European
Commission

# Action Plan Against the rising threats from Antimicrobial Resistance: **Road Map**

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# A. Appropriate use of antimicrobials

**Action n° 1:**

**Strengthen the promotion of the appropriate use of antimicrobials in human medicines in all Member States.**

| Operational objectives | Concrete activities | Milestones/Deadline |
|---|---|---|
| Support the implementation of the provisions of the Council Recommendation 2002/77/EC on the prudent use of antimicrobial agents in human medicine[1] in Member States, notably regarding:<br>• Prescription only requirements<br>• Nursing homes and long term care facilities<br>• Education and training programmes | Launch of the 2012-2014 preparatory action on Antimicrobial Resistance (grant from European Parliament) addressing Antimicrobial Resistance and causes of Non-prudent use of Antibiotics (ARNA)[2] project<br>• Misuse of antimicrobial agents in human medicine<br>• Awareness across the whole chain of stakeholders: prescribers, pharmacists and patients.<br>• Sales of antimicrobial agents without a prescription | Final conference June 2016<br>Draft final report delivered<br>Publication of final report expected mid-2017 |
| | Consultation with MS on the implementation of Council Recommendation 2002/77/EC | Report published mid-2016[3] |
| | Through the Antibiotic Prescribing and Resistance in European Children (ARPEC)[4] project 2010-2013 funded under Health Programme:<br>development of web-based training providing educational modules on optimal antibiotic prescribing in children and antimicrobial resistance | Project completed mid-2014[5] |

[1] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2002:034:TOC
[2] https://www.nivel.nl/en/arna
[3] http://ec.europa.eu/dgs/health_food-safety/amr/docs/amr_projects_3rd-report-councilrecprudent.pdf
[4] http://www.arpec.sgul.ac.uk/
[5] http://www.arpec.sgul.ac.uk/

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|---|---|---|
| Stimulate the appropriate use of antimicrobials in human medicines | Development of EU Guidelines on Prudent Use of Antimicrobials in Human Medicine<br><br>Workshop “Best use of medicines legislation to bring new antibiotics to patients and combat the resistance problem”, organised by EMA (8 November 2013, London)<br><br>Ongoing activities on the modernisation of SmPC of "old antibiotics" and harmonisation of the product information across EU - referrals article 30/31 of Directive 2001/83/EC through scientific evaluation that is performed by EMA CHMP and with input from EC funded projects AIDA[6] and MagicBullet[7] | Public Consultation of draft guidelines completed by ECDC 5 September 2016<br><br>Draft Guidelines reviewed by EU health security committee 10 November 2016<br><br>Workshop conclusions published (December 2013)[8] |
| Research on improving the appropriate use of antimicrobials | The project "Genomics to combat Resistance against Antibiotics in Community acquired low respiratory tract infections in Europe" (GRACE)[9] funded under the EU Framework Programme for Research demonstrated that antibiotics should not be generally prescribed to patients with uncomplicated lower respiratory tract infections (non-pneumonic infections). | Publication in The Lancet Infectious Diseases (February 2013)[10] |
| | The EU Framework Programme for Research funded project 'The appropriateness of prescribing antibiotics in primary health care in Europe with respect to antibiotics resistance" (APRES)[11] assesses the appropriateness of prescribing antibiotics in primary care in 9 European countries. | Book published in 2015[12]<br>Articles published in BMC Family Practice (2014)[13] and PLoS One (2015)[14] |

[6] http://www.aida-project.eu/
[7] http://cordis.europa.eu/result/rcn/140198_en.html
[8] http://www.ema.europa.eu/docs/en_GB/document_library/Report/2013/12/WC500158230.pdf
[9] http://www.2020-horizon.com/GRACE-Genomics-to-combat-resistance-against-antibiotics-in-community-acquired-LRTI-in-Europe(GRACE)-s28368.html
[10] https://www.ncbi.nlm.nih.gov/pubmed/23265995
[11] https://www.nivel.nl/en/apres
[12] http://www.nivel.nl/en/node/2430?database=ChoicePublicat&priref=1002669
[13] http://www.nivel.nl/en/node/2430?database=ChoicePublicat&priref=4959
[14] http://www.nivel.nl/en/node/2430?database=ChoicePublicat&priref=5653

| **Action n° 2:**<br>**Strengthen the regulatory framework on veterinary medicines and on medicated feed.** | | |
|---|---|---|
| **Operational objectives** | **Concrete activities** | **Milestones / Deadline** |
| To address Antimicrobial Resistance related to the use of veterinary medicinal products | Revision of the Veterinary Medicines Legislation[15] | Veterinary Medicines legislation:<br>Commission proposal adopted in 2014 and sent to the EP and the Council. Negotiations between the institutions should take place at least until mid-2017. |
| To address Antimicrobial Resistance related to the use of medicated feed | Revision of the Medicated Feed Legislation[16] Set harmonised limits for residues for veterinary medicines in non-target animal feed related to the production of medicated feed, ban the preventive use of antibiotics via medicated feed and tighten the rules to prescribe and use medicated feed with antimicrobials. | Medicated Feed legislation:<br>Commission proposal adopted in 2014 and sent to the EP and the Council.<br>Negotiations between the institutions should take place at least until mid-2017. |
| To verify on-the-spot that Member States meet all of their obligations with respect to the existing and revised regulatory framework on veterinary medicines and medicated feedstuffs. | In relation to the distribution and use of antimicrobial veterinary medicinal products (including medicated premixes for animal feeding stuffs), DG SANTE Directorate F shall send a questionnaire on this issue to all Member States in the second half of 2015 and, carry out a series of fact-finding missions in selected Member States in 2016. This DG SANTE Directorate F project will generate an overview report. | All Member States, Iceland, Norway, Switzerland and stakeholders (Advisory Group on the Food Chain and Animal and Plant Health members and FVE member organisations) received the questionnaire in August 2015. Nine fact-finding missions in Member States to be completed during 2016; with an interim overview report to be drafted by the first quarter of 2017 and published. It has been decided to extend the project and a further seven fact-finding missions are planned for 2017 with a final overview report to be prepared during 2018 and published. Available mission reports are published on the DG SANTE website.[17] |

