the two Tripartite AMR Projects 'Working together to fight Antimicrobial Resistance' in some South American and Asian countries [23,24].
- The Quadripartite One Health Coordination Group in the Asia-Pacific region provides leadership and technical support for AMR and other One Health related issues [25,26].

Country initiatives:

WOA and the World Veterinary Association provide a global repository of available guidelines for responsible use of antimicrobials in animal health [27]. Country based AMR projects include the Quadripartite AMR Multi-Partner Trust Fund (MPTF) (2019–2030) that implements projects with transformative and innovative practices for AMR in 14 countries. For example, a project in Tajikistan implements capacity-building activities to raise awareness and support priority actions to combat AMR, and a project in Zimbabwe is developing a vaccine for the deadly cattle disease theileriosis to reduce the use of antimicrobials for the treatment of the disease.

WOA also supports national processes of legislative reform through:

- The Veterinary Legislation Support Programme [28]
- The Quadripartite One Health Legislative Assessment Tool for Antimicrobial Resistance
- A methodology to analyse AMR-relevant legislation in food and agriculture sectors for the AMR-Lex database, in collaboration with FAO [29].

Policy recommendations

WOA recommends the following policy-based solutions to strengthen the One Health approach and tackle AMR within the animal health sector and beyond, based on the global Quadripartite call to action.

At policy and institutional level:

- Adopt the One Health multisectoral and multidisciplinary approach to address AMR as it impacts domestic animals, wildlife, humans and plants alike.
- Allocate sufficient resources to support AMR data collection at national and farm levels to improve the quality of reported data and promote reporting of antimicrobial use and animal health data to ANIMUSE and WAHIS.
- Provide financial and technical assistance to Veterinary Services in low- and middle-income countries in relation to AMR.
- By 2030, as outlined in the [Muscat Manifesto](#), reduce overall use of antimicrobials in agriculture and livestock by at least 30%, including through employing antimicrobial susceptibility testing methods that are in accordance with international standards.
- Support the function of and participation in the AMR Multi-Stakeholder Partnership Platform to catalyse a global movement for action against AMR by fostering cooperation among a diverse range of stakeholders at all levels across the One Health spectrum.

At programmatic level:

- Strengthen and promote animal vaccination to limit the need for antimicrobials and encourage the use of alternatives to antimicrobials.
- Develop and update guidelines for responsible and prudent use of antimicrobials at national and sub-regional levels aligned with WOAHA international standards.
- Engage with the private sector, including the pharmaceutical industry, through public–private partnerships to facilitate the adoption of best practices for the production, distribution, sale, use and disposal of antimicrobials in animals.
- Promote joint use of resources between sectors, such as the use of medicine quality control laboratories by the public health and animal health sectors.
- Advocate for responsible use of antimicrobials in animals, avoiding non-veterinary medical use of antimicrobials in healthy animals (e.g. to promote growth and productivity), and explore alternatives to enhance productivity such as improved breeding programmes and animal nutrition.

- Promote research and development of new veterinary medicinal products, including autologous vaccines, alternatives to antimicrobials and rapid, low-cost diagnostic tests for AMR.

At technical level:

- Enhance capacity of national Veterinary Services, via training and education about existing and new AMR laboratory methodologies (e.g. whole genome sequencing) and biosecurity practices.
- Promote communication and sharing of data among the animal, human and environment sectors to inform integrated interventions against AMR.
- Improve awareness and understanding of AMR through effective communication, education and training of animal health providers, animal owners, the public and other relevant stakeholders.

Recommended WOAHA sources for further information

[Antimicrobial Resistance](#)

[Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials](#)

[Global database on Animal Antimicrobial USE \(ANIMUSE\)](#)

[Performance of Veterinary Services \(PVS\) Pathway](#)

[Veterinary Legislation Support Programme](#)

[CAMEVET Project](#)

[Tripartite Antimicrobial Resistance Multi-Partner Trust Fund](#)

[Quadripartite – A One Health Priority Research Agenda for Antimicrobial Resistance](#)

[Quadripartite One Health Joint Plan of Action \(2022–2026\)](#)

[Quadripartite call to action for One Health for a safer world](#)

[Global Leaders Group on AMR](#)



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