

# OIE Annual report on the use of antimicrobial agents in animals

BETTER UNDERSTANDING OF THE GLOBAL SITUATION



**WORLD ORGANISATION FOR ANIMAL HEALTH**

*Protecting animals, preserving our future*



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## Director General's foreword



**Dr Monique Eloit**  
**OIE Director General**

In the framework of the Global Action Plan on Antimicrobial Resistance, adopted by WHO Member States in May 2015, the OIE, supported by FAO and WHO within the tripartite collaboration, has taken the lead to build a global database on the use of antimicrobial agents in animals.

At the 84th General Session in May 2016, the World Assembly of Delegates was informed on the outcomes of the first phase of the worldwide collection of data on the use of antimicrobial agents in animals, presented under the Technical Item 2, and adopted Resolution No. 36, 'Combating Antimicrobial Resistance through a One Health Approach: Actions and OIE Strategy'. On 21 September 2016, the United Nations General Assembly adopted a political declaration aimed at combating the global threat posed by AMR and confirmed the 'One Health' approach in line with the Global Action Plan. The three Directors General of the tripartite partnership were present and addressed the General Assembly to support this declaration.

The structure of the OIE Strategy, published in November 2016, supports the objectives established in the Global Action Plan, and reflects the mandate of the OIE as described in its Basic Texts through four main objectives: 1) improve awareness and understanding; 2) strengthen knowledge through surveillance and research; 3) support good governance and capacity building; and 4) encourage implementation of international standards.

As a result of the tremendous efforts of its Member Countries, the OIE is pleased to present this report on the first phase of data collection at the global and regional levels.

The OIE's partners acknowledge this accomplishment as a major milestone in the global effort to contain antimicrobial resistance. Such a feat was only possible through the contributions and efforts of the 130 OIE Member Countries who responded to this first request in 2015. Nearly 90 of those Member Countries provided detailed quantitative data, and the OIE recognises the efforts of the OIE Delegates and the National Focal Points for Veterinary Products in assisting in this extraordinary effort.

I hope that this report will further encourage all Member Countries to continue to participate in this initiative. Your continued support and involvement will increase the precision and robustness of our understanding of the global use of antimicrobial agents in animals.

A handwritten signature in blue ink, reading 'M. Eloit'.

# Executive Summary

This report provides for the first time an overview of the global use of antimicrobial agents in animals. It presents the findings of the first annual reporting of data on the use of antimicrobial agents in animals, providing a global and regional analysis based on data ranging from 2010 to 2015.

The template used to collect data was designed to allow all OIE Member Countries to participate in annual data collection, even if quantitative data on antimicrobial agents used in animals are not available. The template includes administrative information and provides three options for reporting data on antimicrobials agents used in animals with various levels of detail depending on the data available at the national level.

The template was completed by 130 Member Countries (72% of the 180 OIE Member Countries).

The National Focal Point for Veterinary Products was most often responsible for filling in the OIE template (85 of 130 Member Countries: 65%). This information supports the OIE's efforts to conduct regular training of the OIE National Focal Points for Veterinary Products to establish a regional and global network.

OIE Member Countries were asked if they authorise antimicrobials for growth promotion. A total of 96 of 130 (74%) OIE Member Countries indicated that they do not authorise antimicrobial agents for growth promotion in animals. Twenty-five Member Countries provided a list of antimicrobial agents authorised for growth promotion, in which Tylosin and Bacitracin were most frequently quoted. Colistin was mentioned by 10 of 25 Member Countries.

A total of 89 of 130 OIE Member Countries (68%) submitted to the OIE their quantities on the use of antimicrobial agents in animals for years ranging from 2010 to 2015.

Forty OIE Member Countries reported use of antimicrobial agents through Reporting Option 1, the less detailed option, while 19 Member Countries reported through Reporting Option 2, and 30 Member Countries reported through Reporting Option 3 (the most detailed reporting option).

The source of data varied among countries, the most common sources being data collected from 'Wholesalers and Retailers' and from 'Imports'.

Quantitative results allowed a first picture to be drawn on the use of antimicrobial agents worldwide and by region. The main route of administration in animals was the oral route, and Tetracyclines and Macrolides were the most commonly reported antimicrobial agents used; differences however, were observed between OIE Regions.

The information provided in this report represents a remarkable first step to better understanding the global use of antimicrobial agents in animals.

Nevertheless further efforts and support will be needed to improve the data collection system and the quality of the data collected by countries.

Detailed interpretation of the data also needs further development, in particular to define a denominator (animal biomass) that will allow better data interpretation in the future.

# Acknowledgements

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The OIE is grateful to the members of the OIE *ad hoc* Group on Antimicrobial Resistance following the work on the database, Dr Carolee Carson, Dr Donald Prater, Prof. Kari Grave, Dr Masumi Sato, Dr Chris Teale, Dr Jordi Torren Edo, and Dr Gerard Moulin for all of their efforts from the initial work on this issue in 2011, to the present day. Special thanks are extended to Dr Barbara Freischem for her extensive work on this initiative from its early stages. The OIE would also like to thank all OIE Member Countries, Delegates, National Focal Points for Veterinary Products and other governmental officials who contributed to this first annual collection on data of antimicrobial agents used in animals, without which such knowledge and insight could never be gained on the global use of antimicrobial agents in animals

The OIE thanks the members of the OIE Scientific Commission on Animal Diseases who gave their encouragement and support for this initiative since the beginning.

# Acronyms and Abbreviations

<b>AMR</b>	Antimicrobial resistance
<b>ESVAC</b>	European Surveillance of Veterinary Antimicrobial Consumption
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>OIE</b>	World Organisation for Animal Health
<b>PVS</b>	Performance of Veterinary Services
<b>WHO</b>	World Health Organization

## OIE Glossary

**Antimicrobial agent:** means a naturally occurring, semi-synthetic or synthetic substance that exhibits antimicrobial activity (kill or inhibit the growth of micro-organisms) at concentrations attainable *in vivo*. Anthelmintics and substances classed as disinfectants or antiseptics are excluded from this definition.

**Monitoring:** means the intermittent performance and analysis of routine measurements and observations, aimed at detecting changes in the environment or health status of a population.

**Veterinary medicinal product:** means any product with approved claim(s) to having a prophylactic, therapeutic or diagnostic effect or to alter physiological functions when administered or applied to an animal.

**Veterinary Services:** means the governmental and non-governmental organisations that implement animal health and welfare measures and other standards and recommendations in the *Terrestrial Animal Health Code* and the *OIE Aquatic Animal Health Code* in the territory. The Veterinary Services are under the overall control and direction of the Veterinary Authority. Private sector organisations, veterinarians, veterinary paraprofessionals or aquatic animal health professionals are normally accredited or approved by the Veterinary Authority to deliver the delegated functions.

# 1. Introduction

## 1.1. Background

For two decades, the World Organisation for Animal Health (OIE) has engaged in combatting resistance to antimicrobial agents and endorsed the 'One Health' concept. The topic of antimicrobial resistance is crucial as it concerns both human and animal health.

During the 76<sup>th</sup> General Session of the World Assembly of Delegates in May 2008, OIE Delegates were requested to nominate a National Focal Point for Veterinary Products in their countries. Since then, the OIE, through its Regions, has been implementing seminars and meetings to facilitate the harmonisations of standards, records and control of veterinary medicinal products among OIE Member Countries.

In many countries today, antimicrobial agents are widely available, directly or indirectly, with virtually no restriction or control. Out of 130 OIE Member Countries assessed through the OIE PVS Pathway, more than 110 Member Countries do not yet have complete and relevant legislation to ensure appropriate conditions for the import, manufacturing, distribution and use of veterinary medicinal products, including antimicrobial agents. As a result, these products circulate freely, like ordinary goods, and are often adulterated.

Surveillance of antimicrobial resistance in animal pathogens is another important element to assess the level and evolution of antimicrobial resistance in animals. Currently, very little information is available worldwide on animal pathogens.

The OIE international standards published in the *Terrestrial Animal Health Code*, Chapter 6.7. 'Harmonisation of national antimicrobial resistance surveillance and monitoring programmes'; the *Aquatic Animal Health Code*, Chapter 6.4. 'Harmonisation of national antimicrobial resistance surveillance and monitoring programmes for aquatic animals'; and the *Manual of Diagnostic Test and Vaccines for Terrestrial Animals*, Guideline 3.1 'Laboratory methodologies for bacterial antimicrobial susceptibility testing' provide a basis for such surveillance and monitoring. Future work is needed to provide indicator bacteria relevant to the most commonly raised animal species and to refine recommendations for harmonisation of susceptibility testing in veterinary laboratories.

In 2012, the OIE developed a questionnaire with the following objectives: (1) to enhance the OIE's engagement in the initiative to prevent antimicrobial resistance; (2) to conduct a survey of the implementation by OIE Member Countries of OIE *Terrestrial Animal Health Code* Chapter 6.8. 'Monitoring of the quantities and usage patterns of antimicrobial agents used in food producing animals'; (3) to improve awareness of antimicrobial use in animals by OIE Member Countries and; (4) to determine what actions are needed and to help the OIE to develop its strategy in this field. A total of 152 out of 178 (85%) OIE Member Countries completed the questionnaire. The answers received show that, in 2012, 27% of responding Member Countries had an official system in place for collecting quantitative data on antimicrobial agents used in animals.

The results were presented at the OIE Global Conference on the Responsible and Prudent Use of Antimicrobial Agents for Animals held in March 2013 in Paris, France; the conference recommended the following to its Member Countries:

- To collect harmonised quantitative data on the use of antimicrobial agents in animals with the view to establish a global database, and submit them to the OIE.

- To contribute to the OIE initiative to collect data on the antimicrobial agents used in food-producing animals (including through medicated feed) with the ultimate aim of creating a global database hosted by the OIE), and submit it to the OIE Member Countries.

To this end, in January 2014, the OIE *ad hoc* Group on Antimicrobial Resistance developed a data collection template along with guidance for its completion, endorsed by the Scientific Commission for Animal Diseases. The documents were discussed during 2014 with the OIE National Focal Points for Veterinary Products in the Americas, Europe and Asia-Pacific regions in the framework of the third cycle of training seminars for the OIE National Focal Points for Veterinary Products. National Delegates and their OIE National Focal Points for Veterinary Products of selected countries in Africa and the Middle East were also consulted by letter in 2015.

Through the unanimous adoption of Resolution No. 26<sup>1</sup> during the OIE General Session in May 2015, the OIE was officially mandated to gather data on the use of antimicrobial agents in animals worldwide and to create a global database for monitoring the use of antimicrobial agents in compliance with Chapters 6.8. of the *Terrestrial Animal Health Code* (Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals) and 6.3. of the *Aquatic Animal Health Code* (Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals).

In the framework of the Global Action Plan on Antimicrobial Resistance, developed by the WHO with the active contributions of FAO and OIE in the spirit of 'One Health', the OIE is tasked with the construction and maintenance of a global database on the use of antimicrobial agents in animals. In this endeavour, the OIE is supported by the FAO and the WHO through their tripartite collaboration.

Towards this goal, in the last trimester of 2015, the OIE launched its first annual data collection on the use of antimicrobial agents in animals in OIE Member Countries. The template and guidance documents were developed by the OIE *ad hoc* Group on Antimicrobial Resistance (AMR), endorsed by the Scientific Commission for Animal Diseases, and tested by Member Countries through regional training seminars for OIE National Focal Points for Veterinary Products.

The template for the first annual collection of data on the use of antimicrobial agents was sent to all the OIE Member Countries in October 2015.

As a part of the first phase of the data collection on the use of antimicrobial agents in animals, the OIE requested data for 2013<sup>2</sup>, but accepted more recent data or the most recent older data, but not before 2010. This request presents a challenge for data analysis, as the data collected spans 2010 to 2015 and as a result, the analysis presented in this report are cumulative over that time span. In the second phase of data collection, the OIE requests data for 2014, but accepts data for 2015 and 2016. In this way, the data collected in the first phase will be completed over the next phase, enriching the quality. Over time and once the reporting of data by OIE Member Countries has become more routine, the OIE will request data for one specific calendar year. As a result, reporting on the global use of antimicrobial agents will become more systematic and reliable.

Data were reported back to the OIE by 130 OIE Member Countries (out of 180 Member Countries), with 68% (89 out of 130 Member Countries) providing concrete data on the use of antimicrobial agents in animals. Given the outstanding participation of OIE Member Countries and their expressed desire to further increase transparency on the use of antimicrobial agents in animals, we expect that the annual data collected will become more and more precise with each passing year. Each year,

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<sup>1</sup> [http://www.oie.int/fileadmin/Home/eng/Our\\_scientific\\_expertise/docs/pdf/AMR/A\\_RESO\\_AMR\\_2015.pdf](http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/AMR/A_RESO_AMR_2015.pdf)

<sup>2</sup> Calendar year.

more countries are readying themselves to put in place surveillance systems on the use of antimicrobial agents in animals.

This report gives the first ever glimpse into the global use of antimicrobial agents in animals and presents the overall findings of the first annual reporting of data on the use of antimicrobial agents in animals, providing a global and regional analysis from 2010 to 2015.

## 1.2. Scope

Taking into account the vast differences among OIE Member Countries to monitor antimicrobial use, this report presents the first results from the annual collection of data on the use of antimicrobial agents in animals in OIE Member Countries.

In this first stage, the OIE focused on sales of antimicrobial agents destined for use in animals and for those agents listed in the OIE 'List of antimicrobial agents of veterinary importance'.

The amounts of antimicrobial agents sold or imported for use in animals were provided to the OIE by some Member Countries in kilograms (kg) of antimicrobial agent (chemical compound as declared on the product label) that were calculated according to the information provided in Annex 3. This information was provided by each Member Country in the strictest confidence, and for the sole purposes to better understand the global and regional situation of antimicrobial agent use in animals. This report does not present individual Member Country raw data. Nevertheless, Member Countries are invited to indicate if data and information on the sale of antimicrobial agents in animals are available on the Web.

In addition, at this stage, the numerator, total kilograms of antimicrobial agent used in animals, is not yet robust enough for detailed interpretation, and the denominator (Animal biomass), is currently being optimised for interpretation of the global use of antimicrobial agents in animals. The total amount of antimicrobials agents being used in animals around the world can only be interpreted over time, in the context of a robust denominator. As Member Countries refine their surveillance systems and collect more precise and better quality data, the OIE will be able to present a more refined picture of the use of antimicrobial agents in animals.

## 2. Materials and Methods

Specific recommendations were given at the OIE World Assembly of Delegates in 2015 in Resolution No. 26 'Combating Antimicrobial Resistance and Promoting the Prudent Use of Antimicrobial Agents in Animals':

3. The OIE develop a procedure and standards for data quality for collecting data annually from OIE Member Countries on the use of antimicrobial agents in food-producing animals with the aim of creating an OIE global database to be managed in parallel with the World Animal Health Information System (WAHIS).
4. OIE Member Countries set up an official harmonised national system, based on OIE standards, for the surveillance of antimicrobial resistance and the collection of data on the use of antimicrobial agents in food-producing animals, and actively participate in the development of the OIE global database.

In response to these recommendations, the OIE *Ad hoc* Group on Antimicrobial Resistance developed a template for harmonised data collection (Annex 1), as well as guidance for its completion (Annex 2). This template was translated in the three official OIE languages (i.e. English, French and Spanish) and was sent to all 180 OIE Member Countries in October 2015. An Annex to the Guidance was also developed to give more detailed instructions on mathematical calculations to obtain quantities of active ingredients from antimicrobial products sold (Annex 3). All antimicrobial agents destined for use in animals and contained in the *OIE List of Antimicrobial Agents of Veterinary Importance*<sup>3</sup>, in addition to certain antimicrobial agents used only for growth promotion, were reportable.

For this first phase of the project, the data were collected through worksheets using predefined conditional formulas and analysis tools available in Microsoft Excel. The OIE template (Microsoft Excel file) contains four worksheets labelled 'Baseline Information', 'Reporting Option 1', 'Reporting Option 2', and 'Reporting Option 3'.

The sheet 'Baseline Information' was created to collect general information such as the use of growth promoters, data source and animal groups covered by the data collected.

The different 'Reporting Options' were developed to collect the overall amount of antimicrobial classes used in animals, with the possibility of separating them by type of use (Therapeutic – Growth Promotions), animal group (Terrestrial – Aquatic) and route of administration. The three reporting options represent increasing levels of detail in the data.

The responses endorsed by OIE Delegates were compiled and the results were analysed at OIE Headquarters.

For clarification and validation purposes, questions were addressed to respondents, mainly OIE National Focal Points for Veterinary Products, when relevant.

## 3. Global Analysis

### 3.1. General Information

The OIE maintains offices throughout the world, in: the African Region, the Americas Region, the Asian and Pacific Region, the European Region and the Middle Eastern Region. The data collection template was sent to all OIE Member Countries within all OIE Regions. The list of OIE Member Countries is provided in Annex 4.

From mid-December 2015 to May 2016, 130 of the 180 (72%) OIE Member Countries submitted completed templates to the OIE Headquarters (Table 1). The proportion of responses across OIE Regions varies between 42% and 81% (Figure 1).

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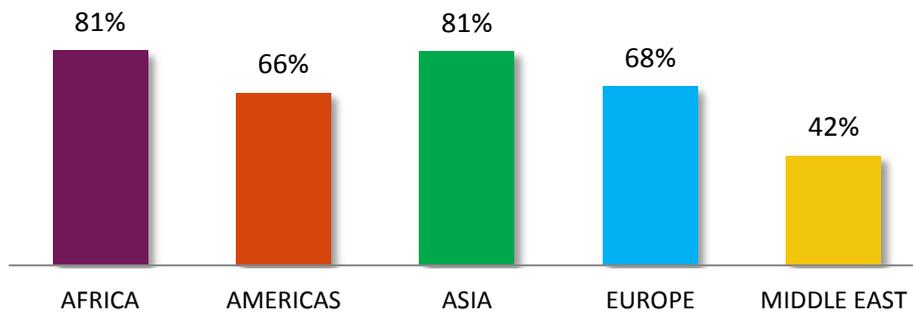
<sup>3</sup> [http://www.oie.int/fileadmin/Home/eng/Our\\_scientific\\_expertise/docs/pdf/Eng\\_OIE\\_List\\_antimicrobials\\_May2015.pdf](http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/Eng_OIE_List_antimicrobials_May2015.pdf)

**Table 1.** OIE Member Countries that submitted templates in 2015, by OIE Region

OIE REGION	Number Member Countries who submitted templates by OIE Region	Number of OIE Member Countries*
AFRICA	44	54
AMERICAS	19	29
ASIA	26	32
EUROPE	36	53
MIDDLE EAST	5	12

\* Distribution of countries by OIE Region is done according to the OIE Note de Service 2010/22 – Annex 4

**Figure 1.** OIE Member Countries that submitted templates in 2015, by OIE Region

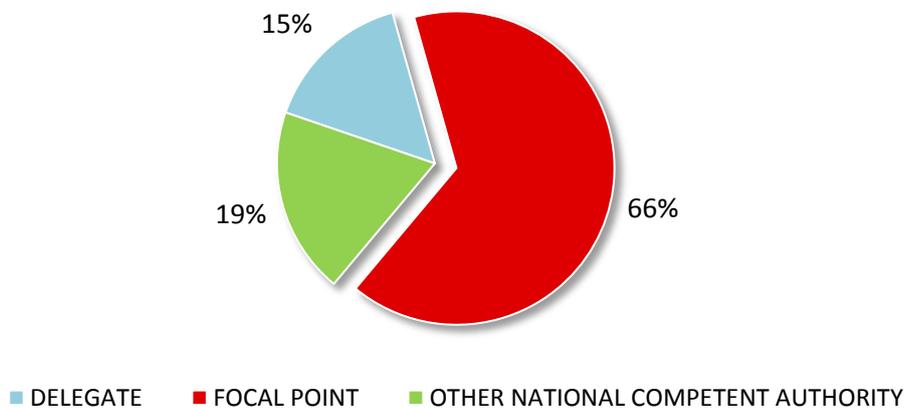


## Global analysis of baseline information

Each OIE Member Country must designate a Delegate who is usually the person in charge of the official Veterinary Services of the Member Country concerned. Since the 76<sup>th</sup> General Session in May 2008, the World Assembly of Delegates decided that OIE Delegates should nominate National Focal Points to assist them in their work on specific topics.

For the 2015 data collection, the National Focal Point for Veterinary Products was most often responsible for filling in the OIE template (85 out of 130 Member Countries). This information supports the OIE’s efforts to conduct regular trainings of the OIE National Focal Points for Veterinary Products to establish a regional and global network (Figure 2).

