



Update on AMR-related issues in several environmental policy contexts

Unit ENV C1 – Sustainable Freshwater Management
DG Environment

AMR One Health Network 29 February 2024

Contents

- Reminder of Strategic Approach to Pharmaceuticals in the Environment including points relevant to AMR
- Update on Water Framework Directive (WFD)
- Info on AMR monitoring in water linked to the WFD (EEA and JRC)
- Update on Industrial Emissions Directive
- Update on Urban Waste Water Treatment Directive
- Update on Sewage Sludge Directive
- Info on soil monitoring

Strategic Approach to Pharmaceuticals in the Environment

adopted March 2019

Six Areas of Action

- Increase awareness and promote prudent use of pharmaceuticals
- Support development of pharmaceuticals intrinsically less harmful for the environment and promote greener manufacturing
- Improve environmental risk assessment and its review
- Reduce wastage and improve the management of waste
- Expand environmental monitoring
- Fill other knowledge gaps

Strategic Approach to Pharmaceuticals in the Environment

- Actions on Antimicrobial Resistance (AMR) in general
 - Limit the preventive use of veterinary antimicrobials
 - Encourage action in third countries where emissions contribute to AMR
 - Consider feasibility of monitoring antimicrobial resistant microorganisms and antimicrobial resistance genes, e.g. in LUCAS Soil Survey
 - Support research into links between antimicrobials in the environment and AMR
 - Support research into cost-effective methods for reducing presence in slurry, manure and sewage sludge

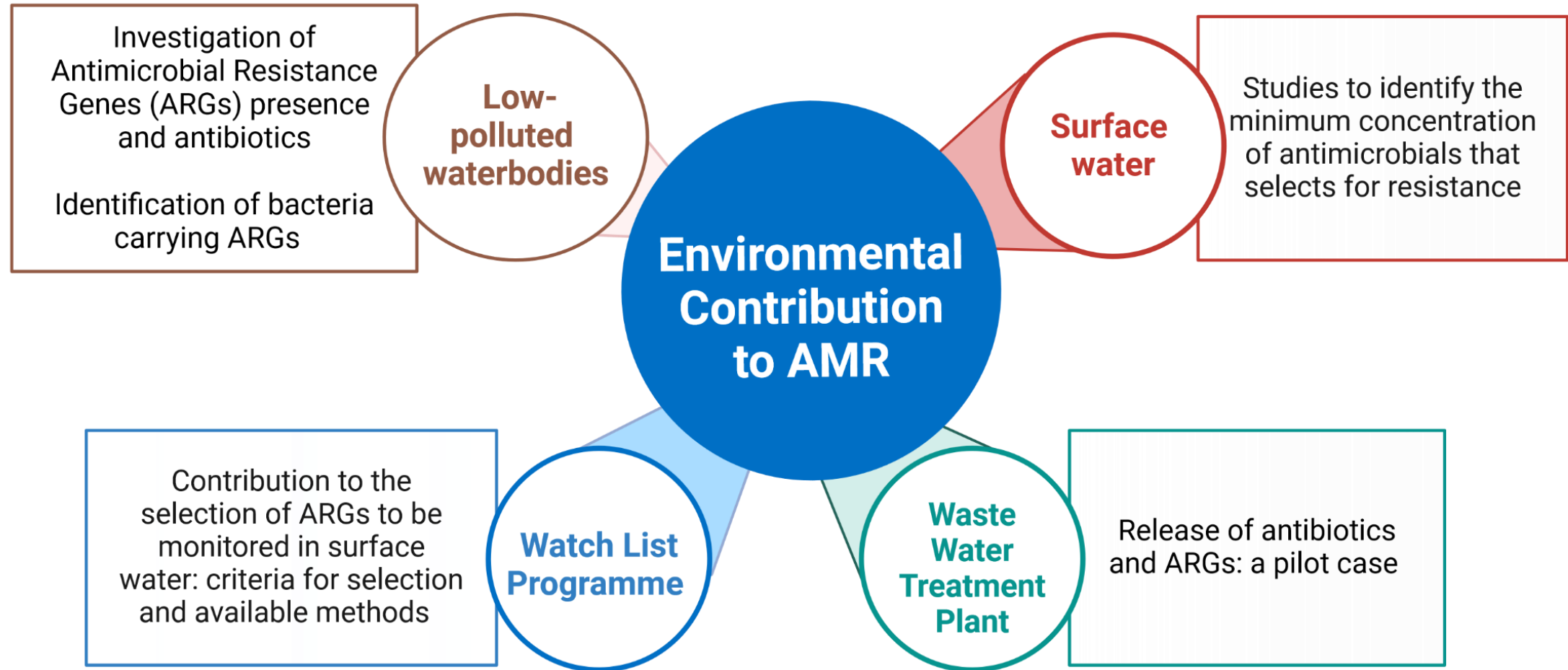
Water Framework Directive/Environmental Quality Standards Directive/Groundwater Directive

