WORLD ORGANISATION FOR ANIMAL HEALTH
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REPORT OF THE MEETING OF THE OIE WORKING GROUP ON ANTIMICROBIAL RESISTANCE

Paris (via Zoom), 13-15 October 2020

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1 Opening

The OIE Working Group on Antimicrobial Resistance (AMR) (hereafter referred to as 'the Group') met from 13th to 15th October 2020 via an on-line application, 13:00 – 15:00 (Central European Time), each of the three days, coordinated by the OIE Headquarters in Paris, France.

Dr Matthew Stone, OIE Deputy Director General International Standards and Science, welcomed the Group members and thanked them for their participation in the Group. He recognised the challenge of participating in and organising online meetings, noting that there has been an increasing drive for professionalism of the OIE Secretariat which includes a commitment to ensuring advancement in organising online meetings. He reminded the Group that the content of the meeting was confidential and requested Group members to declare any conflicts of interest that arise during the meeting. He recognised the changing situation due to COVID-19, and the restrictions that are currently placing demands on Group members. Dr Stone provided an update on recent OIE activities, including the September round of Specialist Commission meetings, for which the reports are under development and about to be released. A recent OIE Council meeting resulted in the decision that the 88th General Session in 2021 will be completely virtual. Consequently, the Working Group Chair will be asked to prepare a pre-recorded video to be released the week ahead of the General Session.

2 Adoption of the agenda and appointment of the rapporteur

The agenda was adopted without additions or revisions. The Group was chaired by Dr Tomoko Ishibashi and Dr Donald Prater acted as rapporteur. The adopted Agenda and List of Participants are presented in Appendices I and II of this report, respectively.

3 Global AMR initiatives and issues of interest for the Group

a) Multi-partner Trust Fund (MPTF) proposals

Dr Ben Davies outlined the current situation for the Multi-partner Trust Fund (MPTF) proposals. The MPTF is up and running and is financed initially by three Development Partners (UK, the Netherlands, and Sweden). The MPTF Operations Manual defines two programming cycles for proposals, a national programme and a global programme, with a current 80/20 allocation split. For all the proposals there is a two-stage process of concept notes for country level and global proposals. Full country proposals have been approved for Cambodia, Indonesia, Morocco and Ghana by the MPTF Steering Committee Meeting on 23rd September 2020. Two full country proposals (Kenya and Zimbabwe) together with five global proposals [Global Leaders, Environment, Monitoring and Evaluation (M&E), Legislation and Tripartite Integrated System for Surveillance of Antimicrobial Resistance and Use (TISSA)] have been submitted to the MPTF Steering Committee for approval decision on the 20th October 2020. Three proposals are in the process of being worked up into full proposals (Tajikistan, Peru, Sudan), and two proposals are at the concept note phase (Senegal and Ethiopia). The MPTF is an effective demonstration of collaborative Tripartite work at a global and country level.

b) One Health UN Leaders Group on AMR

Dr Matthew Stone provided an update on the global governance bodies for AMR which were recommended for creation by the Interagency Coordination Group (IACG) on AMR – the Global Leaders Group (GLG), Independent Panel of Evidence (IPE), and the Stakeholders Platform. The Tripartite focus so far has been on the GLG and the IPE. The IPE's draft Terms of Reference (ToR) (developed by an advisory group) were put out to consultation and are now being finalised by the Tripartite. The Global Leaders Group has ToR available online at the following link: https://www.who.int/news-room/articles-detail/one-health-global-leaders-group-on-antimicrobial-resistance. There was an open call for members from 21st July to 31st August which resulted in strong interest. The final selection process is ongoing and the final composition of the GLG will be announced during World Antimicrobial Awareness Week in November 2020.

c) Monitoring and Evaluation (M&E) Framework for the Global Action Plan (GAP) on AMR

Dr Ben Davies informed the Group that methodology notes for the M&E Framework were published in August 2020. The M&E framework was piloted at country level with report findings published in September 2020. Tripartite country AMR self-assessment Survey (TrACSS) 4th round data analysis is due to be completed and published in November, with the 5th round launch scheduled for the end of the year. The M&E Framework bid was submitted to the MPTF for two years of financing. The grant request focused on delivery of three components: the M&E Framework; the M&E National Action Plan (NAP) Technical Assistance to five low income countries; and Global Action Plan (GAP) global level reporting. If the grants applications are successful, the OIE will recruit a full-time M&E specialist to deliver this work.

d) Codex Task Force on AMR (TFAMR)

Dr Tomoko Ishibashi and Dr Don Prater provided an update on the work of this Task Force since the TFAMR7 in December 2019. It was reminded that the Codex TFAMR is working on two key documents based on their ToR – the review and revision of the *Codes of Practice to Minimise and Contain Antimicrobial Resistance (CAC/RCP 61-2005)*, and the development of *Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance*. There is an existing *Code of Practice* (published in 2005) which is directed towards animals only, and one of the mandates of the TFAMR was to develop a *Code of Practice* that addressed the entire food chain. The revised *Code of Practice* is a One Health risk management document, so the definitions included in this document should be One Health definitions that are relevant for human health, animal health, plant health and the environment. This document makes reference to existing OIE Standards and Guidelines. Although most of the recommendations have to do with antibacterials, some of them are also helpful for antiparasitics, antifungals, and antivirals.

During the forty-third session of Codex Alimentarius Commission (CAC43) started in September 2020, the proposed draft revision of the *Code of Practice* was adopted at step five (meaning it is now a "draft" rather than a "proposed draft"). During the session there was considerable discussion on principles related to the use of antimicrobials for production and prophylactic purposes. The *Proposed draft Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance* is at step two/three for redrafting. In the electronic working group discussion considered the extent to which the guideline should include antimicrobial use (AMU) surveillance. The next step for both documents will be the TFAMR8, postponed from December 2020 to June 2021 in South Korea. It is not yet decided if this meeting will take place in-person or virtually.

