

ONE WORLD ONE HEALTH

BELGIAN “ONE HEALTH” NATIONAL ACTION ON THE FIGHT AGAINST ANTIMICROBIAL RESISTANCE (AMR) 2020-2024



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Preface

Antimicrobial resistance, also known as AMR, is one of the greatest public health threats of today and tomorrow. The OECD already estimates that 533 deaths per year in Belgium are due to infections by resistant bacteria. Most of these infections are contracted in health care settings and few cases are seen among healthy people. Without effective, comprehensive action, we may soon run out of effective antibiotics and some infections will no longer be treatable.

Evidence also shows that resistant bacteria are transmitted between humans, animals and the environment, and that an intersectoral and multidisciplinary approach is therefore needed. A common "One World One Health" approach is therefore required, in which everyone is responsible for their part of the problem and works together to provide safe care, healthy animals, safe food and a healthy environment for all citizens.

Belgium has been active in the fight against AMR for many years now, in the field of both human health and animal husbandry, in order to reduce and/or improve the use of antimicrobial agents (and antibiotics in particular), with a view to avoiding the development and spread of resistant germs. However, our use and resistance figures show that an urgent wake-up call is needed, and that more leadership and ambition are required to turn the tide.

That is why, together with our federal, community and regional partner administrations, and with the help of experts and organisations such as the Belgian Antibiotic Policy Coordination Commission (BAPCOC) and the Center of Expertise on Antimicrobial Consumption and Resistance in Animals (AMCRA), we have combined our strengths and knowledge and drawn up **a new and ambitious action plan against antimicrobial resistance** for 2020-2024 in accordance with the **"One World One Health" approach**. We are therefore ready to give new impetus to the fight against antibiotic and other antimicrobial resistance in all three pillars (human, animal and environmental health).

We are convinced that an effective AMR policy offers many benefits to our population, health care providers, the food chain and the environment, both in public health and economic terms. But we also know that cooperation is essential and that an AMR policy should not be top-down, but rather a policy in which the authorities cooperate with the sectors and all the professionals on the ground. The prescriber is not part of the problem, but part of the solution, and we need the involvement and commitment of all stakeholders. Of course, this plan is not the end, but just the beginning, and I look forward to the future with hope.

Tom Auwers

President of the FPS Health, Food Chain Safety and Environment

Word from the project coordination team

A,M,R, three letters that have brought together so many people from different backgrounds and sectors around a common desire, namely to continue to treat infectious diseases! We would like to expressly thank all those who contributed to the creation of this collective plan within a very constructive One World One Health philosophy. We hope that the exchanges and networks involved in the development of this plan will have a snowball effect towards the broad mobilisation and involvement of all stakeholders in the fight against antimicrobial resistance.

Martine Delanoy, Laetitia Lempereur, Gaëlle Vandermeulen

AMR Coordination, FPS Health, Food Chain Safety and Environment

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Abbreviations and acronyms

AB	Antibiotics
FAMHP	Federal Agency for Medicines and Health Products
FASFC	Federal Agency for the Safety of the Food Chain
AMCRA	Center of expertise on Antimicrobial Consumption and Resistance in Animals
AM-DIA	AntiMicrobial consumption data of Belgian hospitals linked with DIAgnoses
AMR	Antimicrobial Resistance
AMS	Antimicrobial Stewardship
AMU	Antimicrobial Use
ARSIA	Regional Association for Animal Health and Identification
AVIQ	Agency for a Quality Life
AWE	Walloon Association of Livestock
BAPCOC	Belgian Antibiotic Policy Coordination Commission
BelVetSac	Belgian Veterinary Surveillance of Antibiotic Consumption
BIGAME	Computerised database for the management of antibiotics and medications in livestock farming
BVK	Belgian Society for Veal Producers
CBIP	Belgian Centre for Pharmacotherapeutic Information
CDS	Clinical Decision Support
CNPQ	National Council for Quality Promotion
SHC	Superior Health Council
CVO	Chief Veterinary Officer
DGGS	Directorate-General Healthcare (FPS HFCSE)
DGZ	Animal Health Care
EBP	Evidence-Based Practice
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EFSA	European Food Safety Authority
EMA	European Medicines Agency
ESAC-net	European Surveillance of Antimicrobial Consumption Network
ESVAC	European Surveillance Veterinary Antimicrobial Consumption
FTE	Full-time equivalent
FAO	Food and Agriculture Organization of the United Nations
GGA	Antibiotic Therapy Management Group
HCAI	Healthcare associated infections
ILVO	Flanders Research Institute for Agriculture, Fisheries and Food
IMHOTEP	Inventory of Hormonal and Organic Trace Matter in Heritage and Potable Waters
NIHDI	National Institute for Health and Disability Insurance
IPC	Infection Prevention and Control
IPPC	International Plant Protection Convention
KCE	Federal Centre of Health Care Expertise
LIFE	Financial Instrument for the Environment
MBT-ASTRA	Maldi Biotyper-antibiotic susceptibility test rapid assay
MDRO	MultiDrug Resistant Organisms
MRSA	Methicillin-resistant Staphylococcus aureus
MTAB	Medical-Technical Advisory Board
NAC	National Antimicrobial Committee
NAP	National Action Plan
NRC	National Reference Center

NRL	National Reference Laboratory
OECD	Organization for Economic Cooperation and Development
OIE	World Animal Health Information System
WHO	World Health Organisation
OST	Outbreak Support Team
PCU	Population Correction Unit
QFL/IKM	Milk Sector Quality
RAG	Risk Assessment Group
RMG	Risk Management Group
RDT	Rapid Diagnostic Test
IHR	International Health Regulations
FPS	Federal Public Service
FPS HFCSE	FPS Health, Food Chain Safety and Environment
SRSS	Structural Reform Support Service
SPW	Public Service of Wallonia
TC-MDRO	Technical Committee - MDRO
EU	European Union
UNEP	United Nations Environment Programme
VEE	Flemish Association for Veterinary Economics and Epidemiology
WGS	Whole Genome Sequencing

Why a Belgian AMR One Health Action Plan?

1. Background and scope

Antimicrobials are substances that include antibiotics, antivirals, antifungals, and antiprotozoals, and result in the destruction or inhibition of the growth of targeted microorganisms. These agents are essential in preventing and treating certain infections in humans and animals.

Antimicrobial resistance is the ability of microorganisms to become increasingly resistant to the antimicrobial agents to which they were previously susceptible. Antimicrobials lose their effectiveness over time and eventually become ineffective, for example some antibiotics against bacteria.

The World Health Organization (WHO) has declared antimicrobial resistance to be one of the greatest threats to public health for the present and the near future¹. The World Bank considers that without the containment of antimicrobial resistance, the 2030 Sustainable Development Goals, such as eradicating poverty, ensuring healthy lives, reducing inequality and revitalising global development are less likely to be achieved².

Figures and estimates confirm this, as according to the ECDC, 33,000 people die every year in the EU and the European Economic Area (EEA) as a result of infections caused by drug-resistant bacteria. In 2017, nearly 20% of bacterial infections were resistant to antibiotics in OECD countries, while across the G20, antibiotic resistance in some countries exceeded 40%³. In Belgium, an estimated 530 deaths are attributable to AMR each year. An estimated 22,500 people will have died by 2050 if no further control measures are taken³. Most of these infections are acquired in health care settings (Cassini et al., 2018) and there are clear geographical differences in infection rates between the Belgian provinces (Valencia et al., 2016).

In the worst-case scenario, we will soon run out of effective antibiotics. Surgery and cancer treatment will then become very dangerous due to the risk of infection inherent in this type of treatment. Organ transplants will even become almost impossible because the immunosuppression required in these patients makes them particularly vulnerable to infection. Some infections that are now treated easily may become fatal. It is therefore not unthinkable that infectious diseases will again become the main cause of death, as was the case until the beginning of the 20th century.

In addition to the human costs, AMR also has significant economic costs for hospitals, the health insurance system and the agricultural sector; the annual cost of AMR in Belgium is estimated at 24 million euros, but this cumulative cost could reach 787 million euros by 2050, according to OECD estimates⁴. The sale of anti-infectives for systemic use in pharmacies open to the public and in hospital pharmacies alone cost NIHDI €61.7m and €56.6m respectively in 2019, based on Farmanet and doc PH data. An average of 76,586 additional hospital days are also estimated to be associated with AMR

¹ <https://www.who.int/news-room/fact-sheets/detail/antibiotic-resistance>

² <http://documents.worldbank.org/curated/en/323311493396993758/pdf/final-report.pdf>

³ OECD (2018), *Stemming the Superbug Tide: Just A Few Dollars More*, OECD Publishing, Paris. Available at: <https://doi.org/10.1787/9789264307599-en>.

⁴ <https://doi.org/10.1787/9789264307599-en>.

in Belgium each year. In terms of the burden of disease, AMR would result in an additional 13,149 DALYs lost annually for the entire population (DALYs being the number of disability-adjusted life years, which quantifies the burden of a disease as the number of years of healthy life lost due to morbidity and mortality).

In the agricultural sector, the presence of resistant E. coli bacteria in chicken meat in Norway, for example, led to a drop in sales of almost 20% for some distributors, involving economic losses for producers and the economy⁵.

The fight against antimicrobial resistance (AMR) is therefore a major challenge for our society in terms of avoidable deaths, length of hospitalisation, and costs. If we are to continue to treat ourselves with antimicrobials, we must control or even reduce resistance in microorganisms. Furthermore, AMR can also affect public trust in the safety of healthcare, food and the environment when, for example, multidrug resistant organisms spread through healthcare-associated infections, foodstuffs or via the environment.

Belgium has organised several activities and initiatives to combat AMR for decades, and was even a forerunner at European level with the creation of **BAPCOC**⁶, the Belgian Antibiotic Policy Coordination Commission, in 1999. Other structures were subsequently developed, including **AMCRA**⁷, the Centre of Expertise on Antimicrobial Resistance and Antimicrobial Consumption in Animals in Belgium, in 2011, the **MDRO Task Force** and **OST**⁸ in 2013 and the **Antibiotic Convention in Veterinary Medicine** in 2016 and 2021.

Nevertheless, indicators have recently shown that additional efforts are necessary in several areas and that a renewed approach needs to be adopted that enhances coordination and collaboration between the human and animal sectors and takes into account the environmental aspects of AMR:

- This mainly involves the WHO Joint **External Evaluation** team which, during its mission to Belgium to evaluate the implementation of the International Health Regulations (IHR) in 2007, suggested improving stewardship and coordination between the animal, environmental and health sectors around activities related to antimicrobial resistance⁹.
- It also involves the **European Centre for Disease Prevention and Control** (ECDC) and the **European Commission** (DG Health), which Belgium invited to conduct a joint visit to our country in 2017 to discuss the situation of antimicrobial consumption and resistance in Belgium. Both organisations concluded that Belgium had several good initiatives, benefits from high-level scientific expertise and paved the way on AMR policy in many aspects^{10,11} But today, however, the overall approach is fragmented, with a subsequent loss in effectiveness. They insist that Belgium should raise public awareness of the urgency of AMR and that the public authorities should take a real leadership role.
- Lastly, the **consumption figures** showed that no significant improvement has been observed over the last ten years in the human health sector, and that, despite the significant decreases

⁵ https://ec.europa.eu/health/amr/sites/amr/files/amr_factsheet_en.pdf

⁶ <https://consultativebodies.health.belgium.be/en/advisory-and-consultative-bodies/commissions/BAPCOC>

⁷ <https://www.amcra.be/>

⁸ Memorandum of Understanding of 30 September 2013 on the national Multidrug resistant organisms (MDRO) plan – Moniteur belge- 21/11/2013

⁹ <http://www.who.int/ihr/publications/jee-mission-report-belgium/en/>

¹⁰ https://www.ecdc.europa.eu/sites/portal/files/documents/ECDC-AMR-country-visit-report_Belgium-2017.pdf

¹¹ http://ec.europa.eu/food/audits-analysis/audit_reports/details.cfm?rep_id=3995

in consumption observed recently in the veterinary sector, Belgium is above the European median in both sectors (note that taken separately, hospital consumption is below the European average, while outpatient consumption is - significantly - above) (Figures 1 and 2). Moreover, in comparison with our neighbouring countries with comparable health and breeding systems, there seems to be considerable room for improvement (Figure 3). Based on these findings, the FPS HFCSE submitted a request for a study on the subject to the KCE, whose report "Proposals for a more effective antibiotic policy in Belgium" was published on 4 April 2019¹².