**Figure 2.** OIE Member Country contact person profile in 2015, for 130 Member Countries



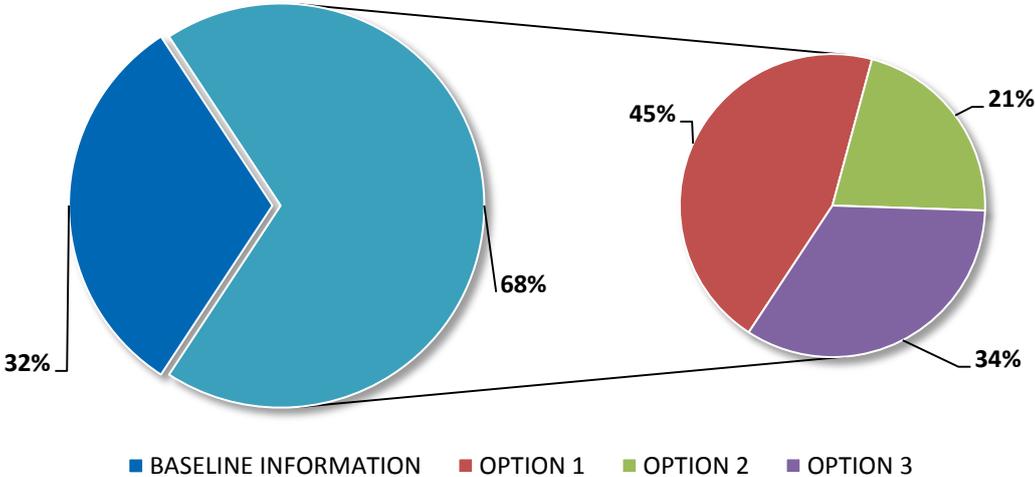
# Reporting Option

The data collection template was designed to allow all Member Countries to participate in the annual data collection, even if quantitative data on antimicrobial agents used in animals are not available. The first part of the template—aimed to collect relevant administrative information—was completed by 130 Member Countries. Quantitative data was provided by 89 of those 130 Member Countries (68%). The following sections of the template, named ‘Reporting Options’ 1, 2 and 3, collect the actual quantities of antimicrobial agents for use in animals. The ability of a Member Country to provide quantitative information reflects their capacity to collect detailed data on the use of antimicrobial agents in animals.

Most Member Countries reported use of antimicrobial agents through Reporting Option 1, requiring only distinction of antimicrobial agents by type of use (Figure 3); Reporting Option 2 requiring distinction by type of use and animal groups was chosen initially by three Member Countries; and Reporting Option 3, requiring distinction by type of use, groups of animals and routes of administration, was chosen by 29 Member Countries.

After analysis of the data submitted by Member Countries, it was found that 16 Member Countries chose Reporting Option 1 to declare the amounts of antimicrobial agents used in animals, while their data had a sufficient level of specificity related to the different animal groups to be reported in Reporting Option 2. For further information please see the section ‘Animal groups’ of this report.

**Figure 3.** Reporting Option and level of specificity of data on antimicrobial agents used in animals in 2015 by 89 Member Countries

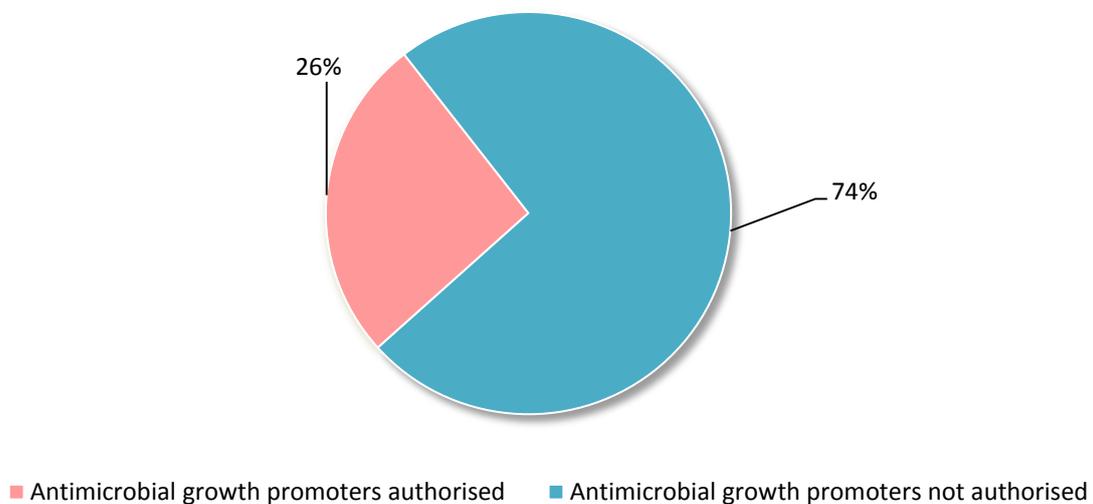


## Growth Promotion

All antimicrobial agents destined for use in animals and listed in the OIE List of antimicrobial agents of veterinary importance<sup>4</sup>, plus certain antimicrobial agents only used for growth promotion were to be reported. The exception to the OIE's request was ionophores, which are mostly used for parasite control, have different regulatory classifications in different countries, and for the purposes of the collection of data on the use of antimicrobial agents in animals, was not to be reported as antimicrobial agents.

In 2015, a total of 96 out of 130 (74%) OIE Member Countries did not authorise antimicrobial agents for growth promotion in animals in their countries (Figure 4). This indicates an important decrease in the percentage of countries authorising use of antimicrobials as growth promoters: in 2012, 77 out of 151 (51%) Member Countries totally banned the usage of antimicrobial agents as growth promoters.

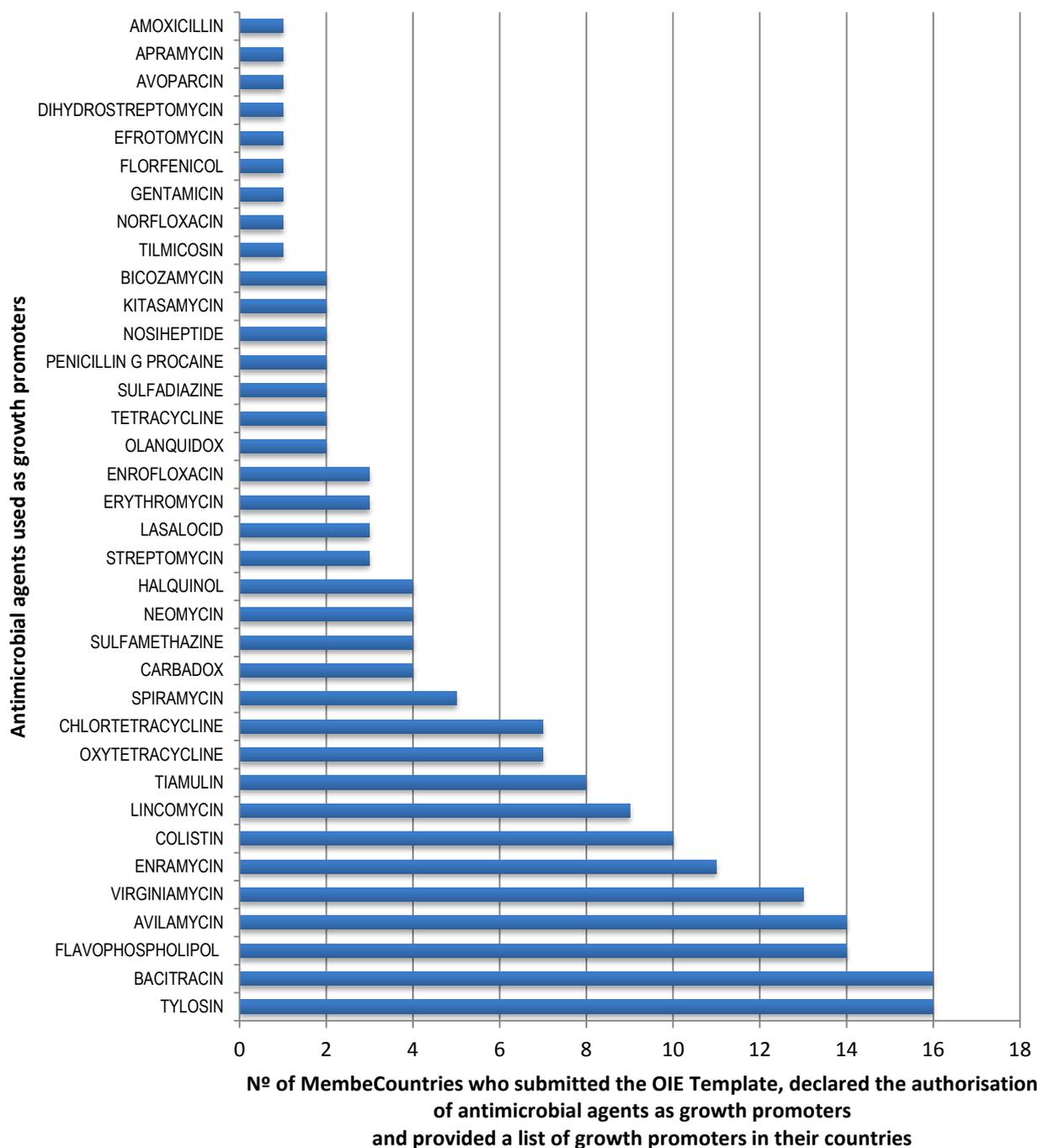
**Figure 4.** Authorisation of Antimicrobial Growth Promoters in 130 OIE Member Countries in 2015



For those Member Countries that reported the authorisation of antimicrobial agents as growth promoters, the OIE also requested a list of antimicrobial agents that were authorised as growth promoters (based on active ingredient). The most frequently listed antimicrobial agents for this purpose were Tylosin and Bacitracin. Colistin was mentioned by 10 countries (Figure 5). Sixty-two percent (62%) of 34 Member Countries authorising antimicrobial agents as growth promoters reported quantities of antimicrobial agents sold for use in animals.

<sup>4</sup> [http://www.oie.int/fileadmin/Home/eng/Our\\_scientific\\_expertise/docs/pdf/Eng\\_OIE\\_List\\_antimicrobials\\_May2015.pdf](http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/Eng_OIE_List_antimicrobials_May2015.pdf)

**Figure 5.** Antimicrobial growth promoters authorised for use in animals in 25 Member Countries, 2010-2015



### 3.2. Quantity of antimicrobial agents reported

The information contained in the ‘Reporting Option’ sections of the data collection template provides an important first glimpse of the total amount of antimicrobial agents used in animals around the world. The data reported, is difficult to interpret and is presented here as a temporary outcome of the first phase of reporting, until a more robust denominator is finalised to allow accurate data interpretation in the future. In the 2012 OIE questionnaire, only 23 Member Countries provided quantitative data, a small number of countries compared to the 89 Member Countries that provided such data in 2015.

Based on templates received by 89 Member Countries, the OIE calculated the total amount of antimicrobials agents reported in kilograms.

### Year of data collection

**Table 2.** Breakdown of Member Countries that filled in the template, by year of reported data

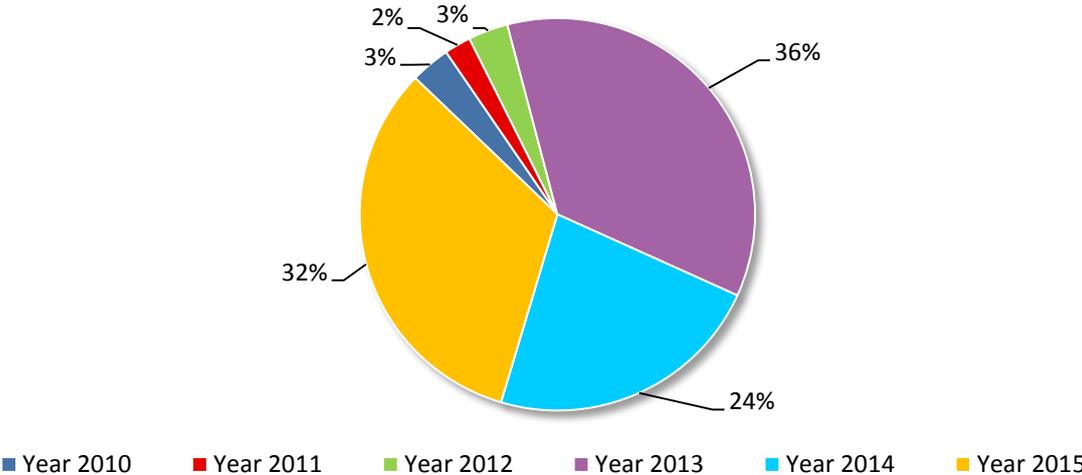
Number of Member Countries that filled in the OIE template in 2015	<b>130</b>
Number of Member Countries that filled in quantities of antimicrobial agents in 2015	<b>89</b>
Number of Member Countries that filled in templates for only one year between 2010 and 2015	<b>85</b>
Number of Member Countries that filled in templates for more than one year between 2010 and 2015	<b>2</b>
Number of Member Countries that filled in templates for a range of years	<b>2</b>

For this first phase of data collection, the OIE aimed to collect data for 2013, but accepted data collected since 2010. The OIE accepted also submissions from any Member Country who wished to provide data for more than one year.

Most OIE Member Countries (85 out of 89; 96%) submitted data for only one year between 2010 and 2015. In this timeframe, only two Member Countries submitted templates for more than one year, and two Member Countries submitted templates for a range of years (one from 2005 to 2015 and other from 2013 to 2015). Since the latter group did not reply to queries requesting clarification of the year for which the data applied, these two submissions were removed from the analysis of the 'Year of data collection' variable. The OIE received a total of 92 templates providing data for specific years of data collection from 87 Member Countries (Table 2).

Thirty-six percent (33/92; 36%) of templates received provided data for 2013 (Figure 6).

**Figure 6.** Years of reported data, reported in 92 templates from 87 Member Countries in 2015



The first year of data collection on the use of antimicrobial agents in animals was launched in 2015; for the purposes of this report, the analysis that follows is based on account the quantitative data from all Member Countries between 2010 and 2015.

## Data coverage

Member Countries were asked to estimate the extent to which their data represented overall antimicrobial agent sales for use in animals, as a percentage of the total sales in their country. Information on data coverage was provided by 79 Member Countries that provided quantitative data on use. As a global average, data coverage achieved was 84.6%; these data are further analysed by region in later sections of this report. This data coverage shows that in a number of Member Countries, surveillance systems do not capture the totality of the antimicrobial agents used in animals.

## Data sources

The OIE data collection template provided an exhaustive list of the possible sources of data, in accordance with Chapter 6.8. of the *Terrestrial Animal Health Code* (Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals) and with Chapter 6.3. of the *Aquatic Animal Health Code* (Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals). Multiple choices were possible and data sources provided were grouped as follows:

- A. WHOLESALERS & RETAILERS:**
  - a. Sales data–Wholesalers.
  - b. Sales data–Retailers.
  - c. Purchase data–Wholesalers.
  - d. Purchase data–Retailers.
  - e. Purchase data–Agricultural cooperatives.
  
- B. IMPORTS:**
  - a. Import data–Customs declarations-Veterinary products.
  - b. Import data–Customs declarations-Active ingredients.
  
- C. MARKETING AUTHORISATIONS HOLDERS:**
  - a. Sales data–Marketing authorisations holders.
  - b. Sales data–Registration authorities.
  
- D. VETERINARIANS:**
  - a. Sales data-Veterinarians.
  - b. Veterinary prescriptions data–Sales.
  - c. Veterinary prescriptions data–Prescriptions.
  - d. Veterinary prescriptions data –Dispensing.
  
- E. PHARMACISTS:**
  - a. Sales data–Pharmacies.
  - b. Sales data–Farm shops/Agricultural suppliers.
  - c. Purchase data–Pharmacies.
  
- F. FEED MANUFACTURERS:**
  - a. Sales data–Feed mills.
  - b. Purchase data–Feed mills.

## G. MANUFACTURERS:

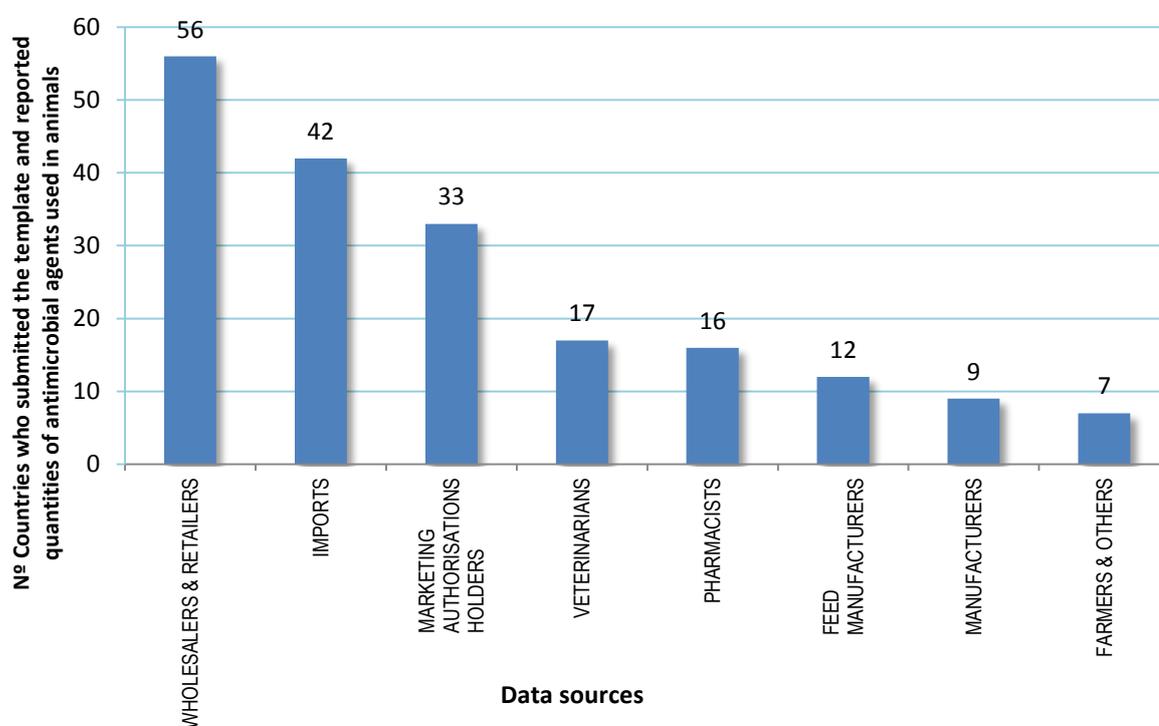
- a. Sales data–Industry trade associations.
- b. Purchase data–Producer organisations.

## H. FARMERS & OTHERS:

- a. Antimicrobial use data–Farm records.

The OIE stated in the Guidance document that ideally, the source of information should be as close to the point of use as possible. However, among the 89 Member Countries that reported actual quantities (Figure 7), the point of use was not the main source of data; ‘Farmers & Others’--the closest category to the point of actual use--was only reported by 7 Member Countries. In 2015, data collected from ‘Wholesalers & Retailers’ (56 out of 89 Member Countries) was most commonly reported, followed by ‘Imports’ (42 out of 89 Member Countries).

**Figure 7.** Data source as reported by 89 Member Countries, 2010-2015

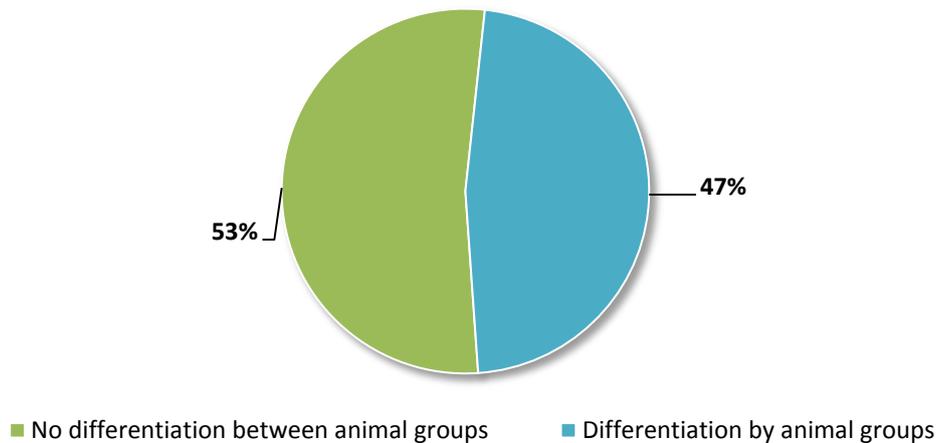


## Animal groups<sup>5</sup>

Most Member Countries (47 out of 89; 53%) were unable to differentiate how antimicrobial agents are being used in different groups of animals (Figure 8).

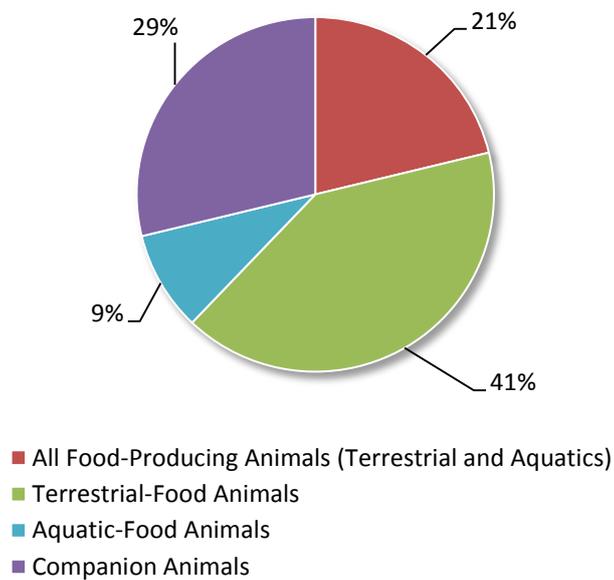
<sup>5</sup> For the purposes of the OIE database, animal groups means: ‘Terrestrial food-producing animals’, ‘Aquatic food-producing animals’ or ‘Companion animals’.

