

THE OIE COMMITMENT TO OVERCOMING ANTIMICROBIAL RESISTANCE AND WHY IT IS IMPORTANT

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As the international reference for standards in animal health and welfare, the World Organisation for Animal Health (OIE) considers combating antimicrobial resistance among its priorities. Through the development of codes and manuals for terrestrial and aquatic animals and significant capacity-building initiatives, the OIE supports the responsible and prudent use of antibiotics in animals in its 181 Member Countries. Towards a One Health approach and following the global action plan on antimicrobial resistance, the OIE collaborates with the World Health Organization (WHO) and Food and Agriculture Organization (FAO) through a tripartite partnership, coordinating a unified response to this global issue.

For over 90 years, the World Organisation for Animal Health (OIE) has established international sanitary policies, becoming the reference organization for intergovernmental standards in animal health, veterinary public health and animal welfare. Formed in response to a rinderpest (cattle plague) outbreak in Europe, the establishment of the OIE in 1924 demonstrated the necessity for intergovernmental collaboration in combating animal disease. Since then, the OIE has steadily expanded and developed its mandate based on the needs of its Member Countries, now grown to 181 in 2017. Originally named the “Office International des Epizooties”, the organization retained its historical acronym but officially changed its name to the “World Organisation for Animal Health” in 2003. This change reflected the breadth of the OIE’s activities in protecting and improving animal health, such as its contribution to the global effort against antimicrobial resistance (AMR).

The primary mandate of the OIE is to produce codes and manuals for terrestrial and aquatic animals, which provide a template of best practice to protect and promote animal health and welfare. Their development involves regular review and formal adoption by the annual World Assembly, made up of delegates designated by the governments of the

181 OIE Member Countries. The OIE also provides significant surveillance and capacity-building initiatives to its Member Countries to support implementation of these standards.

The OIE is led by its elected Director General with a headquarters based in Paris and regional and sub-regional offices on every continent. OIE staff work to implement resolutions passed by the World Assembly, which are developed with the support of elected specialist commissions.

Today, the OIE maintains permanent relations with 71 other international and regional organizations, such as the United Nations Food and Agriculture Organization (FAO), the World Health Organization (WHO), and the World Trade Organization (WTO). The OIE, WHO and FAO form the Tripartite collaboration, for which combating AMR is a shared priority. In these partnerships, the OIE represents, informs on and sets standards for the animal health contribution to the global One Health initiative.

The role of the OIE in combating AMR

The availability and use of antimicrobial agents has transformed the practices of human and animal medicine, making treatable infections that were once lethal. Spectacularly, antibiotics have advanced global public health, animal health, food safety and

food security, and are a common good to humanity. However, the emergence and ever-increasing development of AMR has required all sectors worldwide to re-evaluate the use of antibiotics, particularly their overuse, in order to design ways to control antibacterial resistance and sustain necessary antibiotic efficacy.

Antibiotic resistance is a significant threat to animal health and welfare. Veterinary treatment failures for resistant infections threaten the well-being of individual animals, as well as the safety and security of the food systems that are built on their health and capacity for production. Given the movement of humans, animals and the bacteria they carry, a global and interdisciplinary coordination is necessary to curb the development of resistance patterns that might one day render antibiotics useless to fight common infections.

For over 20 years, the OIE has worked with its Member Countries and alongside its counterparts in standard-setting for the agricultural (FAO) and human health sectors (WHO) in combating antimicrobial resistance. In 2004, the OIE *ad hoc* Group on Antimicrobial Resistance was formed. This committee of international experts, including representatives of WHO and FAO, has since advised the OIE on the implementation of its work against AMR, such as the development and regular updating of the OIE List of Antimicrobial Agents of Veterinary Importance (1). The List also includes recommendations on the use of the antimicrobial agents considered the most critical for human and animal health. The *ad hoc* Group provides expertise towards writing and updating the chapters relevant to the responsible and prudent use of antimicrobials in the OIE Terrestrial Animal Health Code (2), Aquatic Animal Health Code (3) and Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (4). Code chapters include guidelines for both terrestrial and aquatic animals on: harmonization of national AMR surveillance and monitoring programmes, monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals, responsible and prudent use of antimicrobial agents in veterinary medicine, and risk analysis for AMR arising from the use of antimicrobial agents in animals. The Manual of Diagnostics Test and Vaccines provides technical specifications for laboratory methodologies for bacterial antimicrobial susceptibility testing.