During the CAC43, it was clarified that the TFAMR should only have one more meeting, although there are electronic groups that continue to work on these guidelines. Additional meeting times during the TFAMR8 may be provided. The Executive Committee of the Codex Alimentarius Commission (CCEXEC) meets prior to the session and gives advice on the status of the work and how to progress it. The CCEXEC79 recommended that the *Proposed draft Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance* build on work already being done, and to focus the work on the highest priorities and key principles for which there is clear consensus.

e) International instruments on the use of antimicrobials across the human, animal, and plant sectors

Dr Jorge Pinto Ferreira updated the Group on an upcoming official Tripartite publication, *International instruments on the use of antimicrobials across the human, animal, and plant sectors*, for which the lead is Dr Peter Bayer (WHO observer of this Group). This document is now being finalised for publication, aiming to be launched at the World Antimicrobial Awareness Week in November 2020.

This document aims to summarise legal documents and instruments at the global level that regulate international use of antimicrobials in the human, animal, and plant sectors, as well as environment. There is a focus on instruments that have implementable standards. The two main chapters of this document concern compilation of instruments on AMU (human, animal, plant) and environment, and monitoring implementation of these standards. There are annexes of the documents that provide detailed information. It was observed that the density of regulation is much higher in the animal sector than in the human health sector.

4 Other matters for consideration

The Group was updated on other topics, on which it can be involved in the future.

a) *Terrestrial Animal Health Code*: revision of Chapter 6.10

Dr Jorge Pinto Ferreira provided an update on the request received by the Code Commission for revision of *Chapter 6.10 Responsible and prudent use of antimicrobial agents in veterinary medicine* of the *Terrestrial Animal Health Code*. The Code Commission discussed this topic most recently in its September 2020 meeting (Report available at https://www.oie.int/en/standard-setting/specialists-commissions-working-ad-hoc-groups/code-commission-reports/meetings-reports/). Given the importance of ensuring relevant alignments between the Codex *Code of Practice* and Chapter 6.10, and noting that the draft Codex *Code of Practice* was being presented for adoption at step five at the CAC43 in September/October 2020, the Code Commission deferred this discussion to February 2021. The Group was informed that they might need to address the revision of this chapter at a later date if the advice of the Group is requested.

b) Update on OIE work on aquaculture

Dr Dante Mateo presented the OIE's current work on aquaculture to enhance its support to Members to control AMR in aquaculture settings. A review of the current status of available OIE standards, guidelines and activities was conducted. Specific actions have been suggested to overcome the challenges identified and to enhance current tools to control AMR in aquaculture. The detailed work plan, which contains a Theory of Change, was developed in consultation with relevant OIE Departments, OIE Units and Regional Representations and will be shared with the Aquatic Animal Health Standards Commission. This work plan proposes ten activities with their respective outputs that lead to three outcomes in line with the objectives of the OIE Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials and the new OIE Aquatic Animal Health Strategy, currently under development.

c) Ongoing work on antiparasitics

Dr Maria Szabo gave a brief update on the OIE ongoing activities on antiparasitic resistance. She introduced the OIE Electronic Expert Group on Antiparasitic Resistance (EEG APR) which was set up in 2019 as one of the outcomes of OIE Training Seminars for Focal Points for Veterinary Products. The EEG APR developed a simple user-friendly survey on antiparasitic agents and resistance in terrestrial and aquatic animals which was conducted in Asia, Africa, and the Middle East in 2020. The results will serve as inputs for a publication on "Prudent use of antiparasitic agents to help to control antiparasitic resistance" planned for the summer of 2021. This could become the basis for OIE Standards or Guideline(s) for prudent and responsible use of antiparasitics if warranted. An article concerning the result of the outcome of the above-mentioned survey was published in September 2020 in the OIE News: https://oiebulletin.com/wp-content/uploads/2020/09/OIE-News-September-2020-results-of-the-survey-on-antiparasitic-agents-and-resistance-in-terrestrial-and-aquatic-animals-in-the-Africa-region.pdf. The results of the survey conducted in the Middle East will be published in the November 2020 issue of the OIE News.

After the presentation the members provided constructive comments, including to extend the animal species to be considered. The Group suggested to extend the definition of grazing animals to include wildlife, as in some regions a significant game industry exists outside of the national wildlife parks and on these game farms/conservancies anthelmintics are used liberally in antelope species, a practice that drives the development of anthelmintic resistance in wildlife. The Group also recommend to define antiparasitics, as this would also be relevant for FAO's work. Comments will be forwarded to the EEG-APR for further consideration and action.

d) Substandard and falsified veterinary medicinal products

Dr Rebecca Hibbard provided the Group with an update on the OIE's current work on the quality of veterinary products. In light of the altered working situation due to COVID-19, consideration has been given to prioritise activities in the current project proposal that could be maintained or advanced. The following items were highlighted for prioritisation:

- Engagement with Members through priority specific webinars. This activity would be planned for the regions not yet informed of the quality of veterinary products due to the postponement of the remaining 6th Cycle Training Seminars for National Focal Points for Veterinary Products.
- Creation of an information and alert system for Substandard and Falsified veterinary product**s**, with preparatory work in 2020 including validation of tools for data collection and data management and preparation of a pilot of the information and alert system.
- Exploration of options for strengthening field level surveillance of quality of veterinary products. Originally projected as a longer-term activity, this part of the quality project could be advanced at Department level in collaboration with the AMU team.

5 OIE List of antimicrobial agents of veterinary importance in animals

a) Subdivision into animal species

The Group noted the background of the current work as follows:

The development of an appendix of the OIE list of antimicrobial agents of importance for poultry is a continuation of a project that was originally conceptualized and recommended during two consecutive expert meetings organized by the Food and Agriculture Organization of the United Nations (FAO), the World Organisation for Animal Health (OIE), and World Health Organization (WHO). The two workshops were respectively convened in Geneva in 2003 and in Oslo in 2004 to address the public health consequences associated with the use of antimicrobial agents in food producing animals.

The first OIE List of Antimicrobial Agents of Veterinary Importance was adopted by the OIE World Assembly of OIE Delegates in May 2007. The list was further updated and adopted in May 2013, May 2015, May 2018 and May 2019 by the World Assembly.

The OIE List of Antimicrobial Agents of Veterinary Importance was discussed at the 2nd OIE Global Conference on Antimicrobial Resistance and Prudent Use of Antimicrobial Agents that took place in Marrakesh, Morocco in October 2018.

The participants of the OIE Global Conference recommended that the list should be further developed, and that consideration should be given to subdivide the List to refer to the different animal species.