**Figure 8.** Differentiation of the data reported by animal groups in 89 Member Countries, 2010-2015



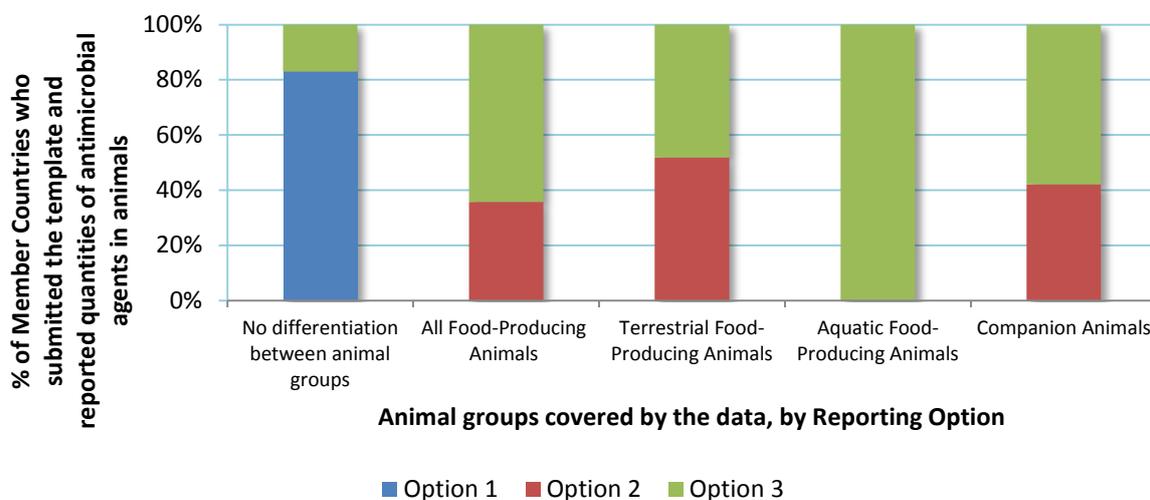
Different possibilities were available to report data by animal group (Figure 9). Multiple options were possible in this field.

**Figure 9.** Animal groups reported by 42 Member Countries, 2010-2015



Most Member Countries (39 out of 47; 83%) that were unable to differentiate data by animal group reported antimicrobial quantities through Reporting Option 1. Member Countries that were able to report by animal group specifically (42 out of 89; 47%), chose Reporting Options 2 or 3 (Figure 10). From this first year of analysis, a preliminary finding shows that national monitoring systems on the use of antimicrobial agents in aquatic food-producing animals are implemented only after national monitoring systems on the use of antimicrobial agents in terrestrial food-producing animals have been implemented to the highest level of specificity, by route of administration.

**Figure 10.** Animals groups covered by the data in 89 Member Countries, by Reporting Option, 2010-2015



### Food-producing animal species

Animal species considered to be food-producing animals vary between countries and the OIE needed to understand how this difference could impact the data reported in the future when comparisons of antimicrobial agents used in milligrams by kilograms of live weight will be possible. The categories below have been adjusted and contain the following species declared in the template:

#### A. POULTRY

- a. Layers – commercial production for eggs
- b. Broilers – commercial productions for meat
- c. Other commercial poultry
- d. Poultry – backyard

#### B. CATTLE

- a. Cattle
- b. Buffaloes (not *Syncerus caffer*)

#### C. SHEEP AND GOATS

- a. Sheep
- b. Goats
- c. Sheep and goats (mixed flocks)

#### D. PIGS

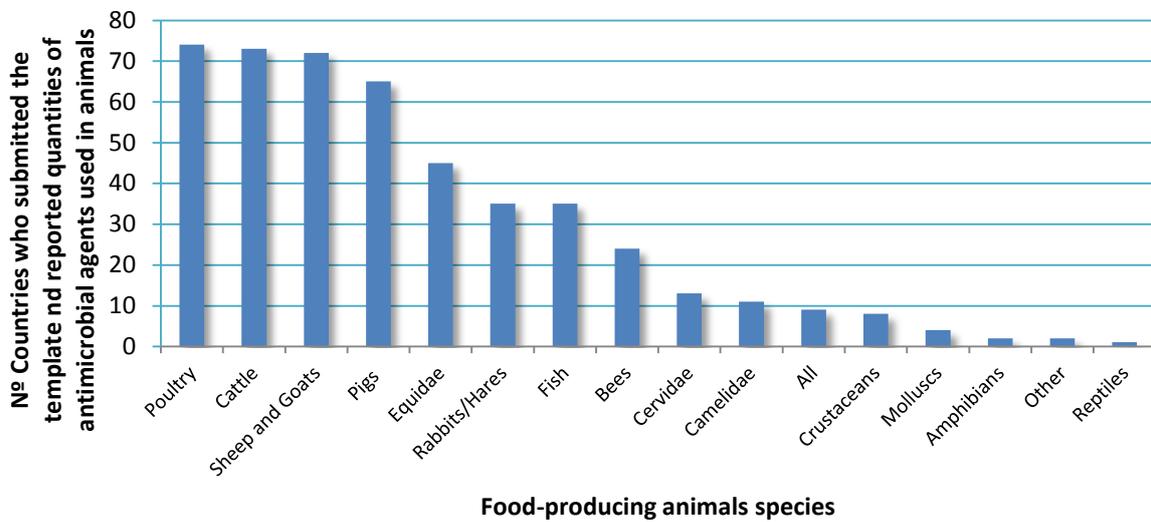
- a. Pigs – commercial
- b. Pigs – backyard

#### E. FISH

- a. Fish – aquaculture production
- b. Fish – fish farmed in fresh water

In 2015, poultry, cattle and sheep/goats are the most frequently reported food-producing species covered by the data provided by Member Countries (Figure 11).

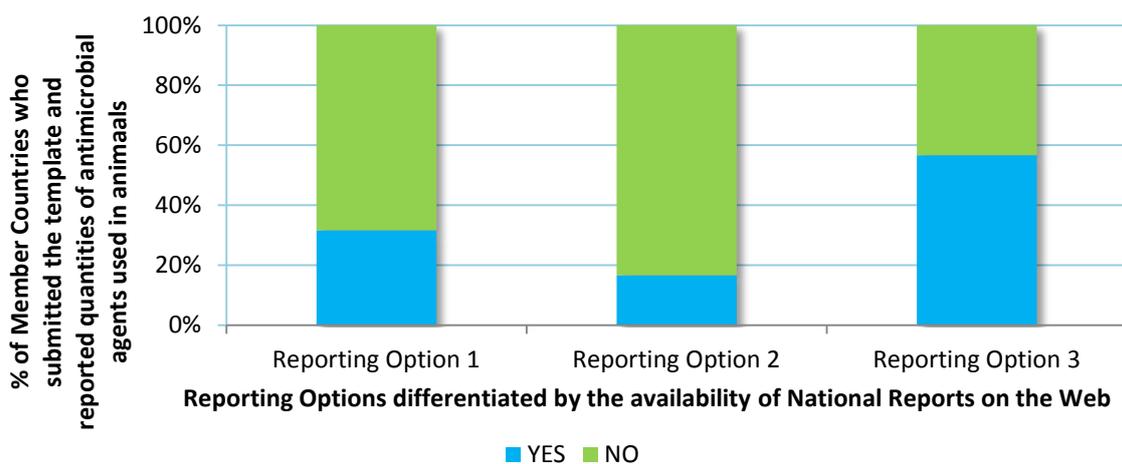
**Figure 11.** Food-producing animal species covered by the data, for 89 Member Countries, 2010-2015



## National reports on the Web

In the template, Member Countries were asked if a national report on the antimicrobial agents used in animals is available on the Web. The first year of data collection showed that 63% of national reports (54/86) on the quantities of antimicrobials used in animals are not available to the public online. Member Countries that chose Reporting Option 3 were more likely to make their reports available to the public (Figure 12).

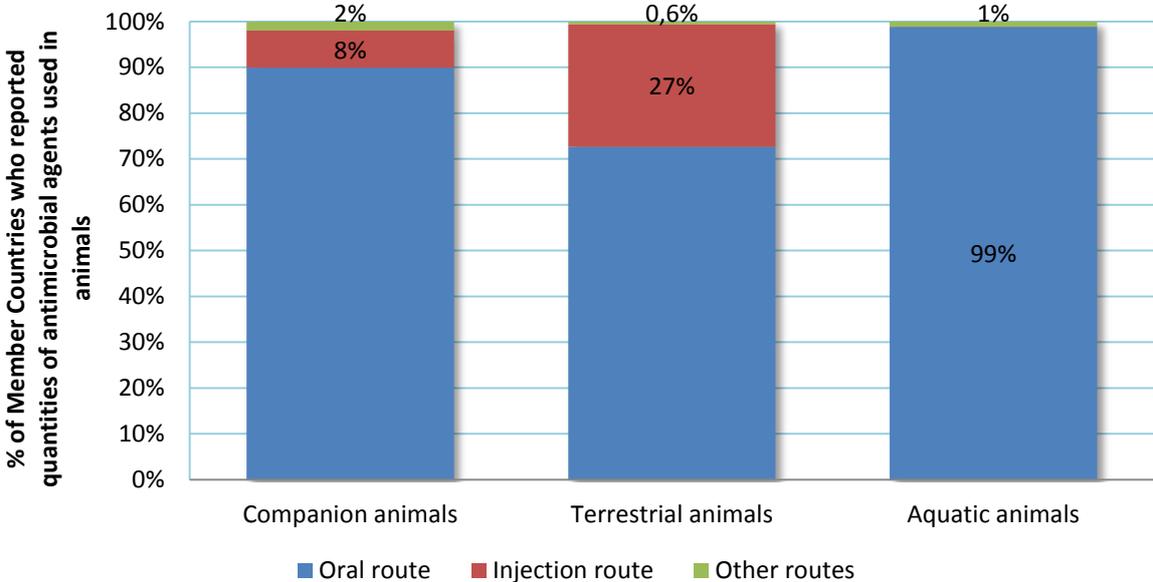
**Figure 12.** National reports available on the Web from 86 Member Countries, by Reporting Option, 2010-2015



### Routes of administration

Regarding the route of administration, oral administration is most commonly used across all animal groups, while in food-producing terrestrial animals, injection administration is also common (Figure 13).

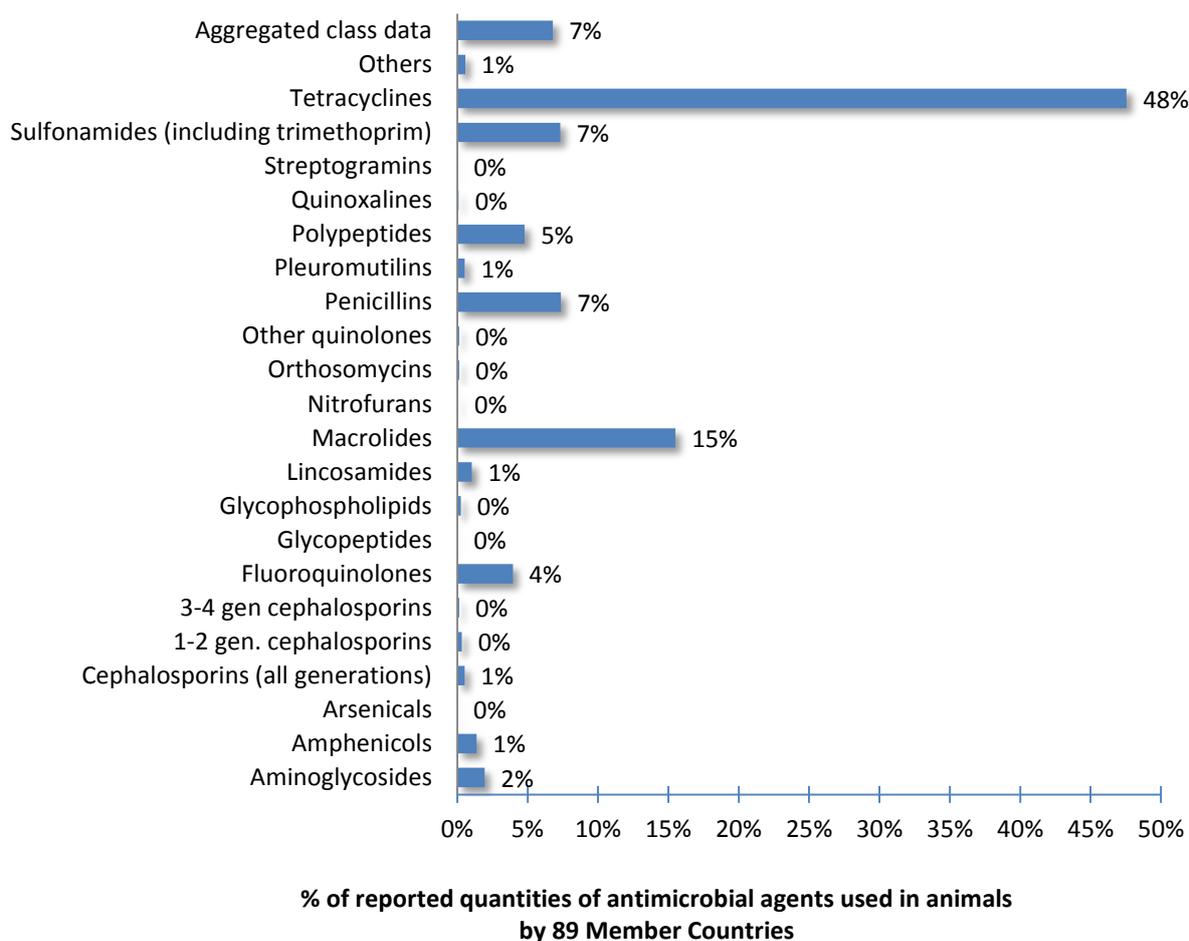
**Figure 13.** Comparison of routes of administration for therapeutic use, by animal group 2010-2015



### Quantities of antimicrobial classes reported

Tetracyclines and Macrolides are the most commonly reported antimicrobial agents used among Member Countries that provided quantitative data on use of antimicrobial agents in animals (Figure 14).

**Figure 14.** Proportion of reported antimicrobial classes by 89 Member Countries, 2010-2015



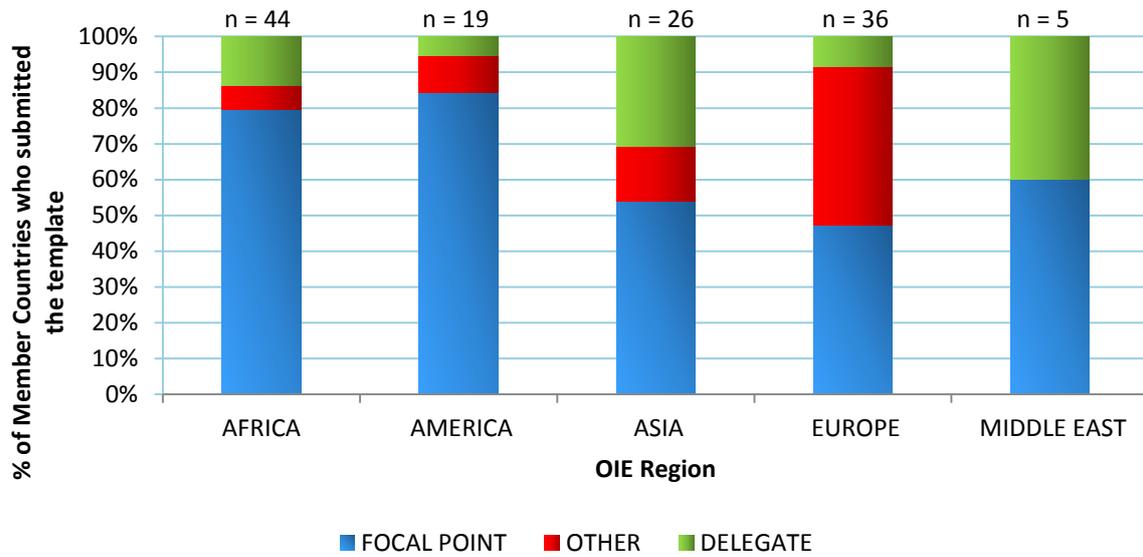
## 4. Analysis by OIE Region

### 4.1. General information by OIE Region

#### Profile of the contact person

The OIE recognises the efforts of the National Focal Points for Veterinary Products in the success of this first year of data collection, as in most countries, the National Focal Point for Veterinary Products was responsible for completion of the template. Nevertheless, in some regions, specifically in Europe, someone other than the OIE Delegate and the National Focal Point for Veterinary Products complete the template. This difference may be linked to differing levels of sophistication of data collection systems, which may have dedicated persons in charge of this topic (Figure 15).

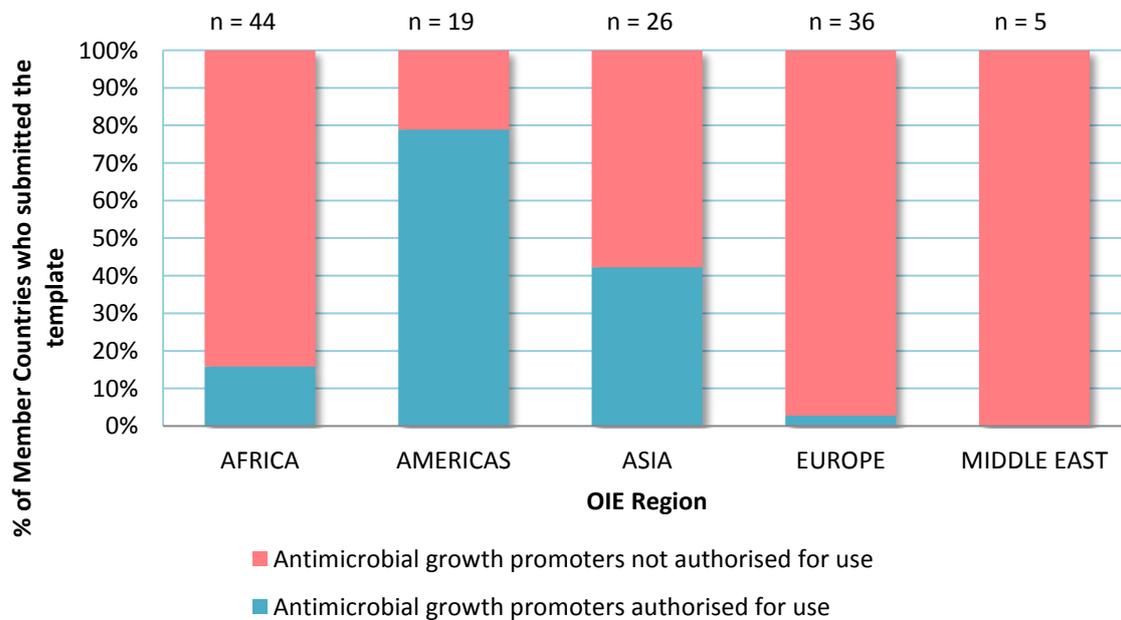
**Figure 15.** Regional proportion of contact person profile by 130 Member Countries



## Growth promoters

When broken down by OIE Region, the Americas, followed by Asia, have the highest proportions of Member Countries that authorise the use of growth promoters (Figure 16).

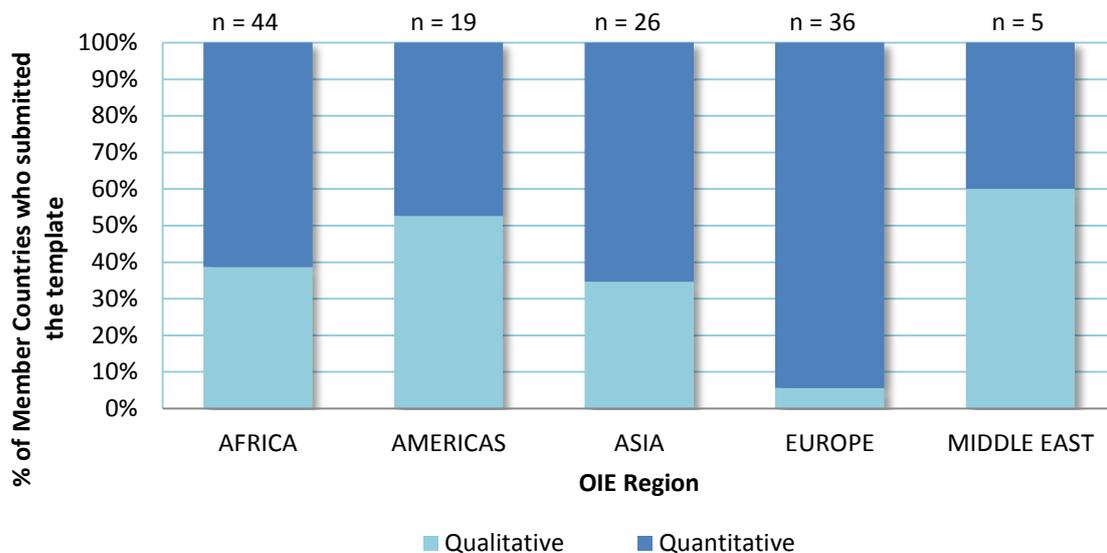
**Figure 16.** Proportion of 130 OIE Member Countries authorising antimicrobial growth promoters in animals, by OIE Region



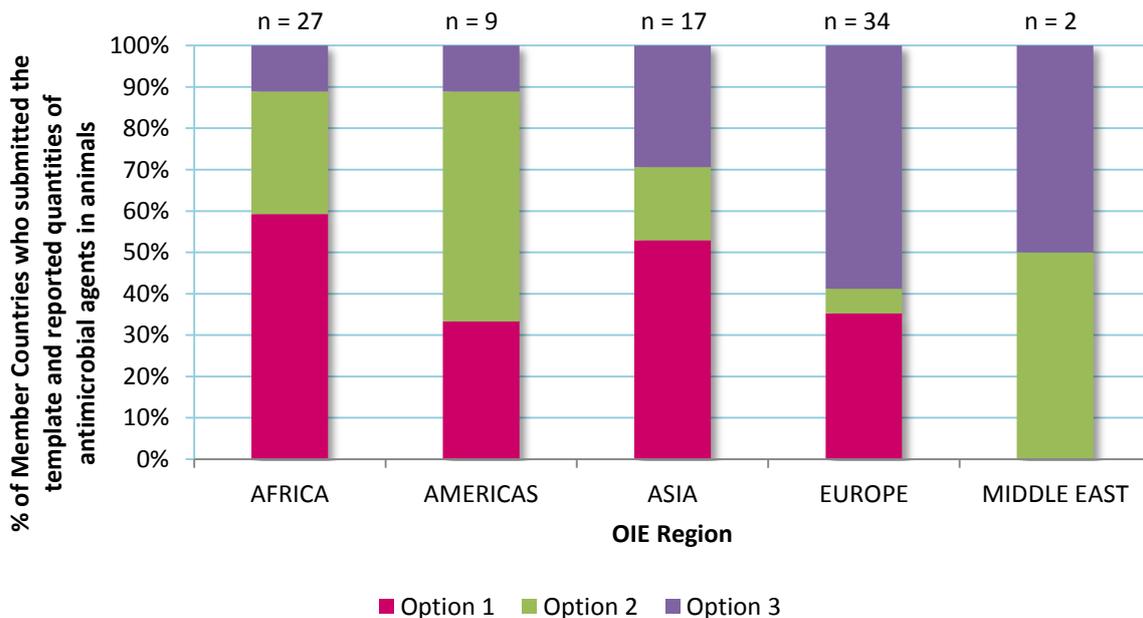
## Reporting Options

When broken down by OIE Region, Europe provided more quantitative data than other OIE Regions and systematically chose a more advanced Reporting Option (Figure 17 and Figure 18). Most European countries in the European Union already have a system in place for data collection on the use of antimicrobial agents in animals, under the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) project that was launched by the European Medicines Agency in September 2009.