Recognizing the necessity of a One Health approach in the face of this multidisciplinary challenge, AMR is also a priority issue of the OIE-FAO-WHO Tripartite partnership. Addressing the needs and challenges of each sector, the Tripartite relationship drives a unified development of policies and tools to support the efforts of Member Countries in combating AMR. Together, the Tripartite promotes the implementation of the Global Action Plan (GAP) on AMR, developed by WHO in close collaboration with the OIE and FAO. The GAP emphasizes

the interconnectedness of the health of humans, animals and ecosystems, and promotes collaboration between stakeholders in all sectors. The three Directors General of the Tripartite also addressed the United Nations General Assembly in September 2016 at a High-Level Meeting on AMR, resulting in the collective commitment of global leaders to fight AMR together through this multisectoral approach.

The OIE strategy on AMR and the prudent use of antimicrobials

Based on a mandate from the World Assembly of Delegates (Resolution No 36 of 84th General Assembly, 2016), the OIE published its official strategy encompassing the scope of its activities against AMR. “The OIE Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials” is defined by four key objectives (5):

Objective 1: Improve awareness and understanding

A comprehensive and shared understanding of the role of antibiotics and the global threat of AMR among Member Countries, veterinarians, farmers, stakeholders and citizens is crucial to reducing the occurrence of resistant bacteria in animals. The OIE supports its Member Countries through expansion of its portfolio of guidance, education and scientific reference materials. Additionally, targeted communications and advocacy materials are developed on the risks of AMR, and strategies to reduce use and slow the spread of resistant organisms. This includes promoting awareness of AMR, particularly through veterinary statutory bodies and veterinary education establishments, which encourages a professional culture that supports the principles of responsible and ethical use of antimicrobials.

Organizing workshops, conferences and symposia is also a significant component of the OIE’s work against AMR. In March 2013, the OIE hosted the first Global Conference on the Responsible and Prudent Use of Antimicrobial Agents, which provided a forum for presentation and discussion on possible ways to fight the development of AMR at regional, national and international levels. The recommendations of that important meeting led directly to insistence on the therapeutic goal of antimicrobial treatment, emphasis on the important role of veterinarians, continued capacity building in Member Countries, and strengthened collaboration with WHO and FAO. The creation of the first global database on the use of antimicrobials in animals was also part of the recommendations.

Objective 2: Strengthen knowledge through surveillance and research

Establishing methods for quality surveillance is a priority of the OIE strategy, as detailed information on the consumption

and outcomes of antimicrobial use in animals is necessary to inform standards for their use. Evaluation missions by OIE Performance of Veterinary Services (PVS) found that in many countries, both legal and counterfeit antimicrobial drugs were widely available and their distribution and use was loosely controlled and unmonitored. Such practices greatly increase the risk of the development and spread of resistant microbes in the animal sector.

Since 2015, following Resolution No 26 on Combating Antimicrobial Resistance and Promoting the Prudent Use of Antimicrobial Agents in Animals, the World Assembly of Delegates has mandated and prioritized the development of a global database on the use of antimicrobials in animals, which is supported by FAO and WHO as part of the Global Action Plan.

The database is the first attempt to establish baseline information on global antibiotic consumption in animals, which is vital for informing future policies to regulate their use. The OIE Annual Report on the Use of Antimicrobial Agents in Animals, the first of which was published in December 2016 (6), will allow the OIE and its Member Countries to assess trends over time and evaluate the success of actions taken to promote the responsible and prudent use of antimicrobial agents. In the process of building this database, the OIE supports its Member Countries in developing and implementing national monitoring systems for antimicrobial use and the emergence of resistant organisms.

In time, this global database will be linked to the World Animal Health Information System (WAHIS), the OIE's online reporting tool for information on animal populations and disease. The WAHIS platform analyses information in real time to notify Member Countries of relevant epidemiological events and provide regular updates on the status of OIE-listed diseases in their territory. The linkage of these two databases will ultimately allow data on antimicrobial use to be analysed in the context of animal populations by country and region.

