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DG Health and
Food Safety

FINAL OVERVIEW REPORT

Measures to Tackle Antimicrobial Resistance through the Prudent Use of Antimicrobials in Animals

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OVERVIEW REPORT
ON
MEASURES TO TACKLE ANTIMICROBIAL RESISTANCE
THROUGH THE
PRUDENT USE OF ANTIMICROBIALS IN ANIMALS

Executive Summary

This overview report summarises the second and final part of a DG Health and Food Safety project regarding antimicrobial resistance (AMR), in particular the efforts to encourage the prudent use of antimicrobials in animals, as advocated in the relevant Union guidelines. The information for this overview report has been extracted from the last five fact-finding missions of the series, as well as from an e-survey and a workshop on prudent use. This overview report should be read in conjunction with the interim overview report (report ref. DG (SANTE) 2016-6238) summarising the work carried out during the first part of this project.

Overall, the report identifies some common elements which appear to facilitate efforts to achieve the reduced and more prudent use of antimicrobials. A national AMR action plan (or strategy) usually provides a solid basis and focus for practical measures to be implemented. Initiatives should also include companion animals and horses, instead of being limited to the farm animal sector only.

Working in a One Health perspective can promote the exchange of experience and paths to success between the veterinary, human health and environmental domains. An example would be infection prevention and control measures to avert healthcare-associated infections, which are widely applied in the human health area and are recognised as increasingly relevant in the veterinary sector. The involvement and consultation with stakeholders in preparing action plans has also proven beneficial in building consensus between the parties on the need to address AMR and to take actions to promote prudent use. In some cases, antimicrobial reduction targets (including sector-specific ones) have served as a concrete and motivational tool to encourage actions and to monitor progress. Measuring antimicrobial use on individual farms or prescription patterns by individual veterinarians have also proven beneficial to promote and disseminate good practices, and resulted in a reduced and prudent use of antimicrobials.

Prudent use guidelines and the availability of AMR surveillance data (including on pathogenic bacteria) provide useful tools to inform and adapt the prescribing practices of veterinarians. Measures to prevent, control and eradicate diseases, including the use of biosecurity and vaccination can all help to facilitate the reduced and more prudent use of antimicrobials. A number of countries have achieved significant reductions in the use of antimicrobials by focussing on the therapeutic treatment of individual animals, rather than the treatment of an entire herd or group of animals.

In some cases, decoupling the prescription and sale of medicinal products by veterinarians is believed to have been very useful in removing a financial incentive for the prescription of antimicrobials. Nevertheless, it is debatable whether this is in itself an essential step in ensuring prudent use, since some countries still record high sales of antimicrobials even when veterinarians cannot sell such products while, conversely, other countries where veterinarians are still allowed to sell antimicrobials record low sale volumes. More emphasis has been placed on the need to address or even prohibit incentives such as rebates and discounts in relation to veterinary medicinal products (VMPs), including antimicrobials, offered by pharmaceutical companies or wholesalers.

Communication and awareness campaigns for all stakeholders, including pet owners and the general public, are considered very important to build consensus on the need to address prudent use. In some countries, media stories have served to focus attention on AMR and

have acted as a stimulus for effective actions to be taken. Specific national legislation on the use of critically important antimicrobials in animals has proven to be very effective in certain countries to achieve a rapid reduction in the use of these substances, although the competent authorities have had to remain vigilant to ensure that animal health and welfare are not jeopardised. There is also a risk that financial and marketing incentives offered for the antimicrobial-free production of farm animals might threaten animal health and welfare if such incentives result in not treating sick animals.

Based on the results of an e-survey, policies on the prudent use of antimicrobials in animals appear to have received a reasonable level of attention from most national competent authorities, notably in relation to farm animals. In particular, measures to minimise the sales and use of colistin in animals have been taken or planned in the majority of countries. Although many countries are aware of data concerning the impact that have had their national measures to promote prudent use, most of them do not yet collect data on the use of antimicrobials at the level of individual farms or on their prescription. Interestingly, some countries have found the collection, analysis and benchmarking of such data to be useful tools to promote prudent use.

During a workshop on the prudent use of antimicrobials held in January 2019, some important challenges that the competent authorities currently face in addressing AMR in general, and this topic in particular, were highlighted. Likewise, some opportunities to make progress on prudent use emerged, also with a view to the future implementation of the new EU Regulations on VMPs and on medicated feed.

The overview report also presents a number of actions launched by the Commission, as part of its wider strategy on AMR, in order to assist Member States in the implementation of their policies on the prudent use of antimicrobials in animals.

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ABBREVIATIONS AND DEFINITIONS USED IN THIS REPORT

Abbreviation	Explanation
AMR	Antimicrobial resistance
BTSF	Better Training for Safer Food
CIA	Critically important antimicrobials
ECDC	European Centre for Disease Prevention and Control
EFSA	European Food Safety Authority
EMA	European Medicines Agency
ESVAC	European Surveillance of Veterinary Antimicrobial Consumption
EU	European Union
JACRA	Joint report on consumption of antimicrobials and AMR in animals, food and humans
MRSA	Methicillin-resistant <i>Staphylococcus aureus</i>
VMP	Veterinary medicinal product

1 Introduction and background

The threat: antimicrobial resistance (AMR)

The rising threat to human and animal health posed by the development of AMR is recognised worldwide, alongside the urgent need for concerted action to limit its development and maintain an arsenal of effective antimicrobials. Each year, drug resistant infections result in a significant number of patient deaths and cause substantial healthcare and productivity losses in the European Union (EU). According to recent reports ¹, if the current situation is left unchecked, AMR deaths will overtake those from cancer by 2050 and the associated costs for the world economy would be 2-3 % of gross domestic product per year.