[15] http://ec.europa.eu/health/veterinary-use/rev_frame_index_en.htm
[16] http://ec.europa.eu/food/safety/animal-feed/medicated-feed/index_en.htm
[17] http://ec.europa.eu/food/audits-analysis/audit_reports/index.cfm

| **Action n° 3:**<br>**Introduce recommendations for prudent use in veterinary medicine, including follow-up reports.** | | |
|---|---|---|
| **Operational objectives** | **Concrete activities** | **Milestones / Deadline** |
| Use existing legal tools to the utmost to ensure prudent use of antimicrobials in the veterinary sector | Commission decision on referral in relation to 3rd and 4th generation cephalosporins | Adopted on 13 January 2012[18] |
| | Scientific recommendations of the EMA Antimicrobial Advice Ad Hoc Expert Group (AMEG) endorsed by the Committee for Medicinal Products for Veterinary Use (CVMP) and the Committee for Medicinal Products for Human Use (CHMP) on the need for further referrals of critically important antimicrobials that are already authorised for use in veterinary medicine and are considered as critically important for humans | Published July 2013[19] |
| | To initiate referrals on veterinary medicinal products taking into account the updated priority list for referrals as established by European Medicines Agency (EMA) | Referral on products containing colistin as a sole active substance of oral administration in food producing animals was initiated in 2014. The CVMP final opinion resulted in a Decision by the European Commission on 16 March 2015.[20]<br><br>Referral on all veterinary medicinal products containing colistin in combination with other antimicrobial substances for oral administration was initiated in May 2015. The CVMP final opinion resulted in a Decision by the European Commission on 14 July 2016.[21] |
| | CVMP-reflection paper of November 2011 on the use of macrolides, lincosamides and streptogramins | Published in June 2013[22] |
| | Request to EFSA for a Scientific Opinion on the Risk for the development of Antimicrobial Resistance (AMR) due to feeding of calves with milk containing residues of antibiotics[23] | EFSA scientific opinion expected to be completed in December 2016 and published in January 2017 |

[18] C(2012)182
http://ec.europa.eu/health/documents/community-register/2012/20120113113370/dec_113370_en.pdf
[19] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_000639.jsp&
[20] Official Journal of the European Union, C 148, 5.5.2015
http://ec.europa.eu/health/documents/community-register/2015/20150316130649/dec_130649_en.pdf
http://ec.europa.eu/health/documents/community-register/2015/20150316130649/anx_130649_en.pdf
[21] Official Journal of the European Union, C 312, 26.8.2016,
http://ec.europa.eu/health/documents/community-register/2016/20160714135332/dec_135332_en.pdf
http://ec.europa.eu/health/documents/community-register/2016/20160714135332/anx_135332_en.pdf
[22] http://www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2011/11/WC500118230.pdf
[23] http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2015-00611

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| To have scientific recommendations on the use in the veterinary sector of last resort antimicrobials for humans (e.g. tigecycline and colistin) | Request for scientific advice (based on Article 57 of Regulation 726/2004) of Agency Committee for Medicinal Products for Veterinary Use (CVMP) and the Committee for Medicinal Products for Human Use (CHMP) on the use of last resort antimicrobials in the veterinary sector.[24] | Final advice published in 2013 and in 2014[25]<br>See also Action 7<br><br>Updated advice on colistin use in animals published on 27 July 2016[26] |
| | CVMP reflection paper on the risk of antimicrobial resistance transfer from companion animals | Published in 30 January 2015[27] |
| | CVMP reflection paper on the use of pleuromutilins in food-producing animals in the European Union | Published on February 2014[28] |
| | CVMP draft guideline on the assessment of the risk to public health from antimicrobial resistance due to the use of an antimicrobial veterinary medicinal product in food-producing animals | Published on March 2015[29] |
| | Final CVMP strategy on antimicrobials 2016-2020 | Published on 6 October 2016[30] |
| | Follow-up of the scientific recommendation published in 2014 prepared by the Antimicrobial Advice Ad Hoc Expert Group (AMEG)[31] | A workshop took place on 26 November 2015 with Member States and stakeholders in order to determine whether there is a need for a follow-up of this advice and if so, the type of activities that could be elaborated[32] |
| | Request to EFSA and EMA a joint scientific opinion on measures to reduce the need to use antimicrobial agents in animal husbandry in the European Union, and the resulting impacts on food safety (RONAFA, reduce overall need of use of antimicrobials), which included a specific request to assess the recent scientific developments in the areas of possible alternatives to the use of antimicrobials in animal husbandry in the EU[33] | EFSA and EMA joint scientific opinion expected to be completed in December 2016 and published in January 2017 |
| To reduce the overall use of antimicrobials in veterinary medicine (better targeted treatments, use according to best practices, etc) | In addition to the legal provisions, development of a guidance document to provide overview of practical examples of prudent use principles to be considered implemented by Member States when developing national strategies on prudent use.<br>Follow up reports of the implementation by Member States. | Commission Guidelines for the prudent use of antimicrobials in veterinary medicine were published in September 2015[34]<br><br>Implementation by the Member States is being followed-up by SANTE Directorate F during fact-finding missions on the prudent use of antimicrobials in animals in 2016 and 2017. |

[24] http://www.ema.europa.eu/docs/en_GB/document_library/Other/2013/04/WC500142070.pdf
[25] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_000639.jsp&mid=WC0b01ac058080a585
[26] http://www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2016/07/WC500211080.pdf
[27] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_001485.jsp&mid=WC0b01ac0580a74c89
[28] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_001486.jsp&mid=WC0b01ac0580a74c89
[29] http://www.ema.europa.eu/ema/index.jsp?curl=pages/home/general/general_content_001483.jsp&mid=WC0b01ac0580a74c89
[30] http://www.ema.europa.eu/docs/en_GB/document_library/Scientific_guideline/2016/10/WC500214901.pdf
[31] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_000639.jsp&mid=WC0b01ac058080a585
[32] http://ec.europa.eu/dgs/health_food-safety/amr/events/ev_20151126_en.htm
[33] http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2015-00216
[34] http://ec.europa.eu/health/antimicrobial_resistance/docs/2015_prudent_use_guidelines_en.pdf