Supporting research is the second and equally significant component of this objective. The OIE has and will continue to guide and support research into alternatives to antibiotics. Importantly, these alternatives must be developed to ensure that a reduction of antibiotic use in animals does not come at the expense of animal welfare, or the production of meat, milk and eggs, necessary to feed the world's growing population. The OIE has supported the organization of two International Symposia on Alternatives to Antibiotics, the second of which was held at OIE headquarters from 12–15 December 2016 (7). These conferences provided a scientific forum for the sharing of new technologies that might reduce the need for antibiotics in animals, and actionable regulatory and funding strategies for their development into usable products. In this effort, and in others, the OIE works to identify and pursue opportunities for

public-private partnerships in AMR research.

Objective 3: Support good governance and capacity building

Ensuring the efficacy of antimicrobial agents to treat animal diseases requires a highly competent veterinary network. Importantly, well-trained veterinarians and veterinary para-professionals must be at the forefront of national and regional efforts to improve animal health and welfare, and stewardship of antimicrobial products. At a clinical level, stewardship includes appropriate timing and dosage of prescription. At a national level, governmental veterinary services must ensure that antibiotic products are safe, are of ensured quality, and are used on the prescription of a veterinarian.

To address the technical authority and capability of Member Countries' veterinary services, the OIE has developed the PVS Pathway. The OIE PVS Pathway is a global programme for the sustainable improvement of a country's veterinary services in compliance with OIE international standards. The PVS Pathway allows for the evaluation of regulations for veterinary medical products for terrestrial and aquatic animals, biologicals and residue monitoring, as well as the general competency and capacity of resourcing, laboratories, veterinarians and veterinary para-professionals. This information is essential to continued improvement of veterinary services.

Following a PVS evaluation in a Member Country, the OIE provides guidance and support to ensure that national veterinary services have the capacity for improved implementation of OIE standards. An example of this support is the OIE Laboratory Twinning Programme, which pairs national laboratories in developing and in-transition countries with OIE Reference Laboratories, to provide scientific expertise in the development of sanitary standards. This resource provides developing laboratories with more ready access to technical support while they progress towards stronger compliance with the standards of the OIE.

Member Countries are additionally engaged through regular training on Focal Points on Veterinary Products, which keeps relevant government officials informed on the most up-to-date standards for the regulation of veterinary medicines, including antimicrobial agents. Such training also provides opportunities to establish direct links between Focal Points and the OIE, and to offer support processes.

Finally, the OIE promotes good governance for the prudent use of antimicrobials through the provision of assistance and leadership to Member Countries developing their national action plans and policies governing antimicrobial use in animals. The tools for this support, developed in coordination with WHO and FAO in line with the Global Action Plan, promote the One Health approach and the interconnectedness of the health of humans, animals, plants and the environment.

Objective 4: Encourage implementation of international standards

OIE standards and guidelines are formed and regularly updated in consultation with subject matter experts from around the world, and as such, reflect the best available science. The OIE Terrestrial and Aquatic Codes and Manuals provide a global reference for the consistent regulation of antimicrobials, for the promotion of their responsible and prudent use, and for associated surveillance, monitoring, risk analyses, and reporting. References also address strategies for the reduction of disease, essential to diminishing the need for antibiotic use in animals, such as improving biosecurity and standards for animal health and welfare.

Success in these activities is critical to building trust and confidence in the livestock sectors, and to slow the emergence and spread of AMR globally. Harmonization achieved through shared standards also ensures the generation of comparable data between sectors, countries and regions, essential to properly understanding the threat of AMR.