**Figure 17.** Proportion of 130 OIE Member Countries providing qualitative data (Baseline Information without completion of a Reporting Option) and quantitative data (Baseline Information with completion of a Reporting Option), by OIE Region



**Figure 18.** Comparison between choices of Reporting Options, by OIE Region



## Data coverage

European data was also the most comprehensive regarding data coverage representing on average 97.6% of overall antimicrobial agents sales (Table 3).

The average data coverage of the Middle Eastern countries could not be compared because countries of this region did not respond to this question on the template.

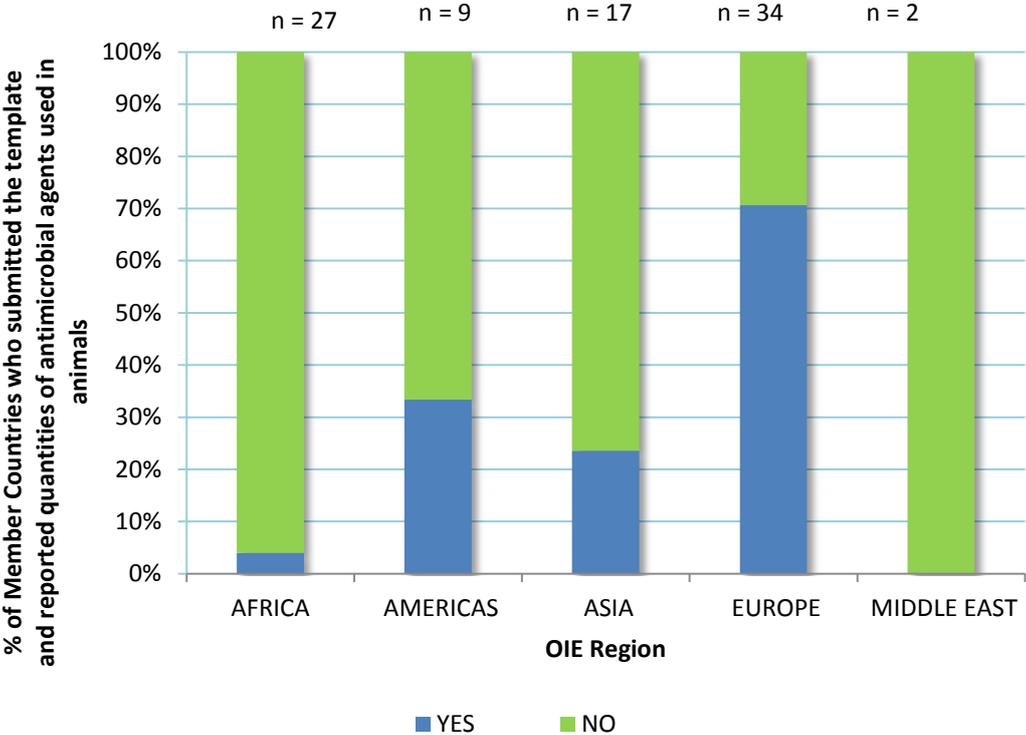
**Table 3.** Estimation of the coverage of data provided by OIE Region

Descriptive statistics	AFRICA	AMERICAS	ASIA	EUROPE
Mean	66.9%	78.9%	85.7%	97.6%
Mode	100%	100%	100%	100%
Standard Deviation	30.4%	22.6%	19.6%	6.8%
Minimum	10%	40%	40%	70%
Maximum	100%	100%	100%	100%

## National reports on the Web

When broken down by OIE Region, most Member Countries do not publish national reports on the Web. Europe is the only region where more than 50% of Member Countries’ national reports are available on the Web (Figure 19).

**Figure 19.** National reports available on the Web by OIE Region



## 4.2. Africa

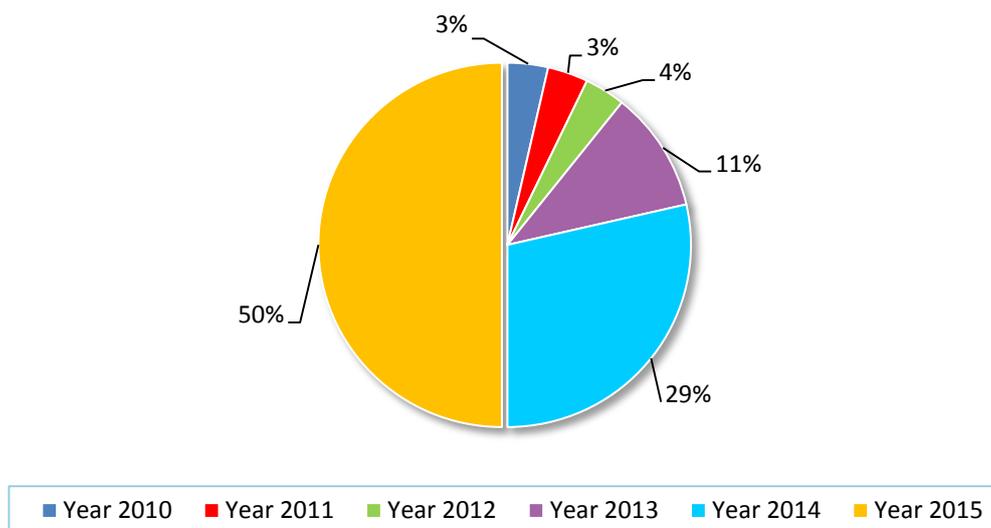
**Table 4.** General information for Africa

General information in Africa	
Number of Member Countries	54
Number of Member Countries responding the questionnaire	44 (81%)
Number of Member Countries providing quantitative data	27 (61%)

### Year of data collection

Based on 27 responses from African Members (Table 4), the most commonly reported year for quantities of sales of antimicrobial agents in animals was 2015 (Figure 20). Few countries were able to provide data for previous years and one country provided data for two different years. These findings may indicate that most Member Countries in Africa have only begun to collect such information recently or only have access to current information.

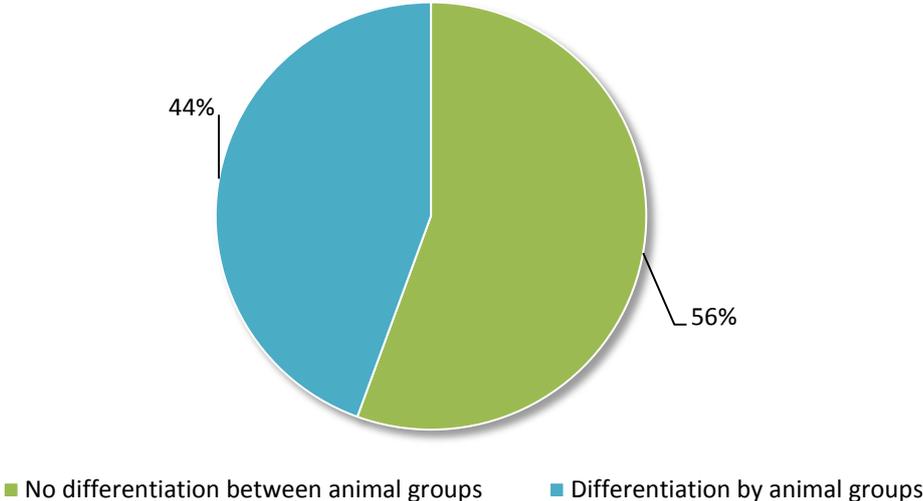
**Figure 20.** Data provided by 27 African countries, by year



# Animal groups

Most of the data from the African Member Countries cannot be differentiated by animal group. This result corresponds with the African Region’s predominant use of Reporting Option 1, which does not allow for differentiation by animal group (Figure 21). Multiple options were possible.

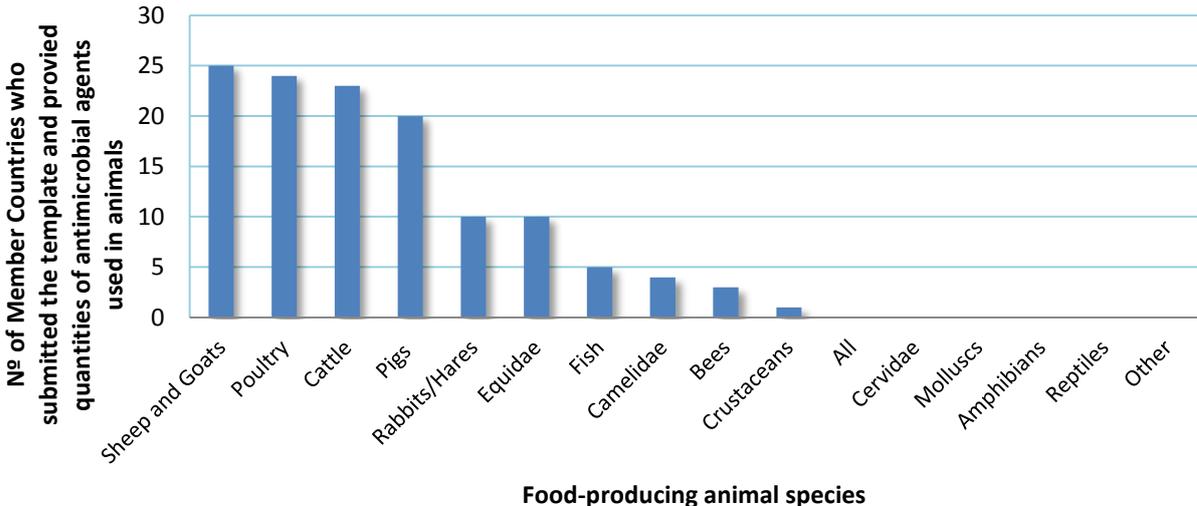
**Figure 21.** Animal groups covered by the data in 27 African Member Countries



# Food-producing animal species

In the 27 African Member Countries that reported actual quantities of antimicrobial agents in animals, the food-producing species most frequently covered by the data are sheep, goats, poultry and cattle (Figure 22).

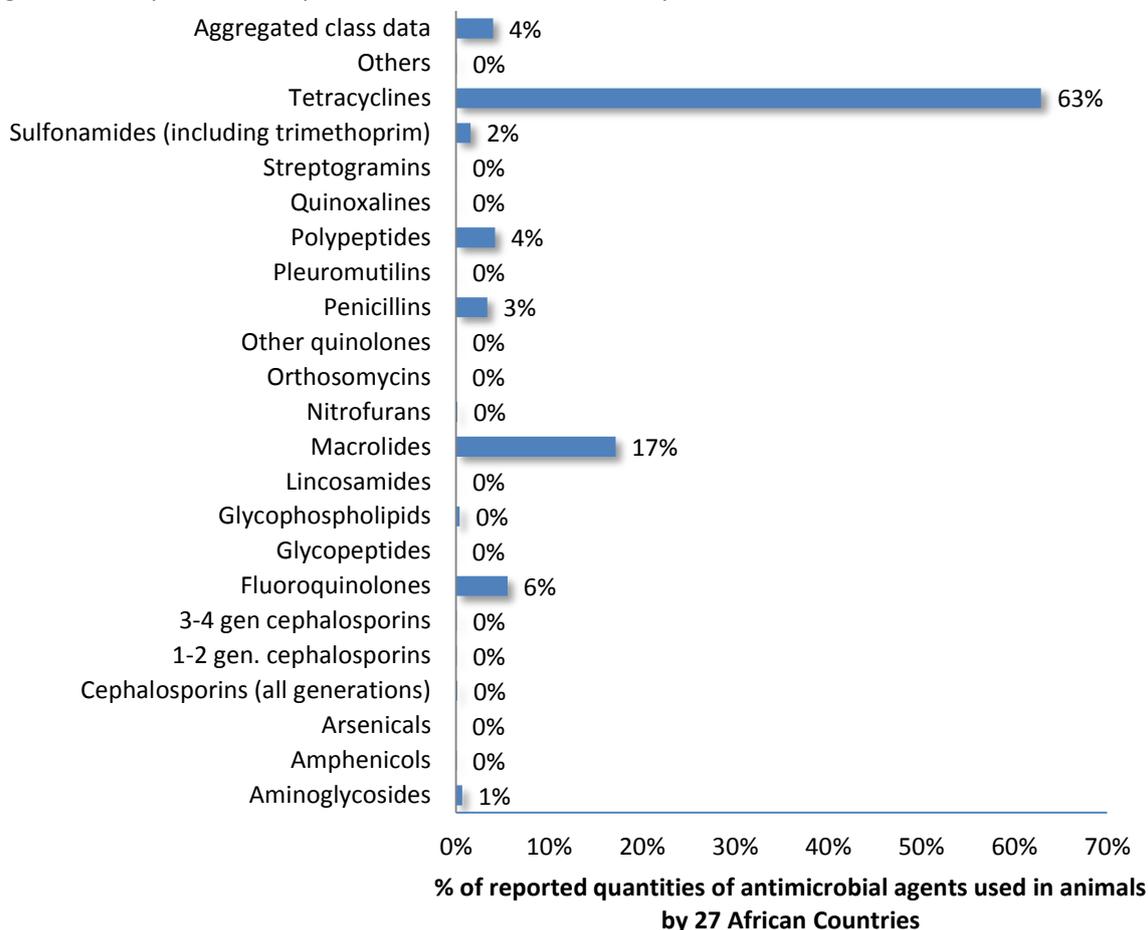
**Figure 22.** Food-producing animal species covered by the data in 27 African Member Countries.



## Quantities of antimicrobial classes reported

In Africa, the largest proportion of all reported antimicrobial classes were Tetracyclines and Macrolides (Figure 23).

**Figure 23.** Proportion of reported antimicrobial classes by 27 African Member Countries, 2010-2015



## 4.3. Americas

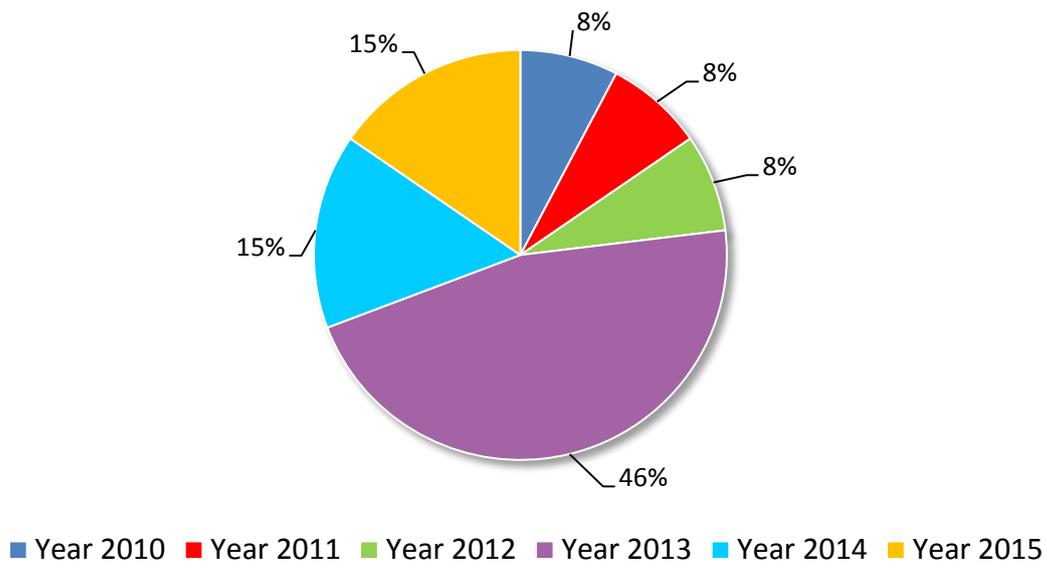
**Table 5.** General information for the Americas

Regional facts	
Number of Member Countries	29
Number of Member Countries responding the questionnaire	19 (66%)
Number of Member Countries providing quantitative data	9 (47%)

### Year of data collection

Most of the nine countries reporting from the Americas (Table 5) provided data on quantities of antimicrobial agents used in animals for 2013, the target year of data collection for the OIE (Figure 24). The OIE will work closely with Member Countries in this region to support them in reporting quantities of antimicrobial agents in animals. One country in the Americas was able to send five years' worth of data to the OIE (from 2010 to 2014), demonstrating the long-standing work of its surveillance system.

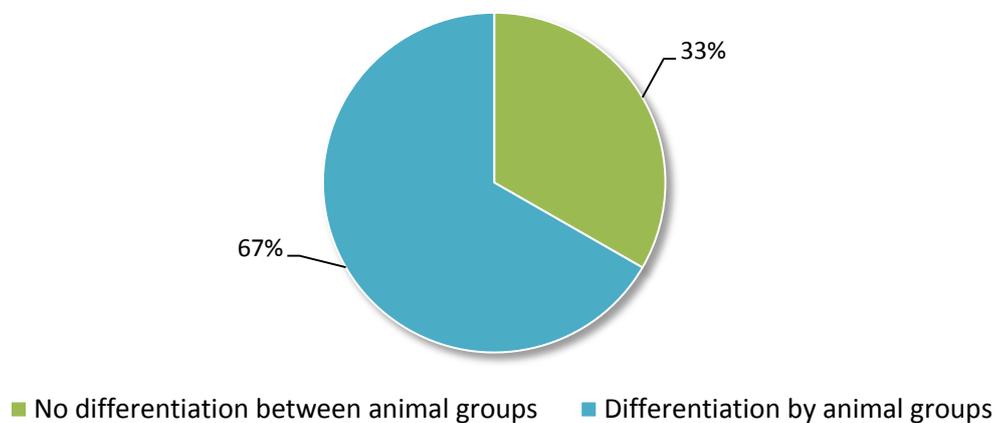
**Figure 24.** Data provided by 9 Member Countries in the Americas



## Animal groups

Most of the data from the Americas can be differentiated by animal groups (6 out of 9; 67%). Six out of the nine Member Countries of the Americas who submitted quantitative data, can distinguish which quantities of antimicrobial classes are being reported in terrestrial food-producing animals (Figure 25). Multiple options were possible in this field.

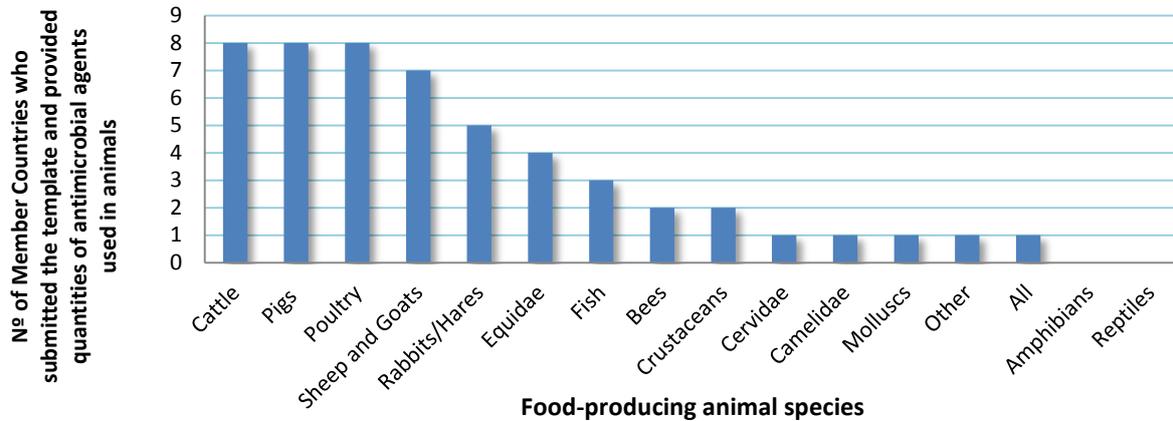
**Figure 25.** Animal groups covered by the data in 9 Member Countries in the Americas



## Food producing animal species

The animal species most frequently reported as food-producing animals were cattle, pigs and poultry (Figure 26). For further information on the grouping of species see Section 3.2. of this report. One Member Country declared that other animals are considered food-producing as mink, lamas, alpacas and bison.