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| Guarantee responsible and efficient use of medicated feed | Raising awareness of the control authorities to risks due to different routes of oral administration of antimicrobials in order to detect misuse and to take remedial action | Current and follow-on to Action 2 |
| To verify on-the-spot that the Member States have acted upon whatever Commission recommendations are proposed for the prudent use of antimicrobials in the Member States | Questionnaire sent in August 2015 and fact-finding missions in selected Member States during 2016- see DG SANTE Directorate F project undertaken pursuant to Action 2. How the Member States put the Commission's and/or national guidelines on prudent use into practice will be one of the elements of the DG SANTE Directorate F fact-finding missions. | All Member States, Iceland, Norway, Switzerland and stakeholders (Advisory Group on the Food Chain and Animal and Plant Health members and FVE member organisations) received the questionnaire in August 2015. Nine fact-finding missions in Member States to be completed during 2016; with an interim overview report to be drafted by the first quarter of 2017 and published. It has been decided to extend the project and a further seven fact-finding missions are planned for 2017with a final overview report to be prepared during 2018 and published. Available mission reports are published on the DG SANTE website.[35] |
| In the course of evaluating Member States residue monitoring plans, focus on the ability of the national laboratories to effectively monitor for residues of antimicrobials of concern (critically important antimicrobials including fluoroquinolones, 3rd and 4th generation cephalosporins and macrolides). | Evaluation of EU Member States' residue monitoring plans and supplementary assessment of Member States' screening methodology by the EU Reference Laboratory for antimicrobial residues. | The evaluation of the 2013 residues monitoring plans was completed in November 2013 and the EURL assessment was provided in February 2014. DG SANTE Directorate F overview report has been finalised and published and presented to Member States and EU agencies at the AMR working group meeting of 1 July 2015.[36] |

[35] http://ec.europa.eu/food/audits-analysis/audit_reports/index.cfm
[36] http://ec.europa.eu/food/audits-analysis/overview_reports/details.cfm?rep_id=77

## B. Prevent microbial infections and their spread

**Action n° 4:**

**Strengthen infection prevention and control in healthcare settings.**

| Operational objectives | Concrete activities | Milestones / Deadline |
|---|---|---|
| Monitor and support the implementation of the Council Recommendation on patient safety incl. healthcare associated infections (HAI)[37] with emphasis on:<br>• Development of guidance on infection prevention and control<br>• Strengthened surveillance of<br>• HAI<br>• Education and training of healthcare workers<br>• Information to patients | 1st Report of the Commission on the implementation of the Council Recommendation on patient safety, including healthcare associated infections. | Adopted and published November 2012[38] |
| | 2nd Report of the Commission on the implementation of the Council Recommendation on patient safety, including healthcare associated infections. | Adopted and published June 2014[39] |
| | Support via the Health Programme projects/actions to follow up the priority areas on which future work should focus include, as identified in the Commission's implementation report | Joint Action on Antimicrobial Resistance and Healthcare-Associated Infection Included in 2016 EU Health Programme Workplan.<br>The Joint Action is expected to be launched in spring 2017 |
| | Continue fostering with the European Centre for Disease Prevention and Control (ECDC) the development of guidance on infection prevention and control, strengthening healthcare-associated infections (HAI) surveillance and the development of training curricula for healthcare workers. | Several guidance documents published by ECDC[40,41]<br><br>Directory of online resources for prevention and control of AMR and HAI published on ECDC website[42]<br><br>Several reports and protocols on HAI surveillance published by ECDC[43,44]<br><br>Core competencies for infection control and hospital hygiene professionals in the EU, and other training resources published by ECDC[45] |

[37] http://ec.europa.eu/health/patient_safety/docs/council_2009_en.pdf
[38] http://ec.europa.eu/health/patient_safety/docs/council_2009_report_en.pdf
[39] http://ec.europa.eu/health/patient_safety/docs/ec_2ndreport_ps_implementation_en.pdf
[40] http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/guidance-infection-prevention-control/Pages/guidance-organisation-infection-prevention-control.aspx
[41] http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/guidance-infection-prevention-control/Pages/guidance-prevention-control-infections-CRE.aspx
[42] http://ecdc.europa.eu/en/healthtopics/healthcare-associated_infections/guidance-infection-prevention-control/pages/guidance-prevention-control-infections-caused-by-multidrug-resistant-bacteria-and-healthcare-associated-infections.aspx
[43] http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/surgical-site-infections/Pages/SSI.aspx
[44] http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/Clostridium-difficile-infections/Pages/Clostridium-difficile-infections.aspx
[45] http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/training-infection-control/Pages/training.aspx

| **Action n° 5:**<br>**Adoption of a proposal for an EU Animal Health Law.** | | |
|---|---|---|
| **Operational objectives** | **Concrete activities** | **Milestones / Deadline** |
| To create an animal health legal framework based on the principle "prevention is better than cure". | Animal Health Regulation proposal will foresee to:<br>• Increase responsibilities of operators to ensure the required level of animal health and biosecurity;<br>• clarify the responsibility of veterinary and aquatic animal health professionals to adopt effective measures to prevent the spread of pathogens and to raise awareness;<br>• clarify responsibility of competent authorities to protect animal health, human health and the environment through reduction of the risks arising from the emergence, introduction or spread of pathogens;<br>• provide for an assessment, prioritisation and categorisation of diseases or disease agents, including where appropriate, the ability to generate resistance to treatment as criterion to decide about appropriate measures;<br>• clarify obligations to ensure appropriate monitoring, surveillance and early detection of pathogens. | The final rule was published on 31 March 2016 as Regulation (EU) 2016/429 of the European Parliament and of the Council of 9 March on transmissible animal diseases and amending and repealing certain acts in the area of animal health ("Animal Health Law").[46] It already entered into force and most of its provisions will be applicable as from 21 April 2021.Further details are foreseen in subsequent delegated and implementing acts as appropriate, some of these are to be laid down by 21 April 2019, others by undefined later dates. |

[46]http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1476967773427&uri=CELEX:32016R0429