¹² https://kce.fgov.be/sites/default/files/atoms/files/KCE_311B_Antibiotique_Politique_synthese_0.pdf

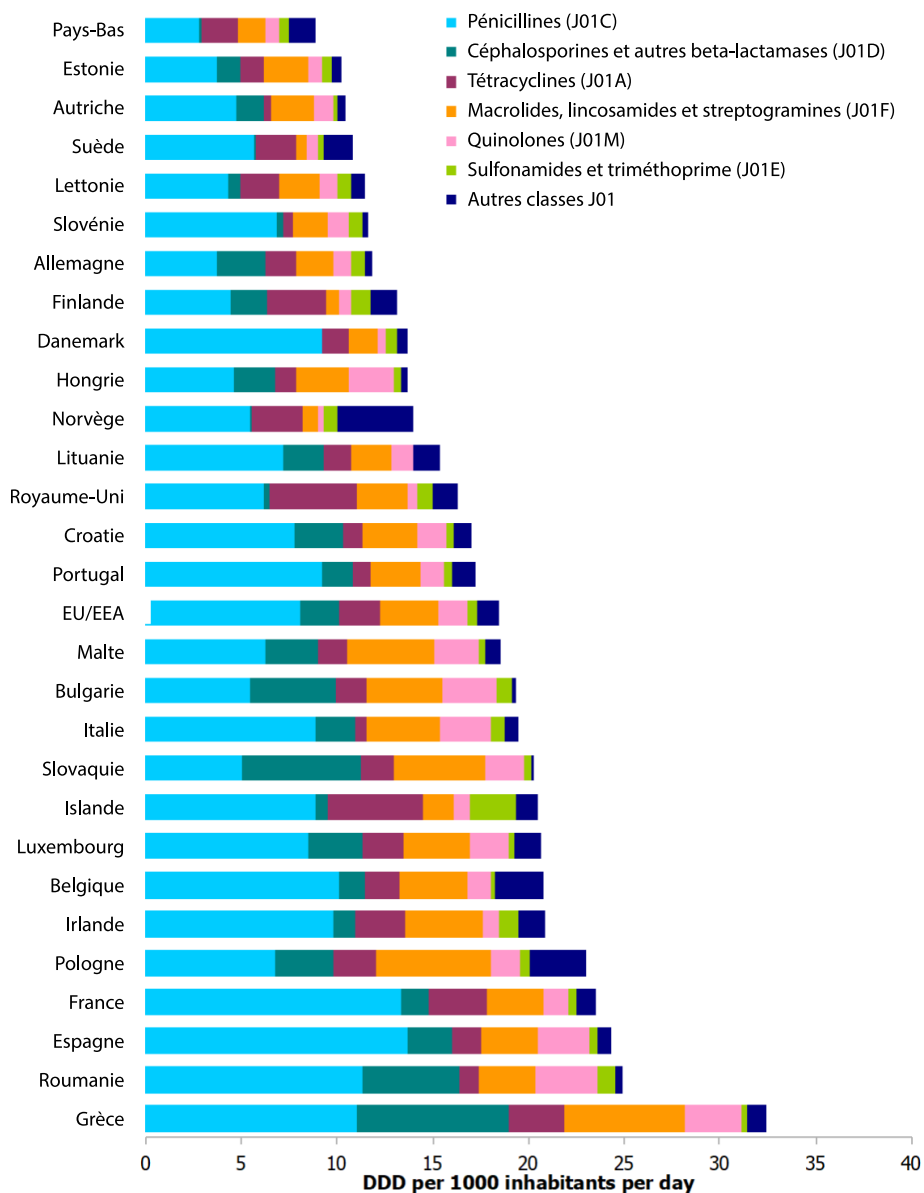


Figure 1: Consumption of antibacterials for systemic use (ATC group J01) by country and in the community (ATC group level 3), of EU/EEA countries in 2018 (expressed in DDD per 1,000 inhabitants per day) ECDC, 2019 (ESAC-net)

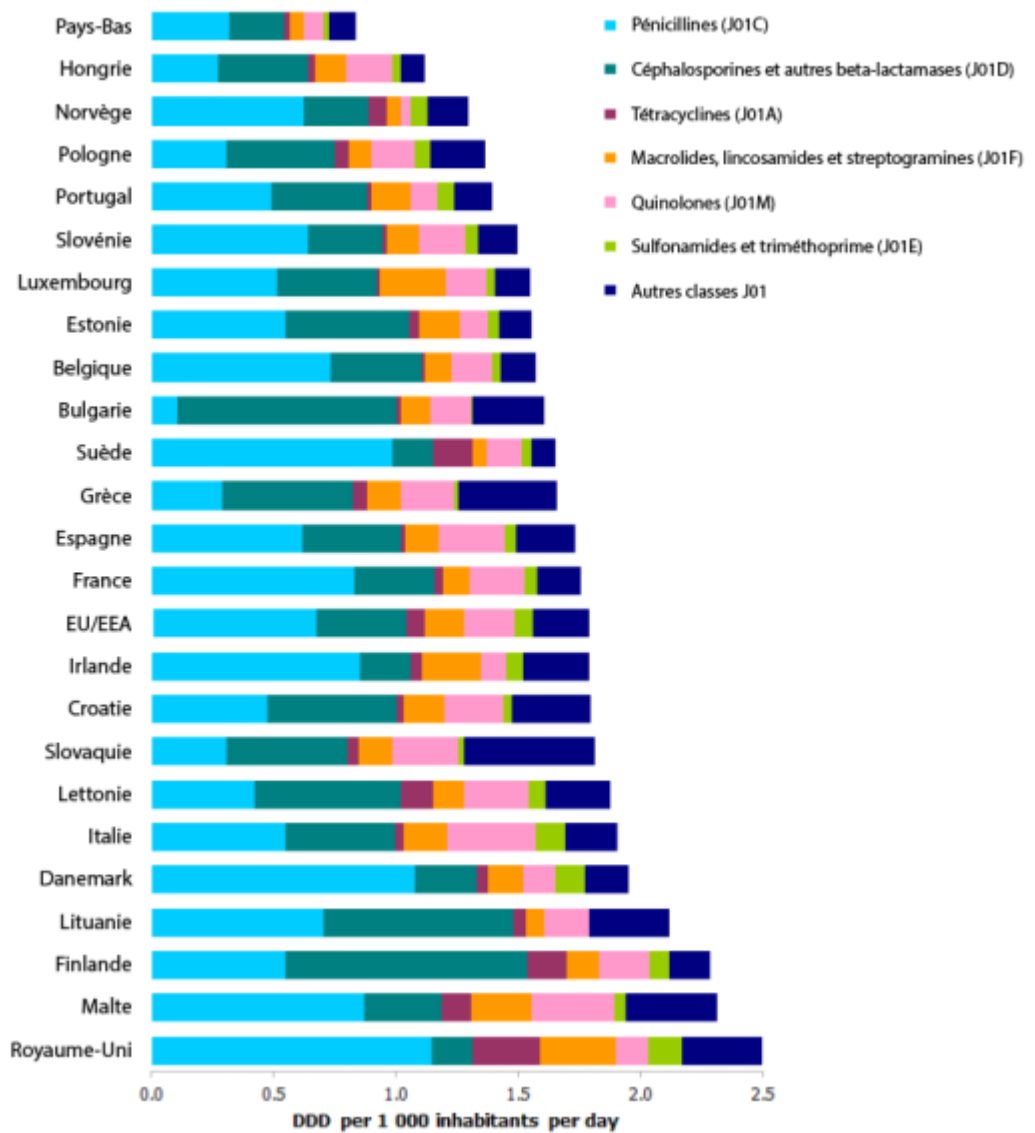


Figure 2: Consumption of antibacterials for systemic use (ATC group J01) by country and ATC group in EU/EEA countries in 2018 (expressed in DDD per 1,000 inhabitants per day) ECDC, 2019 (ESAC-net)

a) Finland: the data includes consumption in remote primary health care centres and care homes.

b) Portugal: the data refers to public hospitals. The population was adjusted based on the hospital catchment area information provided by the country. EU EEA refers to the population-weighted average consumption, based on countries that provided data for 2018.

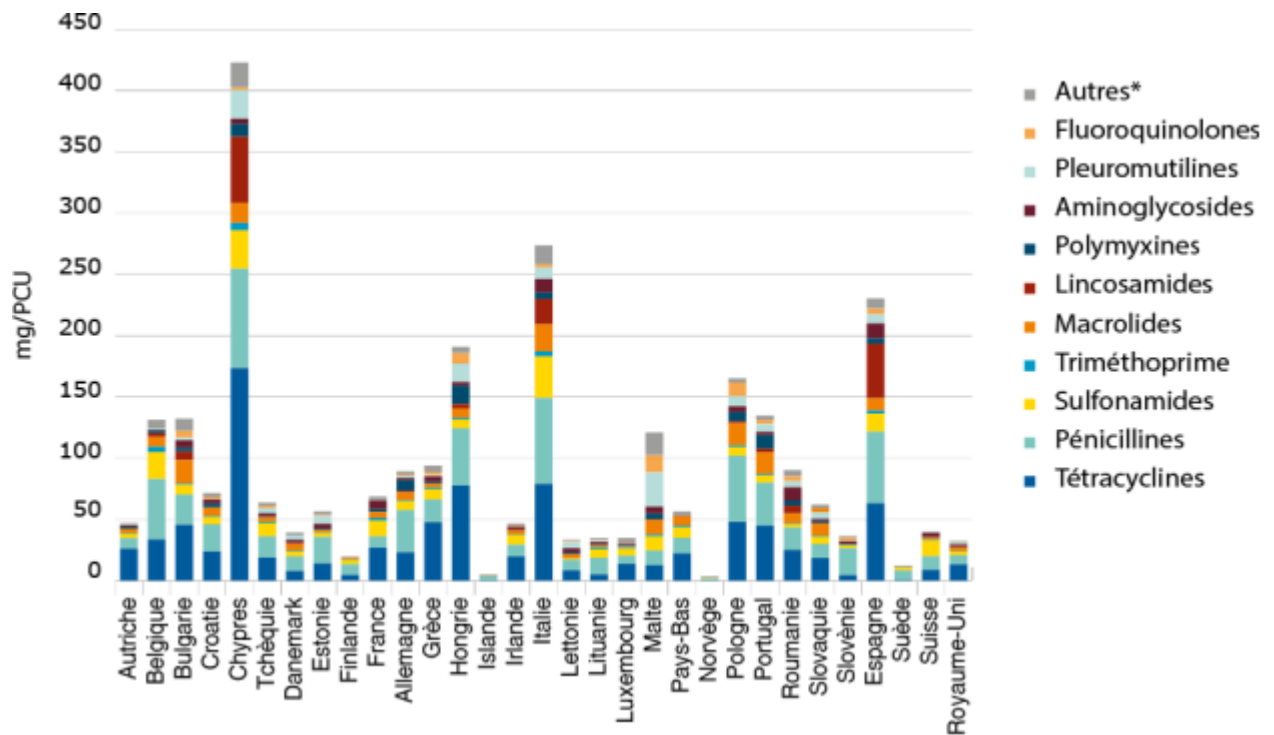


Figure 3: Sales of veterinary antimicrobials in food-producing species, in mg/PCU, for the different classes of veterinary antimicrobials, for 31 European countries, in 2017 - EMA, 2019 (ESVAC report)

Despite the various initiatives already underway, these visits were a **wake-up call** for the public authorities and the Ministers responsible for public health, animal health, safety of the food chain and the environment.