Looking ahead

In line with the principles of its Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials, the OIE will continue to pursue new opportunities to support its Member Countries in promoting animal health and welfare, and utilising antibiotics responsibly and prudently. Technical Item 1 of the 2017 General Session titled “Global action to alleviate the threat of antimicrobial resistance: progress and opportunities for future activities under the One Health initiative” addressed the current situation on antimicrobial resistance mitigation initiatives in Member Countries, which was reported by each country through a questionnaire. The results reflected the situation in Member Countries and informed on areas where support from the OIE would be beneficial in the future. At the 2017 General Session, the Assembly also adopted Resolution No 38, endorsing eleven recommendations for future activities under the “One Health” initiative. These include continuing data collection, specific recommendations on use of antimicrobials of critical importance, and the phasing out of the use of antibiotics for growth promotion in the absence of risk analysis. The Resolution also emphasises the need for collaboration with Tripartite partners and Codex Alimentarius delegates to ensure sustainable coordination in the development and implementation of international standards.

Meanwhile, data collection is already in progress for the second OIE Annual Report on the Use of Antimicrobial Agents in Animals, which will progress further in its level of analysis each year. Currently, experts are working on a formula for animal biomass to be used as a denominator in making comparisons between antibiotic use in animals by region, and to human consumption patterns. As more data is collected,

reports will include meaningful assessments of trends over time.

In fulfilment of its mandate, the OIE will continue to conduct training for Focal Points for veterinary products and carry out PVS-related evaluations, gap analysis and legislation missions in Member Countries, supporting the implementation of OIE standards worldwide, in countries and regions with vastly diverse situations and needs.

Conclusion

Antibiotic resistance and the sustainable use of antibiotic agents are global issues, which cannot be resolved completely by any organization or government alone. Intergovernmental organizations like the OIE play a crucial role in uniting countries in this shared effort, the success of which we are all deeply invested in. In addition to developing standards for the responsible and prudent use of antimicrobial agents in animals and surveillance activities necessary for monitoring antimicrobial use and resistance patterns, the OIE supports its Member Countries in achieving these essential goals.

Antimicrobials are powerful tools, whose efficacy must be safeguarded with the promotion of the principles of responsible and prudent use. The success of the global agricultural venture is dependent on our ability to sustain animal health and welfare, which rely on our ability to treat infectious disease appropriately. It is not too late to combat AMR while also protecting the fundamental role antibiotics play in human and animal health, animal welfare, food safety and food security. At this critical juncture, the international community will work together towards this complex and vital goal. ■

Dr Elisabeth Erlacher-Vindel graduated from the Veterinary University, Vienna, Austria. She was first employed and obtained her Doctor's Degree at the Institute of Breeding and Genetics in Vienna, Austria and later worked in Paris at the Pasteur Institute. After having worked as a field veterinarian in different countries, she worked in the French Professional Dairy Organization, where she became Head of the Food Safety and Environment Unit and Deputy Director of the Scientific Department. She joined the World Organisation for Animal Health (OIE) in 2008 as Deputy Head of the Scientific and Technical Department and became Head of the Science and New Technologies Department in 2016. Dr Erlacher-Vindel is also the OIE Focal Point on Tripartite (FAO-OIE-WHO) activities on AMR.

Professor Jacques Acar, MD, is a member of the WHO Advisory Group on Integrated Surveillance of Antimicrobial Resistance (AGISAR) and Senior Expert at the World Organisation for Animal Health (OIE) Paris, France. Dr Acar trained at the Pasteur Institute and at Harvard Medical School. He has 45 years of experience

in antibiotic resistance and has been involved in AMR in many countries. He is a founding member and former President of the International Society of Infectious diseases (ISID) and of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID). Dr Acar set up with T O'Brien at Harvard University, one of the earliest systems of AMR surveillance in hospitals in 1970. In 1981, with Stuart B Levy, he started APUA; he also initiated the European Study Group for Antibiotic Resistance (ESGAR) with Professor F Baquero. Since 1999, Dr Acar, with the ad hoc Committee at the OIE, updates the chapters of the "Terrestrial Animal Code" related to antibiotic usage and responsible use. He is

also an Expert Adviser at the Fleming Fund and a founding member of WAAAR.

Dr Margot Raicek obtained a BSc from Wesleyan University, and a Doctorate in Veterinary Medicine (DVM) and a Masters in Public Health (MPH) from Tufts University. After completing internships with USDA Veterinary Services (APHIS-VS) and Food Safety Inspection Service (FSIS), she came to the OIE as an intern, and now is Chargée de Mission, with the Science and New Technologies Department, focusing on AMR.

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