This task was delegated to the OIE Working Group on Antimicrobial Resistance, and the Group dedicated the first species specific technical reference document to poultry, which can in future potentially be adapted to other animal species.

The objective of this poultry technical reference document is to provide additional information without serving as a treatment guideline. It can contribute to the development and update of national treatment guidelines, advice on prevention and best practice management, risk management, and risk prioritization to minimize and contain AMR.

The technical reference document for poultry is focused on globally and commercially important poultry species only, not all the avian species that are accommodated by the 'AVI' designation in the OIE List of Antimicrobial Agents of Veterinary Importance. It should be kept in mind that the antimicrobials included in this technical reference document may not all be available or appropriate for use in all poultry species, including egg-laying birds. For example, specific requirements apply to the authorisation of medicines for poultry used in egg-production to account for the transfer of residues from treated birds into the eggs.

i) Poultry – update from the *ad hoc* Group

The Group was presented with the outputs of the work conducted by the OIE Poultry *ad hoc* Group (a task specific sub group of the Working Group), on the development of the *Poultry Technical Reference Document.*

The Group had produced a draft list of poultry diseases and antimicrobial agents that was submitted to external experts specialising in this field and was accompanied by specific questions. Comments from the experts were compiled and analysed by the Poultry *ad hoc* Group, and complemented by data available from the OIE database on antimicrobial agents intended for use in animals, to prepare the current draft of the *Poultry Technical Reference Document*.

During this meeting, the current draft of the *Poultry Technical Reference Document* was reviewed by the Group. The title of the document was suggested to be *Technical Reference Document Listing Antimicrobial Agents of Veterinary Importance for Poultry* (hereafter referred to in shortened form as the *Poultry Technical Reference Document*), with an additional heading indicating that this document is an Appendix to the *OIE List.* The Group made several changes to the introductory material, agreeing to remove the background and scope material, as background information was already provided in the *OIE List*, but to keep a reworded methodology to explain the process used to draft the document. It was agreed to remove the specific recommendations included in the introductory material and to replace this with a sentence making reference to related recommendations already present in OIE Standards and the OIE List of Antimicrobial Agents of Veterinary Importance.

The updated *Poultry Technical Reference Document* can be found in Appendix III of this report.

ii) Aquatic species

The Group agreed that the next species for which a *Technical Reference Document Listing Antimicrobial Agents of Veterinary Importance* should be created as an Annex to the *OIE List* would be aquatic species, using a methodology similar to the one used for the poultry one. At the same time, it was noted that some additional approaches beyond those used for the *Poultry Technical Reference Document* may need to be used to accommodate the wide diversity of aquaculture species. Dr Donald Prater, Prof. Moritz van Vuuren, and Dr Gérard Moulin expressed interest in participating in the future Aquatic Technical Reference *ad hoc* Group, and Ms Barbara Freischem advised she would recommend a suitable expert from the European Medicines Agency (EMA). This *ad hoc* Group will function in a very similar format to Poultry Technical Reference *ad hoc* Group.

iii) Prioritisation of other species

Of the different animal species currently mentioned in the *OIE List of Antimicrobial Agents of Veterinary Importance* (avian, bee, bovine, caprine, camel, equine, rabbit, ovine, fish, and swine), the Group decided that the species addressed after aquatic species should be swine, followed by bovine. This decision was made by considering the relative biomass of different species (bovine and swine are the two largest species for biomass according to the OIE AMU database), the relative amount of global use of antimicrobial agents and the relative complexity of the production systems used for these two species.

Dr Stephen Page, Prof. Moritz van Vuuren, Dr Gérard Moulin and Ms Barbara Freischem expressed interest in participating in the Swine Technical Reference *ad hoc* Group.

The Group discussed the possibility of including antimicrobial agents for use in companion animal species (specifically cats and dogs). Although the current *OIE List* includes only food-producing species, the Group decided to consider the inclusion of these species which have closer and direct physical contact to humans in the future, given the recommendation from the 2nd OIE Global Conference on AMR and Prudent Use of Antimicrobial Agents to consider the inclusion of antimicrobials only used in companion animals.

b) Molecule assessment for potential future inclusion

The Poultry Technical Reference *ad hoc* Group had prepared a list of molecules for which further guidance from the Group was needed, where information provided by the external experts, data available from the OIE database on antimicrobials agents intended for use in animals, and the reference to poultry species in the *OIE List* differed in some way. The Group reviewed this list of molecules and made the following decisions:

i) The Group proposed that the following molecules (already on the *OIE List* with reference to avian species) should be included as "used" in *the Poultry Technical Reference Document*, and to keep the reference to avian species in the *OIE List* unchanged:

- Amoxicillin + clavulanic acid
- Carbomycin
- Ceftiofur
- Ciprofloxacin
- Dihydrostreptomycin
- Mirosamycin
- Ofloxacin
- Oxolinic acid
- Roxarsone
- Nitarsone

The Group noted that for the molecules "Roxarsone" and "Nitarsone", an explanatory note should be added acknowledging that these products are registered but being withdrawn in certain markets, due to carcinogenicity. It may be appropriate to withdraw these molecules from the *Poultry Technical Reference Document* and the *OIE List* at a later date, but the Group agreed that this discussion should be deferred.

ii) The Group proposed that the following molecules (already on the *OIE List* but without reference to avian species) should be included as "used" in *the Poultry Technical Reference Document*, and to add a reference to avian species in the *OIE List*:

- Cefalexin
- Novobiocin
- Ormetoprim + Sulfadimethoxine
- Sulfadoxine

iii) The Group proposed that the following molecules (already on the *OIE List* with reference to avian species) should not be included in the *Poultry Technical Reference Document*, and to remove the reference to avian species in the *OIE List*:

- Ampicillin + sulbactam
- Bicozamycin
- Ceftriaxone
- Danofloxacin
- Fortimycin
- Josamycin
- Marbofloxacin
- Nosiheptide
- Oxacillin
- Pirlimycin
- Polymyxin B
- Sulfanilamide
- Terdecamycine
- Valnemulin

iv) The Group agreed that it may be appropriate to add the following molecules to the *OIE List* at a later date when further Technical Reference Documents (for other animal species) are prepared, but that this discussion should be deferred

- Amprolium
- Clopidol
- Decoquinate
- Diclazuril
- Ethopabate
- Halofuginone
- Nicarbazin
- Pyrimethamine + Sulfaquinoxaline
- Robenidine
- Sulfathiazole
- Toltrazuril
- Zoalene

v) The Group considered the following molecules (not currently on the *OIE List* for any species) should currently not be added to either the *Poultry Technical Reference Document* or the *OIE List* at this point in time:

- Azithromycin
- Bambermycin
- Cefadroxil
- Levofloxacin

The Group agreed that discussion on further additions may need further consideration at a later date when further Technical Reference Documents are prepared, but that this discussion should be deferred.

vi) The Group proposed that the spelling of the molecule "Sulfadimerazin" should be corrected to "Sulfadimerazine" (synonyms: Sulfadimidine, Sulfamethazine), keeping, as it is currently, the molecule in the OIE List, and the reference to avian species.