## C. Develop new effective antimicrobials or alternatives for treatment

**Action n° 6:**

**To promote, in a staged approach, unprecedented collaborative research and development efforts to bring new antibiotics to patients.**

| Operational objectives | Concrete activities | Milestones / Deadline |
|---|---|---|
| To re-activate research and development by industry for new antibiotics and related issues | Calls for proposals via the Innovative Medicine Initiative (IMI), a public- private partnership between the Commission and the industry. IMI[47] projects are funded by the Commission, via Framework Programme 7and Horizon 2020, and the European Federation of Pharmaceutical Industries and Associations. | The Innovative Medicines Initiative 2 (IMI 2) started in 2014 and will run for 10 years. Its goal is to develop next generation vaccines, medicines and treatments, such as new antibiotics. It will build on the successes and lessons learnt under IMI 1. It will tackle Europe's growing health challenges, and secure the future international competitiveness of Europe's pharmaceutical industry. |
| | To support the development of rapid point-of-care tests for appropriate use of antibiotics. | The project RAPP-ID started in April 2011 for a duration of 60 months[48] |
| | The launch of a large IMI programme "New Drugs 4 Bad Bugs"[49] that aims to bring new antibiotics to patients and currently covers:<br>1) innovative trial design and clinical drug development<br>2) learning from success and failure and getting drugs into bad bugs, and<br>3) discovery and development of new drugs for combating Gram-negative infections<br>4) Driving re-investment in R&D and responsible use of antibiotics<br>5) Clinical development of antibacterial agents for Gram-negative antibiotic resistant pathogens<br>6) Systemic molecules against health care associated infections<br>7) Inhaled anti-bacterials in bronchiectasis and cystic fibrosis<br><br>This programme has a budget of more than € 600 million. | Two IMI Projects of the 6th call were launched in February 2013. COMBACTE[50] pioneers new ways of designing and implementing efficient clinical trials for novel antibiotics and TRANSLOCATION[51] aims to increase the overall understanding of how to get antibiotics into multi-resistant Gram-negative bacteria.<br><br>Project ENABLE[52] puts in place an antibiotic drug development platform. The project aims to advance the most promising early discovery stage of novel antibiotic molecules from the academic and SME sector to early clinical development.<br>ND4BB project DRIVE-AB[53], launched October 2014, will develop concrete recommendations for new commercial models that provide industry with an incentive to invest in antibiotic development while ensuring that new antibiotics are used wisely. |

[47] http://www.imi.europa.eu/
[48] http://www.imi.europa.eu/content/rapp-id
[49] http://www.imi.europa.eu/content/nd4bb
[50] https://www.imi.europa.eu/content/combacte-net
[51] http://www.imi.europa.eu/content/translocation
[52] http://www.imi.europa.eu/content/enable
[53] https://www.imi.europa.eu/content/drive-ab

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|---|---|---|
| | | In February 2015, COMBACTE-MAGNET[54] was launched which aims to bring highly innovative studies and activities related to prevention and treatment of infections caused by multi-drug resistant Gram-negative bacteria.<br><br>Project COMBACTE-CARE[55] launched in March 2015 aims to shed new light on the best ways to understand and treat Carbapenem resistant infections.<br><br>The latest project, iABC[56], started in August 2015 and will develop two inhaled antibiotics to help cystic fibrosis and bronchiectasis patients.<br><br>IMI-2 launched its 9th Call in April 2016 addressing the clinical burden of Clostridium difficile infection (CDI).[57] |
| To assess the possibilities for increasing the efficiency of the market authorisation process in relation to new antibiotics | To launch a dialogue with the health authorities of the Member States and other relevant stakeholders in view of a co-ordinated approach to introduce incentives for the development and marketing of new antibiotics. | Event on the best use of medicines legislation to bring new antibiotics to patients and combat the resistance problem (8 November 2013)<br><br>EMA workshop on the use of pharmacokinetics and pharmacodynamics in the development of antibacterial medicinal products (12-13 November 2015)<br><br>Ongoing discussions with EMA & STAMP expert group on optimisation of existing regulatory tools for all medicines, including antibiotics |
| | To complete an assessment of relevant non-legislative market authorisation process aspects in view of streamlining and accelerating the introduction of new antibiotics.<br><br>The EMA Guidance on the use of pharmacokinetics and pharmacodynamics in the development of antimicrobial medicinal products (date of coming into effect - 1 February 2017).<br><br>In March 2016, the EMA launched a new scheme "PRIME" to enhance support for the development of new innovative medicines that target an unmet medical need. The PRIME has the potential to encourage the development and accelerate approval of a new class of antibiotics. | |
| | In light of the results of the assessment mentioned above, to identify possibilities of simplification/streamlining of testing/assessment requirements/procedures and accelerating the assessment process for new antimicrobials and where relevant launch a revision of the relevant guidelines | |
| Discussion with international partners identifying areas of potential cooperation | Cooperation with Japan and the USA | In September 2016, the EMA hosted a two day meeting between three regulatory agencies EMA, Pharmaceuticals and Medical Devices Agency in Japan (PMD) and Food and Drug Administration in the USA (FDA) on Antibacterial Drug Development. The outcome of the meeting was presented at the G7 Kobe Health Ministers' Meeting. |

[54] http://www.imi.europa.eu/content/combacte-magnet
[55] http://www.imi.europa.eu/content/combacte-care
[56] https://www.imi.europa.eu/content/iabc
[57] http://www.imi.europa.eu/content/imi-2-call-9

| **Action n° 7:**<br>**Promote efforts to analyse the need for new antibiotics into veterinary medicine.** | | |
|---|---|---|
| **Operational objectives** | **Concrete activities** | **Milestones / Deadline** |
| To analyse the need for new antibiotics into veterinary medicine | To have scientific advice of European Medicines Agency (Committee for Medicinal Products for Veterinary Use (CVMP) and the Committee for Medicinal Products for Human Use (CHMP)) whether new classes of veterinary antimicrobials contribute to having a better management of the development of AMR and these new classes could be used in the veterinary sector or should be set aside for human use | Final advice published in 2014[58]<br>See also Action 3 |
| | Follow-up of the scientific recommendation published in 2014 prepared by the Antimicrobial Advice Ad Hoc Expert Group (AMEG)[59] | A workshop took place on 26 November 2015 with Member States and stakeholders in order to determine whether there is a need for a follow-up of this advice, and if so, the type of activities that could be elaborated.[60] |
| To facilitate the use of alternatives that may reduce the need for treatment with antimicrobials | Reducing the need for antimicrobials by using specific feed materials and authorised feed additives e.g. with possible effects on the gut flora | Authorisation of additives is dependent on applications received |
| | Request to EFSA and EMA a joint scientific opinion on measures to reduce the need to use antimicrobial agents in animal husbandry in the European Union, and the resulting impacts on food safety (RONAFA, reduce overall need of use of antimicrobials), which included a specific request to assess the recent scientific developments in the areas of possible alternatives to the use of antimicrobials in animal husbandry in the EU[61] | EFSA and EMA joint scientific opinion expected to be completed in December 2016 and published in January 2017 |