On 2 July 2018, the Ministers of Public Health of the federal, regional and community authorities therefore decided, in an inter-ministerial conference on health, to set up an inter-cabinet working group, extended to include representatives of the Ministers responsible for the safety of the food chain, animal health and the environment, aimed at **drawing up a National One Health Action Plan for the fight against antimicrobial resistance**. They appointed the FPS HFCSE as project coordinator.

2. A One Health approach

Microorganisms (including resistant bacteria) and resistance genes are constantly exchanged between humans, animals, and the environment, via contact or food, as well as within the healthcare sector (hospitals, nursing homes, outpatient departments) and farms, via the movement of patients and animals. Infection prevention, including biodiversity improvement¹³, is therefore very important in the fight against antimicrobial resistance. The residues of drugs, including antimicrobials, as well as resistant microorganisms, are found in the environment, particularly through wastewater and the application of manure from treated animals, which may act as a reservoir and/or stimulator of the development of antimicrobial resistance.

AMR in a "One World, One Health" perspective



¹³ See in this respect the Belgian Biodiversity Strategy, which includes the existing frameworks/plans at federal and regional levels, and will be revised during the legislature: <https://www.biodiv.be/documents/BE-national-strategy>

For this reason, AMR should be tackled from a One Health perspective, that is, an integrated approach to human, animal, plant and environmental health that recognises that human health is linked to animal health, the safety of the food chain and the environment in general, and that encourages:

- intersectoral and integrated collaboration between the public and private organisations involved in the different pillars of health (we cannot act on a determinant without taking into account its effects on other determinants),
- structured collaboration with other policy areas (health and environment policies have a global and international societal impact, affecting society, employment, economy, education, mobility, taxation, world trade, security policy, etc.),
- a long-term approach, given the systemic nature of all these determinants.



This "One Health" approach within the AMR framework is widely recognised and promoted at the international level:

- international organisations, including the Food and Agriculture Organization of the United Nations (FAO), the World Health Organization (WHO), the World Organisation for Animal Health (OIE) and the United Nations Environment Programme (UNEP), are working in partnership on this issue and urge Member States to take action and develop National Action Plans (NAP) by adopting the One Health approach.
- The EU Council conclusions of June 2016¹⁴ and June 2019¹⁵ both adopted unanimously by Members States, offer good guidance on the ambitions and main elements that a national action plan should contain. Existing action plans from international organisations, such as the WHO Global Action Plan on antimicrobial resistance (2015¹⁶), the OIE Strategy on Antimicrobial Resistance and the Prudent Use of Antimicrobials (2016¹⁷), the FAO action plan on Antimicrobial resistance (2016¹⁸) and the European One Health Action Plan against Antimicrobial Resistance (2017), provide further tools for actions against AMR¹⁹.

To implement this approach, a **large number of different stakeholders** involved in this issue (policy makers, scientific experts, prescribers, laboratories, control services, teachers, farmers, patients, etc.) need to work together to achieve the common goal of reducing antimicrobial resistance from a Prevention-Detection-Response perspective.

¹⁴ [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016XG0723\(02\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52016XG0723(02))

¹⁵ [https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1575541575599&uri=CELEX:52019XG0625\(01\)](https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1575541575599&uri=CELEX:52019XG0625(01))

¹⁶ <http://www.who.int/antimicrobial-resistance/global-action-plan/en/>

¹⁷ http://www.oie.int/fileadmin/Home/eng/Media_Center/docs/pdf/PortailAMR/EN_OIE-AMRstrategy.pdf

¹⁸ <http://www.fao.org/3/a-i5996e.pdf>

¹⁹ https://ec.europa.eu/health/sites/default/files/antimicrobial_resistance/docs/amr_2017_action-plan.pdf

3. A concerted approach

The One Health National Action Plan for Combating Antimicrobial Resistance will be finalised and submitted for **political agreement** to:

- the federal ministers responsible for public health, animal health, safety of the food chain, and the environment:
 - Frank Vandenbroucke, Deputy Prime Minister and Minister for Social Affairs and Public Health;
 - David Clarinval, Minister of Small Businesses, the Self-Employed, SMEs, Agriculture, Institutional Reform and Democratic Renewal;
 - Zakia Khattabi, Minister for Climate, Environment, Sustainable Development and the Green Deal;

- the regional and community ministers responsible for public health, animal welfare, agriculture and the environment:
 - Christie Morreale, Vice-President of the Walloon Government, Minister for Employment, Training, Social Economy, Health, Social Action, Equal Opportunities and Women's Rights;
 - Willy Borsus, Vice-President of Wallonia, Minister for the Economy, Research and Innovation, the Digital Economy, Agriculture, Town and Country Planning, IFAPME and Competence Centres;
 - Céline Tellier, Walloon Minister for the Environment, Nature, Forestry, Rural Affairs and Animal Welfare;
 - Wouter Beke, Flemish Minister for Welfare, Public Health, the Family and Poverty Reduction;
 - Hilde Crevits, Vice-Minister-President of the Flemish Government, Flemish Minister for Economy, Innovation, Employment, Social Economy and Agriculture;
 - Ben Weyts, Vice-Minister-President of the Flemish Government, Flemish Minister for Education, Sports, Animal Welfare and the Flemish Periphery of Brussels;
 - Zuhal Demir, Flemish Minister of Justice and Home Affairs, Environment, Energy and Tourism;
 - Alain Maron, Minister of the Brussels-Capital Region Government, responsible for Climate Transition, Environment, Energy and Participatory Democracy;
 - Bernard Clerfayt, Minister of the Brussels-Capital Region Government, responsible for Employment and Vocational Training, Digital Transition, Local Authorities and Animal Welfare;
 - Bénédicte Linard, Vice-President of the Wallonia-Brussels Federation and Minister for Childhood, Health, Culture, Media and Women's Rights;
 - Antonios Antoniadis, Deputy Prime Minister of the German-speaking Community, Minister for Health and Social Affairs, Spatial Planning and Housing.

It is the result of **close collaboration** between and **consultations** with:

- the federal administrations and institutions responsible for public health, animal health, safety of the food chain, and the environment:
 - FPS Health, Food Chain Safety and Environment (FPS);
 - the Federal Agency for Medicines and Health Products (FAMHP);
 - the Federal Agency for the Safety of the Food Chain (FASFC);
 - National Institute for Health and Disability Insurance (NIHDI);
 - Sciensano.
- other federal administrations (in particular the FPS Economy)
- the regional and community administrations and institutions:
 - the Agency for a Quality Life;
 - Flemish Agency for Care and Health;
 - Iriscare;
 - the Common Community Commission (COCOM).
- the existing organisations involved in the fight against AMR:
 - BAPCOC;
 - AMCRA;
 - TC-MDRO;
 - National Reference Centres;
 - partners of the Convention on Veterinary Medicine;
 - SHC;
 - KCE;
 - CBIP;
 - CNPQ;
 - etc.
- professional organisations, both private and public, as well as scientific associations and centres of expertise and representatives of all the stakeholders (such as patient representatives) in human health, animal health and the environment, each of which has a role to play in the fight against AMR.

These consultations took place at different levels and at a regular pace, within the existing bodies (BAPCOC, AMCRA, TC-MDRO, etc.), in ad-hoc working groups, and during two specific consultations.

A **Policy Dialogue** was therefore organised by the FPS HFCSE and the European Observatory on Health Systems and Policies on 22 and 23 November 2018.²⁰ This meeting brought together around fifty Belgian stakeholders involved in the fight against antimicrobial resistance from the human health, animal health and environment sectors (representatives of the competent Ministers - federal, regional and community - competent administrations, knowledge centres, academics and scientists) as well as a dozen or so international experts. This dialogue helped to develop a common understanding of the challenges related to AMR in Belgium.

²⁰https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/bel_amr_policy_dialogue_nov_2018_report_final_fr.pdf



Furthermore, a **Stakeholder dialogue** was organised on 22 November 2019 by the FPS HFCSE, in collaboration with FAMHP, FASFC, NIHDI and Sciensano.²¹ During this event, the draft National Action Plan was presented to nearly 200 people (representatives of professional, private and public organisations, as well as scientific associations in the fields of human health, animal health and the environment), who discussed and reflected together on the Belgian strategy to be deployed for the next five years (2020-2024) against antimicrobial resistance in humans, animals and the environment, and against infections associated with hospital care. The elements discussed on this day (and during subsequent contacts) have been taken into account in the finalisation of the draft plan.



²¹https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/20191112_programme_definitif_stakeholders_dialogue_fr.pdf

4. A vision shared by all stakeholders

Our vision is to **ensure continuity in the prevention and treatment of infectious diseases in humans and animals through:**

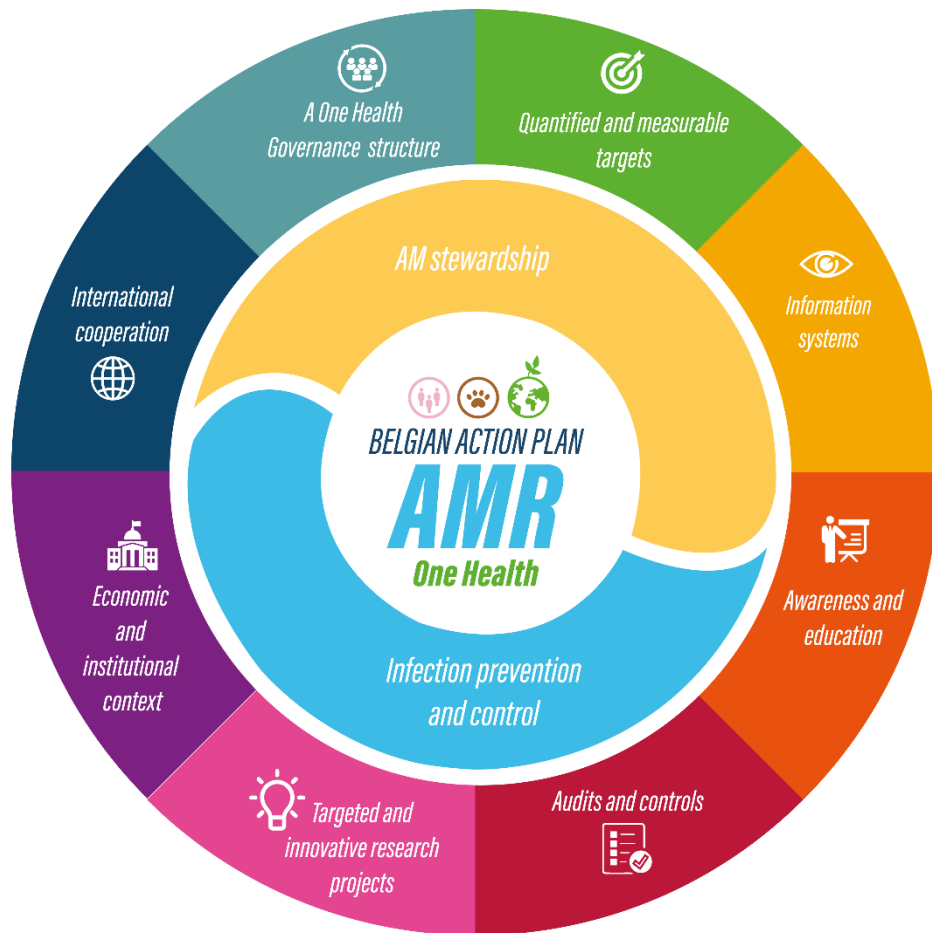
- (I) the availability and responsible use of effective, safe and accessible antimicrobial drugs and tools,**
- (II) the establishment of a broad network of partners capable of preventing, rapidly detecting and responding to the development and transmission of antimicrobial resistance in humans, animals and the environment through strong multisectoral cooperation and common ambitions,**
- (III) the use of the best available science, consideration of the source and not just the consequences of AMR.**

5. Ten strategic directions for combatting AMR

The Belgian policy on the fight against antimicrobial resistance is based on **10 strategic directions** which make up the chapters of this action plan. These directions are seen in the context of "One World One Health"; they apply to the different pillars of health (human health, animal health, plant health and the environment) and take into account the other sectors involved (the economy, education, trade and international cooperation, animal welfare, etc.) and the major trends (e.g. "consumer-stakeholder").