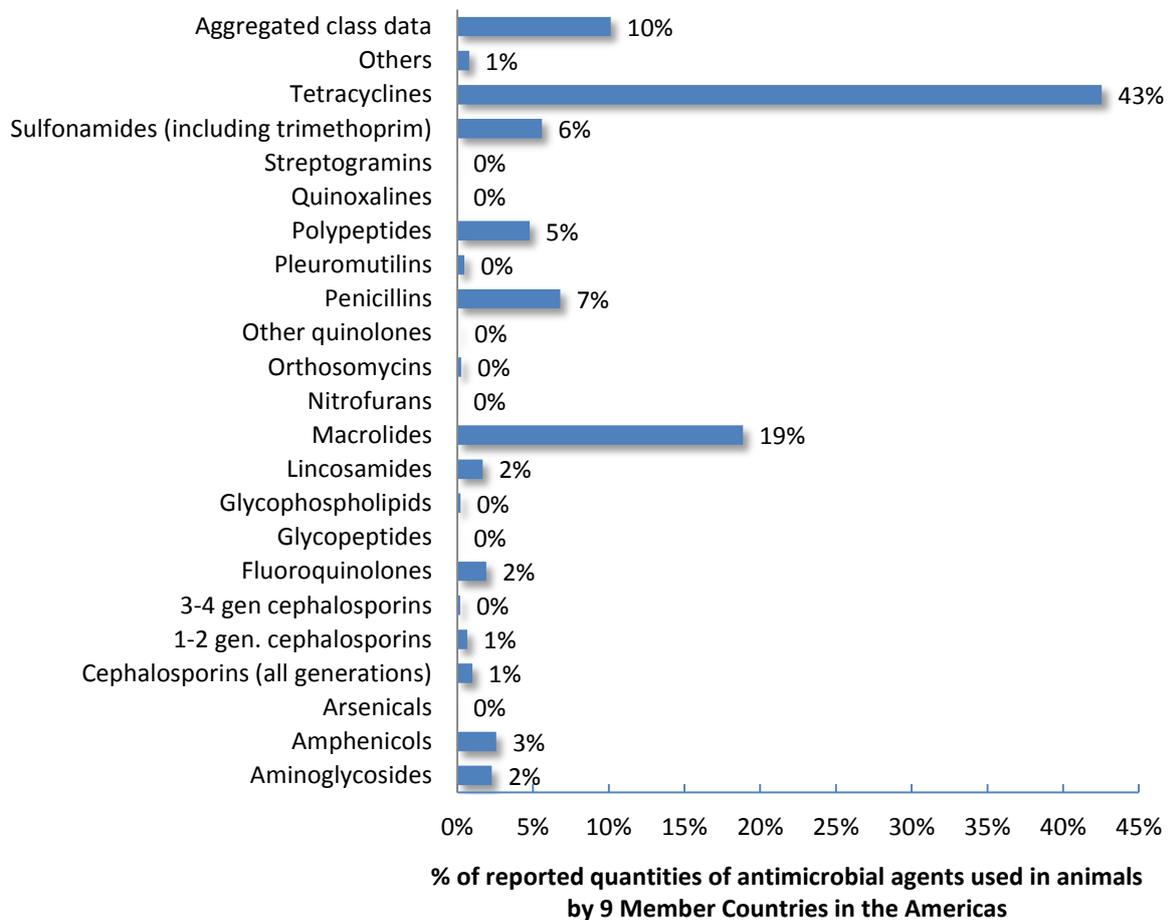
**Figure 26.** Food-producing animal species covered by the data for 9 Member Countries in the Americas



## Quantities of antimicrobial classes reported

In the Americas, the largest proportion of all reported antimicrobial classes were Tetracyclines and Macrolides (Figure 27).

**Figure 27.** Proportion of reported antimicrobial classes by 9 Member Countries in the Americas, 2010-2015



## 4.4. Asia and the Pacific

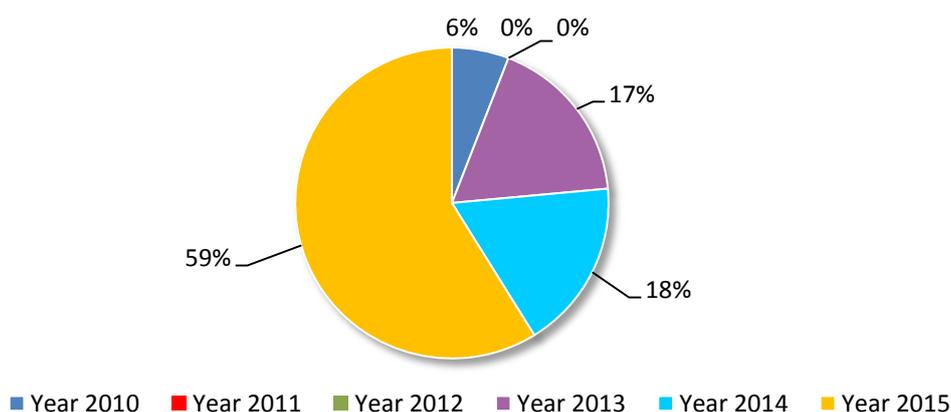
**Table 6.** General information for Asia and the Pacific

Regional facts	
Number of Member Countries	32
Number of Member Countries responding the questionnaire	26 (81%)
Number of Member Countries providing quantitative data	17 (65%)

### Year of data collection

59% (10/17) of Asian Member Countries reported data for 2015 (Table 6). Few countries were able to provide data for previous years, and none of the countries provided data for 2011 or 2012 (Figure 28). These findings may indicate that most Member Countries in Asia have only begun to collect such information recently or only have access to current information.

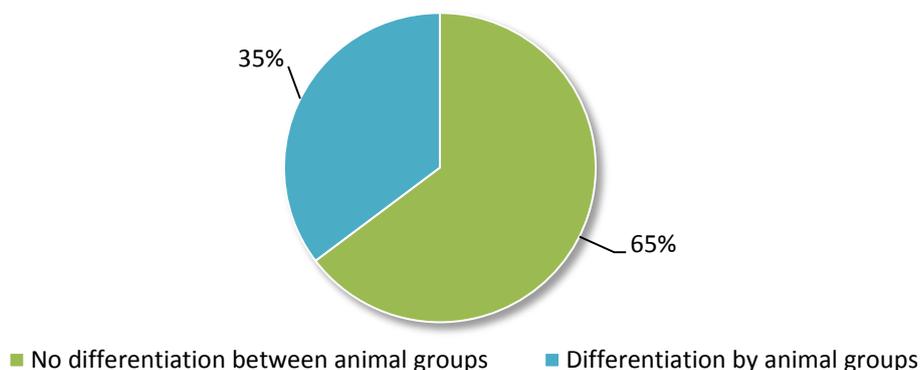
**Figure 28.** Data provided by 17 Asian countries, by year



### Animal groups

Most of the data from the Asian Member Countries cannot be differentiated by animal groups. This result corresponds with the Asian Region's predominant use of Reporting Option 1, which does not allow for differentiation by animal group (Figure 29). Multiple options were possible.

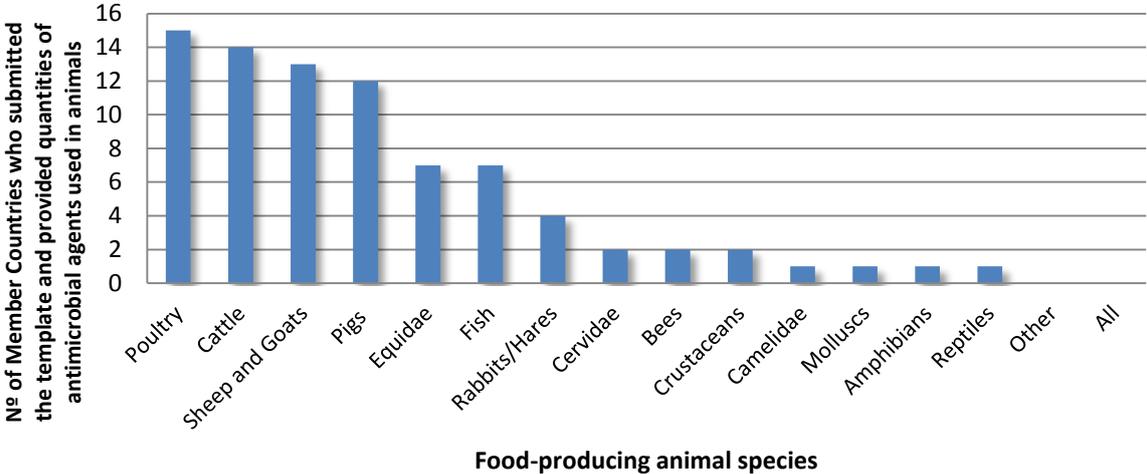
**Figure 29.** Animal groups covered by the data in 17 Asian Member Countries



### Food-producing animal species

In the 17 Asian Member Countries that reported actual quantities of antimicrobial agents in animals, the food-producing species most frequently covered by the data are poultry, cattle and sheep and goats (Figure 30).

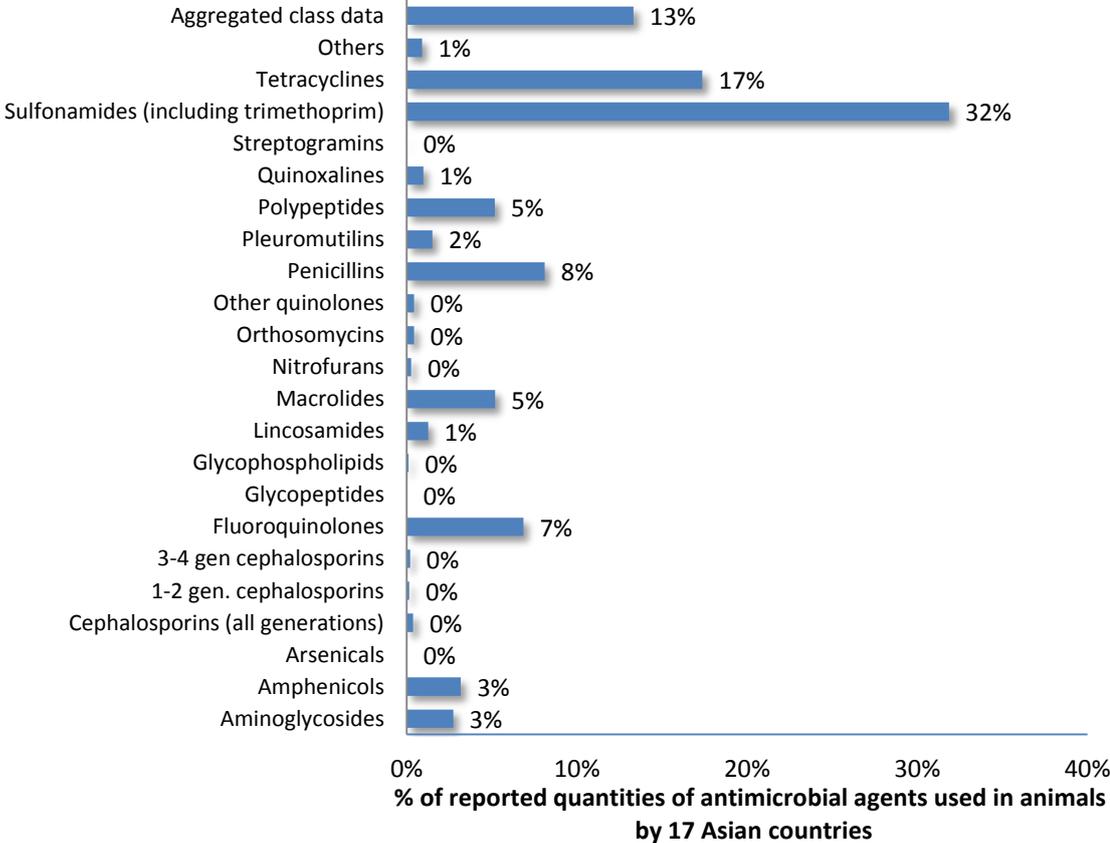
**Figure 30.** Food-producing animal species covered by the data for 17 Asian countries



### Quantities of antimicrobial classes reported

In Asia, the largest proportion of all reported antimicrobial classes were Sulfonamides and Tetracyclines (Figure 31).

**Figure 31.** Proportion of reported antimicrobials classes by 17 Member Countries in Asia, 2010-2015



## 4.5. Europe

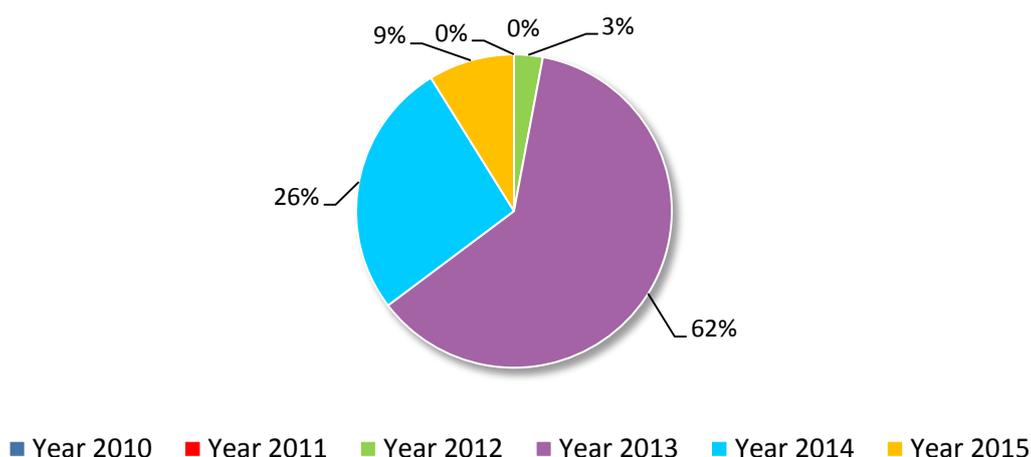
**Table 7.** General information for Europe

Regional facts	
<b>Number of Member Countries</b>	53
<b>Number of Member Countries responding the questionnaire</b>	36 (68%)
<b>Number of Member Countries providing quantitative data</b>	34 (94%)

### Year of data collection

Most of the thirty-four Member Countries reporting from Europe (Table 7) provided data on quantities of antimicrobial agents used in animals for 2013, the target year of data collection for the OIE. Most of the countries of this region usually report sales of veterinary antimicrobial agents through the ESVAC project (Figure 32).

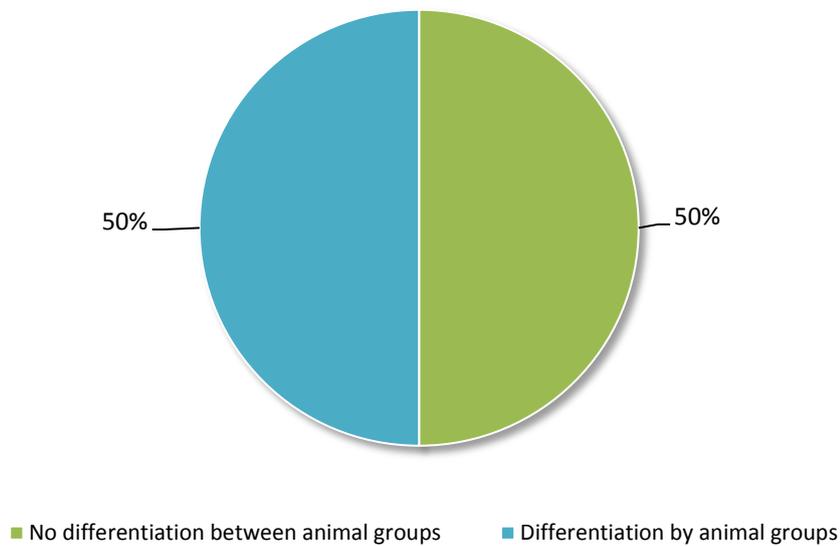
**Figure 32.** Data provided by 34 European countries, by year



### Animal groups

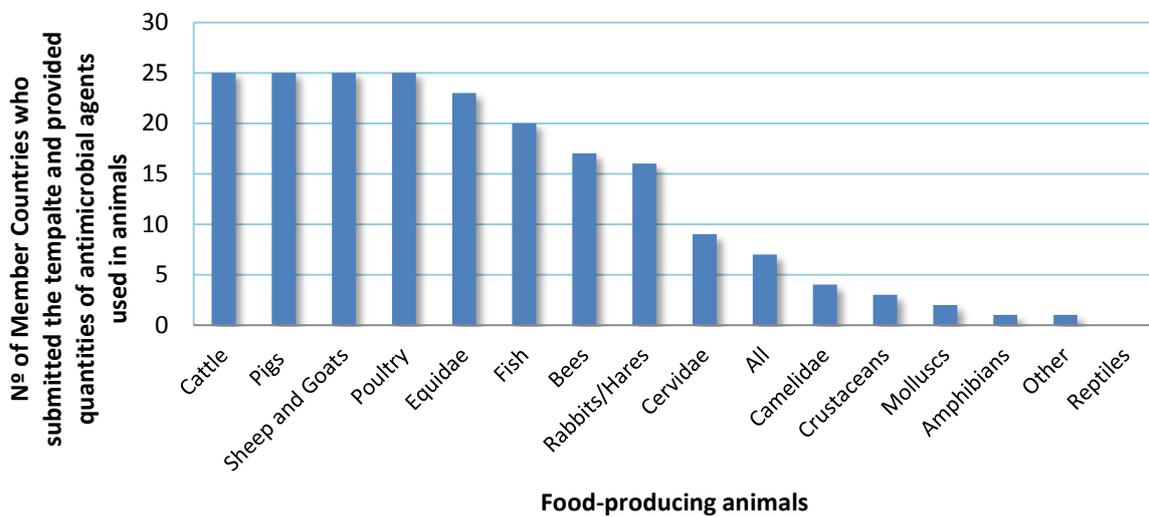
Half of the data reported to the OIE from European Member Countries cannot be differentiated by animals groups; however, many countries used Reporting Option 3 which allows a differentiation of the data by routes of administration and in some cases by animal groups. In Europe more Member Countries are able to report quantities of antimicrobial agents used in aquatic food-producing animals (Figure 33) than in any other region.

**Figure 33.** Animal groups covered by the data in 34 European Member Countries



**Food-producing animal species** In the 34 European Member Countries that reported actual quantities of antimicrobial agents in animals, the food-producing species most frequently covered by the data are cattle, pigs, sheep and goats and poultry (Figure 34).

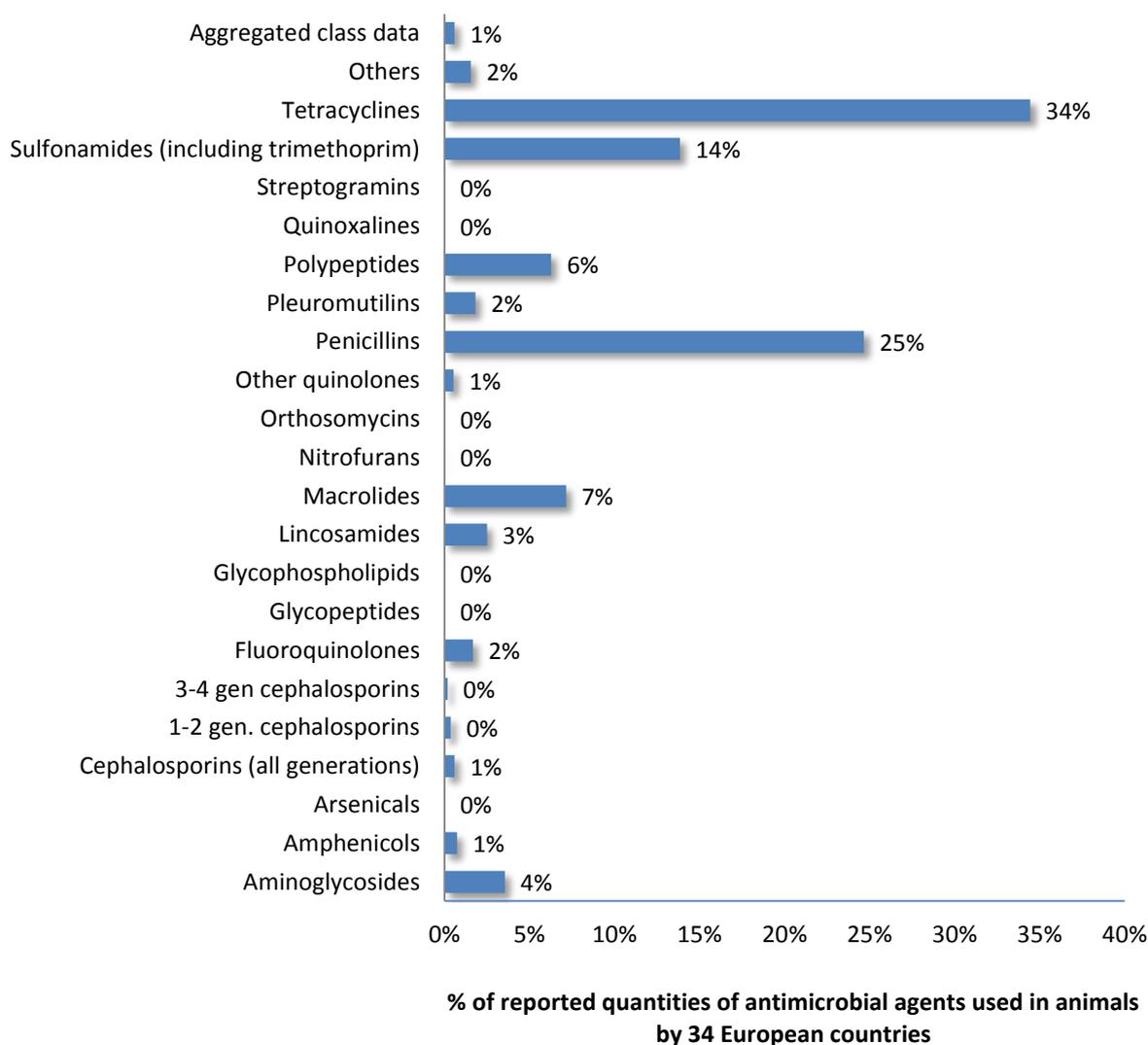
**Figure 34.** Food-producing animal species covered by the data for 34 European countries



## Quantities of antimicrobial classes reported

In Europe, the largest proportion of all reported antimicrobial classes were Tetracyclines and Penicillins (Figure 35).