- July 2022: Surface water watch list under the EQSD updated, adding i.a. the antibiotics clindamycin and ofloxacin (next update due this summer)
- Oct 2022: Commission proposal adopted on **Integrated Water Management** to revise the list of Priority Substances in surface waters under the Water Framework Directive and the list of pollutants in the Groundwater Directive. The proposal https://environment.ec.europa.eu/topics/water/water-framework-directive_en includes:
 - **Azithromycin, clarithromycin and erythromycin**, (plus carbamazepine, three estrogens (EE2, E2, E1), diclofenac and ibuprofen) in the priority substances list, with environmental quality standards;
 - **Sulfamethoxazole** (and carbamazepine) and total pharmaceuticals in the groundwater pollutants list, with quality standards (and primidone as a substance for which MS should consider setting a threshold value).
 - **Selected ARGs to be added to the Watch Lists when a suitable monitoring method becomes available.**
- Ongoing: Negotiations on the COM proposal in the Council (EP supportive in Sep 2023); trilogues might start in the autumn.

AMR monitoring activities linked to the Water Framework Directive

- **European Environment Agency (EEA)** - European Topic Centre (Biodiversity and Ecosystems) and the Eionet (network of 38 European countries) are running a project on monitoring AMR in surface waters from 2023 to 2025.
- In 2024, about 8 countries (self-resourced) will sample a few sites a few times for 5 selected indicators and report their results to the EEA. The aims are to:
 - conduct a pilot survey of AMR in surface waters during 2024, enabling the first harmonised data collection and reporting of the selected resistance indicators at European scale;
 - build capacity and experience (of harmonising the selection of indicators, processes, reporting) for more quantitative monitoring in future.
- A report is expected in early 2025.
- **DG JRC** – has worked on a (molecular-based) method to monitor the presence in water of genes encoding for antimicrobial resistance >>> next slide...

JRC activities to address environmental AMR



Antibiotics and ARGs in water released from Waste Water Treatment Plant (WWTP) to river

- The concentrations of most of the measured antibiotics decreased during wastewater treatment
- Some antibiotics persisted in surface water, though at low concentrations

ng/L	Dec-18		Jan-19		Feb-19		Mar-19	
	WWTP effluent	downstream river	WWTP effluent	downstream river	WWTP effluent	downstream river	WWTP effluent	downstream river
Ciprofloxacin	<LOD	<LOD	29	7	24	7	4	2
Clarithromycin	110	8	1452	118	1130	81	484	44
Lincomycin	<LOD	<LOD	<LOD	<LOD	<LOD	63	<LOD	<LOD
Norfloxacin	<LOD	<LOD	4	8	17	4	6	6
Oxfloxacin	194	<LOD	944	107	989	92	766	83
Sulfamethoxazole	n.a.	n.a.	253	20	138	9	109	5
Roxythromycin	<LOD	<LOD	<LOD	<LOD	<LOD	15	11	<LOD
Trimethoprim	73	5	131	21	78	11	80	11