The definition of the strategic directions was based primarily on the results of the **Policy Dialogue**²², which identified four priority areas of consensus for Belgium, in addition to the need for an improved governance structure. Other strategic directions have been identified by the administrations/institutions involved on the basis of the various international action plans on the fight against AMR, the actions currently underway and discussions between the stakeholders involved, particularly within the inter-cabinet working group set up by the inter-ministerial conference on health.

²²https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/bel_amr_policy_dialogue_nov_2018_report_final_fr.pdf



These ten common strategic directions have each been broken down into **operational objectives** (76 in total) and **actions** (>230). These objectives and actions, which are either sectoral (linked to the human health, animal health or plant health and environment pillar) or common to different pillars, have been defined taking into account the good practices already in place, the recommendations addressed to our country (joint visit of the ECDC and the European Commission -DG Health- to Belgium, Policy Dialogue, KCE report, evaluation of the Memorandum of Understanding on MDROs²³, suggestions of the current BAPCOC and AMCRA working groups), and consultations with the different partners and stakeholders. The actions proposed by AMCRA for the years 2020-2024, which were previously discussed and approved by the steering group comprising the Authorities, have also been included. This list of actions, which constitutes the operational part of the plan (see Annex), may be supplemented by new actions in the light of future developments.

²³ <https://www.health.belgium.be/fr/rapport-devaluation-du-protocole-daccord-concernant-le-plan-national-multidrug-resistant-organismes>

I. Infection prevention and control

Develop and stimulate the introduction of preventive or curative measures that prevent or control infections and thus limit the use of antimicrobials

Poor practices, high densities and insufficient hygiene conditions (care environments, farms, food chain, pets, etc.) promote the transmission of micro-organisms between patients, humans and animals, humans/animals and the environment, some of which are resistant. Reducing antimicrobial consumption therefore also involves taking measures to prevent and control infections. A thorough understanding of the ecosystem and the microbiome is needed in order to act appropriately and address the health problem of antimicrobial resistance at its source. An integrated approach to welfare, including the health of humans, animals and ecosystems, is therefore necessary for combating zoonotic diseases and antimicrobial resistance.

The majority of the measures put in place to prevent hospital-acquired infections in **human medicine** will continue, **in an improved form**, including:

- develop or update and implement the recommendations on **good practice for the prevention and control of infections** (recommendations of the Superior Health Council²⁴), to strengthen the application of hygiene measures (particularly hand hygiene), sterilisation, cleaning and decontamination of the environment;
- continue and improve the implementation of the **infection prevention and control programmes in hospitals** (including national hand hygiene campaigns), in particular by adapting the set of quality indicators for hygiene in hospitals;
- consolidate the **programmes for the prevention and control of healthcare-associated infections in non-hospital practices**, nursing homes and other care facilities, for example by reviewing the role of the coordinating doctor, in consultation with all the authorities concerned;
- continue and support the missions of the **OST (Outbreak Support Team)**, a team composed of inspectors from the federated entities and scientific employees from Sciensano, set up to support healthcare establishments when they are faced with crisis situations related to MDROs, capitalise on the experience accumulated during the various interventions and produce an annual report on their actions (*Communities/Regions*);
- support and strengthen the operation of **infection control platforms**, which bring together, at local level, the various infection control teams from acute care, chronic and psychiatric hospitals, and stimulate the exchange of their respective experiences. The coordinating role of the federal platform, composed of representatives of the regional platforms, will also be supported;
- optimise **prevention and control programmes for healthcare-associated infections in hospitals**.

²⁴ <https://www.health.belgium.be/fr/avis-9277-mdro-0>



New actions are also planned:

- review the surveillance system for healthcare-related infections and antimicrobial resistance, including in long-term care facilities (Sciensano);
- support the development of **alternative treatments such as vaccines (FAMHP and Communities/Regions)**;
- strengthen **infection prevention and control programmes in non-hospital practices** (nursing homes and other care facilities) (*Communities/Regions*).
- Implement and monitor the **Hospital Outbreak Support Team (HOST) projects** aimed at strengthening infection risk management by harmonising hospital hygiene, infection prevention and control programmes and programmes to promote the proper use of anti-infective agents. These projects allow the development of a cross-cutting and cross-sectoral approach that makes hospital expertise available to residential communities and other stakeholders in the primary health care system, including outpatient care structures.

In veterinary medicine, guides for the proper use of antibacterial agents ("e-vademecum") provide concrete guidelines for the treatment of bacterial diseases for each animal species (available for food-producing animals -cattle, pigs and poultry- and for pets -dogs, cats and horses), **including the existence of preventive and alternative methods to the use of antimicrobials.**

Furthermore, there are specific actions to boost biosecurity, including the organisation in 2018 of the "Bioveiligheid Award" by the regional animal health association DGZ, which wants to encourage farmers who make efforts in the field of biosecurity.



New actions to stimulate infection prevention in the animal sector are also set out in this action plan, including:

- stimulate and implement **good animal husbandry practices** on farms, through the requirement for a farm health plan that includes biosecurity measures, infrastructure, management, hygiene, feeding programme, etc;
- encourage biosecurity measures and good husbandry practices (keeping animals healthy, infrastructure, hygiene, weaning strategies, feeding programmes, nutritional strategies, vaccination, etc.) through the **coaching of farmers** with improvable benchmark values ("red" farms). The application developed by the animal health organisations DGZ and ARSIA is a tool for assessing the health situation of a herd and establishing a health plan. (See coaching action in the "Prudent use" chapter);

//. Prudent use

Actions to improve the prudent use of antimicrobials to reduce the risk of resistance

Antimicrobial resistance is a consequence of natural selection and genetic mutation processes and can be transmitted to other microorganisms²⁵. The process of natural selection is exacerbated by human-induced factors such as the overuse of antimicrobials in human and veterinary medicine. The fight against antimicrobial resistance must therefore aim to reduce the consumption of antimicrobials in these two sectors and/or improve the use of these drugs (no unnecessary consumption, sufficient duration of therapy, type of antimicrobial adapted to the situation, etc.).

Most of the measures put in place to promote the prudent use of antimicrobials (and antibiotics in particular) in **human medicine** will continue, **in an improved form**, including:

- the publication of **validated recommendations** for the prescription of antibiotics for the different sectors/pathologies (outpatients, hospitals, dentistry, urinary tract infections, respiratory infections, etc.)²⁶, based on a global plan for the elaboration and updating of priority recommendations, via the establishment of structural, perennial cooperation with recognised partners (CBIP, federal EBP network, etc.) to improve the continuity, dissemination and implementation of these recommendations;
- supporting and funding **antibiotic therapy management groups** (AMGs) that have missions to ensure the appropriate use of anti-infective agents within hospitals. GGAs have been compulsory since 2007 in all Belgian acute care hospitals, and the optimisation of their operation through, among other things, an evaluation of practices, recommendations based on observations, the adequacy of the necessary resources and the development of validated indicators;
- sending **feedback to first-line prescribers** (outpatients), pending improvement of the system to provide faster and more appropriate feedback (based on indications and not just population);
- sending **feedback to hospitals**²⁷;
- improving the **availability of antimicrobials** (including "narrow spectrum", "old" or "innovative" antibiotics), via the FAMHP "Antibiotic Unavailability" working group, in consultation with the pharmaceutical industry;
- a change in the **reimbursement of certain antibiotics** (the reimbursement rate of antibiotics was changed in 2017²⁸ as well as the conditions for the reimbursement of quinolones, which are thus limited to specific pathological situations²⁹);

²⁵ <https://eur-lex.europa.eu/legal-content/FR/TXT/PDF/?uri=CELEX:52017DC0339&from=EN>

²⁶ <https://consultativebodies.health.belgium.be/en/advisory-and-consultative-bodies/commissions/BAPCOC>

²⁷ <https://www.healthstat.be/>

²⁸ <https://www.inami.fgov.be/fr/themes/cout-remboursement/par-mutualite/medicament-produits-sante/remboursement/specialites/adaptations/Pages/antibiotiques-20170501.aspx>

²⁹ <https://www.inami.fgov.be/fr/themes/cout-remboursement/par-mutualite/medicament-produits-sante/remboursement/specialites/adaptations/Pages/antibiotiques-fluoro-quinolones.aspx>



New actions to stimulate the prudent use of antimicrobials are also set out in this action plan, including:

- recognising the **specialities of clinical infectiologist and medical microbiologist**, and paying for their consulting services (*FPS/NIHDI*);
- measurements aimed at the **delivery of antimicrobial agents by unit or in more suitable packaging** by pharmacies open to the public, in order to minimise the risk of antibiotic overconsumption and self-medication (consumption of surplus) (*FAMHP/NIHDI*);
- specific actions to ensure that **essential antimicrobials are placed and kept on the market**, by specifically analysing the Belgian antimicrobial situation, and identifying incentives, in collaboration with the FPS Economy and NIHDI and also with a European approach to achieve this (*FAMHP*);
- supporting the development of **alternative treatments** such as **vaccines** and **phagothrapy**, currently being developed by the Belgian Royal Military Hospital and used in several Belgian hospitals (Belgium is a leading country in this field in Western Europe) (*FAMHP*).
- the creation of an **inventory of the Belgian situation regarding the conditions for the reimbursement of certain antibiotics**, particularly last resort antibiotics, followed by the **limitation of the status of delivery or reimbursement of these antibiotics**, by the FAMHP, in collaboration with NIHDI (*FAMHP/NIHDI*);
- the development of a **decision support module in the computerised medical record**, coupled with the therapeutic indication and linked to treatment recommendations (generic CDS tool + integration of therapeutic recommendations) (*NIHDI*).
- improving the **tools, methods** and frequency of **self-assessment**, which will enable **first-line prescribers** (outpatients) to adapt their practices, in relation to the patient's file and the recommendations for anti-infective treatment made available (*NIHDI*).
- expanding **epidemiological monitoring within the outpatient sector, monitoring and improving practices in non-hospital care facilities**, in consultation with all the relevant authorities (*Communities/Regions*);
- supporting the adoption of **prudent use measures in the front line (outpatient practice), in nursing homes and other care institutions**, where almost 90% of antibiotic use in human health is prescribed, with the consolidation of existing measures, for example in connection with the role of the coordinating doctor (*Communities/Regions*);