What is prudent use?

The European Commission published in September 2015 guidelines for the prudent use of antimicrobials in animals ², which set out many potential factors to be considered in establishing policies and actions reflecting the multi-faceted, complex issues involved in tackling AMR. These guidelines define the prudent use of antimicrobials as leading to more rational and targeted use of these substances, thereby maximising their therapeutic effect and minimising the development of AMR. Taking into account cross- and co-resistance, which mean that any exposure to antimicrobials increases the occurrence of AMR, the final outcome of prudent use should be an overall reduction in the use of antimicrobials, predominantly by limiting their use only to situations where they are necessary. In such cases, antimicrobials should be i) used as targeted treatments based on clinical diagnosis and, whenever possible, on the result of microbiological susceptibility tests, and ii) of as narrow a spectrum as possible. This approach is encapsulated in the motto 'as little as possible, as much as necessary'.

The ultimate objective is to reduce the need for antimicrobials by averting disease (i.e. 'prevention is better than cure'). Animal diseases and infections should primarily be prevented by biosecurity, vaccination, good production and management practices and, overall, by implementing integrated disease control programmes to minimise the occurrence of diseases and eradicate endemic conditions.

Antimicrobials and antibiotics

Throughout this report, the term 'antimicrobial' is used generically to encompass antibiotics and antibacterial agents, but excluding antivirals and antiparasitics. This is consistent with the definitions used by *Codex Alimentarius* and the European Food Safety Authority (EFSA), the European Centre for Disease Prevention and Control (ECDC) and the European Commission in its guidelines for the prudent use of antimicrobials in animals.

¹ The Review on Antimicrobial Resistance: Antimicrobial Resistance: Tackling a crisis for the health and wealth of nations. https://amr-review.org/sites/default/files/160525_Final%20paper_with%20cover.pdf

² Guidelines for the prudent use of antimicrobials in veterinary medicine. OJ C 299, 11.9.2015, p. 7. http://ec.europa.eu/health/sites/health/files/antimicrobial_resistance/docs/2015_prudent_use_guidelines_en.pdf

Critically important antimicrobials

Antimicrobials of particular importance in human medicine are considered critically important antimicrobials (CIAs)³, and there is broad consensus that these should be used with particular care in veterinary medicine. It should be noted that there is some divergence in the list of CIAs in accordance to different organisations. This report refers to the CIAs stemming from the scientific advice on this matter produced by the European Medicines Agency (EMA) in 2014⁴. An updated advice on antimicrobial categorisation is expected for December 2019 and, in addition, the new Regulation on veterinary medicinal products (VMPs – see section 6) will propose a list of antimicrobials to be reserved for human use, based on criteria also proposed by EMA.

In particular, following the discovery of a new resistance mechanism to colistin (caused by the *mcr-1* gene), EMA updated its scientific advice on the use of this antimicrobial in animals⁵. The main recommendations of this advice included i) minimising the sales of colistin for use in animals and, ii) adding colistin to a more critical category of medicines, reserved for treating clinical conditions for which there are no effective alternative treatments.

Support available to the Member States

The European Commission has been actively involved in matters relating to AMR for more than 15 years, during which time it has set out a range of initiatives and actions in this area⁶. The Commission's first Action Plan against the rising threats from AMR⁷ and associated road map⁸ covered the period 2011 to 2016. Following an evaluation of the outcome of this plan, in June 2017 the Commission published a European One Health Action Plan against AMR⁹ with an emphasised 'One Health' approach. These globally recognised terms¹⁰ acknowledge the interconnections between animal health, human health and the environment, as well as the common danger posed by the development of AMR.

The provision of assistance to the Member States in implementing the guidelines for the prudent use of antimicrobials in animals was one of the actions of the 2011-2016 Commission Action Plan on AMR. This action has been kept in the more recent European One Health Action Plan against AMR. Overall, this assistance is expected to increase the extent to which the EU could be recognised as a 'best practice' region in the fight against AMR.

³ <http://www.fai farms.com/portfolio-item/what-constitutes-critically-important-antimicrobials/>

⁴ http://www.ema.europa.eu/docs/en_GB/document_library/Other/2014/07/WC500170253.pdf

⁵ https://www.ema.europa.eu/en/documents/scientific-guideline/updated-advice-use-colistin-products-animals-within-european-union-development-resistance-possible_en-0.pdf

⁶ https://ec.europa.eu/health/amr/action_eu_en

⁷ https://ec.europa.eu/health/amr/sites/amr/files/communication_amr_2011_748_en.pdf

⁸ https://ec.europa.eu/health/sites/health/files/antimicrobial_resistance/docs/roadmap_amr_en.pdf

⁹ https://ec.europa.eu/health/amr/sites/amr/files/amr_action_plan_2017_en.pdf

¹⁰ <http://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/about-amr/one-health>

Another action envisaged by both Commission AMR Action Plans concerned the verification of the implementation of Decision 2013/652/EU of the European Parliament and of the Council on the monitoring and reporting of AMR in zoonotic and commensal bacteria. This activity has been covered in the corresponding interim and final overview reports (ref. DG (SANTE) 2016-6239 ¹¹ and DG (SANTE) 2019-6789, respectively).