**Figure 35.** Proportion of reported antimicrobials classes by 34 Member Countries in Europe, 2012-2015



## 4.6. Middle East

**Table 8.** General Information for the Middle East

Regional facts	
Number of Member Countries	12
Number of Member Countries responding the questionnaire	5 (42%)
Number of Member Countries providing quantitative data	3 (60%)

Due to confidentiality concerns, most variables included in the template cannot be published in this report for the Middle East region as the data represents only a small number of Member Countries (Table 8). Higher participation by Member Countries in the Middle East Region in the future will allow a more in-depth study of the data.

## 5. Future developments for data collection and the database

For the second phase of this initiative, several improvements have been made to the OIE Template and Guidance documents in order to minimise misinterpretation and to simplify the burden on Member Countries.

The OIE *ad hoc* Group on Antimicrobial Resistance agreed that a provisional denominator to be used by the OIE in order to interpret antimicrobial agent usage data will need to be refined. The OIE will use additional data to explore the possibility of defining cycle factors and mean weights of main production animals by regions or sub-regions and, in parallel, precise information on additional animal sub-categories needs to be obtained from OIE Member Countries.

Further work will be conducted to refine the information on animal census data in WAHIS in order to construct the denominator for data comparison in the long-term. In particular, the total number of terrestrial animals produced in one year is critical to put into context the total amount of antimicrobial agents used in one year. Simultaneously, it is expected that Member Countries will improve the quality and details of data on their use of antimicrobial agents in animals.

A denominator based on animal population or production is currently under study, as its refinement would reduce uncertainty about the use of antimicrobial agents in animals and facilitate the detection of trends in use of antimicrobial agents in animals over time.

In the future, the OIE will work more closely with Member Countries to support them to transform national data into the reportable format through the regional seminars for National Focal Points for Veterinary Products.

## 6. Discussion

Several Member Countries stated that they did not provide a list antimicrobial agents used as growth promoters as no legislation exists regarding this topic in their country. In the future, the OIE will need to explore further this topic.

In this first year of data collection, the period of time covered by the data was sometimes unclear. The OIE will continue to support Member Countries to provide information covering a full year's worth of data, in order to ensure appropriate interpretation of data and trends over time.

While participation was high (72% of all OIE Member Countries) in this first year of data collection, more participation from those Member Countries who didn't participate in 2015, as well as those Member Countries who only filled in the Baseline Information section, will be sought in order to better understand trends over time.

In 2015, some Member Countries responded to two questions in the Baseline Information section that should only apply to those Member Countries who provided quantitative data. The modifications made to the 2016 version of the data collection template attempt to address difficulties in the completion and interpretation of the 'animal groups covered by the data' and 'food-producing animal species covered by the data' variables.

The information obtained in this first phase shows that national monitoring systems that collect data on antimicrobial agents used in animals rely on different sources.

In order to enable accurate comparisons between countries, it is important to take into account the animal population of the country that is susceptible to be treated. There is variability in production cycles and animal weights around the world and comprehensive data are not yet available. Further developments to define a denominator (Animal Biomass) are under development and will facilitate data interpretation in the future.

## 7. Conclusions

The information provided in this report represents a remarkable first step in better understanding the global use of antimicrobial agents in animals. Given the outstanding participation of OIE Member Countries and their expressed desire to further increase transparency on the use of antimicrobial agents in animals around the world, we expect that the data reported will become more and more precise with each passing year. Each year, more countries are readying themselves to put in place surveillance systems on the use of antimicrobial agents in animals, and they expressed their enthusiasm to report information to the OIE in the future.

This report shows the need to provide additional support to Member Countries to improve their national monitoring systems. Detailed interpretation of the data also needs further development and in the future, the OIE database should allow countries to provide their information through an electronic portal.

## 8. References

1. World Organisation for Animal Health (OIE). – *Terrestrial Animal Health Code*. Chapter 6.8. Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals. Available at: [http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre\\_antibio\\_monitoring.htm](http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_antibio_monitoring.htm) (accessed on 9 December 2016).
2. World Organisation for Animal Health (OIE). – *Aquatic Animal Health Code*. Chapter 6.3. Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals. Available at: [http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre\\_control\\_feed\\_hazard.htm](http://www.oie.int/index.php?id=169&L=0&htmfile=chapitre_control_feed_hazard.htm) (accessed on 9 December 2016).
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Annual Report of Sales Amount and Sales Volume of Veterinary drugs, Quasi-drugs and Medical Devices (therapeutic use). (2005 to 2014) Retrieved from: <http://www.maff.go.jp/nval/iyakutou/hanbaidaka/index.html>

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SDa-rapport : het gebruik van antibiotica bij landbouwhuisdieren in 2015 (2015). Retrieved from: <https://www.rijksoverheid.nl/documenten/rapporten/2016/06/22/sda-rapport-het-gebruik-van-antibiotica-bij-landbouwhuisdieren-in-2015>

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Antibiotic sales reports (2003 to 2011). Retrieved from: <http://www.foodsafety.govt.nz/industry/acvm/reports/reviews/sales.htm>

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Usage of Antimicrobial Agents and Occurrence of Antimicrobial Resistance in Norway (1999 to 2013). Retrieved from: <http://www.vetinst.no/overv%C3%A5king/antibiotikaresistens-norm-vet>

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# ANNEXES

- Annex 1 OIE template
- Annex 2 Guidance for completing the OIE template for the collection of data on antimicrobial agents used in animals
- Annex 3 Annex to the Guidance for Completing the OIE template for the collection of data on Antimicrobial Agents used in Animals
- Annex 4 Distribution of countries by OIE region according to the OIE Note de Service 2010/2012



# Annex 1. OIE Template

This sheet of the OIE template should be completed by all OIE Member Countries		Questions/data requests in <i>italics</i> and grey font are not mandatory, if data are available they should be given.		
1	<b>Contact Point for data collection</b>			
2	Name (order: salutation, first name, surname)	<free text field>		
	Role with respect to the OIE	<free text field>		
3	Organisation	<free text field>		
4	Address	<free text field>		
5	Phone number	<free text field>		
6	Email address	<free text field>		
6	<b>Year of data collection</b>	<free text field>		
7	<b>Country</b>	<free text field>		
8	<b>Are antimicrobial growth promoters authorised for use in your country?</b>	<input type="radio"/> Yes <input type="radio"/> No		
9	<i>List of allowed antimicrobial growth promoters, if the answer to the previous question is 'yes'</i>	<free text field>		
10	<b>Data source</b>	<input type="checkbox"/> Sales data – Wholesalers <input type="checkbox"/> Sales data – Retailers <input type="checkbox"/> Sales data – Marketing Authorisation Holders <input type="checkbox"/> Sales data – Registration Authorities <input type="checkbox"/> Sales data – Feed mills <input type="checkbox"/> Sales data – Pharmacies <input type="checkbox"/> Sales data – Farm shops/agricultural suppliers <input type="checkbox"/> Sales data – Industry trade associations <input type="checkbox"/> Sales data – Veterinarian <input type="checkbox"/> Purchase data - Wholesalers <input type="checkbox"/> Purchase data – Retailers <input type="checkbox"/> Purchase data – Feed mills <input type="checkbox"/> Purchase data – Pharmacies <input type="checkbox"/> Purchase data – Agricultural Cooperatives <input type="checkbox"/> Purchase data – Producer organisations <input type="checkbox"/> Import data – Customs declarations – veterinary products <input type="checkbox"/> Import data – Customs declarations – active ingredients <input type="checkbox"/> Veterinary prescription data – Sales <input type="checkbox"/> Veterinary prescription data – Prescriptions <input type="checkbox"/> Veterinary prescription data – Dispensing <input type="checkbox"/> Antimicrobial use data – Farm records <input type="checkbox"/> None <input type="checkbox"/> Other (further specified in 'Data source clarification')		
11	<i>Data source clarification</i>	<free text field>		
12	<i>Are data on amounts of antimicrobial agents for use in animals accessible?</i>	<input type="radio"/> Yes <input type="radio"/> No		
13	<i>Estimated coverage of accessible data on total amount (in %)</i>	<free text field>		
14	<i>Is the information extrapolated from representative samples?</i>	<input type="radio"/> Yes <input type="radio"/> No		
15	<i>Explanation of estimated coverage and extrapolations carried out</i>	<free text field>		
16	<i>Animal groups covered by the data</i>	<input type="checkbox"/> All animals <input type="checkbox"/> All food-producing animals (terrestrial and aquatic) <input type="checkbox"/> Terrestrial food-producing animals <input type="checkbox"/> Aquatic food-producing animals <input type="checkbox"/> Companion animals <input type="checkbox"/> Other		
17	<i>Food producing animal species covered by the data</i>	<input type="checkbox"/> Cattle <input type="checkbox"/> Pigs - commercial <input type="checkbox"/> Pigs - backyard <input type="checkbox"/> Sheep <input type="checkbox"/> Goats <input type="checkbox"/> Sheep and goats (mixed flocks) <input type="checkbox"/> Layers – commercial production for eggs <input type="checkbox"/> Broilers – commercial productions for meat <input type="checkbox"/> Other commercial poultry <input type="checkbox"/> Poultry - backyard <input type="checkbox"/> Buffaloes (not <i>Syncerus caffer</i> ) <input type="checkbox"/> Cervidae (farmed) <input type="checkbox"/> Camelidae <input type="checkbox"/> Equidae <input type="checkbox"/> Rabbits/Hares <input type="checkbox"/> Bees <input type="checkbox"/> Fish – aquaculture production <input type="checkbox"/> Fish – fish farmed in fresh water <input type="checkbox"/> Crustaceans –aquaculture production <input type="checkbox"/> Molluscs –aquaculture production <input type="checkbox"/> Amphibians <input type="checkbox"/> Reptiles (e.g. Crocodiles) <input type="checkbox"/> Other <input type="checkbox"/> All		
18	<i>Clarification of species considered as food-producing</i>	<free text field>		
19	<i>National report(s) on sales of antimicrobials for use in animals available on the web?</i>	<free text field>		
21	<b>Choosing your Reporting option, once the Baseline information is completed</b>			
22	Please choose your Reporting option in accordance with the table and complete the corresponding sheet			
22	National sales data / data on types or amounts of antimicrobial agents used in animals available	Information available for food producing terrestrial or aquatic animals or both	Data available per route of administration	
24	Reporting option 1	Y	N	N
25	Reporting option 2	Y	Y	N
25	Reporting option 3	Y	Y or N	Y

**OIE template for the collection of data on antimicrobial agents used in animals**  
**Reporting option 1 - Overall amount sold for/used in animals by antimicrobial class; with the possibility to separate by type of use**

Antimicrobial class	Overall amount (Growth promotion + Therapeutic use)	Amount for Therapeutic use (including prevention of clinical signs)	Amount for Growth promotion
	All animal species (kg)	All animal species (kg)	All animal species (kg)
Aminoglycosides			
Amphenicols			
Arsenicals			
Cephalosporins (all generations)			
1-2 gen. cephalosporins			
3-4 gen cephalosporins			
Fluroquinolones			
Glycopeptides			
Glycophospholipids			
Lincosamides			
Macrolides			
Nitrofurans			
Orthosomycins			
Other quinolones			
Penicillins			
Pleuromutilins			
Polypeptides			
Quinoxalines			
Streptogramins			
Sulfonamides (including trimethoprim)			
Tetracyclines			
Others			
<b>Aggregated class data</b>			
Total kg			

<i>If 'Aggregated class data' are reported, please list here the classes combined</i>	<free text field>	List all classes for which the amounts were combined, using whenever possible the 'Antimicrobial class' terms or the terminology of the OIE list of antimicrobial agents of veterinary importance. Substances included in the data aggregation that are not part of the recommended terminology should also be listed. If one class was reported that needs to remain confidential, please enter 'Confidential'.
<i>If 'Others' are reported under 'Antimicrobial class', list here the classes reported</i>	<free text field>	Describe the class or classes reported as 'Others', using whenever possible the terminology of the OIE list of antimicrobial agents of veterinary importance.
<i>Please report here any additional calculations applied</i>	<free text field>	Please describe here calculations carried out in addition to the ones recommended by the OIE in sections 1 and 2 of the annex to the instructions for the compilation of the OIE template.

**OIE template for the collection of data on antimicrobial agents used in animals**  
**Reporting option 2 - Overall amount sold for/used in animals by antimicrobial class; with the possibility to separate by type of use and species group**

Antimicrobial class	Overall amount (Growth promotion + Therapeutic use) (kg)	Amount for Therapeutic use (including prevention of clinical signs)				Amount for Growth promotion (kg)
		All animal species (kg)	All food producing animals (terrestrial & aquatic) (kg)	Terrestrial food producing animals (kg)	Aquatic food producing animals (kg)	
Aminoglycosides						
Amphenicols						
Arsenicals						
Cephalosporins (all generations)						
1-2 gen. cephalosporins						
3-4 gen cephalosporins						
Fluoroquinolones						
Glycopeptides						
Glycophospholipids						
Lincosamides						
Macrolides						
Nitrofurans						
Orthosomycins						
Other quinolones						
Penicillins						
Pleuromutilins						
Polypeptides						
Quinoxalines						
Streptogramins						
Sulfonamides (including trimethoprim)						
Tetracyclines						
Others						
Aggregated class data						
Total kg						
<i>If 'Aggregated class data' are reported, please list here the classes combined</i>	<free text field>	List all classes for which the amounts were combined, using whenever possible the 'Antimicrobial class' terms or the terminology of the OIE list of antimicrobial agents of veterinary importance. Substances included in the data aggregation that are not part of the recommended terminology should also be listed. If one class was reported that needs to remain confidential, please enter 'Confidential'.				
<i>If 'Others' are reported under 'Antimicrobial class', list here the classes reported</i>	<free text field>	Describe the class or classes reported as 'Others', using whenever possible the terminology of the OIE list of antimicrobial agents of veterinary importance.				
<i>Please report here any additional transformations applied</i>	<free text field>	Please describe here calculations carried out in addition to the ones recommended by the OIE in sections 1 and 2 of the annex to the instructions for the compilation of the OIE template				

OIE template for the collection of data on antimicrobial agents used in animals

**Reporting option 3 - Overall amount sold for/used in animals by antimicrobial class; with the possibility to separate by type of use, species group and route of administration**

Overall amount (Growth promotion + Therapeutic use)		Amount for Therapeutic use (including prevention of clinical signs)													
Antimicrobial class	All animal species (kg)	All animal species			All food-producing animals (terrestrial and aquatic)			Terrestrial food-producing animals			Aquatic food-producing animals				
		Oral route (kg)	Injection route (kg)	Other routes (kg)	Oral route (kg)	Injection route (kg)	Other routes (kg)	Oral route (kg)	Injection route (kg)	Other routes (kg)	Oral route (kg)	Injection route (kg)	Other routes (kg)		
Aminoglycosides															
Amphenicols															
Arsenicals															
Cephalosporins (all generations)															
1-2 gen. cephalosporins															
3-4 gen cephalosporins															
Fluoroquinolones															
Glycopeptides															
Glycophospholipids															
Lincosamides															
Macrolides															
Nitrofurans															
Orthosomycins															
Other quinolones															
Penicillins															
Pleuromutilins															
Polypeptides															
Quinoxalines															
Streptogramins															
Sulfonamides (including trimethoprim)															
Tetracyclines															
Others															
<b>Aggregated class data</b>															
<b>Total kg</b>															
<i>If 'Aggregated class data' are reported, please list here the classes combined</i>		List all classes for which the amounts were combined, using whenever possible the 'Antimicrobial class' terms or the terminology of the OIE list of antimicrobial agents of veterinary importance. Substances included in the data aggregation that are not part of the recommended terminology should also be listed. If one class was reported that needs to remain confidential, please enter 'Confidential'.													
<i>If 'Others' are reported under 'Antimicrobial class', list here the classes reported</i>		Describe the class or classes reported as 'Others', using whenever possible the terminology of the OIE list of antimicrobial agents of veterinary importance.													
<i>Please report here any additional transformations applied</i>		Please describe here calculations carried out in addition to the ones recommended by the OIE in sections 1 and 2 of the annex to the instructions for the compilation of the OIE template.													

# Annex 2. Guidance for completing the OIE template for the collection of data on antimicrobial agents used in animals

World Organisation for Animal Health 2015

## Guidance for completing the OIE template for the collection of data on antimicrobial agents used in animals

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## Introduction

The OIE proposes to collect data on antimicrobial agents used in animals from OIE Member Countries implementing Chapters 6.8. Monitoring of the quantities and usage patterns of antimicrobial agents used in food-producing animals of the OIE *Terrestrial Animal Health Code* and 6.3. Monitoring of the quantities and usage patterns of antimicrobial agents used in aquatic animals of the OIE *Aquatic Animal Health Code*, and to contribute to the global effort against antimicrobial resistance.

Member Countries differ in the degree to which they collect, collate and publish data on antimicrobial sales or use in animals and also in the degree to which they can stratify the quantities of antimicrobial agents used in animals or used in different animal species.

Through this initiative, by means of a specific template (OIE template), the OIE seeks to collect data on antimicrobial agent use in animals from all OIE Member Countries in a harmonised way. Using a phased approach, the OIE will initially focus on **sales**<sup>6</sup> of antimicrobial agents destined for use in animals as an indicator of actual use. All antimicrobial agents destined for use in animals and listed in the OIE List of antimicrobial agents of veterinary importance<sup>7</sup>, plus certain antimicrobial agents only used for growth promotion should be reported. The exceptions are ionophores, which are mostly used for parasite control and therefore need not be reported as antimicrobial agents. The OIE places highest priority on food-producing animals, however data on all animals may be reported. Reporting will occur at antimicrobial class and, on one occasion, at sub-class level.

For the purpose of reporting data on antimicrobial quantities (amounts sold or imported for use in animals expressed in kg antimicrobial agent (chemical compound as declared on the product label) that is to be calculated from the available information as explained in the annex to this guidance document), animals are grouped into 'all animal species', 'all food-producing animals', 'terrestrial food-producing animals', and 'aquatic food-producing animals'.

Further refinement of the OIE collection of data on antimicrobial sales or use in animals is anticipated in the light of the experience gained with the utilisation of the OIE template and additional changes will be necessary as Member Countries capabilities of reporting stratified data develop.

For questions on the OIE template please contact the OIE at [antimicrobialuse@oie.int](mailto:antimicrobialuse@oie.int).

## Introducing the individual sheets of the OIE template for the collection of data on antimicrobial agents used in animals

### Required information and choices for reporting

As noted before, OIE Member Countries differ in the degree to which data on antimicrobial sales for use in animals is accessible and in the degree to which the quantities of antimicrobial agents used in animals can be further differentiated, for example by species. Therefore, three different reporting options are proposed.

There are four worksheets in the OIE template (four tabs at the bottom of the Microsoft excel file) labelled 'Baseline information', 'Reporting option 1', 'Reporting option 2', and 'Reporting option 3'.

**All OIE Member Countries** should complete the sheet **Baseline information**. On this sheet, some fields are formatted in *italics and grey*; these fields are optional, but Member Countries are encouraged to provide information to the greatest extent possible. Subsequently, and in accordance with the level of detail for data on antimicrobial agents used in animals available in the reporting country, either the sheet labelled **Reporting option 1** or the sheet labelled **Reporting option 2** or the sheet labelled **Reporting option 3** should be completed – only one of the three Reporting options should be selected.

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<sup>6</sup> 'Sales' in the context of the OIE data collection on antimicrobial agents used in animals should be interpreted to include data on import of antimicrobial agents for use in animals.

<sup>7</sup> [http://www.oie.int/fileadmin/Home/eng/Our\\_scientific\\_expertise/docs/pdf/Eng\\_OIE\\_List\\_antimicrobials\\_May2015.pdf](http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/Eng_OIE_List_antimicrobials_May2015.pdf)

## Baseline information

This sheet collects administrative information relevant to the data collected with this template. It should be completed by **all OIE Member Countries**.

At the bottom of this sheet a matrix is provided to help OIE Member Countries decide which Reporting option to complete next.

## Reporting option 1 (overall amount sold for / used in animals by antimicrobial class, with the possibility to separate by type of use)

The form **Reporting option 1** is designed for the reporting of data on amount or type of antimicrobial agents used in all animals and accommodates reporting with only limited additional differentiation. Data may be reported overall for all animal species, but can be separated by antimicrobial class and possibly by type of use (therapeutic use, including prevention of clinical signs, or growth promotion use; see definitions below). If you know which classes of antimicrobial agents are used in animals in your country, but not how much is sold, you can still use this sheet. Instead of a number, please enter three dots, <...>, in the table.

## Reporting option 2 (overall amount sold for / used in use animals by antimicrobial class, with the possibility to separate by type of use and species group).

If the data can be differentiated by use in all food-producing animals, and / or by use in terrestrial and aquatic food-producing animals, **Reporting option 2** is the appropriate choice. Further differentiation by antimicrobial class, therapeutic use, including prevention of clinical signs, or growth promotion use is possible.

## Reporting option 3 (overall amount sold for / used in animals by antimicrobial class, with the possibility to separate by type of use, species group and route of administration).

If the data can be differentiated by route of administration, **Reporting option 3** is the appropriate choice. Further differentiation by antimicrobial class, use in food-producing species and, where possible, by use in terrestrial and aquatic food-producing species as well as therapeutic use, including prevention of clinical signs, or growth promotion use is possible.

## Guidance notes on the data to be provided in the OIE template

### Explanation of terms used in the context of the OIE template and related documents

A number of terms require definition of their use in the context of the OIE template, in order to ensure a harmonised approach to data collection.