In veterinary medicine, most of the measures put in place to promote the prudent use of antibiotics will continue, or be expanded, including:

- updating and stimulating the implementation of the **guides for the correct use** of antibacterial agents ("**e-vademecum**"), which provide concrete guidelines for the treatment of bacterial diseases for each animal species (available for **food producing animals** -cattle, pigs and poultry- and for **pets** -dogs, cats and horses) and list the available antibacterial substances, divided into first, second and third choice groups (identified by the colours yellow/orange/red respectively), elaborated, published and disseminated by AMCRA³⁰ and used by the partners of the Antibiotic Convention, with the evaluation of the effective implementation of the guides and the boosting of the use of the e-vademecum;

³⁰ AMCRA: <https://www.amcra.be/fr>

- reducing the production and consumption of **compound feed and medicated feed containing antibiotics** for livestock through the taking of initiatives by the sector³¹ (electronic prescription, collection of prescription data and benchmarking of manufacturers in the same sector), with a focus on stopping the use of colistin in medicated feed in 2021;
- taking legislative measures concerning veterinary medicines to **restrict the use of certain critical antibiotics**; additional restrictions on the use of these 'critical' antibiotics will be proposed (conditions of use in pets) following the publication of the Royal Decree of 21 July 2016 drastically limiting the use of critical fluoroquinolones and third and fourth generation cephalosporins in food-producing animals via the obligation to carry out an antibiotic susceptibility test for these products;
- monitoring the presence of antimicrobial resistance in a **group treatment setting**;
- the continued **benchmarking of pig, fattening calf and poultry farmers**, who receive at least annual farm reports indicating their level of antibiotic consumption by type of antibiotic and in comparison with other similar farms (classification according to the colours green/orange/red), with an extension to other farms (dairy cattle in particular), and the creation of higher frequencies and added value (e.g. nearly real time reporting) for members of particular specifications;
- the continued **benchmarking of veterinarians** managing pig, fattening calf and poultry farms, who receive annual reports from AMCRA giving an overview of their practice in the use, prescription and supply of antibiotics in the farms they monitor, with classification into three groups (green/yellow/red for "low suppliers", "suppliers to watch" and "high suppliers" respectively), with an extension to **pet veterinarians** (cf new actions box);
- the publication of a **quarterly barometer**³² showing the evolution of total antibiotic use, the use of critical antibiotics (including colistin³³) and zinc oxide for the different animal species (pigs, fattening calves and poultry), expressed in number of tons, over three periods of one year, advancing by one quarter each time, thus allowing the close monitoring of consumption, and the development of a version 2.0;
- developing **complementary support tools**, such as "Altibiotique"³⁴ (a joint project by the animal health association ARSIA and the agricultural and veterinary world aimed at informing and training cattle breeders in good breeding practices related to bacterial resistance to antimicrobial substances and enabling breeders to take stock of their sanitary practices on their farms) and the BIGAME³⁵ interface (Computerised Database for the Management of Antibiotics and Medication in Livestock Farming), developed jointly by ARSIA and AWE, which offers an analysis of antibiotic consumption on farms and the production of herd management indicators).

³¹ Belgian Feed Association: https://bfa.be/BFA_Convenant_Medicated_Feed#b130

³² <https://www.amcra.be/fr/bovins/nieuwe-barometer-antibioticagebruik-sanitel-med/?lid=23815>

³³ Since the discovery of horizontally transferable resistance mechanisms, the "polymyxin" class of antibiotics has been re-evaluated by the World Health Organization (WHO) and is now considered a "high priority critically important class of antibiotics for public health". Colistin is the only antibiotic in this class that is used in animals.

³⁴ <https://www.amcra.be/fr/recent-nieuws/altibiotique-le-projet-de-larsia-rcolte-un-franc-succs/?lid=15618>

³⁵ <https://www.arsia.be/nos-services-a-lelevage/bigame/>



New actions to encourage the prudent use of antimicrobials in the animal sector are also set out in this action plan, including:

- the study and implementation of **specific measures targeting "large users/suppliers"**;
- **stronger legal measures** such as issuing quantities of antibiotics strictly limited to the duration of the treatment, reviewing veterinary guidance to ensure the proper use of **antibiotic stock** on farms, and strictly limiting the **preventive use** of antibiotics as imposed by a new European regulation;
- improving the **coaching of breeders and veterinarians** whose benchmarking values could be improved;
- improving prudent use in **pets** through the obligation to register the use of antibiotics in pets and then through the extension of benchmarking to pet veterinarians (see "Information systems" chapter);
- the development of an app for the off-line use of the e-vademecum.



The formulation of recommendations/conditions for the proper use of **diagnostic tools** (e.g. rapid diagnostic tests - RDT) to optimise the prescription of antimicrobials is also planned (*FPS/NIHDI*).

With respect to the presence of antimicrobials in the **environment**, this is a result of consumption at source, i.e. in the human and animal health sectors. The decrease in consumption within these sectors should therefore have a positive impact on the presence of antimicrobials and resistant bacteria in the environment. Nevertheless, this does not exclude certain environmental measures being taken to limit this presence and thus the risks of transmission to humans and animals in contact with the environment, particularly via bathing water for humans and the consumption of water and plants in the meadows for animals.

Different regional regulations, technologies and measures relating to waste management have an impact on these elements:

- the permit policy for **wastewater discharges**, including from healthcare facilities;
- **wastewater treatment** techniques in water treatment plants;
- the **system for collecting unused medicines**, including antimicrobials, and treating them via incineration to limit this route of entry into the environment;
- the management of **sewage sludge** from wastewater treatment facilities and human sewage sludge (septic tanks), prior to any prohibitions or conditions on its dispersal on land for agricultural purposes.



Each antimicrobial can induce resistance, but resistance development mechanisms can vary depending on the products, the microorganisms present and the surrounding environment. Moreover, residues of consumed antimicrobials are found in the environment. Therefore, one action

in this plan aims to **improve knowledge of the environmental profile of antimicrobial drugs** so that this can, in the long term, influence therapeutic choices, when possible (for equal effectiveness, the choice of antimicrobial could be made based on the product with the best environmental profile). Many products currently on the market have not been assessed for their environmental risk, even though this assessment has been part of the authorisation application files since 2006 for human medicines and since 2005 for veterinary medicines. Belgium will therefore support a request for information exchange between the authorities and the pharmaceutical companies at European level.

III. Monitoring/information systems

Establish effective and transparent surveillance for the close monitoring of antimicrobial use and the early detection of resistance to enable rapid and targeted responses

"Measuring is knowing". This is why antimicrobial use and antimicrobial resistance levels in microorganisms in the human and animal health sectors are measured regularly in Belgium.

Sciensano's Healthcare Associated Infections & Antibiotic Resistance Service³⁶ coordinates the surveillance of healthcare-associated infections and antibiotic resistance in hospitals, nursing homes and related care institutions. NIHDI, for its part, has the reimbursement figures for pharmacies.

The monitoring of antimicrobial (and antibiotic in particular) use and resistance levels in **human medicine** will continue, with the following improvements:

- **periodic epidemiological surveillance** (with the preparation of reports on infections, antimicrobial resistance - including the fungus *Aspergillus fumigatus* - and consumption of antimicrobial agents) **in the hospital sector**³⁷ and **for long-stay facilities** (nursing and care homes and psychiatric institutions and services)³⁸, with the improvement of reports (validation of methodologies, publication deadlines, etc.);
- monitoring of **MDRO-related crises** in care institutions (Communities/Regions);
- the **collection of data** related to antimicrobial use/prescription via pharmacy sales figures and usage data related to prescriptions of the antimicrobials used in human medicine.



New actions are also planned:

- review the **surveillance system for healthcare-related infections and antimicrobial resistance, including in long-term care facilities**, in collaboration with the federated entities (*Sciensano*);
- develop the **genetic analysis of MDROs** to assess whether resistance is caused by the spread of resistant strains or by the transfer of their resistance determinants between different strains and species (via the creation of a molecular database) (*Sciensano and NRC/NRL*);
- establish ***E. coli* indicator monitoring in humans**, to link general levels of resistance to what is found in animals and the environment (*Sciensano*);
- publish an **annual report** compiling information on antimicrobial use, healthcare-associated infections and resistance levels **in human health** (hospital care, outpatient care and long-stay facilities), based on key indicators (including indicators of bacterial resistance, both in the community and in hospitals: monitoring of *E. coli* resistance to third generation cephalosporins and fluoroquinolones and monitoring of *K. pneumoniae* resistance to carbapenems) (*FPS DGGS*).

³⁶ http://www.nsih.be/nsih/nsih_fr.asp

³⁷ http://www.nsih.be/nsih/nsih_fr.asp

³⁸ http://www.nsih.be/surv_ltcf/download_fr.asp

At the **veterinary** level, the data on the sale of antibacterial substances in Belgium, both for farm animals and pets, is monitored and the results are published annually in the BelVetSac report³⁹. In addition, the data on the prescription, administration and supply of antimicrobials by veterinarians for the fattening calf, pig, broiler and laying hen sectors are registered in the "SanitelMed" data collection system⁴⁰ (database managed by the Federal Agency for Medicines and Health Products - FAMHP), based on a legal obligation. The data on antibiotic use for each of these animal species can thus be isolated from this database⁴¹.

Most of the measures put in place to monitor the use of antimicrobials (and antibiotics in particular) and levels of resistance to them in **veterinary medicine** will continue, **in an improved form**, including:

- the **collection of data** relating to the use of antibiotics on farms **and the transmission of this data** to the central Sanitel-Med database, either directly or via the BEpork, Belplume, QFL/IKM and BVK specification managers, and the obligation to extend the collection of data to all food-producing animals (2026) and pets (2029) (dates laid down in European regulations);
- the **maintenance of the Sanitel-Med database**, which is necessary for the development of benchmarks for farmers and veterinarians and the publication of barometers relating to the use of antibiotics on farms, as well as its further development with a view to publishing farm reports online and extending the coding to other animal species;
- continued **monitoring of the resistance of germ-indicating (E. coli intestinal bacteria) and zoonotic (Salmonella and Campylobacter) micro-organisms in the food chain** (from food-producing animals - pigs, poultry and calves/bovines and their carcasses and meat), in accordance with European regulations, by the Federal Agency for the Safety of the Food Chain (FASFC)⁴² and Sciensano⁴³. In 2017, the FASFC also began the specific monitoring of **E.coli ESBL** ("extended-spectrum betalactamases", i.e. those with resistance to betalactam antibiotics) in raw milk. The zoonotic bacterium **MRSA** (Methicillin-resistant Staphylococcus aureus) is also monitored, via a three-year cycle (poultry, cattle, pigs) to determine the prevalence and diversity of MRSA strains isolated among production animals. Finally, the surveillance of **enterococci** in food-producing animals restarted in 2019;
- the **monitoring of the resistance** of isolated microorganisms from samples of clinically ill animals by the regional animal health associations, ARSIA and DGZ;
- the publication of an **annual report** compiling **the actions taken by all partners**, the results obtained in terms of sales of veterinary antibiotics and use as registered in Sanitel-Med, and the evolution of bacterial resistance to antibiotics in this sector⁴⁴.

³⁹ <http://www.belvetsac.ugent.be>

⁴⁰ <https://www.afmps.be/fr/SANITEL-MED>

⁴¹ The registration in Sanitel-Med of the use of antibiotics for beef and dairy cattle, small ruminants, horses, turkeys, rabbits and all other (domestic) animals is not compulsory at the moment.