Commission's oversight on prudent use

Within the above-described framework, DG Health and Food Safety has carried out a project to facilitate the adoption of measures leading to a more prudent use of antimicrobials in animals. The objective of the project was to promote prudent use through the gathering and sharing of information on national policies, as well as highlighting examples of potential good practice and commonly faced challenges. In terms of scope, the project examined the implementation of existing recommendations and guidelines on the prudent use of antimicrobials in veterinary medicine, in particular those published by the Commission.

Gathering of information for this overview report

The first phase of the above mentioned Commission's project on the prudent use of antimicrobials in animals was set in motion with the submission, in September 2015, of a comprehensive questionnaire to the competent authorities in the Member States, Norway, Iceland and Switzerland, to the respective national organisations of the Federation of Veterinarians of Europe, and to the advisory group on Food Chain and Animal and Plant Health. The responses to this questionnaire were analysed together with other relevant information, notably the reports of the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) project ¹². Subsequently, a series of fact-finding missions focusing on the prudent use of antimicrobial in animals was organised in cooperation with the national competent authorities.

Nine of these fact-finding missions were carried out in 2016. After each mission, a report presented the main observations and good practices identified. The main findings and conclusions stemming from the first phase of the project were summarised in an interim overview report (ref. DG(SANTE) 2016-6238) ¹³.

The second and final phase of the project has consisted of five additional fact-finding missions in 2017-2018, an e-survey aimed at updating the knowledge of the situation on policies concerning this topic, and a dedicated workshop on the prudent use of antimicrobials. The present overview report summarises the second phase of the project, and it should be read in conjunction with the above-mentioned interim overview report, with which it shares the same objectives.

¹¹ <https://publications.europa.eu/en/publication-detail/-/publication/57108bb1-6dc0-11e7-b2f2-01aa75ed71a1/language-en>

¹² This project aims at developing 'a harmonised approach for the collection and reporting of data on the use of antimicrobial agents in animals from EU and European Economic Area (EEA) Member States'.
http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/document_listing/document_listing_000302.jsp

¹³ <https://publications.europa.eu/en/publication-detail/-/publication/aa676ddd-2d87-11e8-b5fe-01aa75ed71a1/language-en>

Comprehensive details of specific initiatives on prudent use are explored in depth in the EMA and EFSA Joint Scientific Opinion on measures to reduce the need to use antimicrobial agents in animal husbandry in the EU, and the resulting impacts on food safety (RONAFA)¹⁴, and in the joint report on consumption of antimicrobials and AMR in animals, food and humans (JIACRA)¹⁵, produced by ECDC, EFSA and EMA, under a One Health approach.

What is meant by good practice in this report?

The existence of many inter-linked factors, which can influence both the development of AMR and the prudent use of antimicrobials in animals, make it problematic to assess the impact of specific actions. Accordingly, the potential examples of good practice described in this overview report are mostly based on approaches which have supported, or contributed significantly to, the effective implementation of prudent use policies. Nevertheless, it is recognised that some of these practices may not be easily transferable into another national context, and their inclusion in this report should not be understood as an endorsement by the Commission.

2 Fact-finding missions

This section presents the most salient findings and conclusions from the fact-finding missions carried out in 2017-2018, including good practices and challenges to the development and implementation of policies for the prudent use of antimicrobials. The information reflected under this section does not constitute an exhaustive account of the situation encountered during the missions. A more comprehensive picture is set out in the individual reports of the missions (see Annex 2), which are available on the website of DG Health and Food Safety.

2.1 France

The national veterinary AMR action plan (*EcoAntibio*) has been instrumental in achieving significant and comprehensive progress towards the more prudent use of antimicrobials in animals. The advancements made have been reflected in a reduction, in comparison with the situation in 2012, of more than 20 % in the use of antimicrobials with an associated decline in the reported levels of AMR. In particular, restrictions have been placed on CIAs, whose use has been reduced significantly in animals. Measures have focussed not only on farm animals but also on pets and horses. Ambitious reduction targets were set in the past and these have been largely met, proving to be a useful stimulus and catalyst for activities in the veterinary field, despite corresponding reduction targets not being reached in the human health area.

A new *EcoAntibio* plan was published in 2017, with a more streamlined and less regulatory approach. Emphasis has been also being given to carefully evaluating the impact of the measures implemented in the first plan, as well as to actions that had already been taken on human health and environmental aspects, in a One Health perspective.

¹⁴ <http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2017.4666/epdf>

¹⁵ ECDC/EFSA/EMA second joint report on the integrated analysis of the consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food-producing animals [June 2018]. https://ecdc.europa.eu/sites/portal/files/documents/efs2_4872_final.pdf

Good practice

The following elements have been considered key for the success of the *EcoAntibio* plan:

- the time set aside to elaborate the plan prior to its launch, allowing a careful consideration of the possible challenges, and
- the methodology adopted for the development and implementation of the plan, with the active, structured and engaged involvement of veterinarians and other stakeholders in the relevant production sectors.

A sizeable budget has been allocated for a set of comprehensive and broad-ranging communication tools such as slogans, posters, leaflets, use of social media and advertisements, in order to draw the attention of the general public and relevant stakeholders to the issue of AMR and the prudent use of antimicrobials in animals. Nevertheless, a number of challenges have been found in relation to adapting production practices and systems to safeguard animal health and to developing alternatives to using antimicrobials. Focussing primarily on reducing the sales and use of antimicrobials was also not well-perceived by some veterinarians and farmers, who saw this as disruptive to their normal practices and also as an implication that there was some potential wrongdoing.

Good practice

- A network of national laboratories (*Résapath*) monitors and compiles data on AMR in pathogenic bacteria of animal origin, characterises their genetic background for specific resistance profiles and provides technical support in this domain. The results from this network provide valuable data to inform the veterinarians' prescription of antimicrobials and treatment choices.