In addition to these decisions, it was noted that some molecules for inclusion in the *Poultry Technical Reference Document* are only used in combination with other molecules. The Group agreed that it may be useful to include a general explanatory comment outlining the approach to combinations, and to include this information to note in comments with an explanatory sentence. The Group also noted that there would need to be some explanatory text in the methodology section noting that molecules were included if they were found to be used in any one country.

c) Future perspectives

The discussed future perspectives of the OIE List of Antimicrobial Agents of Veterinary Importance have been addressed in the previous sections of this report, namely, for example, the development of Appendices dedicated to aquatic species, swine and cattle.

6 OIE Antimicrobial Use (AMU) database: current stage, future development, and Technical Reference Group

a) Current stage

Dr Delfy Góchez provided the results of the 5th round of the AMU Data Collection that closed in May 2020 with the participation of 160 countries: 156 from OIE Members (n = 182; 86%), one non-contiguous territory of an OIE Member and three non-OIE Members. The 5th AMU Report will be published in early 2021. The 6th AMU round was officially launched on 16 September 2020 and the deadline for submitting the data is on 1st December 2020. The second version of the AMU calculations Tool was presented to the Group; it is expected that more countries will be using the tool to report their data to OIE.

b) IT project

Mr Mduduzi Magongo updated the group on the IT project for the AMU database. He indicated that the official project kick-off was the 18th of June 2020. The workshop phase has just been concluded and the development phase was due to start on the 19th of October 2020. He also highlighted that the Agile System Development Methodology allowed OIE and the IT supplier, ASI Group, to work in proximity and to continuously adapt the solution to OIE Members' requirements. The first phase of the AMU interactive system is expected to be ready for use by Members for the 8th round of AMU data collection (2022).

c) Future development

Dr Morgan Jeannin presented the Group with considerations for the future development of the AMU data collection as part of the response to the recommendations of the 2nd OIE Global Conference on AMR and Prudent Use of Antimicrobials. These recommendations include the ability for the AMU data collection "to accommodate data submissions by animal species" and therefore, further refine the granularity of the reported data. It must be considered that species level reporting could be applied to AMU data originating from different levels of data sources (imports or sales as estimations and for prescriptions or field level data as captured information). This feature was not included in the first phase of development of the AMU interactive system but should be considered for inclusion in the future development phases.

Moreover, these recommendations also pertain to the possibility of "addition of data from field studies" in the future AMU database system. It was also noted that several countries had recently asked the OIE for guidance on collecting AMU data at field level for projects at a national level. The OIE provided technical guidance to assist some Members regarding the minimum information that needs to be collected at field level in order to calculate AMU data, and to facilitate harmonisation between approaches used by different countries. It was clarified that field level AMU data collection was a new area that the OIE is exploring, and that this level of data collection was not yet included in the OIE's annual AMU data collection.

The Group considered that information on AMU data collection at field level could be relevant for future updates to *Chapter 6.10 Responsible and prudent use of antimicrobials* in the *OIE Terrestrial Animal Code*, noting that the current chapter is mainly focused on sales rather than use data. It was observed that some countries are already able to collect data at field and at species level, and that where protocols exist, harmonisation could begin around the key data elements used.

d) Technical Reference Group

The Group was informed that the formal invitation letters to the proposed members of this Technical Reference Group were sent. Positive feedback was received from all the invitees. The Group agreed that the OIE Secretariat should organise the first online meeting of this Technical Reference Group in November and that the main topic of this meeting should be change management (management of the change from an Excel based data collection to a database).

7 Review of the work programme

The work programme was reviewed by the Group and updated. It is available in Appendix IV.

8 Any other business

No other business was discussed.

9 Date of next meeting

The proposed date of the next meeting is April 6th – 9th 2021 by remote connection. The Group agreed to extend the meeting schedule to take place across four days rather than three, with an additional half hour for the second and third days, to allow for the inclusion of an open discussion and brainstorming session on the final day about possible issues which the Group may recommend the OIE to take up.

10 Adoption of report (online)

The Group adopted the draft report via online consensus.

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…/Appendices

Appendix I

MEETING OF THE OIE WORKING GROUP ON ANTIMICROBIAL RESISTANCE

Paris (via Zoom), 13-15 October 2020

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Day 1 (October 13)

1. Opening
2. Adoption of the agenda and appointment of rapporteur
3. Global AMR initiatives and issues of interest for the group
    a) MPTF proposals
    b) One Health Global Leaders Group AMR
    c) M&E framework
    d) Codex TFAMR
    e) International instruments on the use of antimicrobials across the human, animal and plant sectors
4. Other matters for consideration
    a) Terrestrial Animal Health Code: revision of chapter 6.10
    b) Update on OIE work on aquaculture
    c) Ongoing work on antiparasitics
    d) Substandard and falsified veterinary products
5. Any other business

Day 2 (October 14)

6. OIE List of antimicrobial agents of veterinary importance in animals: refining classification of molecules
    a) Subdivision into animal species
        - Poultry – update from the ad hoc Group
        - Aquatic species
        - Prioritisation of other species
    b) Molecules assessment for potential future inclusion
    c) Future perspectives

Day 3 (October 15)

7. OIE Antimicrobial Use (AMU) database:
    a) Current stage
    b) IT project
    c) Future development
    d) Technical Reference Group
8. Review of the work programme
9. Date of next meeting
10. Adoption of report

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MEETING OF THE OIE WORKING GROUP ON ANTIMICROBIAL RESISTANCE

Paris (via Zoom), 13-15 October 2020

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Technical Reference Document Listing Antimicrobial Agents of Veterinary Importance for Poultry

An appendix to the OIE List of antimicrobial agents of veterinary importance

Scope

The objective of this *Technical Reference Document Listing Antimicrobial Agents of Veterinary importance for Poultry* is to provide additional, species specific information without serving as a treatment guideline. By identifying antimicrobial agents used in poultry, it can contribute to the development and update of national treatment guidelines, advice on prevention and best practice management, risk management, and risk prioritisation to minimise and contain AMR.