LOD= Limit of Detection

- ARGs also significantly decreased during the waste water treatment process
- ARGs found at significant levels in the downstream river belonged to the macrolides family (*mphE* and *msrE*) and tetracyclines family (*tet39*)
- Some ARGs (e.g. *mphE* and *msrE*) were enriched at the freshwater sampling site compared to the WWTP effluent

Industrial Emissions Directive (IED)

- Action in Strategic Approach to Pharmaceuticals in the Environment: “When the Industrial Emissions Directive is next evaluated, assess whether it should address intensive dairy farming” (in addition to intensive pig and poultry farming) .
- Intensive dairy / cattle farming was assessed in the impact assessment and included in the COM proposal to revise the IED but rejected by the co-legislators during the negotiations.
- Separately, discussions continue on how to improve coherence between the legislation on water and the legislation on industrial emissions.

Urban Waste Water Treatment Directive

- Actions on Wastewater Treatment in the Strategic Approach: Invest in removal of pharmaceuticals and ARGs; investigate feasibility of upgrading selected UWWTPs to more advanced treatment technologies; support development of “greener” pharmaceuticals that degrade more readily to harmless substances
- Proposal to revise the UWWTD adopted by COM in October 2022 https://environment.ec.europa.eu/topics/water/urban-wastewater_en, including:
 - For all agglomerations of 100 000 p.e. and more, MS to monitor AMR at the inlets and outlets of UWWTPs at least twice/year, to increase knowledge/support further action.
 - Obligation on MS to conduct a risk assessment (human health/environment) and apply additional treatment where necessary.
 - Extended producer responsibility for pharmaceuticals and personal care products to contribute to treatment costs.

Urban Waste Water Treatment Directive

- Compromise text recently agreed in trilogues includes:
 - Reference to One Health approach in Article 1
 - AMR monitoring at UWWTPs for agglomerations of 100 000 p.e. and more; COM to prepare implementing act re frequency of monitoring and methodology.
 - Obligation on MS to conduct a risk assessment (human health/environment) and apply additional treatment where necessary, but with lower priority given to environmental risk.
 - EPR for pharmaceuticals and personal care products. (In the case of quaternary treatment, limited to 80% of costs.)

Sewage Sludge Directive

- Objective/action in the Strategic Approach: Encourage innovation where it can help to address the risks, and promote the circular economy by facilitating the recycling of resources such as water, sewage sludge and manure; support further research into cost-effective methods for reducing the presence of pharmaceuticals including antimicrobials in slurry, manure and sewage sludge to enable their use in the circular economy.
- Evaluation of the Sewage Sludge Directive 86/278/EEC: published in May 2023 – SWD/2023/0157 final https://environment.ec.europa.eu/topics/waste-and-recycling/sewage-sludge_en#contact
 - Conclusions: The Directive remains relevant but the set of pollutants which it regulates needs review, notably considering organic compounds, pathogens, pharmaceuticals, and microplastics which are present in sewage sludge. Sludge use in agriculture is relatively cost-efficient... but data are lacking on sludge use in agriculture (research is ongoing).
- Any revision of the Sewage Sludge Directive would require an impact assessment. (NB The revision of the UWWTD will already have implications for sludge quality and utilisation.)

Soil monitoring

- LUCAS 2018 soil survey: The main report https://esdac.jrc.ec.europa.eu/public_path/shared_folder/dataset/75-LUCAS-SOIL-2018/JRC_Report_2018%20LUCAS_Soil_Final-v2.pdf promised a separate report on AMR monitoring, but this has not yet been published.
- June 2023: [Soil microbial diversity at European scale: a first assessment - European Commission \(europa.eu\)](#) – see also paper: [Patterns in soil microbial diversity across Europe | Nature Communications](#)
- July 2023: Commission adopted proposal for a Directive on Soil Monitoring and Resilience (Soil Monitoring Law) https://environment.ec.europa.eu/topics/soil-and-land/soil-health_en - this is currently under negotiation. The proposal requires MS to select and determine the concentration of organic contaminants taking into account existing concentration limits, e.g. for water quality and air emissions, in Union legislation.

Thank you



© European Union 2020