The introduction of national legislation restricting the use of CIAs in animals has led to a dramatic and rapid reduction in their use. National measures have also been introduced to prohibit rebates, discounts and promotions concerning the sales of antimicrobials to veterinarians. In the same vein, ethical obligations regarding the responsible use of antimicrobials have been introduced in the veterinary code of conduct. Nevertheless, concerns were expressed by stakeholders about placing restrictions on the ability of veterinarians to prescribe and supply medicines to farms (e.g. supply exclusively by pharmacists instead), since an alternative economic model would be necessary to ensure the continued financial viability of many veterinary practices. This would be especially relevant in rural areas, where a network of practitioners contributes to the permanent availability of care for animals and to the epidemiological surveillance across the entire country.

Regarding the development of data collection systems, the need to proceed carefully was highlighted, favouring the organisation of feasibility studies and pilot phases before rolling out such systems in a more generalised way. The availability of veterinary vaccines and antimicrobials were highlighted as very relevant issues, including the need to reformulate existing but unavailable antimicrobials to ensure their wider market access.

In various animal production sectors such as veal calves, poultry and rabbits, industry organisations have played an active role in efforts to promote the reduced and more prudent use of antimicrobials by farmers. Measures have been introduced to discourage the mass group administration of antimicrobials via medicated feed, and instead to promote their more focussed and flexible administration via drinking water, where the course of treatment (duration and dose) can be more easily controlled and adjusted as necessary. Possible animal health and welfare risks of antimicrobial-free animal production were also identified, namely in cases of sick animals in need of antimicrobial treatment but which may not receive it due to the potential loss of a premium by the farmer.

2.2 Italy

Sales of antimicrobials have remained high compared to most other ESVAC reporting countries, despite a 30% reduction in the period 2010-2016. This is regardless of the fact that veterinarians are only allowed to sell antimicrobials for the initiation of treatments. Rebates, discounts and financial incentives from pharmaceutical companies appear to play a significant role in promoting the sales of antimicrobials to farmers. In this context, the general awareness of AMR and the need to use antimicrobials prudently is still quite low.

Good practice

- A national association of veterinarians has developed software for the voluntary monitoring of the use of antimicrobials in livestock farms, specifically in dairy cows and pigs. This tool was developed to calculate the antimicrobials actually used on farms, rather than relying on sales data. The results have improved the farmers' awareness about the high level of exposure of their animals to antimicrobials.

A national AMR action plan has been developed, with many of the veterinary actions being voluntary in nature. The competent authorities have placed great emphasis on the compulsory introduction of an electronic prescription system for veterinarians which became applicable in 2019. It is intended to use the data generated in order to focus official controls on farms using high volume of antimicrobials, and also to clarify why some farms use very low levels.

A voluntary new 'farm veterinarian' concept has been introduced in 2019, initially for pig farmers. In particular, these veterinarians are meant to provide support for compliance with the provisions on the use of VMPs and for the adoption of good practices to ensure the prudent use of antimicrobials.

Various pilot projects on pig and dairy farms (e.g. involving the provision of expert advice, biosecurity assessment, focussing on infection prevention and control and laboratory and diagnostic tests) have shown that dramatic reductions in antimicrobial use can be achieved without impairing animal productivity, animal health and welfare or farm profitability. The poultry industry has also successfully implemented strategies to dramatically reduce the use of antimicrobials in general and CIAs in particular. Such initiatives can act as an important communication and motivation tool, also helping to share experience on individual farms and identifying critical success factors in relation to prudent use. Various communication, awareness and training activities have been undertaken, involving veterinarians, farmers and other stakeholders. These initiatives are essential, since there are indications that for some farmers it might still be cheaper to continue using antimicrobials rather than investing in improvements in farm infrastructure or husbandry systems.

2.3 Latvia

Latvia has consistently reported relatively low sales of antimicrobials, although the proportion of CIAs is relatively higher than the average. The national AMR veterinary action plan focusses on improving the health of the livestock population and encouraging the more prudent use of antimicrobials, rather than setting a target for reducing the use of these substances. A database containing the results of the various AMR monitoring initiatives is envisaged to be in place by the end of 2019, with an accompanying project to analyse these data in relation to the amount of antimicrobials used on the corresponding farms. The outcome of such an analysis will be used in the drafting of guidelines on measures to prevent and treat diseases of farmed animals. The guidelines will contain, among others, a list of antimicrobials of choice for the most prevalent diseases, taking account of the associated AMR levels.

The competent authorities envisage that the above guidelines would be legally binding, which should tackle some of the underlying reasons behind the use of antimicrobials, notably CIAs, as reported by some veterinarians. These reasons refer to the relatively short withdrawal period and simple treatment regime of CIAs, as well as a limited awareness about other effective treatments.

2.4 Norway

Norway has consistently reported some of the lowest sales of antimicrobials among the ESVAC reporting countries. Likewise, the levels of AMR detected in bacteria isolated from human and animal populations have been relatively low. Narrow-spectrum penicillins are the most frequently used class of antimicrobials for food producing animals and the vast majority of antimicrobials marketed were for treatment of individual animals.

This favourable situation can mainly be attributed to the longstanding and comprehensive initiatives taken under successive national AMR strategies, the latest of which covers the period 2015 to 2020 and is based on a One Health approach, with initiatives linked to human, animal and environmental aspects. The specific and ambitious targets for reducing the use of antimicrobials in animals set out in previous strategies had been achieved, and additional

targets to further reduce consumption have been included in the current national AMR strategy.