**Active entity:** Antimicrobial agents (see definition below) are chemical compounds that can come in various forms. In order to render an antimicrobial agent suitable for use in a veterinary medicine, or to achieve desirable pharmacokinetic or organoleptic properties, antimicrobial agents can exist as different salts or esters or other chemical compounds. The **active entity** is the part of the chemical compound responsible for the antimicrobial action. The name used to refer to an antimicrobial agent listed on the OIE List of antimicrobial agents of veterinary importance is generally identical to the **active entity** of that agent.

**Antimicrobial agent:** As defined in the glossaries of the *OIE Terrestrial Code* and the *OIE Aquatic Code*, this means a naturally occurring, semi-synthetic or synthetic substance that exhibits antimicrobial activity (kill or inhibit the growth of micro-organisms) at concentrations attainable in vivo. Anthelmintics and substances classed as disinfectants or antiseptics are excluded from this definition. In the context of the OIE template, this term is being used as a general reference to substances with antimicrobial activity.

**Antimicrobial classes for use in animals:** Any antimicrobial agent belonging to the antimicrobial classes listed on the *OIE List of antimicrobial agents of veterinary importance* is included. In addition, antimicrobial agents used exclusively for growth promotion are also included. With the exception of ionophores, which are mostly used for parasite control, all uses of these substances should be reported, whether the antimicrobial agents are categorised as veterinary medicines or not.

**Chemical compound as declared on the product label:** As explained for active entity, an antimicrobial agent may exist in the form of various chemical compounds. For example, benzylpenicillin (the active entity) the sodium, potassium, procaine, benzathine or benethamine salts, and the prodrug penethamine hydroiodide are used in veterinary medicine. In consequence they may be traded as bulk products or be included in veterinary medicinal products containing antimicrobial agents (see explanation below). The term **chemical compound as declared on the product label** refers to the substance as it is reported on the label of a veterinary medicinal product or a bulk container or in the information provided to customs. This may be either the active entity (e.g. benzylpenicillin) or the complete chemical compound (e.g. sodium benzylpenicillin).

**Growth promotion, growth promoters:** In line with the definition developed by Codex Alimentarius in *CAC/RCP 61-2005*, Growth Promotion refers to the use of antimicrobial substances to increase the rate of weight gain and/or the efficiency of feed utilization in animals by other than purely nutritional means. The term does NOT apply to the use of antimicrobial agents for the specific purpose of treating, controlling, or preventing infectious diseases, even when an incidental growth response may be obtained. **Growth promoters** in the context of this template are antimicrobial agents used for the purpose of growth promotion.

**Therapeutic use:** Administration of an antimicrobial agent to animals to prevent, control or treat infection or disease. Acknowledging that the OIE template may be completed without consulting this guidance document, it was agreed that for reasons of clarity the OIE template would use 'Therapeutic use (including prevention of clinical signs)' in the table headings of all reporting options.

**Extrapolation:** An approach by which the total amount of antimicrobial agents used in animals was derived from a limited, but representative dataset. Details on the approach should be provided. Caution should be exercised in situations where the data sources are not representative of the whole. For example, extrapolation from a limited number of wholesalers may not adequately represent the entire antimicrobial sales market.

**Food-producing species:** The animal species that are managed by people for the purpose of producing food for humans. The relevant species may differ between countries.

**Quantitative data versus qualitative data:** The term 'quantitative' refers to a type of information based in quantities or else quantifiable data (objective properties) — as opposed to 'qualitative' information which deals with apparent qualities (subjective properties). Quantitative data may also refer to mass, time, or productivity. In the context of this template, **quantitative data** means that the amount of antimicrobial agents used in animals can be determined, for example through information on amount of antimicrobials imported, or number of packages of specific antimicrobial products used in animals, and is reportable in the metric 'kg antimicrobial agent'. In the context of this template, **qualitative data** means that the classes of antimicrobial agents used in animals can be described, without knowing the amounts used.

**Sales of antimicrobial agent(s) used in animals versus use data:** For the purpose of data collection through the OIE template, **sales data**, also referred to as 'amount of antimicrobial agent(s) used in animals' relates to the amounts of antimicrobial agents imported, manufactured and /or sold within a country for use in animals. Sales data are used as an approximation of actual use. **Use data** refers to the amount of antimicrobial agents actually administered to animals. Such data are difficult to collect in most environments, as the data sources would be at the level of individual farmers or veterinarians.

**Veterinary medicinal product containing antimicrobial agent(s):** As defined in the glossaries of the *OIE Terrestrial Code* and the *OIE Aquatic Code*, the term *veterinary medicinal product* means any product with approved claim(s) to having a prophylactic, therapeutic or diagnostic effect or to alter physiological functions when administered or applied to an animal. A veterinary medicinal product containing antimicrobial agent(s) refers to veterinary medicinal products used for their antimicrobial effect due to one or more antimicrobial agents they contain.

## Baseline information

Field name	Information to be provided
<b>Contact Point for data collection</b>	Please provide the contact details of the person entering the information, also indicating the role of the person entering the data with respect to the OIE. The information is needed in case there are queries on the data provided.
<p><b>Name:</b> Please complete the fields as follows:</p> <p><b>Role with respect to the OIE</b> Salutation (e.g. Dr, Ms, Mr), first or given name, surname or family name From the provided drop down list please choose either 'Delegate', 'National Focal Point for Veterinary Products' or 'Other' to describe your relation to the OIE.</p> <p><b>Organisation:</b> Name of the organisation you work for, administrative subunit, and position – if necessary</p> <p><b>Address:</b> Full mailing address of your organisation</p> <p><b>Phone number:</b> Please provide your full telephone number including the international dialling code.</p> <p><b>Email address:</b> Please provide the email address where you can best be reached.</p>	
<b>Year of data collection</b>	Calendar year for which you are providing data. We aim for 2013 data, but will accept more recent data or the most recent older data (but not before 2010). For each year a separate form needs to be filled in, indicating the calendar year to which the data relate.
<b>Country</b>	Please enter your country's name in full text.
<b>Are antimicrobial growth promoters authorised for use in your country?</b>	Please respond by ticking either 'Yes' or 'No'. Choose 'Yes' if your country's legislation / regulations has no provisions for antimicrobial growth promotion, but use of antimicrobial agents for growth promotion is known to occur.
<b>List of allowed antimicrobial growth promoters, if the answer to the previous question is 'yes'</b>	If antimicrobial growth promoters are used (meaning the response to the question above is 'Yes'), please list the antimicrobial agents (active ingredient name, not product name) used for growth promotion. Please report using either the simplified terminology of the tables on <b>Reporting option 1, 2 or 3</b> , or by using the terminology of the OIE List of antimicrobial agents of veterinary importance.
<b>Data source</b>	Please describe the origin of the data on antimicrobial sales for use in animals, the preferred data at this stage. The template provides options for data sources, and you are asked to report all data sources that apply. Chapter 6.8 of the <i>OIE Terrestrial Code</i> and Chapter 6.3 of the <i>OIE Aquatic Code</i> provide more detail on potential sources of such information. Possible data sources include: <ul style="list-style-type: none"> <li>• Sales data - complete data on antimicrobials sold to / bought from wholesalers.</li> <li>• Purchase data - data based on sampling of a limited number of wholesalers and requiring extrapolation to estimate the full amount of antimicrobials purchased, but should be used with care.</li> <li>• Import data - complete import data from customs.</li> <li>• Manufacturing data - complete production numbers reported by manufacturers.</li> <li>• Prescription data - complete or representative sample information obtained from veterinarians; if representative sample information is obtained extrapolation to the estimated full use may be possible.</li> </ul>

Field name	Information to be provided
	<ul style="list-style-type: none"> <li>• Antimicrobial use data - complete or representative sample information obtained from farm records; if representative sample information is obtained extrapolation to the estimated full use may be possible</li> <li>• Other data - all other ways of delivering antimicrobial agents to the animals, including distribution through state veterinary services.</li> </ul> <p>It is suggested to develop an overview to the drug distribution system in your country. Mapping out the distribution pathways in your country will help you identify the most appropriate source of information on import or sales of antimicrobial agents for use in or animals. Great care is necessary to avoid duplicate or multiple reporting of quantities; mapping out the distribution will also help you devise measures aimed at avoiding multiple reporting. Ideally, the source of information should be as close to the point of use as possible. Experience has shown that whenever possible sales data at the package level should be collected, keeping in mind that the data will be measured in kg of antimicrobial agent (please refer to the annex of this document for details on the necessary conversions). Good communication between all parties involved in the data collection is critical to obtain good data sets.</p>
<b>Data source clarification</b>	If under <b>Data source</b> the option 'Other (further specified in 'Data source clarification')' is selected, please explain here which source of information was used.
<b>Are quantitative data on sales available?</b>	<p>Please indicate whether quantitative data (i.e. data on the amount) on antimicrobial agents used in animals are available, by choosing 'Yes' or 'No'. If quantitative data is available for part of your country, choose 'Yes'.</p> <p>In the subsequent field '<b>Estimated coverage of accessible data on total sales</b>', indicate the extent to which the available data cover total sales of antimicrobial agents for use in animals as a percentage (in relation to the overall use). In the field '<b>Explanation of estimated coverage and extrapolations carried out</b>' please provide a description of the sales not covered by the data, if there is less than 100% coverage.</p> <p>If the data available in your country is qualitative (the types of antimicrobial agents used in animals are known but not how much is sold), choose 'No'. If you know which substances or classes of antimicrobials are used in your country, please report this in the sheet <b>Reporting option 1</b> by entering three dots, '...', in the cells that would normally hold the numbers for quantities sold.</p> <p>If you do not know which substances or classes of substances are used in animals in your country, the completion of the OIE template is terminated after completing the <b>Baseline information</b> form.</p>
<b>Estimated coverage of accessible data on total amount (in %)</b>	Please provide an estimate of the extent to which the quantitative data you report is representative of the overall antimicrobial sales for use in animals, as a percentage of the total sales in your country. If less than 100% are reported, please describe the data not covered.
<b>Is the information extrapolated from representative samples?</b>	Please indicate here, whether the data provided in your report have been extrapolated from representative samples.
<b>Explanation of estimated coverage and extrapolations carried out</b>	Please explain in this field which sales are not captured by the data on antimicrobial agents used in animals reported for your country, or the nature of any extrapolations that were carried out in order to provide the data recorded in the OIE template.

Field name	Information to be provided
	Data coverage may vary by geographical aspects; examples include but are not limited to situations that use may be well known for urban but not rural areas, or that use in certain representative regions is well known but not actually measured throughout the whole country. Incomplete data coverage may include situations where importation is not covered or statistical sampling of relevant establishments (farms, veterinary practices, etc.) is carried out. Another source of incomplete data may lie in market segment coverage, where incomplete data is available from certain market segment (e.g. some production systems are not covered such as extensive versus intensive farming systems or certain wholesalers do not report their data).
<b>Animal groups covered by the data</b>	Please indicate here to which broad category of animals the data provided apply, by selecting the appropriate category or categories from the list. The choices are: 'All animal species', 'All food-producing species (terrestrial and aquatic)', 'Terrestrial food-producing species', 'Aquatic food-producing species', "Companion animals" and 'Other'. Multiple selections are possible.
<b>Animals raised in your country and considered 'food producing species'</b>	Animal species considered to be food-producing animals vary between countries. The OIE needs to gain an understanding how this difference impacts the data reported to the OIE and future reporting of summary data by the OIE. Please indicate here which animals are considered as food-producing animals in your country. Multiple selections are possible.
<b>Clarification of species considered as food-producing</b>	Please provide any explanations you may feel necessary to explain which animal species are raised in your country for the purpose of providing food for humans.
<b>National report available on the web?</b>	If a national report on antimicrobial sales and/or use in animals is available in your country please insert the link to the site where the report is available on the internet.

### Classes of antimicrobial agents for reporting

All antimicrobial classes used in animals (for therapeutic use including prevention of clinical signs, as well as growth promotion, whether classified as veterinary medicines or not, with the exception of ionophores) should be included in the table by the reporting OIE Member Country.

Antimicrobial class	Guidance
<b>Aminoglycosides</b>	Includes aminocyclitols (e.g. streptomycin, dihydrostreptomycin and spectinomycin) and all other aminoglycosides (e.g. gentamicin, kanamycin, neomycin, apramycin).
<b>Amphenicols</b>	Includes florfenicol and thiamphenicol.
<b>Arsenicals</b>	Includes nitarsonsone, roxarsone and others.
<b>Cephalosporins</b>	May be reported as <b>Cephalosporins (all generations)</b> or in relevant category groupings ( <b>1-2 generation cephalosporins</b> as one category and <b>3-4 generation cephalosporins</b> as a second category).
<b>Fluoroquinolones</b>	Includes danofloxacin, difloxacin, enrofloxacin, marbofloxacin and other fluoroquinolones, but not other quinolones (flumequine, oxolinic acid, nalidixic acid) that are reported separately.
<b>Glycopeptides</b>	Includes avoparcin and others.

Antimicrobial class	Guidance
<b>Glycophospholipids</b>	Includes bambamycin (synonym flavomycin).
<b>Lincosamides</b>	Includes lincomycin, pirlimycin and others.
<b>Macrolides</b>	Includes substances with all macrolide structures, such as erythromycin, spiramycin, tylosin, tylvalosin, gamithromycin, tildipirosin, tulathromycin and others.
<b>Nitrofurans</b>	Includes furazolidone, nitrofurantoin, nitrofurazone and others.
<b>Orthosomycins</b>	Includes avilamycin and others.
<b>Other quinolones</b>	Includes flumequine, nalidixic acid, oxolinic acid and others.
<b>Penicillins</b>	Includes all penicillins (e.g. natural penicillins, aminopenicillins and others), but excludes other beta lactam antimicrobials like cephalosporins.
<b>Pleuromutilins</b>	Includes tiamulin, valnemulin and others.
<b>Polypeptides</b>	Includes bacitracin, colistin, polymyxin B and others.
<b>Quinoxalines</b>	Includes carbadox, olaquinox and others.
<b>Streptogramins</b>	Includes virginiamycin, pristinamycin, and others.
<b>Sulfonamides (incl. trimethoprim)</b>	Includes all sulfonamides, as well as trimethoprim and similar compounds.
<b>Tetracyclines</b>	Includes for example chlortetracycline, doxycycline, tetracycline, and oxytetracycline.
<b>Others</b>	All others not covered, including for example coumarin antimicrobials like novobiocin, fusidic acid, kirromycins, phosphonic acids like fosfo- or tobramycin, rifamycins, thiostrepton.
<b>Aggregated class data</b>	<p>It may not be possible to individually report sales by class name for one or more antimicrobial classes for animal use, for example to protect confidential (proprietary) information or as required by legislation. Such amounts may be reported in this line.</p> <p>Report here the individual or cumulative amounts of antimicrobial classes used in animals that cannot be reported independently for confidentiality / proprietary reasons. If more than one data aggregation exists in your country, please sum them up for the OIE template.</p> <p>In cases where the amounts sold for more than one class are reported as aggregated data, please enter &lt;AGG&gt; in the table for those substances for which sales quantities have been included in the aggregated amount, and list the names of the classes of antimicrobial agents that cannot be reported individually in the free-text field called '<b><i>If 'Aggregated class data' are reported, please list here the classes combined'</i></b>' located underneath the table collecting the antimicrobial quantities.</p>

Explanatory notes on the free-text fields below the tables for reporting quantities.

Field name	Information to be provided
<b>If 'Aggregated class data' are reported, please list here the classes combined</b>	<p>If for your country, there are <b>Aggregated class data</b>, please list here the names of the classes of antimicrobial agents that cannot be reported individually.</p> <p>If sales for only one antimicrobial class that needs to remain confidential are reported as <b>Aggregated class data</b>, please enter the word 'Confidential' in this free-text field.</p> <p>Whenever possible, use the 'Antimicrobial class' terms explained above or the terminology of the <i>OIE List of antimicrobial agents of veterinary importance</i>, <a href="http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/Eng_OIE_List_antimicrobials_May2015.pdf">http://www.oie.int/fileadmin/Home/eng/Our_scientific_expertise/docs/pdf/Eng_OIE_List_antimicrobials_May2015.pdf</a></p> <p>Aggregated data may include substances that are not mentioned in the definition of 'Antimicrobial classes for use in animals'. In such cases, please specify here any additional classes of antimicrobials which are included in the reported amount for <b>Aggregated class data</b> that are not listed in the table.</p>
<b>If 'Others' are reported under 'Antimicrobial class', list here the classes reported</b>	Describe the class or classes reported as 'Others', using whenever possible the terminology of the <i>OIE list of antimicrobial agents of veterinary importance</i> .
<b>Please report here any additional calculations applied</b>	Please describe here calculations carried out in addition to the ones recommended by the OIE in sections 1 and 2 of the annex to the guidance for completing the OIE template.

### Reporting options 1, 2 and 3: Reporting quantities of antimicrobial agents

The amount of the antimicrobial agents used in animals in kilograms (kg) should be reported. Where data is available in the form of number of packages of a given pharmaceutical preparation sold or in cases or stated in international units or % weight per volume (% w/v), mathematical conversion will be necessary, which is explained in the annex to this document. In cases where the amount sold for the listed class is part of a data aggregation reported under 'Aggregated class data', please enter the three letters <AGG> in the table for all classes, for which quantities sold have been summarised.

Ideally, the OIE is interested in the amount of active entity (moiety), that is, the substance as listed in the OIE list of antimicrobial agents of veterinary importance (for example: benzylpenicillin), not the total weight of the actual chemical compound (salt, ester or other; for example: sodium or potassium benzylpenicillin) contained in a veterinary medicinal product or traded as bulk material. At this stage of the project, the precision gained by the refined reporting of amounts of active entity, achieved by mathematical conversion of amounts of chemical compound as declared on the product label, is not justified. Therefore, the OIE template will accept the amounts of chemical compound as declared on the product label. Data on amounts of active entities will also be accepted, but the additional calculations carried out should be described in the corresponding free-text field in the OIE template (on the sheet for reporting option 1, 2 or 3, see section above for explanation).

For data sourced from customs, import or other bulk trading, information will likely come as tons of chemical compound. Please convert into kg for reporting in the OIE template; the annex provides conversion factors to kg from different weight units.

For veterinary medicinal products the content of the antimicrobial agent(s) may be stated in one of several ways, including (i) strength in milligram (mg) or gram (g) of the active ingredient per volume or weight or other unit, for example millilitre (ml), or kilogram (kg) or tablet, (ii) strength in International Units (IU) per weight, volume or other unit, or (iii) strength in per cent (%) weight per weight (w/w) or weight per volume (w/v). The annex provides details on the necessary conversions.

For veterinary products containing more than one antimicrobial agent, the amounts of each should be added to the respective class columns.

If there are no quantities to report for a class or route of administration, please enter a zero, 0, in the corresponding field of the table.

### Reporting option 1, 2 and 3: Differentiation by type of use

For **Reporting option 1**, complete the columns **Therapeutic use (including prevention of clinical signs)** and **Growth promotion**. The sum of sales for **Therapeutic use** and **Growth promotion** should equal the amount entered in the column **Total amount (Growth promotion and Therapeutic indications)** for each class.

For **Reporting options 2 and 3**, **Growth promotion** can be reported jointly for terrestrial and aquatic food-producing animals.

### Reporting option 2 and/or 3: Differentiation by animal species group

If sales for use in animals can be differentiated into sales for therapeutic purposes and for growth promotion and additionally by animal species category, please complete under the heading **Therapeutic use (including prevention of clinical signs)** the columns for **All animal species**, **All food-producing animals (terrestrial and aquatic)**, **Terrestrial food-producing animals**, **Aquatic food-producing animals**. These animal categories include all age groups and life stages of the relevant species. The first column of the table for both Reporting option 2 and Reporting option 3, **Total amount (Growth promotion and Therapeutic use)**, allows reporting of the total amount for all uses and animal categories per antimicrobial class. The last column labelled **Growth promotion** captures the amounts sold for growth promotion purposes in terrestrial and aquatic food-producing animals.

### Reporting option 3: Differentiation by routes of administration

In the category of **Therapeutic use (including prevention of clinical signs)**, the OIE is interested in differentiating the proportion of sales by routes of administration for mass treatment (e.g. via feed) versus those more suited for treatment of individual animals (injection route, other routes). If sales for therapeutic use can be sub-divided by route of administration, please report the quantities used for the listed route of administration. If further differentiation by animal category is possible, then it should be reported if the data are available.

Column label	Guidance
<b>Oral route</b>	Includes all orally administered pharmaceutical forms, including “in water” or “in feed” administration, but also oral bolus administration.
<b>Injection route</b>	Includes all forms of parenteral administration that readily lead to elevated blood levels of the active ingredient, such as subcutaneous, intramuscular, intravenous, including intravenous infusion (intravenous drips).
<b>Other routes</b>	Summarises all other routes of administration, including intramammary preparations, and, mostly for aquatic animals, the bath route where an animal or a group of animals immersed in a solution containing the active ingredient.

### Calculating the quantities to report in Reporting options 1, 2 and 3

Please refer to the annex of this document for detailed examples and the calculations necessary to report kg of antimicrobial agents intended for use in animals. As explained above, for pragmatic reasons in most cases the amount of the chemical compound as declared on the product label can be reported, though OIE Member Countries wishing to provide more refined data on amounts of active entities are welcome to do so.