⁴² <http://www.favv-afsca.fgov.be/productionanimale/antibioreistance/resultats/#intro>

⁴³ <https://www.sciensano.be/en/health-topics/antimicrobial-resistance-amr/role-0>

⁴⁴ <http://www.favv-afsca.fgov.be/professionnels/publications/thematiques/reportconvenantAB/>



Further actions to monitor the use of antimicrobials (and antibiotics in particular) and levels of resistance to them in **veterinary medicine** are also foreseen under this action plan, including:

- the creation of a system for collecting **data on antibiotic prescriptions for pets** via the obligation to encode these animals and the creation of an encoding system (*FAMHP*);
- extending the **collection of data** related to antibiotic use to **all food-producing animals** (*FAMHP*);
- **the addition of the therapeutic indication** in the data collection system;
- **expanding the monitoring of resistance**, particularly to pathogenic bacteria in food-producing animals and pets (see also One Health action below);
- **monitoring of fungal and viral resistance in animals** (*FASFC*).



The analysis of the genetic data of resistant microorganisms (WGS = Whole Genome Sequencing), complementary to the phenotypic data of resistance monitoring, is also planned in order to better understand how resistance is acquired, maintained and can be transferred and to study the phylogenetic links between animal and human strains.

At the **environmental** level, water monitoring is carried out by the Regions in Belgium, notably on the basis of European regulations. Note in this regard the publication in March 2019 of the "European Union Strategic Approach to Pharmaceuticals in the Environment"⁴⁵, several of whose work areas concern antimicrobial resistance, as well as a recent report by the European Environment Agency⁴⁶.

The monitoring of surface waters includes the antibiotics provided for by the EU-watchlist, as required by the European Water Framework Directive⁴⁷. One-off projects by the Regions supplement these samplings, in particular the AntiBIOBUG pilot project by the Walloon Region, which measures *E. coli* resistance in surface water downstream of farms and hospitals (Ourthe and Vesdre)⁴⁸.

The Regions also finance one-off projects for monitoring antimicrobial resistance in groundwater, including the IMHOTEP project by the Walloon Region, in which the Brussels-Capital Region is also participating⁴⁹.

In the Flemish Region, several studies have also been conducted or are ongoing, including a preliminary analysis of antimicrobial resistance in surface waters near intensive livestock production, conducted in collaboration with ILVO and whose results are available.

⁴⁵ <https://ec.europa.eu/transparency/regdoc/rep/1/2019/FR/COM-2019-128-F1-FR-MAIN-PART-1.PDF>

⁴⁶ <https://forum.eionet.europa.eu/nrc-eionet-freshwater/library/meeting-note-antimicrobial-resistance-and-urban-waste-water-treatment/antimicrobial-resistance-and-urban-waste-water-treatment-meeting-note>

⁴⁷ https://ec.europa.eu/environment/water/water-framework/index_en.html

⁴⁸ <http://environnement.sante.wallonie.be/files/Plan%20ENVieS.pdf>

⁴⁹ http://eau.wallonie.be/IMG/pdf/IMHOTEP_RF_180807.pdf



New environmental actions are planned:

- **fungal agent resistance monitoring in the environment** (*Sciensano*);
- **centralisation and consolidation of some environmental monitoring of antimicrobial residues and resistant bacteria in the environment** (surface water, groundwater and wastewater) to be able to monitor the state of the environment and collate this information with the resistance observed in human and animal health (*Regions*). In addition, the information collected will be shared with the water treatment organisations in order to strengthen techniques for purification and the removal of antimicrobial residues and resistant bacteria, where possible.



On the basis of the various data available in Belgium on the use of antimicrobials and the levels of resistance of micro-organisms within the human and animal health sectors, as well as the available water monitoring data, an **annual One Health report** on the Belgian consumption and resistance situation ("BELMAP" report) will be drawn up, in collaboration with the institutions that own this data and the public and private reference centres and laboratories. This report will also include an analysis of the association between consumption and resilience within and across sectors. Interactive dashboards, integrated in a single website and linked to ECDC and EFSA data, will also be created (*Sciensano*).

IV. Information and awareness-raising

Appropriate communication/awareness actions and the improved training of professionals so that everyone is a stakeholder in the fight against antimicrobial resistance, in their own field and according to their context.

While antibiotics are only available on prescription in Belgium, the erroneous beliefs of part of the general public can influence doctors' decisions regarding prescriptions. However, everyone, in their own field and according to their own context, can be part of the fight against antimicrobial resistance, provided they are sufficiently informed on the subject. A better knowledge of the correct use of antibiotics is therefore fundamental, as is a better understanding of the concept of resistance and of the link between human health, animal health (including via food) and the environment. The importance of hygiene measures, especially hand and food hygiene, must also be widely understood. The objective of this increase in knowledge is to bring about a change in the behaviour of health professionals and citizens regarding the use of antibiotics.

Numerous awareness-raising actions are already being carried out in our country, both among the general public⁵⁰ and in the medical⁵¹ and veterinary sectors⁵², as well as specific training for health professionals and certain students. These actions are supported both at the federal level and by the federated entities. Appropriate communication and awareness actions and the improved training of professionals are needed and planned as part of this action plan so that everyone can play an active role in the fight against antimicrobial resistance, in their own field and according to their context.

Some measures have already been put in place to raise awareness and educate people about the prudent use of antimicrobials in **human medicine**:

- the "**Hand hygiene**" campaigns, organised every two years since 2005 by the FPS Public Health, Safety of the Food Chain and Environment and the Federal Platform for Hospital Hygiene⁵³, which aim to promote hand hygiene in all care institutions in order to promote adherence to basic hygiene and precautionary measures and thus limit the number of hospital infections;
- the provision by BAPCOC of **awareness-raising material** (posters, leaflets, radio adverts, etc.) for general practitioners and the general public (colouring books, games, comics, etc.)⁵⁴;

⁵⁰ <https://www.usagecorrectantibiotiques.be/fr>

⁵¹ <https://www.health.belgium.be/fr/sante/prenez-soin-de-vous/influences-de-lenvironnement/hygiene-des-mains>

⁵² <https://www.amcra.be/fr/sensibilisation/>

⁵³ <https://www.vousetesendebonnesmains.be/fr>; www.health.belgium.be/fr/sante/prenez-soin-de-vous/influences-de-lenvironnement/hygiene-des-mains; http://www.nsih.be/surv_hh/inleiding_fr.asp

⁵⁴ <https://www.usagecorrectantibiotiques.be/fr/pour-les-enfants>

- the provision of training (**e-learning**) to support GPs in their effective communication skills and through the interactive use of a patient brochure during consultations (GRACE-Intro/TRACE)⁵⁵;
- the **website**⁵⁶ dedicated to raising awareness of the prudent use of antibiotics in human health;
- the development of **collaboration with professional associations and scientific societies** to support training and best practices for health professionals on the subject of AMS, AMR and CPI.



New awareness actions are also planned:

- the organisation of an **annual event** to communicate the results on antimicrobial use and resistance, healthcare-associated infections in the human sector (hospital sector, long stay facilities and outpatient care), based on key indicators;
- the organisation of **new awareness campaigns/tools**, rethinking key messages and target audiences, with an optimisation of the communication strategy (including the use of new media). These actions will aim to change behaviour in order to reduce antibiotic consumption, based on the priorities of the action plan, the results of the previous national campaigns and the various (inter)national actions carried out. The effectiveness of the communication actions will also be evaluated (*SPF*).

At the **veterinary** level, the measures put in place to raise awareness of the prudent use of antimicrobials will also continue, with the following improvements:

- **AMCRA, in collaboration with the FASFC, FAMHP and FPS HFCSE**, is continuing its efforts in terms of the awareness and information of the parties concerned, by developing and distributing brochures (including the brochure "*Antibiotics, it's not automatic!*") and posters, and taking part in trade fairs and conferences;
- **farmers' organisations** publish articles on the responsible use of antibiotics in professional journals for farmers and via social networks and help disseminate advice to farmers and veterinarians on vaccination for the different animal sectors;
- the **specifications** also organise information sessions for vets and breeders and distribute newsletters and articles in the specialist press;
- furthermore, there are **one-off actions** to boost biosecurity, including the organisation in 2018 of the "Bioveiligheid Award" by the regional animal health association DGZ, which wants to encourage farmers who make efforts in the field of biosecurity;
- the continued organisation of an **annual event** (with press conference) to communicate the results achieved in terms of sales of veterinary antibiotics and the evolution of bacterial resistance to antibiotics in this sector, with a focus on the One Health approach and the results/linkages in other sectors.

Training in the prudent use of antimicrobials is also provided:

- **AMCRA** organises training courses for veterinarians and breeders and presents training modules within the veterinary science curricula in Belgian universities (UGent and ULiège);

⁵⁵ https://www.health.belgium.be/sites/default/files/uploads/fields/fpshealth_theme_file/grace_intro.pdf

⁵⁶ <https://www.usagecorrectantibiotiques.be/fr>

- **farming organisations** provide training for farmers on the responsible use of antibiotics;
- several training courses have been organised for **veterinary organisations** on the theme of "responsible use of antibiotics", with a focus on preventive veterinary medicine and the application of correct biosecurity in all animal sectors;
- the **regional animal health associations** (ARSIA - DGZ) co-organise exchange events such as the VEE study day on the theme of social veterinary epidemiology, "How to bring about a change in behaviour in animal health management?";
- the **pharmaceutical industry** is raising awareness among its members and employees, including through the e-learning module "Correct use of antibiotics", which was also updated during 2018.



At the veterinary level, **new actions** will involve raising awareness, improving the accessibility of antimicrobial consumption results to veterinarians and farmers, and integrating One Health aspects into communication and training actions (*supporting AMCRA's expanded missions*).

In terms of environmental awareness, the Regions are conducting campaigns on pollution linked to medicines, including antimicrobials, for example through radio advertisements and video clips⁵⁷ inviting citizens to return their expired or unused medicines to pharmacies.



There will be a greater focus on making citizens, as well as farmers and veterinarians, aware of the benefits of returning unused products to the pharmacy (via the municipalities, pharmacies, doctors, etc.).



Communication within the spirit of "One Health" will take place (when it brings added value). Studies have shown that changing behaviour is not easy, especially since understanding the concept of resistance is particularly complex. It is therefore necessary to coordinate the key messages for each sector, whenever possible, so that each target audience receives the same message. This synergy will be possible thanks to the creation of a "One Health" working group that brings together communication stakeholders from the federal (FPS HFCSE, FASFC, NIHDI, FAMHP, Sciensano) and federated (Communities/Regions) authorities and other structures involved in the AMR (AMCRA, BAPCOC). Among other tasks, this working group will discuss with the experts the communication actions to be carried out for each sector, according to the priorities decided on by the other working groups (FPS).

⁵⁷ <https://youtu.be/D9El621jngo>



New actions linked to education are also planned:

- raise awareness in **primary and secondary schools** of basic hygiene measures and the correct use of antimicrobials, using modernised tools (*Communities/Regions*);
- encourage the integration of training on infection prevention and antimicrobial management, including the One Health approach, in **higher education** and for all fields of study related to human, animal and environmental health. There are plans to create a basic training module, with a One Health approach and references to the existing BAPCOC and AMCRA tools, and to raise awareness among higher education training institutes and professional advice boards. the creation of a label for universities that provide the module is also envisaged (*FPS*);
- encourage health professionals to follow targeted **continuous training** on the prevention of infections, antimicrobial resistance and their proper use, by integrating the One Health approach, for example by making suitable e-learning available, defining high accreditation points for the human health sector and veterinarians, introducing compulsory training for farmers with a guidance contract, promoting this theme among pharmacists, in collaboration with NIHDI, the veterinary association, agricultural organisations, professional associations and scientific societies.