Good practice

- The national AMR strategy includes sector-specific goals for food-producing and companion animals, public health and the environment. These include a) mapping reservoirs in animals of resistant bacteria which are important to food safety, b) preventing livestock-acquired methicillin resistant *Staphylococcus aureus* (MRSA) from becoming established in the national pig population, c) significantly reducing the presence of extended-spectrum β -lactamase producing organisms in poultry, and d) phasing-out narasin and possibly other coccidiostats with antibacterial properties.

The high level of cooperation and coordination between the authorities and stakeholders, underpinned by strong political support, coupled with a broad range of comprehensive actions, has enabled maintaining and enhancing animal health and tackling issues linked to the development of AMR. Such actions include the promotion of national and farm-level biosecurity and vaccination programmes, decoupling the prescription and sale of VMPs, drafting treatment guidelines advocating individual rather than group treatments with antimicrobials, and a policy of culling animals with recurring chronic conditions. The eradication of certain infectious animal diseases has helped to facilitate the lower use of antimicrobials in animals, as well as the provision of advice to farmers on disease prevention and good husbandry practices.

Good practice

- Surveillance programmes for AMR in humans, animals, food and feed have been carried out since at least 2000 and the results, along with data on the use of antimicrobials, are made publicly available together with analyses on trends in the development of AMR and their potential links. This information is used as a basis for risk assessments and to evaluate the effectiveness of measures taken against AMR. In particular, these data have shown that the proportion of bacteria sensitive to most antimicrobials is among the highest in Europe.

A prescription database is being further developed to provide greater insights into the prescribing behaviour of veterinarians, enabling knowledge-sharing and benchmarking, as well as targeting actions at high users of antimicrobials. Extensive awareness-raising activities have been undertaken, including to pet owners. A compulsory e-learning course on the prudent use of antimicrobials has been developed for veterinarians granted a preliminary licence to practise veterinary medicine. Prudent use guidelines for farm animals have been in place since 1998 and were updated in 2012, together with more recent guidelines for

companion animals and horses. However, these guidelines are not legally binding, making it difficult to determine unambiguously if veterinarians have followed guideline principles. In order to address this and other issues, national legislation on the use of VMPs is being revised in an attempt to make explicit the obligation for prescribers to comply with prudent use guidelines.

2.5 Sweden

Sweden consistently reports one of the lowest use of antimicrobials among the ESVAC reporting countries, as well as relatively low and stable levels of AMR in animals.

Good practice

The above situation can be attributed to the following factors:

- a well-established awareness about AMR related issues,
- long-standing efforts to eradicate and prevent the introduction of infectious diseases in farm animals,
- the so-called ‘Swedish Model’ of consensus thinking, mutual support and cooperation between government, industry and other stakeholders, and
- the monitoring and evaluation of trends in the development of AMR and the undertaking of actions before they become problematic.

The detection of MRSA and methicillin-resistant *S. pseudintermedius* (MRSP) in companion animals has helped to further sensitise professionals and the general public about the importance of AMR. In addition, recent documentaries describing findings of MRSA in animal products from other countries have boosted the demand for Swedish products, owing to the perception that they are safer, which in turn has increased prices – and the return to farmers. Such a situation has served to present the efforts to reduce AMR and use antimicrobials prudently as economically viable, in contrast to the previous perception that these efforts placed a competitive disadvantage in comparison to food produced under less stringent conditions.

The national AMR action plan acknowledges the importance of a One Health approach to tackle AMR, although it emphasises issues concerning human and animal health rather than those concerning environmental aspects. National measures in relation to the environment focus mainly on the reduction or elimination of pharmaceuticals in water.

Good practice

- The introduction of national requirements for infection control procedures to be established in veterinary clinics and practices both for farm and companion animals has highlighted the benefits of working closely with human medicine specialists in infection control and healthcare-associated infections. This One Health approach should reduce the potential transmission of resistant strains between animals and between animals and humans.

Veterinarians cannot sell the VMPs they prescribe, and strong emphasis is placed on treating individual animals (for which more than 90% of the antimicrobials sold) rather than entire flocks or herds. There are extensive data on the monitoring of AMR in animal pathogens, and this information is used to facilitate the choice of antimicrobials to be prescribed. Systems to record the use of antimicrobials by farms, animal species and prescribing veterinarian are expected to generate data which will allow the identification of the success factors facilitating the low use of antimicrobials.

3 e-Survey

At the end of 2018, an electronic questionnaire (e-survey) on policies concerning the prudent use of antimicrobials in animals was launched by DG Health and Food Safety following the above five fact-finding missions. The e-survey, which focused on a discrete number of topics, aimed at completing the project's overview knowledge about the situation on prudent use, and it was addressed to the competent authorities in all the Member States, Iceland, Norway and Switzerland.

This section presents the overall results of the responses to the e-survey, to which all the 31 countries replied, although in a few cases some questions received no reply. It must be noted that the implicit self-reporting approach in the e-survey urges some caution in analysing the data. Nevertheless, the results provide a useful and broad overview of the current situation on prudent use in the EU and beyond.

3.1 Measures to promote the prudent use of antimicrobials in animals

The majority of the responding countries (28) stated that they had implemented specific measures to promote prudent use and, in most cases, that such measures applied to both farm and companion animals. Only a few countries (3) declared that no measures had been taken in this regard. These measures consisted of guidelines developed by the competent authorities (national, regional or local) in the majority of countries (22), and by stakeholders (veterinary or farming organisations, production quality schemes or other industry bodies) in many countries (16). Aside from guidelines, awareness-raising activities, training and workshops, a risk categorisation of farms and electronic prescription systems were also cited as other measures that had been implemented.