[58] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_000639.jsp&mid=WC0b01ac058080a585
[59] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/general/general_content_000639.jsp&mid=WC0b01ac058080a585
[60] http://ec.europa.eu/dgs/health_food-safety/amr/events/ev_20151126_en.htm
[61] http://registerofquestions.efsa.europa.eu/roqFrontend/questionLoader?question=EFSA-Q-2015-00216

## D. Joining forces with international partners to contain the risks of spreading AMR from international trade and travel and via the environment

**Action n° 8:**

**Develop and/or strengthen multilateral and bilateral commitments for the prevention and control of AMR in all sectors.**

| Operational objectives | Concrete activities | Milestones / Deadline |
|---|---|---|
| Maintain and deepen EU/US transatlantic cooperation addressing AMR | Implementation of the 17 Transatlantic Taskforce Antimicrobial Resistance (TATFAR) Recommendations[62] | TATFAR progress report published May 2014[63]<br><br>Face-to-face meeting during of TATFAR group took place on 22-23/10/2015 as an associated event of the Luxembourgish Presidency and it was decided to prolong TATFAR (2016-2020). TATFAR Work plan for 2016-2020 adopted 1st quarter 2016. TATFAR expanded to include Canada and Norway from October 2016.<br><br>TATFAR publication on new business models for antimicrobial development[64] (accepted manuscript) and on knowledge gaps regarding the transmission to human of antimicrobial resistance arising out of use of antimicrobials in animals (June 2016)[65]. |
| | Bi-annual TATFAR audio-conference meetings and organisation of a face-to-face meeting with part of the group to review progress and discuss follow-up (depending on available funding) | |
| | End of 2013, TATFAR was prolonged with an additional two years (2014-2016). The taskforce decided to continue with 15 recommendations, retiring two, and created one new recommendation on knowledge gaps regarding the transmission to human of antimicrobial resistance arising out of use of antimicrobials in animals for collaboration from 2014-2016.<br><br>In October 2015, TATFAR was extended for an additional five years (2016-2020). | |
| Discussion with international partners identifying areas of cooperation | Cooperation and joint actions in the fields of surveillance, promotion of prudent use of antimicrobials, awareness/communication and healthcare-related infection prevention and control | 2016 Joint Action on Antimicrobial Resistance and Healthcare-Associated Infection under development with EU Member States, Norway, Serbia and Moldova to include activities on evaluation of 'one health national action plans', prudent use of antimicrobials, awareness raising. The Joint Action is expected to be launched in spring 2017, see also Action 4. |
| | Bilateral cooperation China-EU | 1st Seminar China-EU (Beijing) March 2013<br>2nd Seminar China-EU (first half 2015)<br>Comparative studies on policies (ongoing) |
| | Bilateral cooperation Russian Federation-EU | AMR as standing item of meetings of the Russian Federation Sub-group on Communicable Diseases (on hold) |
| | Cooperation with Brazil and South American countries (Argentina, Chile, Colombia, Paraguay, Peru and Uruguay) | Commission and EEAS holding conference on AMR in Rio, Brazil January 2017, followed by 6 seminars on different AMR topics in partner country capitals over 2017 and 2018. |

[62] http://ecdc.europa.eu/en/activities/diseaseprogrammes/TATFAR/Documents/210911_TATFAR_Report.pdf
[63] http://www.cdc.gov/drugresistance/pdf/tatfar-progress_report_2014.pdf
[64] http://cid.oxfordjournals.org/content/early/2016/08/29/cid.ciw593.full.pdf+html
[65] http://www.cdc.gov/drugresistance/pdf/tatfar-report---recommendation-18.pdf

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| United Nations | Cooperation with international partners in UN, WHO, OIE and FAO to raise awareness on AMR and gain political commitment globally to implement the WHO Global Action Plan | Political Declaration and participation in UN high-level meeting on AMR at United Nations General Assembly September 2016 |
| World Health Organization (WHO) | 1) Cooperation with WHO to support development of WHO Global Action Plan<br>2) Grant to WHO to implement the pilot project on mapping the global threat of AMR in sub Saharan Africa – 750 000 EUR | 1) Participation to WHO meetings related to the development of the WHO Global Action Plan<br>Provide input to WHO consultation on global action plan<br>2) Grant contract with WHO to be signed 1st semester 2017; work to be carried out 2017-2018 |
| Implementation of the World Health Organization (WHO/Europe)-DG Health and Food Safety "Health Security Roadmap" identifying Antimicrobial Resistance as an area for cooperation" | Annual WHO/Europe / EC Senior officials meetings reviewing WHO/Europe-DG Health and Food Safety "Health Security Roadmap" | WHO-EC meeting May 2013<br>WHO-EC meeting June 2014<br>WHO-EC meeting February 2015 |
| | Cooperation to support capacity building (laboratories in charge of surveillance of AMR in the food chain) in non EU Member States | Several workshops and trainings (2014-2015) |
| World Organisation for Animal Health (OIE) | Support to the Conference on Antimicrobial Resistance organized by the World Organisation for Animal Health (OIE) | March 2013 |
| | Collaboration revision chapters on AMR of the Terrestrial and Aquatic Codes and participation on ad hoc groups AMR | August 2013, January- July-December 2014 |
| OECD | Grant to OECD on economic burden of AMR<br>Two year action to assess the health and economic burden of AMR and produce a model to assess policy impacts. | 2016 grant to OECD agreed under the EU Third Health Programme |
| European Observatory | Grant to European Observatory<br>Mapping and analysis of good practices and a book of evidence on good practices and enablers / obstacles to their transfer. | 2016-2017 grant to European Observatory agreed under the EU Third Health Programme |
| Food and Agricultural Organization (FAO) | Bilateral meeting FAO-EC | September 2014 |
| To identify options for addressing potential risks from pharmaceuticals in the environment | Development of a strategic approach to pharmaceuticals in the environment | Outcome expected in 2017 |