# Annex 3. Annex to the guidance for completing the OIE template for the collection of data on antimicrobial agents used in animals

## Considerations on converting content of antimicrobial active ingredients in veterinary medicines into kilograms

### **Calculating the quantities to report in kilogram (kg)**

Data on antimicrobial agents intended for use in animals comes in different forms. The OIE template for the collection of data on antimicrobial agents used in animals (OIE template) is designed to collect data on the amounts of chemical compound as declared on the product label. The information may vary, ranging from bulk quantities of antimicrobial agents to numbers of packs of a veterinary medicinal product. The content of antimicrobial agents in such products can be stated in a number of possible ways. It will be necessary, where appropriate, to calculate the required data to populate the OIE template.

Detailed instructions are provided to harmonise some aspects of data reporting:

- Transformation of bulk quantities ([Section 1](#)); use this section if you need to convert quantities of raw material, e.g. from import data into the required format.
- Data on veterinary medicinal products ([section 2](#)), including conversion from International Units (IU) to kg (section 2. (ii))
- Recommendations are made in [section 3](#) for further optional conversions, aimed at achieving refined reporting of active entities, the ultimately desired format. If such calculations are made, they should be reported in the OIE template in the free text field provided on the sheets for Reporting Option 1, 2 and 3.

The following abbreviations and symbols will be used:

Symbol/abbreviation	Explanation
Strength	amount of antimicrobial agent per unit of veterinary product
% w/v	per cent weight per volume
mg	milligram
g	gram
kg	kilogram
t	ton (metric)
ml	millilitre
l	litre

### **1. For data on bulk quantities**

Such information is usually sourced from customs, import or other bulk trading. It will likely come as a weight in a number of possible units (e.g. metric tons) of chemical compound and needs to be converted to kg. When conversion into kg is necessary, follow the steps below. If additional conversion factors are needed, please contact the OIE at [antimicrobialuse@oie.int](mailto:antimicrobialuse@oie.int).

**Step 1:** Multiply the amount of antimicrobial agent, i.e. the chemical compound as declared on the product label with the appropriate conversion factor from the table 1 below.

$$\text{Antimicrobial agent (kg)} = \text{antimicrobial agent (unit Z)} \times \text{conversion factor}$$

Table 1: Converting weight units into kg

Unit reported (unit Z)	Conversion factor to kg (for multiplication)
Metric ton	1000
Imperial ton (long)	1016
Imperial ton (short)	907.18
Stone (Imperial)	6.35
Imperial Pound	0.4536
Ounce	0.0283

## 2. For data on veterinary medicinal products

For veterinary medicinal products containing antimicrobial agents, data on quantities sold is likely to be available as numbers of packages of product sold, with each package containing a specified quantity of medicinal product with a specified amount of antimicrobial agent. In such cases, the amount of antimicrobial agent (chemical compound as declared on the product label) per package needs to be calculated first, and subsequently the result needs to be multiplied with the number of packages of the presentation sold to obtain the overall amount of antimicrobial agent, which should be reported in kg.

The most common ways to indicate the content of the antimicrobial agent(s) of a veterinary medicinal product are:

- (i) Strength in mg or g of the active ingredient per volume or weight or other unit, (for example: ml, l, kg, tablet),
- (ii) Strength in International Units (IU) per weight, volume or other unit,
- (iii) Strength in per cent (%) weight per weight (w/w) or weight per volume (w/v).

Each situation requires a different kind of mathematical conversion.

### 2. (i) – content of antimicrobial active ingredient (antimicrobial agent) stated in milligram per volume or weight or other unit (for example millilitre, litre, kilogram, tablet) of content

Step 1: Calculation of the content of antimicrobial agent per package

Multiply the amount of antimicrobial agent (chemical compound as declared on the product label) per unit of content, that is, the strength of the product, with the total number of units contained in the package

$$\begin{aligned} & \text{Content of antimicrobial agent per package} \\ & = \text{Strength (amount antimicrobial agent per unit)} \times \text{number of units per package} \end{aligned}$$

*Example A:*

Tiamulin 100 g/kg premix for medicated feeding stuff; package sizes: (a) 1 kg, (b) 5 kg and (c) 20 kg

Calculation of content of antimicrobial agent, tiamulin, per package:

- (a)  $\text{Pack content} = 100 \text{ g/kg} \times 1 \text{ kg} = 100 \text{ g}$
- (b)  $\text{Pack content} = 100 \text{ g/kg} \times 5 \text{ kg} = 500 \text{ g}$
- (c)  $\text{Pack content} = 100 \text{ g/kg} \times 20 \text{ kg} = 2000 \text{ g}$

*Example B:*

Tetracycline intrauterine tablet containing 2000 mg tetracycline hydrochloride per tablet; package sizes: (a) carton with 1 blister of 5 intrauterine tablets, (b) carton with 4 blisters of 5 intrauterine tablets each (20 tablets), (c) carton with 20 blisters of 5 intrauterine tablets each (100 tablets).

Calculation of content of antimicrobial agent, tetracycline, per package:

$$\begin{aligned}(a) \text{ Pack content} &= 2000 \text{ mg} & \times & 5 = 2 \text{ g} & \times & 5 = 10 \text{ g} \\(b) \text{ Pack content} &= 2000 \text{ mg} & \times & 20 = 2 \text{ g} & \times & 20 = 40 \text{ g} \\(c) \text{ Pack content} &= 2000 \text{ mg} & \times & 100 = 2 \text{ g} & \times & 100 = 200 \text{ g}\end{aligned}$$

*Example C:*

Tilmicosin 300 mg/ml solution for injection for cattle; package sizes: containers of 100 ml and 250 ml; packs of (a) 6, (b) 10 and (c) 12 units of 100 ml and 250 ml.

Calculation of content of antimicrobial agent, tilmicosin, per package:

$$\begin{aligned}(a) \text{ Container content} &= 300 \text{ mg/ml} & \times & 100 \text{ ml} = & 30000 \text{ mg} & = & 30 \text{ g} \\ \text{Pack content:} & & & & & & \\ & (a) & 6 & \times & 30 & \text{ g} = & 180 \text{ g} \\ & (b) & 10 & \times & 30 & \text{ g} = & 300 \text{ g} \\ & (c) & 12 & \times & 30 & \text{ g} = & 360 \text{ g} \\(b) \text{ Container content} &= 300 \text{ mg/ml} & \times & 250 \text{ ml} = & 75000 \text{ mg} & = & 75 \text{ g} \\ \text{Pack content:} & & & & & & \\ & (a) & 6 & \times & 75 & \text{ g} = & 450 \text{ g} \\ & (b) & 10 & \times & 75 & \text{ g} = & 750 \text{ g} \\ & (c) & 12 & \times & 75 & \text{ g} = & 900 \text{ g}\end{aligned}$$

Step 2: Sum up the antimicrobial agent contained in all presentations and packages sold

Convert all contents of antimicrobial agent calculated under step 1 to the same weight unit and add up the total

Step 3: If necessary: convert the total sum of antimicrobial agent contained in all packages of all presentations sold to kg

Multiply the result from step 2 with an appropriate conversion factor to achieve the result in kg

**2. (ii) – content of antimicrobial agent (chemical compound as declared on the product label) in International Units (IU) per weight, volume or other unit (for example millilitre, litre, kilogram, tablet) of content**

Where the strength of the antimicrobial agent in the veterinary medicinal product is stated International Units (IU) per unit of finished product, an additional conversion step is necessary to obtain results in mg, g, or kg. Table 2 is used to convert content of antimicrobial agents declared in IU on the product label into mg for reporting to the OIE: either divide the total number of IUs of an antimicrobial agent by the value in the column 'International Units (IU) per mg' for this agent in table 2, or, if multiplication is preferred, multiply the total number of IUs with the conversion factor listed for the agent. To convert mg values into kg, please multiply the result of the conversion with  $1 \times 10^{-6}$  equalling 0.000001.

For some antimicrobial agents in veterinary medicinal products, the IU content or strength may be stated in respect to the active entity rather than to the chemical compound actually included; for example: a product may contain penethamate hydroiodide, or procaine benzylpenicillin, but the stated strength in IU refers to benzylpenicillin (product X containing penethamate hydroiodide, equivalent to xx IU benzylpenicillin, or, product Y containing procaine benzylpenicillin, equivalent to yy IU benzylpenicillin). For such cases, use the conversion factor for the relevant active entity listed in table 2 (in the examples used: benzylpenicillin). To convert mg values into kg, please multiply the result of the conversion with  $1 \times 10^{-6}$  equalling 0.000001.

If additional conversion factors are needed or have been used, please contact the OIE at [antimicrobialuse@oie.int](mailto:antimicrobialuse@oie.int).

Step 1: Calculating the content of antimicrobial agent per package in IU

Multiply the amount of IU antimicrobial agent per unit of content with the total number of units contained in the package

$$\begin{aligned} & \text{Content of antimicrobial agent per package in IU} \\ & = \text{Strength (amount IU antimicrobial agent per unit)} \times \text{number of units per package} \end{aligned}$$

Step 2: Converting the content of antimicrobial agent per package in IU into mg

$$\begin{aligned} & \text{Content of antimicrobial agent per package in mg} \\ & = \text{Content of antimicrobial agent in IU} \times \text{conversion factor} \end{aligned}$$

Steps 3-4: Follow steps 2-3 described for (i)

**Table 2:** Conversion of International Units (IUs) of certain antimicrobial agents into mg and relevant active entities, based on the ESVAC conversion factors<sup>8</sup>

Antimicrobial agent in the veterinary medicine	Antimicrobial active entity for reporting to OIE	International Units per mg	Conversion factor to mg for multiplication
Bacitracin	Bacitracin	74	0.013514
Benzylpenicillin (penicillin G)	Benzylpenicillin	1666.67	0.0006
Chlortetracycline	Chlortetracycline	900	0.001111
Colistin methane sulfonate sodium (colistimethate sodium INN)	Colistin	12700	0.000079
Colistin sulfate	Colistin	20500	0.000049
Dihydrostreptomycin	Dihydrostreptomycin	820	0.00122
Erythromycin	Erythromycin	920	0.001087
Gentamicin	Gentamicin	620	0.001613
Kanamycin	Kanamycin	796	0.001256
Neomycin	Neomycin	755	0.001325
Neomycin B (Framycetin)	Neomycin B (Framycetin)	670	0.001492
Oxytetracycline	Oxytetracycline	870	0.001149
Paromomycin	Paromomycin	675	0.001481
Polymyxin B	Polymyxin B	8403	0.000119
Rifamycin	Rifamycin	887	0.001127
Spiramycin	Spiramycin	3200	0.000313
Streptomycin	Streptomycin	785	0.001274
Tobramycin	Tobramycin	875	0.001143
Tylosin	Tylosin	1000	0.001
Tetracycline	Tetracycline	950	0.001

**2. (iii) – content of antimicrobial agent (chemical compound as declared on the product label) in per cent (%) weight per weight (w/w) or weight per volume (w/v) of content**

The amount of antimicrobial agent contained in a veterinary medicine concerned may be stated in per cent weight per weight (% w/w) (example 1: product X contains tylosin 100% w/w or, example 2, product Y contains amoxicillin 22.2 % w/w) or in per cent weight per volume (% w/v) (example: product Z contains procaine benzylpenicillin 30% w/v). Such figures first need to be converted into mg/g, g/g, or mg/ml, followed by the calculations described under (i).

Converting % w/w: Conversion calculations are performed by relating the content of antimicrobial agent to 1 g of the finished product. Divide the percentage value by 100 to obtain the amount of antimicrobial agent in g per g finished product.

$$\text{value antimicrobial agent in g per gram finished product} = \frac{\text{value (\%)} \times \text{g}}{100} \times \text{g (finished product)}$$

Example 1: Product X containing 100% w/w tylosin will contain 100/100 x g = 1 g tylosin per g finished product.

<sup>8</sup> [http://www.ema.europa.eu/ema/pages/includes/document/open\\_document.jsp?webContentId=WC500189269](http://www.ema.europa.eu/ema/pages/includes/document/open_document.jsp?webContentId=WC500189269)

Example 2: Product Y containing 22.2% w/w amoxicillin will contain  $22.2/100 = 0.222$  g amoxicillin per g finished product.

Continue with Steps 1-3 of (i)

Converting % w/v: Conversion is based on the assumption that 1 ml of the products weighs 1000 mg. Multiply the percentage value with 10 to obtain the content in mg/ml.

$$\text{value antimicrobial agent in g per ml finished product} = \frac{\text{value (\%)} \times 10 \times \text{mg}}{1 \text{ ml (finished product)}}$$

Example: Product Z containing 30% w/v benzylpenicillin will contain  $(30 \times 10 \times \text{mg})/1\text{ml}$ , equal to 300 mg/ml benzylpencillin.

Continue with Steps 1-3 of (i)

### 3. Additional recommendations for further conversions of quantities of antimicrobial agents

For pragmatic reasons the OIE accepts the reporting of antimicrobial agents in amounts of chemical compound as declared on the product label of the veterinary medicinal product. However, OIE Member Countries may wish to carry out further calculations to report amounts of active entity. If such further calculations are carried out, please describe them in the OIE template.

(i) Calculating the total amount expressed in weight of chemical compound as declared on the product label of a veterinary medicinal product into antimicrobial active entity (e.g. salt into base)

This step may be carried out once the steps described in section 1 or section 2. (i) have been completed.

As an example, for the antimicrobial agent tiamulin that is often available in the form of tiamulin hydrogen fumarate (the chemical compound as declared on the product label), the conversion formula to tiamulin (the active entity) would be:

Salt (including base): Tiamulin hydrogen fumarate MW 609.8

Base: Tiamulin MW 493.7

Conversion factor = MW base/MW salt (including base) = 0.81

Multiply the final result in kg obtained by following steps 1 to 3 with the appropriate conversion factor

$$\text{Content of active entity (kg)} = \text{Content of chemical compound as listed on the label (kg)} \times \text{conversion factor}$$

(ii) The antimicrobial agent is in the form of a prodrug, expressed in weight

Where the antimicrobial agent contained in the veterinary medicinal product is a long-acting salt (example: benethamine benzylpenicillin) or a pro-drug (example: penethamate hydroiodide) and the content is stated in weight in reference to the actual chemical compound (example: product x contains 500 mg/ml benzylpenicillin benzathine), an additional conversion step as described below is needed to calculate the amount of active entity. When the antimicrobial agent is described in reference to the active entity (example: product y contains cloxacillin benzathine equivalent to 500 mg cloxacillin activity) the conversion using a prodrug conversion factor described below is not necessary.

Taking the prodrug conversion factors used by the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) program managed by the European Medicines Agency, as a starting point, table 3 lists the suggested conversion factors for relevant long-acting salts and prodrugs. The amount of the actual chemical compound as declared on the product label (example: benzylpenicillin benzathine) needs to be multiplied with the prodrug conversion factor to obtain the corresponding amount of the active entity (example: benzylpenicillin).

If additional conversion factors are needed or have been used, please contact the OIE at [antimicrobialuse@oie.int](mailto:antimicrobialuse@oie.int).

**Table 3:** Conversion of content stated in mg, g or kg of long-acting salts and prodrugs of antimicrobial agents in the veterinary product into corresponding mg, g or kg antimicrobial active entity for reporting to the OIE, based on the ESVAC conversion factors<sup>9</sup>

<b>Antimicrobial agent (prodrug)</b>	<b>Active entity</b>	<b>Prodrug conversion factor for multiplication</b>
Benethamine benzylpenicillin	Benzylpenicillin	0.65
Benzathine benzylpenicillin	Benzylpenicillin	0.39
Cefapirin benzathine	Cefapirin	0.41
Cefalexin benzathine	Cefalexin	0.36
Cloxacillin benzathine	Cloxacillin	0.43
Oxacillin benzathine	Oxacillin	0.69
Penethamate hydroiodide	Benzylpenicillin	0.63
Procaine benzylpenicillin	Benzylpenicillin	0.61

Step 1–3: As described in section 2. (i)

Step 4: Multiply the final result in kg obtained by following steps 1 to 3 with the appropriate conversion factor listed in table 3

$$\begin{aligned}
 & \textit{Antimicrobial agent (active entity)(kg)} \\
 & = \textit{antimicrobial agent (chemical compound as declared on the product label)(kg)} \\
 & \quad \times \textit{prodrug conversion factor}
 \end{aligned}$$

For bulk quantities of antimicrobial agents in form of prodrugs, the additional step 2 described below should be applied after the calculations described in section 1.

Step 2: If the antimicrobial agent is a long-acting salt or prodrug listed in table 3 above, additionally multiply with the corresponding conversion factor.

$$\begin{aligned}
 & \textit{Antimicrobial agent (active entity)(kg)} \\
 & = \textit{Step 1 antimicrobial agent (chemical compound as declared on the product label) kg} \\
 & \quad \times \textit{prodrug conversion factor}
 \end{aligned}$$

<sup>9</sup> [http://www.ema.europa.eu/ema/pages/includes/document/open\\_document.jsp?webContentId=WC500189269](http://www.ema.europa.eu/ema/pages/includes/document/open_document.jsp?webContentId=WC500189269)

# Annex 4. Distribution of countries by region according to the OIE Note de Service 2010/2012

## Invitation of Members in all OIE meetings (except to the Conferences of the OIE Regional Commissions)

AFRICA (54)	AMERICAS (29)	ASIA (32)	EUROPE (53)
1. ALGERIA	1. ARGENTINA	1. AUSTRALIA	1. ALBANIA
2. ANGOLA	2. BAHAMAS	2. BANGLADESH	2. ANDORRA
3. BENIN	3. BARBADOS	3. BHUTAN	3. ARMENIA
4. BOTSWANA	4. BELIZE	4. BRUNEI	4. AUSTRIA
5. BURKINA FASO	5. BOLIVIA	5. CAMBODIA	5. AZERBAIJAN
6. BURUNDI	6. BRAZIL	6. CHINA (PEOPLE'S REP. OF ~)	6. BELARUS
7. CAMEROON	7. CANADA	7. FIJI	7. BELGIUM
8. CAPE VERDE	8. CHILE	8. INDIA	8. BOSNIA AND HERZEGOVINA
9. CENTRAL AFRICAN REP.	9. COLOMBIA	9. INDONESIA	9. BULGARIA
10. CHAD	10. COSTA RICA	10. IRAN	10. CROATIA
11. COMOROS	11. CUBA	11. JAPAN	11. CYPRUS
12. CONGO (REP. OF THE ~)	12. DOMINICAN REP.	12. KOREA (REP. OF ~)	12. CZECH REP.
13. CONGO (DEM. REP. OF THE ~)	13. ECUADOR	13. KOREA (DEM. PEOPLE'S REP. OF ~)	13. DENMARK
14. CÔTE D'IVOIRE	14. EL SALVADOR	14. LAOS	14. ESTONIA
15. DJIBOUTI	15. GUATEMALA	15. MALAYSIA	15. FINLAND
16. EGYPT	16. GUYANA	16. MALDIVES	16. FORMER YUG. REP. OF MACEDONIA
17. EQUATORIAL GUINEA	17. HAITI	17. MICRONESIA (FED. STATES OF ~)	17. FRANCE
18. ERITREA	18. HONDURAS	18. MONGOLIA	18. GEORGIA
19. ETHIOPIA	19. JAMAICA	19. MYANMAR	19. GERMANY
20. GABON	20. MEXICO	20. NEPAL	20. GREECE
21. GAMBIA	21. NICARAGUA	21. NEW CALEDONIA	21. HUNGARY
22. GHANA	22. PANAMA	22. NEW ZEALAND	22. ICELAND
23. GUINEA	23. PARAGUAY	23. PAKISTAN	23. IRELAND
24. GUINEA BISSAU	24. PERU	24. PAPUA NEW-GUINEA	24. ISRAEL
25. KENYA	25. SURINAME	25. PHILIPPINES	25. ITALY
26. LESOTHO	26. TRINIDAD AND TOBAGO	26. SINGAPORE	26. KAZAKHSTAN
27. LIBERIA	27. UNITED STATES OF AMERICA	27. SRI LANKA	27. KYRGYZSTAN
28. LIBYA	28. URUGUAY	28. TAIPEI (CHINESE)	28. LATVIA
29. MADAGASCAR	29. VENEZUELA	29. THAILAND	29. LIECHTENSTEIN
30. MALAWI		30. TIMOR LESTE	30. LITHUANIA
31. MALI	<b>MIDDLE EAST (12)</b>	31. VANUATU	31. LUXEMBOURG
32. MAURITANIA	1. AFGHANISTAN	32. VIETNAM	32. MALTA
33. MAURITIUS	2. SAUDI ARABIA		33. MOLDAVIA
34. MOROCCO	3. IRAQ		34. MONTENEGRO
35. MOZAMBIQUE	4. JORDAN		35. NETHERLANDS
36. NAMIBIA	5. KUWAIT		36. NORWAY
37. NIGER	6. LEBANON		37. POLAND
38. NIGERIA	7. OMAN		38. PORTUGAL
39. RWANDA	8. QATAR		39. ROMANIA
40. SAO TOME AND PRINCIPE	9. SAUDI ARABIA		40. RUSSIA
41. SENEGAL	10. SYRIA		41. SAN MARINO
42. SEYCHELLES	11. UNITED ARAB EMIRATES		42. SERBIA
43. SIERRA LEONE	12. YEMEN		43. SLOVAKIA
44. SOMALIA			44. SLOVENIA
45. SOUTH AFRICA			45. SPAIN
46. SOUTH SUDAN (REP. OF)			46. SWEDEN
47. SUDAN			47. SWITZERLAND
48. SWAZILAND			48. TAJIKISTAN
49. TANZANIA			49. TURKEY
50. TOGO			50. TURKMENISTAN
51. TUNISIA			51. UKRAINE
52. UGANDA			52. UNITED KINGDOM
53. ZAMBIA			53. UZBEKISTAN
54. ZIMBABWE			

Note regarding Turkey: - For WAHIS workshops Turkey will be invited to the Middle East meetings.  
- For Communication seminars Turkey will be invited to both the Europe and Middle East meetings.