This document is focused on commercially important poultry species only, and does not include all the avian species accommodated by the 'AVI' designation in the OIE main List of Antimicrobial Agents of Veterinary Importance. It should be kept in mind that the antimicrobials listed in this technical reference document may not all be available or appropriate for use in all poultry species. For example, specific requirements apply to the authorisation of medicines for poultry used in egg-production to account for the transfer of residues into the eggs from treated birds.

It is acknowledged that the situation is very diverse in different regions for licensing, availability, off-label use, and resistance to antimicrobial agents, and that the general information provided in this document should be interpreted in light of the local context.

Poultry-related recommendations stated in the OIE Standards and Guidelines (namely on the OIE List of Antimicrobial Agents of Veterinary Importance) should be considered alongside this document.

Methodology to prepare this document

An *ad hoc* Group was nominated by the OIE to work on the development of the Poultry Technical Reference Document. The *ad hoc* Group's members consisted of members of the Working Group on AMR, and consulted with international non-governmental organisations with whom the OIE has established a cooperation agreement.

As a first step, an evidence-guided rapid review was undertaken by the *ad hoc* Group to prepare a preliminary table of important bacterial pathogens of poultry and the antimicrobial agents used to treat these pathogens.

For the preparation of this table of poultry pathogens, four globally focused reviews of poultry disease published in the last 10 years were consulted for poultry pathogens and recommended treatments. The most detailed review was that contained within Diseases of Poultry (Swayne et al 2020). To commence the project, a thorough review of the chapters devoted to bacterial diseases (Chapters 16 -24, pages 719-1107) was undertaken and a table of disease names, causative pathogens, target poultry species and treatment options was compiled.

To assess the completeness of the information extracted from Swayne et al (2020), the relevant content in three contemporary guidance documents (Guidelines for Antimicrobial Use in Poultry 2009; Antimicrobial Drug Use in Poultry 2013; and the Terrestrial Animal Health Code 2019) was examined and new information integrated into the summary draft table of pathogens. The table compiled from this rapid review included 83 pathogens of poultry, including chicken, turkey, duck, quail, peacock, guinea fowl, goose and pigeon.

Additional sources of information used were:

- The original answers to an OIE questionnaire sent to OIE Members in 2006, which formed the basis for the current OIE List of Antimicrobial Agents of Veterinary Importance. The answers to this questionnaire contain information on antimicrobials used to treat pathogens by animal species.
- List of antimicrobials authorised for the named species in countries
- Existing specific treatment guidelines
- OIE *ad hoc* Group report on vaccines that can reduce the use of antimicrobials
- OIE *Terrestrial* and *Aquatic Animal Health Codes*

The end product of the review was a table presenting the following information:

- Disease;
- Pathogen involved;
- Antimicrobial class;
- Antimicrobial sub class;
- Molecule;
- Comments and other considerations.

Once this table was established by the poultry *ad hoc* Group, it was submitted to a panel of poultry experts. After this external review, the OIE poultry *ad hoc* Group took into consideration the feedback received from the experts to prepare the final draft of the Poultry Technical Reference Document that was further validated by the OIE Working Group on AMR, and afterwards endorsed by the OIE hierarchy.

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Abbreviations:

VCIA: Veterinary Critically Important Antimicrobial Agents
VHIA: Veterinary Highly Important Antimicrobial Agents
VIA: Veterinary Important Antimicrobial Agents

Annexes:

Annex 1: List of major pathogens and diseases affecting poultry species

Annex 2: Antimicrobial classes used in veterinary medicine for poultry infections

ANTIMICROBIAL AGENTS (CLASS, SUB-CLASS)	Categorisation			Molecules	Species	Used/not used in poultry	Specific comments for poultry by class
	VCIA	VHIA	VIA				
AMINOCOUMARIN			x	Novobiocin	**AVI**, BOV, CAP, OVI, PIS	Used	Novobiocin is used to treat staphylococcal infections in poultry.
AMINOCYCLITOL	x			Spectinomycin	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	Used in combination with lincomycin for colibacillosis (multisystemic syndromes; omphalitis, airsacculitis, fowl cholera).
AMINOGLYCOSIDES	x			Dihydrostreptomycin	**AVI**, BOV, CAP, EQU, LEP, OVI, SUI	Used	The wide range of applications and the nature of the diseases treated make aminoglycosides extremely important for veterinary medicine. Aminoglycosides are of importance in the following diseases: colibacillosis, coryza, necrotic enteritis, gangrenous dermatitis, prevention of infection with *Histomonas* spp. Apramycin and fortimycin are currently only used in animals. Few economic alternatives are available.
				Streptomycin	API, **AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	
AMINOGLYCOSIDES + 2 DEOXYSTREPTAMINE	x			Amikacin	EQU	Not used	
				Apramycin	**AVI**, BOV, LEP, OVI, SUI	Used	
				Fortimycin	BOV, LEP, OVI, SUI	Not used	
				Framycetin	BOV, CAP, OVI	Not used	
				Gentamicin	**AVI**, BOV, CAM, CAP, EQU, LEP, OVI, SUI	Used	
				Kanamycin	**AVI**, BOV, LEP, OVI, SUI	Used	
				Neomycin	API, **AVI**, BOV, CAP, EQU, LEP, OVI, SUI	Used	
				Paromomycin	**AVI**, BOV, CAP, OVI, LEP, SUI	Used	
				Tobramycin	EQU	Not used	
AMPHENICOLS	x			Florfenicol (vet only)	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	The wide range of applications and the nature of the diseases treated make phenicols extremely important for veterinary medicine. This class represents a useful alternative in respiratory infections of poultry.
				Thiamphenicol	**AVI**, BOV, CAP, OVI, PIS, SUI	Used	
ANSAMYCINS - RIFAMYCINS		x		Rifampicin	EQU	Not used	
				Rifaximin	BOV, CAP, EQU, LEP, OVI, SUI	Not used	
ARSENICALS			x	Nitarsone	**AVI**, SUI	Used	Arsenicals have been withdrawn from markets in some countries/regions due to carcinogenicity problems.
				Roxarsone	**AVI**, SUI	Used	
BICYCLOMYCIN			x	Bicozamycin	BOV, PIS, SUI	Not used	
CEPHALOSPORINS		x					Cephalosporins are subject to specific OIE recommendations. In some countries/regions use of cephalosporins in poultry is not allowed or strongly restricted.
Cephalosporin 1st G				Cefacetrile	BOV	Not used	
				Cefalexin	**AVI**, BOV, CAP, EQU, OVI, SUI	Used	
				Cefalonium (vet only)	BOV, CAP, OVI	Not used	
				Cefalotin	EQU	Not used	
				Cefapyrin	BOV	Not used	
				Cefazolin	BOV, CAP, OVI	Not used	
Cephalosporin 2nd G				Cefuroxime	BOV	Not used	
Cephalosporin 3rd G	x			Cefoperazone	BOV, CAP, OVI	Not used	
				Ceftiofur (vet only)	**AVI**, BOV, CAP, EQU, LEP, OVI, SUI	Used	
				Ceftriaxone	BOV, OVI, SUI	Not used	
Cephalosporin 4th G				Cefquinome (vet only)	BOV, CAP, EQU, LEP, OVI, SUI	Not used	
FUSIDANE			x	Fusidic acid	BOV, EQU	Not used	