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|---|---|---|
| Rationale use of medicines through the Renewed Partnership (2012-2016) EU-WHO in 15 countries[66] | 1) Provide technical assistance to countries to update their list of essential medicines, their Standard Treatment Guidelines and their National Formulary<br>2) Provide technical assistance to countries to survey prescribing, dispensing and use of medicines using WHO methodology- Done in Ghana<br>3) Provide technical assistance to countries for improving prescribing, dispensing and use of medicines in public sector facilities- Tanzania: dispensers and prescribers from 10 districts trained in rational medicine | Depends on the countries (x15)- below some examples:<br>a) Burundi: Training of trainers on the use of guidelines for medicinal products in health centers<br>b) DRC: Perform a survey of prescribing practices, dispensing and use of antibiotics in the Eastern Region.<br>c) Ghana: Develop surveillance system for antibiotic use in three in hospitals. Train staff to use the system to collect data on antibiotic use. |
| Local capacity building and awareness campaigns through a comprehensive support to national policy and plans | Health is a sector of concentration in 17 countries.[67] The main approach is to provide a comprehensive and coordinated support to the developing countries. Pharmaceutical strategic plans would cover aspects of medicines regulation, public sector procurement, supply and distribution and medicines use. | On-going with the development of the activities under the 11th European Development Fund (EFD) |
| Global Health Security Agenda (GHSA) | Cooperating and steering international activities with forum of countries active on AMR | GHSA meeting on international surveillance May 2016 |

[66] Burundi ; Cameroon ; Congo ; DRC ; Ethiopia ; Ghana ; Guinea-Conakry ; Kenya ; Mali ; Mozambique ; Senegal ; Tanzania ; Togo ; Zambia ; Zimbabwe.
[67] Burkina Faso ; Guinea-Conakry ; Guinea Bissau ; Mauritania ; Nigeria ; Burundi ; CAR ; DRC ; Ethiopia ; South-Soudan ; Zimbabwe ; Afghanistan ; Tajikistan ; Morocco and Grenada.

# E. Monitoring and surveillance

**Action n° 9:**

**Strengthen surveillance systems on AMR and antimicrobial consumption in human medicine.**

| Operational objectives | Concrete activities | Milestones / Deadline |
|---|---|---|
| Strengthen surveillance systems on antimicrobial resistance and antimicrobial consumptions | Ensuring the sustainability of the European Surveillance system of Antimicrobial Consumption (ESAC).<br>Transfer of the European Surveillance system of Antimicrobial Consumption to the European Centre for Disease Prevention and Control (ECDC). | Completed December 2012. The system adopted the name of "European Surveillance of Antimicrobial Consumption Network" (ESAC-Net) |
| | Publication of EARS-Net reports<br>Publication of ESAC-Net reports<br>Publication of point prevalence survey reports | Several EARS-Net and ESAC-Net reports published by ECDC, together with summaries of data and updates of interactive databases[68]: November each year<br><br>Several reports on point prevalence surveys published by ECDC: acute care hospitals, July 2013[69]; long-term care facilities, May 2014.[70] Two additional European point prevalence surveys, in acute care hospitals and in long-term care facilities are currently coordinated by ECDC (2016-2017). |
| | Implementation of the newly adopted measures on new case definitions for antimicrobial resistance and healthcare-associated infections (Commission Implementing Decisions 2012/506/EU of August 2012 under Decision No 2119/98/EC of the European Parliament and of the Council)[71] | Decision adopted 2012.<br>Monitor of the implementation: by December 2015.<br><br>Review of the Decision in progress as part of the updating of legislation following adoption of Decision 1082/2013 on serious cross border threats to health. |
| | Addressing the lack of data on antimicrobial resistance and antimicrobial consumption in children:<br>Completion of the Antibiotic Prescribing and resistance in European Children (ARPEC) proiect[72] | Completed 2014 |

[68] http://ecdc.europa.eu/en/healthtopics/antimicrobial-resistance-and-consumption/Pages/antimicrobial-resistance-and-anitmicrobial-consumption.aspx
[69] http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/point-prevalence-survey/Pages/Point-prevalence-survey.aspx
[70] http://ecdc.europa.eu/en/healthtopics/Healthcare-associated_infections/point-prevalence-survey-long-term-care/Pages/point-prevalence-survey-long-term-care-facilities.aspx
[71] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:262:0001:0057:EN:PDF
[72] http://www.arpec.sgul.ac.uk/

| **Action n° 10:**<br>**Strengthen surveillance systems on AMR and antimicrobial consumption in animal medicine.** | | |
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| **Operational objectives** | **Concrete activities** | **Milestones / Deadline** |
| Harmonized surveillance systems and monitoring on the occurrence of antimicrobial resistance and consumption of antimicrobials will provided the necessary data on the use of antimicrobials and on the impact of antimicrobial consumption on the occurrence of antimicrobial resistance in the food chain (animals and food) in the EU. | European Surveillance of Veterinary Antimicrobial Consumption (ESVAC)[73] project coordinated by the European Medicines Agency on collection data on the consumption of antimicrobials on a multiphase approach:<br>• Pilot project collecting standardized overall sales data<br>• Collecting and report overall national sales data from all Member States | • 6th ESVAC report was published in October 2016 - on sales in 2014 (26 Member States, 2 EEA countries and Switzerland provided data.<br>• Pilot project on collection data per species was initiated in 2014. After the test phase, the project was postponed due to insufficient number of participating countries. Meanwhile, data collection protocols for the project are being developed. |
| | Reinforce legal base for collection of antimicrobials in regulatory framework for veterinary medicines | Commission proposal for review of veterinary medicines legislation, adopted in 2014 (see Action 2) provides for compulsory collection of data on sales and use. |
| | **Harmonization of surveillance and monitoring of antimicrobial resistance in the food chain:** | |
| | Request of scientific and technical assistance to the European Food Safety Authority (EFSA) on harmonizing monitoring in bacteria transmitted through food | EFSA opinion on harmonization monitoring AMR published in 2012[74] |
| | New legal framework for harmonised monitoring of antimicrobial resistance in zoonotic and commensal bacteria in the food chain | Decision 2013/652/EU[75] on harmonised monitoring and reporting of antimicrobial resistance in the food chain in the EU |
| | Financial contribution from the Union to the harmonized monitoring of AMR carried out by the Member States | Decision 2013/653/EU[76] financial aid towards a coordinated control plan for AMR monitoring in 2014.<br>Financial aid for 2015: individual grant decision sent to the Member States in February 2015. |
| | Request of scientific and technical assistance to the European Food Safety Authority (EFSA) on randomisation of sampling for the purpose of AMR monitoring | EFSA opinion on randomisation of sampling for monitoring AMR published in May 2014[77] |