3.2 Measures to minimise the sales and use of colistin in animals

The majority of the countries indicated that they had already taken specific measures to minimise the sales and use of colistin in animals (21) or that such measures were planned but not yet taken (5). Conversely, only a few countries (5) indicated that measures on colistin had neither been taken nor planned.

Concerning the nature of these measures, they mostly consisted of guidelines, which had been developed by the competent authorities (12) and by stakeholders (10). As regards the animal species affected, the majority of the countries stated that these measures would apply to pigs (23), and an important number of countries indicated that the measures would apply to cattle (15) and poultry (15). Other countries indicated additional animal species to which these measures would apply, or that they would apply to all animals or all farmed animals.

3.3 Impact of measures to promote the prudent use of antimicrobials in animals

Regarding the impact of the measures to promote prudent use in various fields:

- the majority of countries (23) indicated an impact in reducing the total sales/use of antimicrobials in animals,
- the majority of countries indicated an impact in reducing the total sales/use of colistin in animals (19), as well as of other CIAs such as fluoroquinolones, and 3rd and 4th generation cephalosporins (23),
- a substantial number of countries (17) indicated an impact in reducing the prevalence of resistant bacteria in animals, whereas only a third of the countries (10) indicated such an impact in reducing the prevalence of resistant bacteria in humans, and
- the majority of countries indicated an impact in increasing the awareness about the prudent use principles among veterinarians (23), farmers (21) and the general public (22).

3.4 Collection of data on antimicrobial use on individual farms

Some of the countries (13) stated that data on the use of antimicrobials on individual farms were currently collected. All of these countries were collecting such data on poultry farms, and most of them also on farms of pigs (12) and cattle (11). A few countries (2) indicated that there were plans for such data being collected as of 2019. In the afore-mentioned 13 countries, the data were currently evaluated by the competent authorities and/or by stakeholders, but only in some countries (7) for the purpose of identifying and benchmarking the farms' levels of antimicrobial use.

3.5 Collection of data on antimicrobial prescription by individual veterinarians or veterinary practices

Only one third (10) of the countries stated that data on the total quantity of antimicrobials prescribed by individual veterinarians or veterinary practices were currently collected. These data were evaluated by the competent authorities and/or by stakeholders in most cases (9), in

many cases for the purpose of identifying and benchmarking the prescription patterns of veterinarians or veterinary practices (6).

4 Workshop

Following the completion of the series of fact-finding missions, a workshop on the prudent use of antimicrobials in animals as a measure to tackle AMR was organised in January 2019. Representatives from all Member States, Iceland, Norway, Switzerland and the EFTA (European Free Trade Association) Surveillance Authority were invited to attend this one-off workshop, which was carried out under the umbrella of the Better Training for Safer Food (BTSF) initiative¹⁶. The goals of the workshop were that the participants and their respective countries would:

- learn from the findings and conclusions of the fact-finding mission reports and the interim overview report and use them to improve their official control activities,
- gain an understanding of good practices in the EU and beyond, and how these may be possibly applied in their own countries, and
- be able to identify and discuss challenges and weaknesses in their own countries, as well as across the EU and beyond, with the aim of identifying possible solutions at those levels.

During the workshop, there was a wide range of presentations about policies and practices in different countries. The agenda for the workshop and the presentations that were delivered are available at the following link: <https://eu.eventscLOUD.com/ehome/200184543>.

This section presents the most salient elements stemming from the discussions with the participants about the situation in their own countries held during the workshop, both in terms of difficulties in advancing towards a more prudent use of antimicrobials and in relation to opportunities for actions that could result in progress in this area.

4.1 Difficulties

The workshop participants identified a number of issues as challenges or obstacles to the development and implementation of policies aiming at the prudent use of antimicrobials in animals in their own countries. The main such issues were as follows:

- A lack of political support to implement actions which could inconvenience important electoral stakeholders such as farmers (in particular, the introduction of legal measures, rather than relying solely on guidance and voluntary actions), and a lack of willingness of certain stakeholders to accept ownership of the problem and their responsibility to act.
- The struggle to keep AMR high on the political agenda, in a context of other competing priority topics such as climate change, and the need to ensure the sustainability of the current model of animal production.

¹⁶ This workshop was not part of the series of ‘regular’ BTSF training courses on AMR in a ‘One Health’ context mentioned in section 6.

- Veterinarians profiting from the sale of antimicrobials, who might be financially incentivised to increase prescriptions, as well as veterinarians who could also be pressurised to prescribe antimicrobials by farmers (indicating that they might call another veterinarian in case of refusal to do so).
- The need for more detailed prudent use guidelines and the establishment of national, sector-specific targets for the reduction of antimicrobial use.
- Difficulties in changing the behaviour of farmers and veterinarians, and empowering them to be brave enough not to use antimicrobials for prophylaxis, and the need to support veterinarians in their clinical decisions in order to ensure that their advice is followed by farmers.
- Concerns about the possible impact on animal health and welfare of further tightening strict antimicrobial use targets.
- The risks posed by online pharmacies and prescriptions issued by veterinarians without examining the animals concerned.
- Limited cooperation between the human health, veterinary and environmental authorities when attempting to work in a One Health perspective.