ANTIMICROBIAL AGENTS (CLASS, SUB-CLASS)	Categorisation			Molecules	Species	Used/not used in poultry	Specific comments for poultry by class
	VCIA	VHIA	VIA				
IONOPHORES		x		Lasalocid	**AVI**, BOV, LEP, OVI	Used	Ionophores are essential for animal health because they are used to control intestinal parasitic coccidiosis (*Eimeria* spp.) where there are few or no alternatives available, as well as necrotic enteritis. Ionophores are critically important in poultry. This class is currently only used in animals.
				Maduramicin	**AVI**	Used	
				Monensin	API, **AVI**, BOV, CAP	Used	
				Narasin	**AVI**, BOV	Used	
				Salinomycin	**AVI**, LEP, BOV, SUI	Used	
				Semduramicin	**AVI**	Used	
LINCOSAMIDES		x		Lincomycin	API, **AVI**, BOV, CAP, OVI, PIS, SUI	Used	Used in combination with spectinomycin for colibacillosis (multisystemic syndromes; omphalitis, airsacculitis, fowl cholera).
				Pirlimycin (vet only)	BOV, SUI	Not used	
MACROLIDES	x						
Macrolides 14-membered ring				Erythromycin	API, **AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	The wide range of applications and the nature of the diseases treated make macrolides extremely important for veterinary medicine. Macrolides are used to treat *Mycoplasma* spp. infections in poultry (chronic respiratory disease (CRD), arthritis), fowl cholera, *Ornithobacterium rhinotracheale* infection (ORT), necrotic enteritis, avian intestinal spirochetosis, ulcerative enteritis (UE), gangrenous dermatitis.
				Oleandomycin	BOV	Not used	
Macrolides 15-membered ring				Gamithromycin (vet only)	BOV	Not used	
				Tulathromycin (vet only)	BOV, SUI	Not used	
Macrolides 16-membered ring				Carbomycin	**AVI**	Used	
				Josamycin	PIS, SUI	Not used	
				Kitasamycin (vet only)	**AVI**, PIS, SUI	Used	
				Mirosamycin	API, **AVI**, SUI, PIS	Used	
				Spiramycin	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	
				Terdecamycin	SUI	Not used	
				Tildipirosin (vet only)	BOV, SUI	Not used	
				Tilmicosin (vet only)	**AVI**, BOV, CAP, LEP, OVI, SUI	Used	
				Tylosin (vet only)	API, **AVI**, BOV, CAP, LEP, OVI, SUI	Used	
				Tylvalosin (vet only)	**AVI**, SUI	Used	
Macrolides 17-membered ring				Sedecamycin	SUI	Not used	
ORTHOSOMYCINS			x	Avilamycin (vet only)	**AVI**, LEP, SUI		Avilamycin is used in the treatment of many diseases including *Clostridium* spp. infections in poultry (necrotic enteritis, gangrenous dermatitis).
PENICILLINS	x						
Natural penicillins (including esters and salts)				Benethamine penicillin	BOV	Not used	The wide range of applications and the nature of the diseases treated make penicillins extremely important for poultry. Agents within this class are used in poultry to treat many diseases, *E. coli* infections (local and systemic infections, airsacculitis, arthritis), *Clostridium* spp. infections (necrotic enteritis, botulism, ulcerative enteritis) and respiratory diseases such as fowl cholera, coryza, *Riemerella anatipestifer* infection (RA), and *Ornithobacterium rhinotracheale* infection (ORT). Few economical alternatives are available.
				Benzylpenicillin	**AVI**, BOV, CAM, CAP, EQU, LEP, OVI, SUI	Used	
				Benzylpenicilline procaine/Benzathine penicillin	BOV, CAM, CAP, EQU, OVI, SUI	Used	
				Penethamate hydriodide (vet only)	BOV	Not used	
Amidinopenicillins				Mecillinam	BOV, SUI	Not used	
Aminopenicillins				Amoxicillin	**AVI**, BOV, CAP, EQU, OVI, PIS, SUI	Used	
				Ampicillin	**AVI,** BOV, CAP, EQU, OVI, PIS, SUI	Used	
				Hetacillin	BOV	Not used	