V. Audits and inspections

Stricter audits and inspections to encourage the follow-up of antimicrobial resistance control measures

Numerous initiatives are being taken in the human medicine sector, at the local, regional and national levels, to control the consumption of antimicrobial agents and prevent and control healthcare-associated infections. The implementation of these projects and their financing also imply the need to evaluate their impact and the benefits of their continuation or adaptation. This is why actions will be set up to determine the good practices to be reinforced and proposed widely to health care institutions. There are also plans to develop projects to validate a certain amount of data already collected, so that the available resources can be directed towards improving the quality of care.



It is expected that practices related to antimicrobial prescribing and infection control in hospitals will be audited, through a multi-year programme of hospital audits and the development of a framework for validating the data reported to the health authorities, for example via inter-hospital audits (*FPS DGGS*).

Moreover, regular controls are carried out in the **veterinary sector** and in the Belgian **food chain**.

In 2018, the FASFC and the FAMHP carried out **general checks** on livestock farmers and veterinarians respectively, to verify compliance with the **modalities for encoding** antibiotic treatments in Sanitel-Med and **compliance with the conditional use of critical antibiotics** (Royal Decree of 21 July 2016). In addition, the FASFC and the FAMHP have worked together on specific actions. Moreover, the FASFC carries out inspections of operators throughout the food chain to monitor, among other things, animal health, **biosafety and hygiene**, three important aspects in the context of antibiotic use and resistance.

The presence of **antibiotic residues** in the food chain is also monitored by the FASFC⁵⁸ and is very rare, given the correct application of the standards on waiting times between the treatment of animals and their slaughter in Belgium. Furthermore, the use of antibiotics as growth promoters has been prohibited in the European Union since 1 January 2006. The direct input of antibiotics via foodstuffs, leading to the development of germ resistance in humans, is therefore negligible in our country.

⁵⁸ <http://www.afsca.be/activiteitenverslag/2018/monsternemingenanalyses/geneesmiddelen/>



New actions are also planned in the veterinary sector:

- continue and, if necessary, strengthen the official controls in the animal sector in order to detect irregularities, in particular in terms of antimicrobial consumption and encoding;
- strengthen the controls on compliance with weaning procedures and animal welfare obligations in accordance with current European and regional legislation;
- monitor the implementation of measures to increase and improve biosecurity on farms.



The strengthening of the control and supervision of **illegal online sales** (e-commerce), specifically for antimicrobial medicines, through an analysis of the problem, cooperation with the parties involved (post, customs, etc.) and an inventory of high-risk websites are also planned (*FAMHP*).

VI. Innovative, targeted research

Targeted, innovative research projects to improve the effectiveness of control measures and the understanding of known sources of transmission of resistant micro-organisms between humans, the environment, the food chain and animal populations

Many Belgian scientists are involved in Belgian or European/international research on the fight against antimicrobial resistance. Furthermore, various research projects are being financed by federal (FPS contractual research, Sciensano, Belspo, etc.), regional and community public institutions on this subject. While maintaining the autonomy of each party in the participation and definition of its research projects, one of the objectives of this plan is to better coordinate research activities in this field in order to optimise their consistency with the identified needs, in an increasingly restricted budgetary context.

As examples, here are some projects already financed and in progress at the Belgian level:

- rapid determination of antimicrobial resistance using MBT-ASTRA in bacterial lung and udder pathogens in cattle (FPS (contract research));
- emergence or decline of classical lactamases (BLAC), cephalosporinases (BLAAmpC), extended-spectrum lactamases (BLAESBL) and carbapenemases (BLACPE) among bovine coliform enterobacteriaceae: identification of coding genes and neutralisation by antibodies (FPS (contract research));
- antibiotic residues, antibiotic resistant bacteria and antibiotic resistant genes in manure, soil and plants and potential human exposure (FPS (contract research));
- research into the causes of the high prevalence of fluoroquinolone resistance in broilers (SPF (contract research));
- Sciensano research on improving the monitoring of antibiotic consumption for the inclusion of the therapeutic indication (AM-DIA, 2019-2022), and on the implementation of long-read sequencing in microbiological monitoring (Ylieff project);
- a study is planned on the impact of the use of biocidal active substances (antimicrobials) on the development of resistance in micro-organisms (DG Environment).



New One Health actions are also planned:

- identify, among representatives of the human health, animal health and environment sectors, the priority research needs related to the fight against AMR for Belgium, in a One World One Health approach (see X- governance chapter). For example, the impact of medical and breeding practices, phage therapy, the identification of resistance gene transfer to soil micro-

organisms, the analysis of resistance reservoirs, and the viability of resistance-carrying organisms are all potential avenues for investigation;

- defend the priority research needs within Belgian and international research programmes (BELSPO, Horizon Europe, Health Programme, SRSS, LIFE, Digital Europe, etc.), and national (KCE, CSS) or international (e.g. OECD) authorities;
- encourage collaboration between Belgian research institutions active in the AMR sector (in particular via the Belgian One Health Network⁵⁹);
- fund national research projects (e.g. Sciensano, FPS contract research) and/or participate in European/international research projects to fill the knowledge gaps on AMR and ensure the effective implementation of policies for addressing AMR, in line with the One Health approach.



At the environmental level, the characterisation of the Belgian situation in terms of resistance to antifungal agents in order to encourage the rational use of antifungal drugs and their release into the environment is planned from 2020 to 2023 (*Sciensano*).

⁵⁹ <https://www.biodiversity.be/4813/>

VII. Economic and institutional context

Develop an economic and institutional environment conducive to investment and the development of products and tools to combat antimicrobial resistance

The availability on the Belgian market of antimicrobial products and tools to combat antimicrobial resistance may be influenced by our country's economic and institutional context. Certain actions, at the Belgian or European/international level, can promote the availability of these products and tools, which are sometimes essential in the fight against AMR.



There are plans to identify and promote appropriate economic models to support the development of 'new' antimicrobial agents and ensure the availability of 'old' antibiotics, by initiating and actively participating in discussions at European level, analysing existing economic models, pricing systems, possible incentives, and options for the registration and reimbursement of antibiotics in other European countries (*FAMHP*).



At the veterinary level, there are plans to identify economic incentives for reducing the consumption of antibiotics in the animal sector by taking structural actions enabling farmers to invest in measures to improve prevention in animal health (promoting vaccines, biosecurity, etc.), modify taxation on the use of antibiotics, ensure better prices for animal products, in particular differentiated channels based on the reduction of antibiotic use, etc., in collaboration with the relevant federal and regional administrations and the stakeholders (including retailers and food processors).



At the environmental level, there are plans to better integrate environmental aspects into the Belgian and European institutional context, by supporting the environmental risk assessment of veterinary medicinal products at EU level and improving the level of environmental expertise of the Belgian and European committees and networks involved in the environmental risk assessment of medicinal products.

VIII. International cooperation

International cooperation to actively contribute to the achievement of international AMR goals

Neither antimicrobial resistance (AMR) nor the excessive use of antibiotics is an exclusively Belgian phenomenon. Some other European and non-European countries also have very high consumption levels. Through these countries, we can see how new and dangerous multi-resistant bacteria are spreading throughout the world. A well-known example is the "New Delhi metallo-beta-lactamase-producing carbapenem-resistant Enterobacteriaceae", now widespread throughout the world, but whose first cases were linked to hospitalisations in India and the Balkans⁶⁰.

This is why a global approach is essential. This issue has therefore been placed high on the political agenda in recent years by international institutions with a mandate for (animal) health, such as the World Health Organization (WHO), the Food and Agriculture Organization (FAO), the European Union and the OECD. For example, in 2016, under the Dutch presidency, the EU ministers responsible for public health and agriculture adopted the Council's conclusions "on the next steps in the fight against antimicrobial resistance"⁶¹. In these Council conclusions, the competent ministers committed to jointly drawing up One Health AMR action plans by mid-2017.

However, progress remains limited. A recent report by the European Court of Auditors (November 2019), for example, is critical of the meagre results achieved by the EU in recent years⁶². The World Bank has also concluded that huge amounts of money are being allocated globally for financial support to agriculture, but relatively little progress is being made, and that more attention needs to be paid to how actions can be integrated with existing activities. This also applies to the fight against AMR. That is why Belgium's first priority is to ensure that it can present itself to the world as a country that is achieving results and also approaches the fight against AMR at global level with the necessary ambition, and to ensure that the focus does not wane in the years to come.

There are also aspects of the AMR issue that can almost only be addressed at the European and/or international level. For example, the challenge of drug shortages, with the corollary of stock-outs/unavailability of first-line antibiotics. Another example is the European Commission's proposal to impose, through free trade agreements for foodstuffs, the same conditions on Europe's trading partners regarding the consumption of antibiotics as the regulatory conditions in the EU. Belgium wants to help ensure that international solutions are found for these drug shortages and that food trade with our partner countries is conducted under fair conditions.

⁶⁰ <https://www.ecdc.europa.eu/sites/default/files/documents/04-Jun-2019-RRA-Carbapenems%2C%20Enterobacteriaceae-Italy.pdf>

⁶¹ <https://www.consilium.europa.eu/en/press/press-releases/2016/06/17/epsco-conclusions-antimicrobial-resistance/#>

⁶² <https://www.eca.europa.eu/en/Pages/DocItem.aspx?did={8892C8C4-6776-4B27-BE36-C181456EED71}>



At the international level, it is expected that:

- Belgium will emerge as a reliable international partner that fulfils its part of the commitments it has entered into and ensures that others also fulfil their commitments. If necessary, we will advocate for an increase in the international level of ambition if results are not forthcoming in the fight against AMR. We would also like to advocate the application of the One World One Health approach in this area, and therefore the mobilisation of all the relevant channels and bodies. To this end, regular consultations are held between the competent political authorities and administrations on the points of view defended by Belgium in the field of AMR within the relevant institutions (European Union, including the formal group of CVOs set up within the European Council, WHO, FAO, OIE, IPPC, OECD, etc.).
- Belgium is also involved in various European and other international partnerships that can support Belgium's One Health AMR policy.
- Belgium will also participate in monitoring the international spread of multi-resistant germs through various international fora such as the EU Health Security Committee, and will recommend actions to prevent this spread as far as possible.

IX. Target objectives

Establish quantified and measurable targets for reducing antimicrobial use

Targets and indicators can support action, but they must be used with care to ensure that they measure the right things and encourage the right behaviours. Targets should be realistic, but also motivate stakeholders to be as ambitious as possible in monitoring AMR, without inadvertently giving them the opportunity to be complacent.

The **veterinary sector** has been working for several years on the basis of quantified objectives linked to the reduction of antibiotic consumption. This experience has proved positive, in particular because it unites all the stakeholders around common objectives and facilitates communication on the results obtained (a communication event is held annually on the basis of these objectives).

The three objectives contained in the AMCRA 2020 strategic plan and incorporated in the Antibiotic Convention for the veterinary sector were:

- a 50% reduction in antibiotic consumption by 2020;
- a 75% reduction in the most critical antibiotics by 2020; and
- a 50% reduction in antibiotic-containing premixes by 2017.

Two of these three objectives were achieved⁶³:

- a **77.7% decrease in the use of critical antibiotics** in food-producing animals was observed compared to 2011;
- in 2019, a **total reduction of 71.1% in the use of medicated feeds containing antibiotics** could be observed between 2011 and 2019.

And one goal is well underway:

- compared to 2011 (base year), a **cumulative decrease of 40% in total use** was registered in 2019.