Some attendees considered that the Commission's AMR veterinary working group, which held its last meeting in 2015, was a very useful forum for the exchange of information and technical discussions between Member State experts, the Commission and the relevant EU agencies (ECDC, EFSA, and EMA). These attendees stated that the Commission's One Health network meetings, while very useful, are necessarily of a more general nature and do not provide an equivalent forum in order to hold detailed discussions on how to practically address day-to-day issues on the prudent use of antimicrobials in animals ¹⁷.

4.2 Opportunities

The workshop participants identified a number of concrete actions that could be put in practice in their own countries in order to achieve tangible, and preferably short term, progress in relation to the prudent use of antimicrobials in animals. The main ones were as follows:

- Performing a more detailed analysis of the use of currently available antimicrobials and of AMR surveillance data (also from the human health sector).
- Improving the communication with and the involvement of industry stakeholders and, at the same time, expanding communication to the wider public, taking the example of communication and awareness campaigns organised in the human health sector.

¹⁷ Following the workshop, the Commission services confirmed that a meeting of the afore-mentioned working group could be organised if a specific need arose, but that currently this has not been considered necessary given the availability of the One Health network meetings for discussions.

- Drafting guidance documents for veterinarians on improving hygiene and infection prevention and control measures, and promoting more direct linkages and possible contracts between farmers and their veterinarians.
- Rewarding farmers using low levels of antimicrobials. The option to use a quality mark or label was discussed, as well as possible measures under the EU Common Agricultural Policy to support sustainable practices.
- Engaging with the environmental authorities so that they better understand their role in addressing AMR.
- Giving more attention to prudent use in the companion animals sector.
- Getting veterinarians and farmers to think differently about the use of antimicrobials, rather than merely following their standard practices acquired over many years' experience.
- Introducing reduction targets for some antimicrobials.
- Reducing the use of medicated feed to avoid that preventive treatments are administered to entire groups of animals.
- Engaging with human pharmacies, which often sell veterinary antimicrobials without fully understanding the intended purpose of the products they are selling.

Finally, all attendees expected that the future implementation of the new EU Regulations on VMPs and medicated feed (see section 6) should lead to important improvements in prudent use.

5 Overall conclusion

The report identifies some common elements which appear to facilitate efforts to achieve the reduced and more prudent use of antimicrobials. A national AMR action plan (or strategy) usually provides a solid basis and focus for practical measures to be implemented. Initiatives should also be limited not only to the farm animal sector but should also consider companion animals and horses.

Working in a One Health perspective can promote the exchange of experience and paths to success between the veterinary, human health and environmental domains. An example would be infection prevention and control measures to avert healthcare-associated infections, which are widely applied in the human health area and are recognised as increasingly relevant in the veterinary sector. The involvement and consultation with stakeholders in preparing action plans has also proven beneficial in building consensus between the parties on the need to address AMR and to take actions to promote prudent use. In some cases, antimicrobial reduction targets (including sector-specific ones) have served as a concrete and motivational tool to encourage actions and to monitor progress. Measuring antimicrobial use on individual farms or prescription patterns by individual veterinarians have also proven beneficial to promote and disseminate good practices, and resulted in a reduced and prudent use of antimicrobials.

Prudent use guidelines and availability of AMR surveillance data (including in pathogenic bacteria) provide useful tools to inform and adapt the prescribing practices of veterinarians. Measures to prevent, control and eradicate diseases, including the use of biosecurity and vaccination can all help to facilitate the reduced and more prudent use of antimicrobials. A number of countries have achieved significant reductions in the use of antimicrobials by focussing on the therapeutic treatment of individual animals, rather than the treatment of an entire herd or group of animals.

In some cases, decoupling the prescription and sale of medicinal products by veterinarians is believed to have been very useful in removing a financial incentive for the prescription of antimicrobials. Nevertheless, it is debatable whether this is in itself an essential step in ensuring prudent use, since some countries still record high sales of antimicrobials even when veterinarians cannot sell such products while, conversely, other countries where veterinarians are still allowed to sell antimicrobials record low sale volumes. More emphasis has been placed on the need to address or even prohibit incentives such as rebates and discounts in relation to VMPs, including antimicrobials, offered by pharmaceutical companies or wholesalers.

Communication and awareness campaigns for all stakeholders, including pet owners and the general public, are considered very important to build consensus on the need to address prudent use. In some countries, media stories have served to focus attention on AMR and have acted as a stimulus for effective actions to be taken. Specific national legislation on the use of CIAs in animals has proven to be very effective in certain countries to achieve a rapid reduction in the use of these substances, although the competent authorities have had to remain vigilant to ensure that animal health and welfare are not jeopardised. There is also a risk that financial and marketing incentives offered for the antimicrobial-free production of farm animals might threaten animal health and welfare if such incentives result in not treating sick animal.

Based on the results of an e-survey, policies on the prudent use of antimicrobials in animals appear to have received a reasonable level of attention from most national competent authorities, notably in relation to farm animals. In particular, measures to minimise the sales and use of colistin in animals have been taken or planned in the majority of countries. Although many countries are aware of data concerning the impact that have had their national measures to promote prudent use, most of them do not yet collect data on the use of antimicrobials at the level of individual farms or on their prescription. Interestingly, some countries have found the collection, analysis and benchmarking of such data to be useful tools to promote prudent use.

During a workshop on the prudent use of antimicrobials held in January 2019, some important challenges that the competent authorities currently face in addressing AMR in general, and this topic in particular, were highlighted. Likewise, some opportunities to make progress on prudent use emerged, also with a view to the future implementation of the new EU Regulations on VMPs and on medicated feed.