ANTIMICROBIAL AGENTS (CLASS, SUB-CLASS)	Categorisation			Molecules	Species	Used/not used in poultry	Specific comments for poultry by class
	VCIA	VHIA	VIA				
Aminopenicillin plus betalactamase inhibitor				Amoxicillin + clavulanic acid	**AVI**, BOV, CAP, EQU, OVI, SUI	Used	
				Ampicillin + sulbactam	BOV, SUI	Not used	
Carboxypenicllins				Ticarcillin	EQU	Not used	
				Tobicillin	PIS	Not used	
Ureidopenicillins				Aspoxicillin	BOV, SUI	Not used	
Phenoxypenicillins				Pheneticillin	EQU	Not used	
				Phenoxymethylpenicillin	**AVI**, SUI	Used	
Antistaphyloccocal penicillins				Cloxacillin	BOV, CAP, EQU, OVI, SUI	Not used	
				Dicloxacillin	BOV, CAP, EQU, OVI, SUI	Not used	
				Nafcillin	BOV, CAP, OVI	Not used	
				Oxacillin	BOV, CAP, EQU, OVI, SUI	Not used	
PHOSPHONIC ACID DERIVATIVES		x		Fosfomycin	**AVI**, BOV, PIS, SUI	Used	Used in the treatment of colibacillosis and necrotic enteritis.
PLEUROMUTILINS		x		Tiamulin (vet only)	**AVI**, CAP, LEP, OVI, SUI	Used	The class of pleuromutilins is essential against respiratory infections in poultry. This class is also essential against avian intestinal spirochetosis. It is also used to treat ulcerative enteritis.
				Valnemulin (vet only)	SUI	Not used	
POLYPEPTIDES		x		Bacitracin	**AVI**, BOV, LEP, SUI, OVI	Used	Bacitracin and enramycin are used for the treatment of *Clostridium* spp. infections (necrotic enteritis, gangrenous dermatitis, ulcerative enteritis (UE)).
				Enramycin	**AVI**, SUI	Used	
				Gramicidin	EQU	Not used	
Polymyxins				Polymyxin B	BOV, CAP, EQU, LEP, OVI	Not used	Polymyxins are used for colibacillosis (local and systemic infections). Colistin use is subject to specific OIE recommendations. In some countries/regions use of colistin is not allowed or strongly restricted.
				Polymyxin E (Colistin)	**AVI**, BOV, CAP, EQU, LEP, OVI, SUI	Used	
QUINOLONES							Quinolones are subject to specific OIE recommendations. In some countries/regions use of quinolones is not allowed or strongly restricted.
Quinolones 1G		x		Flumequin	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	Quinolones of the 1st generation are used in the treatment of *E. coli* infections (colibacillosis (local and systemic infections), airsacculitis, arthritis), *Mycoplasma* spp. infections (chronic respiratory disease) and *Pasteurella* spp. infections (fowl cholera).
				Miloxacin	PIS	Not used	
				Nalidixic acid	BOV	Not used	
				Oxolinic acid	**AVI**, BOV, LEP, PIS, SUI, OVI	Used	

ANTIMICROBIAL AGENTS (CLASS, SUB-CLASS)	Categorisation			Molecules	Species	Used/not used in poultry	Specific comments for poultry by class
	VCIA	VHIA	VIA				
Quinolones 2G (Fluoroquinolones)	x			Ciprofloxacin	**AVI**, BOV, SUI	Used	Quinolones of the 2nd generation (Fluoroquinolones) are used in the treatment of *E. coli* infections (colibacillosis (local and systemic infections), airsacculitis, arthritis), *Mycoplasma* spp. infections (chronic respiratory disease) and *Pasteurella* spp. infections (fowl cholera).
				Danofloxacin (vet only)	BOV, CAP, LEP, OVI, SUI	Not used	
				Difloxacin	**AVI**, BOV, LEP, SUI	Used	
				Enrofloxacin (vet only)	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	
				Marbofloxacin (vet only)	BOV, EQU, LEP, SUI	Not used	
				Norfloxacin	**AVI**, BOV, CAP, LEP, OVI, SUI	Used	
				Ofloxacin	**AVI**, SUI	Used	
				Orbifloxacin (vet only)	BOV, SUI	Not used	
				Sarafloxacin	PIS	Not used	
QUINOXALINES			x	Carbadox (vet only)	SUI	Not used	
				Olaquindox (vet only)	SUI	Not used	
SULFONAMIDES	x			Phthalylsulfathiazole (vet only)	SUI	Not used	The wide range of applications and the nature of the diseases treated make sulfonamides extremely important for poultry. These classes alone or in combination are critically important in the treatment of a wide range of diseases (bacterial and coccidial infections).
				Sulfacetamide	**AVI**, BOV, OVI	Used	
				Sulfachlorpyridazine	**AVI**, BOV, SUI	Used	
				Sulfadiazine	**AVI**, BOV, CAP, OVI, SUI	Used	
				Sulfadimethoxazole	**AVI**, BOV, SUI	Used	
				Sulfadimethoxine	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	
				Sulfadimidine (Sulfamethazine, Sulfadimerazine)	**AVI**, BOV, CAP, EQU, LEP, OVI, SUI	Used	
				Sulfadoxine	**AVI**, BOV, EQU, OVI, SUI	Used	
				Sulfafurazole	BOV, PIS	Not used	
				Sulfaguanidine	**AVI**, CAP, OVI	Used	
				Sulfamerazine	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	
				Sulfamethoxine	**AVI**, PIS, SUI	Used	
				Sulfamonomethoxine	**AVI**, PIS, SUI	Used	
				Sulfanilamide	BOV, CAP, OVI	Not used	
				Sulfapyridine	BOV, SUI	Not used	
				Sulfaquinoxaline	**AVI**, BOV, CAP, LEP, OVI	Used	
Sulfonamides + diaminopyrimidines				Ormethoprim+ sulfadimethoxine	**AVI**, PIS	Used	
				Sulfamethoxypyridazine	**AVI**, BOV, EQU, SUI	Used	
				Trimethoprim + sulfonamide	**AVI**, BOV, CAP, EQU, LEP, OVI, PIS, SUI	Used	
DIAMINOPYRIMIDINES				Baquiloprim	BOV, SUI	Not used	
				Ormethoprim	**AVI**	Used	
				Trimethoprim	**AVI**, BOV, CAP, EQU, LEP, OVI, SUI	Used	
STREPTOGRAMINS			x	Virginiamycin (vet only)	**AVI**, BOV, OVI, SUI	Used	Virginiamycin is an important antimicrobial in the prevention of necrotic enteritis (*Clostridium perfringens*).