New quantified targets have been set for the period 2020-2024 **in the animal sector**:

- a maximum consumption of 60 mg of antibiotics/PCU in 2024, which corresponds to a 65% decrease in antibiotic consumption compared to 2011;
- a maximum consumption of 1 mg colistin/kg in 2024, which corresponds to a 36% decrease compared to 2018;
- target a maximum of 1% of users in alarm zones for each animal category by the end of 2024;
- reduce the use of medicated feed containing antibiotics by 75%;
- maintain the already achieved 75% reduction in the use of critical antibiotics.

⁶³ <https://www.amcra.be/fr/vision-2020/>

BAPCO's 2014-2019 policy note also included the following indicators and target values for the **human health sector**:

- For hospitals (for 2019):
 - choice of therapeutic antibiotics according to local guidelines in at least 90% of cases;
 - indication of antibiotic therapy in the medical record in at least 90% of cases;
 - choice of surgical prophylactic antibiotic treatment according to local guidelines in at least 90% of cases;
 - duration of surgical prophylactic antibiotic treatment according to local guidelines in at least 90% of cases.
- For outpatient practice:
 - a decrease in the total consumption of antibiotics from more than 800 prescriptions per 1,000 inhabitants per year in 2014 to 600 prescriptions in 2020 and 400 prescriptions in 2025;
 - a decrease in the consumption of quinolones from approximately 10% of total antibiotic consumption in 2014 to 5% in 2018; and
 - an increase in the ratio of amoxicillin versus amoxicillin-clavulanic acid from approximately 50/50 in 2014 to 80/20 in 2018.

Positive but excessively slow progress has been observed for the first objective, while the other two objectives have not been achieved⁶⁴. Based on the experience with these indicators and inspired by the veterinary sector, the human health sector has developed new quantitative targets and will regularly monitor them.



The NAP-AMR allows for the use of the structural measures that are most likely to achieve **new quantified targets** in the **human health sector**. These are or will be defined at national level for the period 2020-2024:

- Indicators of antibiotic consumption in **outpatient medicine**, based on historical indicators already being monitored:
 1. a gradual reduction in total AB consumption of 5 to 10% per year to reach an overall reduction of 40% compared with 2019;
 2. a decrease in the consumption of quinolones to a maximum of 5% of total antibiotic consumption by 2024; and
 3. a continued improvement in the quality of prescribing (decrease in the prescribing of broad-spectrum antibiotics out of total antibiotics; increase in the ratio of amoxicillin to amoxicillin/clavulanic acid from 51/49 in 2019 to a target ratio of 80/20).
- Indicators of antibiotic consumption in **hospitals**:
 4. a gradual decrease in total antibiotic consumption, to be monitored in the light of the national and international epidemiological context;

⁶⁴ Performance report 2019 (annex): https://www.healthybelgium.be/metadata/hspa/qa3_qa4_qa5.pdf

5. a decrease in broad-spectrum antibiotic consumption as a proportion of total antibiotic consumption and a 5% increase in the prescription of narrow-spectrum antibiotics (based on the WHO AWaRe classification).
- Indicators related to the **prevention and control of healthcare-associated infections**:
6. an overall reduction in severe healthcare-associated infections (catheter-related septicemia);
 7. an improvement in the rate of hand hygiene compliance to 75%;
 8. a structural indicator linked to federal and hospital investment in this area.

X. One Health governance versus AMR

New governance structure ensuring collaboration and effective cooperation between the human health, animal health and environment sectors, and ensuring the effective involvement of the relevant public authorities

New governance is needed to structure the collaboration between all the Belgian partners involved in the fight against antimicrobial resistance and allow the implementation of the One Health approach through the integration of the four nuances of health (human health, animal health, plant health and environmental health). This need is reflected in the reports of the joint ECDC and European Commission (DG Health) visit to Belgium, the Policy Dialogue, the KCE "Proposals for a more effective antibiotic policy in Belgium" report⁶⁵, the evaluation of the MDRO MoU, and some current BAPCOC working groups.

This governance must emphasise the involvement of the public authorities (both federal and federated entities⁶⁶) in the management of this issue and build on existing structures and initiatives, the main ones being BAPCOC, AMCRA, the MDRO Technical Committee, the Outbreak Support Team, the Management Committee of the Antibiotic Convention in Veterinary Medicine, and the Network of Reference Centres.

The basic principle is that each stakeholder plays a role and takes its share of responsibility:

- the **political and administrative** worlds are implementing 'their' National Action Plan (NAP) actions. The NAP implementation is monitored together at a high level;
- the involvement of the **existing entities** and the (civil society/private) **stakeholders** in the elaboration of the action plan in order to work together towards common goals through active participation in stakeholder dialogue and public consultation on the draft plan;
- the **scientific** community assesses the overall situation of AMR in Belgium in a comprehensive, independent and objective manner;
- mixed **working groups** (experts, academics, sectors) coordinate the implementation of specific NAP actions.

To this end, the Belgian One Health governance in the fight against AMR will be made up of the following entities:

1. a **governance platform** for the intersectoral coordination of AMR policy, composed of high-level representatives of all the Belgian public entities involved in the fight against AMR, which coordinates and ensures the application and implementation of the Belgian strategy to fight antimicrobial resistance by the different Belgian stakeholders involved, within a One Health

⁶⁵ https://kce.fgov.be/sites/default/files/atoms/files/KCE_311B_Antibiotique_Politique_synthese_0.pdf

⁶⁶ FPS HFCSE, NIHDI, FAMHP, FASFC, Sciensano 2.0, AVIQ, Common Community Commission of Brussels Capital, Agentschap Zorg en Gezondheid, German-speaking Community DGOV, Vlaamse Milieumaatschappij, SPW, Environnement Bruxelles

approach. This platform, coordinated by the Federal Health Administration, is assisted in its tasks by three steering groups for sectoral activities (human health, animal health and environmental health, respectively) and a steering group for transversal activities, which ensure the necessary interactions with the existing structures and other administrations involved in the fight against AMR (including AMCRA and the management committee of the antibiotic convention in the animal sector, the TC-MDRO, the OST, the NAC, the FAMHP 'Antibiotic Unavailability' working group, the MTAB and the RAG/RMG in the human health sector). One of the missions of the transversal steering group will be to ensure the early detection of signs of a new emergence of antimicrobial resistance, within a One Health spirit.

2. an **independent scientific council**, composed of independent scientific experts appointed in a personal capacity for the duration of the Action Plan, recognised for their expertise in the fight against antimicrobial resistance (human health, animal health/food safety and environmental health), which assesses at least annually the epidemiological situation of AMR in Belgium, based on existing scientific reports, and recommends priority research activities related to the fight against AMR for Belgium. Observers from Sciensano, the SHC, and the Scientific Committee of the FASFC will be invited to these meetings.
3. **working groups**, which coordinate the implementation of certain actions of the National Action Plan, on the basis of a mandate, and are composed of experts from the academic world, administrations, federations, research centres and the private sector, depending on the mandate.
4. a **support team**, established within the Federal Health Administration to reinforce the current support team of the human pillar, to provide administrative, logistical and scientific support to the governance platform and its steering groups, and create and coordinate a network of the secretaries of the working groups and the independent scientific council with a view to ensuring information flow, and the adequate and regular sharing and storage of information to achieve the missions of the Belgian One Health governance for AMR.

This new governance will allow a more efficient implementation of the Belgian antimicrobial policy thanks to structured collaboration with the different Belgian public and private stakeholders, the stronger involvement of high-level representatives of all the Belgian public entities involved, and the setting up of transversal structures allowing the implementation of joint intersectoral actions, within a One Health approach. This new governance, some aspects of which will have to be regulated, will also ensure that the experts involved are compensated for their costs.

Within this new governance, each partner is responsible for the actions for which they are competent, making available the required human and budgetary resources, and ensures they are involved in the common actions (which may be funded with shared budgets), bringing an added "One Health" value.

Close monitoring of actions and evaluation of the plan

An annual evaluation of the implementation of the national action plan is planned to maintain a sense of urgency among all the stakeholders in the fight against AMR, monitor the implementation of the plan's actions and identify possible problems or risks. This evaluation will be one of the tasks of the governance platform, in addition to its dissemination, particularly to stakeholders.

This evaluation will be disseminated via the website www.resistanceantimicrobiens.be or www.antimicrobieleresistentie.be.

Conclusion

Thanks to the commitment of all the partners, Belgium for the first time has a national **One Health** action plan for the fight against antimicrobial resistance, containing the actions of the different Belgian stakeholders in the pillars of human health, animal health and environmental health.

This plan, which covers the years 2020 to 2024, is structured around ten strategic directions common to all three pillars, the two most important of which are infection prevention and the prudent use of antimicrobials. The plan will be implemented through the application of 76 operational objectives, each operationalised via one or more actions that are either sectoral (related to a specific pillar) or common to different pillars. This plan is intended to be dynamic, with new actions to be added over the next four years.

One of the strategic directions of this plan is the establishment of a One Health governance structure that will bring together the institutional stakeholders active in the pillars of human health, animal health and environmental health, and organise links with existing structures engaged in the fight against AMR. This governance is seen as an essential element of success by promoting a global approach centred on a common vision, communication and cooperation between stakeholders, and monitoring and guiding the results of actions.

The large number of objectives and actions proposed in this plan reflects, on the one hand, the ambition and commitment of the various players to this health challenge and, on the other hand, the complexity of the problem, which must be tackled through different axes in each of the sectors. But let us be clear that the implementation of this plan will require additional human and budgetary resources, as well as strong support from the political world.

Useful links

Useful links in the human sector

BAPCOC: <https://consultativebodies.health.belgium.be/en/advisory-and-consultative-bodies/commissions/BAPCOC>

Sciensano: <https://www.sciensano.be/en/health-topics/antimicrobial-resistance-amr/role-0>

NIHDI: <https://www.inami.fgov.be/fr/Pages/default.aspx>

FAMHP: https://www.famhp.be/en/info_patients/Antibiotics

Superior Health Council (SHC): <https://www.health.belgium.be/en/superior-health-council>

SHC recommendations for the prevention, control and management of patients with multidrug-resistant antibiotics (MDRO) in healthcare facilities: <https://www.health.belgium.be/fr/avis-9277-mdro-0>

Page on the correct use of antibiotics in human health: <https://www.usagecorrectantibiotiques.be/fr>

Useful links for the veterinary sector

FAMHP:

https://www.fagg-afmps.be/nl/DIERGENEESKUNDIG_gebruik/geneesmiddelen/geneesmiddelen/goed_gebruik/Antibiotica_Resistentieproblematiek

FASFC: <http://www.favv-afsca.fgov.be/productionanimale/antibioresistance/>

AMCRA: <https://www.amcra.be/fr/home/>

Sciensano: <https://www.sciensano.be/en/health-topics/antimicrobial-resistance-amr/role-0>

Report on 'Activities and achievements in reducing antibiotic use and antibiotic resistance in animals in Belgium in 2018': <https://www.amcra.be/fr/home/>

BelVet-SAC report: <https://www.amcra.be/fr/home/>

ANNEX: operational plan

The ten common strategic directions have been broken down into **operational objectives** and **actions**. These operational objectives and actions form the operational part of the plan. This operational plan is drafted in the form of a table, which details, for each action:

- the strategic direction to which the action is linked,
- the operational objective to which the action relates,
- the description of the action,
- the scope of the action (H: human health, A: animal health, E: environmental health),
- the entity responsible for the action,
- other participating entities,
- the expected timing of the action,
- (possibly) the prerequisite(s) for carrying out the action,
- the objective of the action,
- the indicator(s) of the action,
- the method of monitoring this/these indicator(s).