6 Actions taken or planned by the Commission services

The Commission services have already launched a number of actions, as part of its wider strategy on AMR, aimed at strengthening the regulatory framework, expanding the knowledge-base and assisting Member States in the implementation of the policies on the prudent use of antimicrobials in animals.

1. Progress continues with the actions under the umbrella of the European One Health Action Plan against AMR. The last progress report listing the concrete activities, timelines and deliverables has been recently published ¹⁸.
2. Bi-annual meetings of the EU AMR One-Health Network, chaired by the European Commission, continue to be organised. This network includes government experts on human health and animal health, the EU scientific agencies (ECDC, EFSA and EMA) and Commission experts. These meetings provide members with a platform to present national action plans and strategies and keep each other up to date on their progress, to share best practices, and to discuss policy options and how to enhance cooperation and coordination.
3. One Health AMR joint country visits have continued to be organised by the Commission and ECDC since 2017. The overall objective of these country visits is to assist the Member States in further developing and implementing their national strategies and policies to tackle AMR in a One Health context. The scope of visits encompasses the human health, veterinary and environmental aspects of AMR, as well as inter-sectoral coordination and cooperation aspects. To date, six visits have been carried out with another two scheduled for the second half of 2019. With the agreement of the Member States concerned, the reports of these visits are made publicly available ¹⁹.
4. The Commission continues to support Member States through the Joint Action on AMR Healthcare-Associated Infections ²⁰ co-funded by the EU. In addition, technical assistance is available from the Structural Reform Support Service, and the Member States are invited to apply for available financial support (e.g. EU structural funds), to help in the further development and implementation of their national AMR strategies and action plans.
5. The Commission has provided for the dissemination of information on AMR to the competent authorities through its BTSF initiative ²¹, with the specific purpose of spreading the knowledge on the One Health approach, and on the best practices on the design, implementation and management of national action plans against AMR.

¹⁸ https://ec.europa.eu/health/amr/sites/amr/files/amr_2018-2022_actionplan_progressreport_en.pdf

¹⁹ These reports can be retrieved, introducing the terms 'country visits' in the Advanced Search engine, at the following link: http://ec.europa.eu/food/audits-analysis/audit_reports/index.cfm

²⁰ <https://eu-jamrai.eu/>

²¹ http://ec.europa.eu/chafea/food/trainings/available-trainings_en.htm

6. The Commission plans to request ECDC, EFSA and EMA to continue joint analysis of data from the relevant surveillance systems on consumption of antimicrobials and AMR in humans, animals and food in the EU, and provide updated reports (JIACRA).
7. Regulation (EU) 2019/6 of the European Parliament and of the Council on veterinary medicinal products and Regulation (EU) 2019/4 of the European Parliament and of the Council on medicated feed were published in January 2019 and they will apply in January 2022. These Regulations establish a wide range of concrete measures to fight AMR and to promote a prudent and responsible use of antimicrobials, following the One Health approach.

In the Member States such measures will include, amongst others:

- a ban on the preventive use of antimicrobials in groups of animals and also via medicated feed,
- restrictions on the metaphylactic use of antimicrobials ²²,
- a reinforced ban on the use of antimicrobials for promoting growth and increasing yield (in addition to the 2006 ban, which already prohibited using antimicrobials as feed growth promoters),
- the possibility to reserve certain antimicrobials for human use only, and
- the obligation for Member States to collect data on the sale and use of antimicrobials.

Third countries will have to respect, for their exports to the EU, the ban on using antimicrobials for promoting growth and increasing yield, as well as the restrictions on antimicrobials reserved for human use in the EU.

²² Metaphylaxis means the administration of a medicinal product to a group of animals after a diagnosis of clinical disease in part of the group has been established, with the aim of treating the clinically sick animals and controlling the spread of the disease to animals in close contact and at risk and which may already be subclinically infected.

ANNEX 1 – LEGAL REFERENCES

Legal Reference	Official Journal	Title
Reg. 2019/4	OJ L 4, 7.1.2019, p. 1–23	Regulation (EU) 2019/4 of the European Parliament and of the Council of 11 December 2018 on the manufacture, placing on the market and use of medicated feed, amending Regulation (EC) No 183/2005 of the European Parliament and of the Council and repealing Council Directive 90/167/EEC
Reg. 2019/6	OJ L 4, 7.1.2019, p. 43–167	Regulation (EU) 2019/6 of the European Parliament and of the Council of 11 December 2018 on veterinary medicinal products and repealing Directive 2001/82/EC
Dir. 2001/82/EC	OJ L 311, 28.11.2001, p. 1-66	Directive 2001/82/EC of the European Parliament and of the Council of 6 November 2001 on the Community code relating to veterinary medicinal products
Dec. 2013/652/EU	OJ L 303, 14.11.2013, p. 26-39	2013/652/EU: Commission Implementing Decision of 12 November 2013 on the monitoring and reporting of antimicrobial resistance in zoonotic and commensal bacteria

ANNEX 2 - DETAILS OF INDIVIDUAL DG HEALTH AND FOOD SAFETY FACT-FINDING MISSIONS CONSIDERED FOR THIS OVERVIEW REPORT

Country	Dates of Audit	Reference No.
France	21 to 30 March 2017	2017-6200
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=3850		
Latvia	30 May to 6 June 2017	2017-6202
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=3916		
Norway ¹	27 February to 8 March 2017	2017-6199
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=3847		
Sweden	10 to 18 October 2017	2017-6201
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=3957		
Italy	08 to 16 November 2018	2018-6371
http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=4111		

¹ This fact-finding mission was carried out jointly by the EFTA Surveillance Authority and the Directorate-General for Health and Food Safety.

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