ANTIMICROBIAL AGENTS (CLASS, SUB-CLASS)	Categorisation			Molecules	Species	Used/not used in poultry	Specific comments for poultry by class
	VCIA	VHIA	VIA				
TETRACYCLINES	x			Chlortetracycline	**AVI**, BOV, CAP, EQU, LEP, OVI, SUI	Used	The wide range of applications and the nature of the diseases treated make tetracyclines extremely important for poultry. These classes alone or in combination are critically important in the treatment of a wide range of diseases (bacterial and coccidial infections).
				Doxycycline	**AVI**, BOV, CAM, CAP, EQU, LEP, OVI, PIS, SUI	Used	
				Oxytetracycline	API, **AVI**, BOV, CAM, CAP, EQU, LEP, OVI, PIS, SUI	Used	
				Tetracycline	API, **AVI**, BOV, CAM, CAP, EQU, LEP, OVI, PIS, SUI	Used	
THIOSTREPTON			x	Nosiheptide	SUI	Not used	

Annex 1: List of major pathogens and diseases affecting poultry species

Pathogens	Examples of diseases
Bacteria	
Avibacterium (Haemophilus) paragallinarum	Infectious coryza
Bordetella avium	Bordetellosis (Turkey coryza)
Brachyspira pilosicoli	Avian intestinal spirochaetosis
Chlamydia psittaci	Avian chlamydiosis
Clostridium spp.	Botulism (intoxication and / or infection)
	Gangrenous dermatitis
	Necrotic enteritis (NE)
	Ulcerative enteritis (UE)
E. coli	Airsacculitis
	Arthritis
	Colibacillosis: local and systemic infection
	Omphalitis
Enterococcus spp.	Enterococcosis
Erysipelothrix rhusiopathiae	Erysipelas
Gallibacterium anatis (formerly *P. haemolytica*)	Respiratory disease, salpingitis
Riemerella anatipestifer	Acute to chronic septicaemia with polyserositis; Septicaemia in ducklings; Respiratory disease, salpingitis
Mycobacterium avium	Tuberculosis
Mycoplasma spp.	Arthritis
	Chronic respiratory disease (CRD)
	Mycoplasma gallisepticum infection (MG) and *Mycoplasma synoviae* (MS) infection
	Mycoplasma iowae infection
	Mycoplasma meleagridis infection (MM)
Ornithobacterium rhinotracheale	Respiratory tract infections
Pasteurella multocida	Fowl cholera
Pseudomonas aeruginosa	Septicaemia, cellulitis
Salmonella spp.	Arizonosis
	Fowl typhoid (FT)
	Paratyphoid infections (PT)
	Pullorum disease (PD)
	Salmonellosis
Spironucleus (Hexamita) meleagridis	Spironucleosis
Staphylococcus aureus	Arthritis
Streptococcus spp.	Streptococcosis
Protozoa	
Eimeria spp.	Coccidiosis
Histomonas meleagridis	Histomoniasis

Annex 2: Antimicrobial classes used in veterinary medicine for poultry infections

	Avibacterium paragallinarum infection	*Bordetella* spp. infection	*Brachyspira* spp. infection	*Chlamydia psittaci* infection	*Clostridium* spp. infection	*E. coli* infection	*Eimeria* spp. infection	*Enterococcus* spp. infection	*Erysipelothrix rhusiopathiae* infection	*Gallibacterium* spp. infection	*Histomonas* spp. infection	*Mycoplasma* spp. infection	*Ornithobacterium rhinotracheale* infection	*Pasteurella multocida* infection	*Spironucleus* spp. infection	*Staphylococcus aureus* infection	*Streptococcus* spp. infection
AMINOCOUMARIN																X	
AMINOCYCLITOL						X								X			
AMINOGLYCOSIDES	X					X										X	
AMINOGLYCOSIDES + 2 DEOXYSTREPTAMINE	X				X	X					X						
AMPHENICOLS	X					X						X	X	X			
CEPHALOSPORINS						X											
IONOPHORES							X										
IONOPHORES + ANTICOCCIDIAL							X										
LINCOSAMIDES					X	X		X	X			X	X	X		X	
LINCOSAMIDES + AMINOCYCLITOL					X	X						X					
MACROLIDES	X		X		X							X	X	X		X	
MACROLIDES + TETRACYCLINES												X					
ORTHOSOMYCINS					X												
PENICILLINS	X				X	X		X	X	X			X	X		X	X
PENICILLINS + MACROLIDES					X												
PHOSPHONIC ACID DERIVATIVES					X	X				X							
PLEUROMUTILINS			X		X							X					
POLYMYXINS					X	X											
POLYPEPTIDES					X												
QUINOLONES	X	X				X				X		X	X	X			
STREPTOGRAMINS					X												
SULFONAMIDES	X					X	X							X			
SULFONAMIDES + DIAMINOPYRIMIDINES	X				X	X	X		X				X	X		X	
TETRACYCLINES	X	X	X	X	X	X	X	X	X			X	X	X	X	X	

Appendix IV

Updated Work Programme for the OIE Working Group on Antimicrobial Resistance

Subject	Issue/Action	Status	Timeline
OIE List of Antimicrobial Agents of Veterinary Importance, subdivision by species	- poultry subdivision pilot exercise	Finalisation	April 2021
	- adaptation/application of the methodology for other species	Future work	October 2021
	- consideration of other species: completed an initial discussion on prioritisation	In progress	Aquatic and swine: April 2022, cattle TBD
	- discussion on the addition of companion animals	Future work	April 2021
	- review of the Main OIE List	Future work	24 months
OIE Global AMU database	- transition of data collection from spreadsheet to a database system, expert advice	IT project ongoing	October 2021
	- refinement of the numerator, denominator (biomass), and reporting	Ongoing	
Field level data	- reflection on obtaining field level data	Ongoing; pilot project in countries	October 2021
OIE work on antiparasitics	- oversight	Ongoing	
OIE *Terrestrial and Aquatic Code* chapters related to AMR	- update of the Chapters	On request	
Alternatives to Antimicrobials (ATA)	- information on categorisation of products	Future work	
	- review of related existing information in the OIE Manual	Future work	
Substandard and falsified products	- be updated on progress of existing and ongoing work by OIE (directly or indirectly linked including PVS) and by other international bodies	In progress pending funding availability	
Monitoring and Evaluation framework for the OIE Strategy on AMR	- be updated on progress		April 2021