[73] http://www.ema.europa.eu/ema/index.jsp?curl=pages/regulation/document_listing/document_listing_000302.jsp
[74] http://www.efsa.europa.eu/en/efsajournal/pub/2742 and http://www.efsa.europa.eu/en/efsajournal/pub/2897
[75] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013D0652
[76] http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013D0653
[77] https://www.efsa.europa.eu/en/efsajournal/pub/3686

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| Surveillance and monitoring of the occurrence of pathogens in the framework of Animal Health Regulation. No treatment of animals without proper diagnosis; in particular treatment should not jeopardize detection of certain maior pathogens. | Animal Health Regulation proposal | The same as for Action 5, see update there, including also the link to the official text and full details of the final rule as adopted by the European Parliament and Council. |
| To verify on-the spot that Member States comply with the legislation on monitoring of AMR. Identify good practices. Gather information on voluntary monitoring systems. | A series of targeted audits in 14 Member States and Switzerland (issuing of individual reports after each audit with recommendations).<br><br>Preparation of a final overview report (evaluation of the implementation of Decision 2013/652/EU by Member States, identification of common difficulties and good practices). | Two pilot audits were carried out in the autumn of 2015.<br>Six audits in Member States to be completed by the end of 2016.<br>For 2017 seven further audits are planned in six Member States and Switzerland.<br>Reports are published on DG SANTE website.[78]<br><br>Interim overview report to be prepared by March 2017 and published and a final overview report to be prepared by the end of the first quarter of 2018 and also published. |
| The information on antimicrobial resistance and antimicrobial consumption collected by the three agencies EFSA, EMA and ECDC needs to be combined and analysed in order to allow a clear identification and quantification of the risk of developing and spreading antibiotic resistance in the food chain. | Request from the Commission to the 3 Agencies (EFSA, EMA and ECDC) on the establishment of a new organisational structure to improve the analysis of the data on AMR and consumption (Joint Interagency Antimicrobial Consumption and Resistance Analysis Report, JIACRA). | First JIACRA report published January 2015[79] |
| | Follow-up of the scientific Joint Interagency Antimicrobial Consumption and Resistance Analysis Report (JIACRA). | The second JIACRA report is to be published by June 2017 |
| | Request for a joint ECDC, EFSA and EMA scientific opinion on a list of outcome indicators as regards surveillance of antimicrobial resistance and antimicrobial consumption in humans and food-producing animals | The Joint ECDC, EFSA and EMA Scientific Opinion is expected by September 2017 |

[78] http://ec.europa.eu/food/audits-analysis/audit_reports/index.cfm
[79] http://www.efsa.europa.eu/en/efsajournal/pub/4006

# F. Additional Research and Innovation

**Action n° 11:**

**Reinforce and co-ordinate research efforts.**

| Operational objectives | Concrete activities | Milestones / Deadline |
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| Reinforce antimicrobial resistance research in a coordinated fashion in three different thematic areas within the last calls of the seventh Framework Programme for Research | An overview of research projects related to drug resistance can be found at: http://ec.europa.eu/research/health/index.cfm?pg=area&areaname=amdr | An overview of EU supported research activities was published in The Lancet in August 2016[80] |
| | Under the 7th Framework Programme the European Commission has published Research Work Programmes in which call topics on AMR were published in a coordinated manner:<br>• HEALTH Work Programme (WP) (https://ec.europa.eu/research/participants/portal/doc/call/fp7/common/156764 5-1. health upd 2013 wp 27 june 2013 en.pdf)<br>• Knowledge Based Bio-Economy (KBBE) Work Programme (http://ec.europa.eu/research/participants/data/ref/fp7/132093/b-wp-201301_en.pdf) and the<br>• Nanotechnologies, Advanced Materials and. Production (NMP) Work programme (http://ec.europa.eu/research/participants/data/ref/fp7/132117/d-wp-201301_en.pdf) | 2007 -2013 |
| | The codes below refer to the call topics in the Work Programmes: | |
| Antimicrobial transfer throughout the food chain | • WP2013, call7, topic KBBE.2013.1.3-05 for €9 Mio EU contribution<br>• WP2013, call 7, KBBE topics KBBE.2013.1.1-01, KBBE.2013.1.3-03, KBBE.2013.3.5-01 for a total of €21Mio EU contribution | Project EFFORT[81], which studies the ecology and transmission of AMR from farm to fork, started in December 2013. |
| Antimicrobial resistance in farming and animal production | WP2012, call6, topics KBBE.2012.1.2-10 & KBBE.2012.1.4-04; | Projects on Impact matrix analysis and cost-benefit calculations to improve management practices regarding health status in organic dairy farming ("IMPRO"[82]) and on Targeted disease prophylaxis in European fish farming ("TARGETFISH"[83]) projects started 4th quarter 2012 |

[80] http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(16)31425-8/fulltext
[81] http://www.effort-against-amr.eu/
[82] http://www.dev.impro-dairy.eu/index.php/fr/
[83] http://www.wageningenur.nl/en/show/TARGETFISH.htm

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| Development of diagnostic tools for infectious diseases | HEALTH.2012.2.3.0-1 | Projects funded include: "Routine diagnostic tool for urinary tract infections caused by extended spectrum beta lactamase and carbapenamase producing bacteria" (ROUTINE), "Rapid identification of respiratory tract infections (RID-RTI), "Development of a handheld antibacterial drug resistance diagnostic device using nanowire technology" (NANOMAL), "Automated next generation sequencing for diagnostic microbiology" (PATHSEEK), "Assured point-of-care device for Syphilis and HIV in pregnant women and new-born" (Preventit), "Rapid Aptamer based diagnostic for bacterial meningitis"(RAPTA Diag) and "Detection of persistent infections by human papillomaviruses" (PIPAVIR). More information is available on the CORDIS website.[84] |
| | PHC-12-2015 (SME Instrument) | Two projects are funded under the SME Instrument Phase II: Project "Respiratory- ImmunoDx" is about distinguishing bacterial versus viral lower respiratory tract infections at the PoC to facilitate the appropriate/targeted use of Abs. Project "PneumoSIP" aims to develop a fully automated PoC device for the fast quantitative aetiological diagnose of Community- Acquired Pneumonia (CAP) also analysing antibiotic resistances to enable appropriate treatment. |
| | HOA 8 - 2015: Horizon Prize | The EC launched on 26/2/2015 the Horizon Prize - Better use of Antibiotics, which offers a cash reward of €1 million to whoever who can develop a rapid test that will allow healthcare providers to distinguish, at the point of care, between patients with upper respiratory tract infections that require antibiotics and those that can be treated safely without them.[85] Award decision: Q4 2016. |

[84] http://cordis.europa.eu/home_en.html
[85] www.ec.europa.eu/horizonprize/antibiotics

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| Mobilise Small and medium enterprise (SME) to develop new antimicrobials and vaccines | HEALTH.2013.2.3.1-1 | Seven projects to support research and development of drugs, vaccines or alternative treatments for bacterial infections have been funded.[86] The work of 44 innovative SMEs is directly supported. |
| Research to the use of antimicrobials via personalised approaches | HEALTH.2013.2.3.1-2 | Four funded projects seek to identify better methods to use currently available antibiotics. |
| Developing novel nanotechnology enabled therapies for bacterial infectious diseases | • NMP.2013.1.2-2<br>• HEALTH. 2012.2.3.1-1 | Four projects study the usage of novel nano technology for drug delivery. |
| Piloting personalised medicine in health and care systems | SC1 PHC-24-2015 | The "Personalised Risk assessment in febrile illness to optimise Real-life Management across the European Union" (PERFORM) project will develop a comprehensive management plan for febrile children allowing discrimination of viral and bacterial infections.[87] |
| Support the Joint Programming Initiative (JPI) on Antimicrobial Resistance (AMR) | | Participation in the Management Board of the JPI AMR as a non-voting member and funding for the implementation of this JPI via two coordination and support actions (since September 2012). The JPIAMR Strategic Research Agenda was launched 3 April 2014[88] |
| | HCO 12 - 2015: ERA-NET | First H2020 WP published at the end of 2013 EC support of transnational research calls of JPIAMR via ERA-NET Co-fund scheme<br><br>Information on the outcome of the closed calls is available on the JPIAMR website[89] |
| | • 1st transnational call: InnovaResistance<br>• 2nd transnational joint call on "transnational research on repurposing of neglected antibiotics and characterizing antibiotics or antibiotic and non-antibiotic combinations to overcome bacterial antibiotic resistance".<br>• 3rd transnational call: Transmission Dynamics – ERA-NET Cofund call<br>• 4th transnational call: Research Networks Working Groups | |

[86] http://europa.eu/rapid/press-release_MEMO-13-996_en.htm
[87] http://www.perform2020.eu/
[88] http://www.jpiamr.eu/document-library/strategicresearchagenda/
[89] http://www.jpiamr.eu/activities/open-call/

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| Contribute to a global mapping of drug resistance | H2020 WP 2014-15 | Meeting between the World Health Organization (WHO) and the European Commission ( EC) in January 2012, participation in WHO Advisory Group 2013 |
| | Cooperation and joint actions in the field of global mapping | |
| Foster Innovation-Focus group on reduction of antimicrobials in pig production | Creation of the focus group (20 experts) | 2013 |
| | Develop and explore cost-effective integrated strategies to reduce the use of antibiotics<br><br>Final report of the focus group. | Publication final report in 2014[90] |

[90] http://ec.europa.eu/eip/agriculture/en/content/animal-husbandry

## G. Communication, education and training

**Action n° 12:**

**Communication, education and training: Survey and comparative effectiveness research.**

| Operational objectives | Concrete activities | Milestones / Deadline |
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| Assess and improve the impact of the EU awareness and communication initiatives on antimicrobial resistance | European Antibiotic Awareness Day (EAAD) evaluation report | Publication of EAAD evaluation[91] |
| | Annual EAAD stakeholder event and communication activities | EAAD marked annually by a stakeholder event and communication activities on and around 18th November[92] |
| Monitor evolution of behaviour on antimicrobial resistance and prudent use in human medicine | Eurobarometer Survey on antimicrobial resistance | Eurobarometer published and presented at the occasion of European Antibiotic Awareness Day 2013[93]<br>Eurobarometer published and presented at Health Council June 2016[94] (Results in EU Member States)<br>Eurobarometer published at the occasion of European Antibiotic Awareness Day 2016[95] |
| Monitor evolution of behaviour on antimicrobial resistance and prudent use in veterinary medicine | In collaboration with relevant stakeholders identification of target groups and evaluation, (surveys, enquires, etc) on the impact and implementation of campaigns on prudent use antimicrobials, awareness, etc. | On 11 September 2015 the European Commission published a Commission Notice on "Guidelines for the prudent use of antimicrobials in veterinary medicine"[96] |
| Conference Antimicrobial Resistance: Dissemination of information about EU approach on antimicrobial resistance | Mid-term review of the Commission's 5-year action plan against AMR with competent authorities of member states, international organizations and stakeholders representatives, focussing discussions on the challenges ahead, the drivers and possible limitations of the envisaged measures | Published December 2013[97] |
| To inform about the progress made so far on the implementation of the Action Plan. | AMR Progress report | Published March 2015[98] |
| To evaluate the impact and effectiveness of the measures taken and goals achieved by the implementation of the 5-year Action Plan | AMR evaluation report | Published October 2016[99] |

[91] http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=20928
[92] http://ecdc.europa.eu/en/EAAD/Pages/Home.aspx
[93] http://ec.europa.eu/public_opinion/archives/ebs/ebs_407_en.pdf
[94] http://ec.europa.eu/COMMFrontOffice/publicopinion/index.cfm/Survey/getSurveyDetail/instruments/SPECIAL/surveyKy/2107
[95] Ongoing, link not available yet
[96] http://ec.europa.eu/health/antimicrobial_resistance/docs/2015_prudent_use_guidelines_en.pdf
[97] http://ec.europa.eu/dgs/health_food-safety/amr/events/ev_20131211_en.htm
[98] http://ec.europa.eu/health/antimicrobial_resistance/docs/2015_amr_progress_report_en.pdf
[99] http://ec.europa.eu/dgs/health_food-safety/amr/action_eu/index_en.htm