

Reducing Antimicrobial Discharges from Food Systems, Manufacturing Facilities and Human Health Systems into the Environment

Call to Action by the Global Leaders Group on Antimicrobial Resistance

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Disposal of untreated or inappropriately managed waste and runoff from various sources including food systems, manufacturing facilities and human health systems can contain biologically active antimicrobials, antimicrobial resistant organisms, unmetabolized antimicrobials and antimicrobial resistance determinants (e.g. resistance-conferring genes) that are released into the environment. These discharges can contaminate the environment and contribute to the spread of antimicrobial resistance (AMR). The most important approach to controlling AMR spread from food systems and human health systems is responsible and sustainable use of antimicrobials in humans, terrestrial and aquatic animals and plants/crops. In addition, adequate measures to treat and safely dispose of waste are required, including human, animal and manufacturing waste.

The GLG commends ongoing efforts - particularly by the G7 countries - to address antimicrobial discharges into the environment and encourages countries to implement the Codex Code of practice to minimize and contain foodborne AMR and Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance approved in November 2021.

To improve the management of discharges into the environment that may contribute to the emergence and spread of antimicrobial resistance, the Global Leaders Group calls for the following:

1 STRENGTHENED GOVERNANCE AND OVERSIGHT

In general, countries should:

- Develop or build on and implement regulatory frameworks, guidelines, standard operating procedures (SOPs) and standards to establish safe levels, better control and monitor the distribution and release of antimicrobials, antimicrobial resistant bacteria and antimicrobial resistance determinants from food systems, manufacturing facilities and human health systems into the environment; and
- Include prevention and management measures in national action plans on AMR to minimize the impacts of environmental discharges.

In the manufacturing sector specifically, countries should:

- Develop and implement legal and policy frameworks with a lifecycle approach for antimicrobials manufacturing. Such an approach considers the entire timespan that a pharmaceutical is active and can impact the surrounding systems, would help to effectively address AMR environmental risks and ensure resilient antibiotic supply chains and stimulate the design, development, manufacture, and commercialization of needed new antibiotics and alternatives to antimicrobials;
- Promote and develop balanced and staged environmental policies and approaches to manage and regulate manufacturing facilities and support environmental inspections, recognizing the current fragility of supply chains and significant access gaps;

- Incentivize industry for compliance and excellence, including highlighting their contribution to the achievement of the Sustainable Development Goals; and
- Develop national antimicrobial manufacturing pollution standards based on best available evidence, treatment technology and situational analysis, and strengthen the capacity of environmental authorities to conduct audits and monitor compliance.

In the human health sector specifically, countries should:

- Develop and implement antimicrobial stewardship policies and protocols in human health systems that include responsible and sustainable use and procurement of antimicrobials, and effective waste management approaches; and
- Implement and enforce laws and policies to reduce or eliminate antimicrobial use that is not under the guidance of a trained health care provider, while ensuring equitable access to quality antimicrobials.

In food systems specifically, countries should:

- Develop or build on and implement regulatory frameworks, guidelines, SOPs and standards to effectively treat and/or manage waste discharge from food-producing animal farms, aquaculture farms and crop fields, as well as waste used to irrigate crops and run-off from crop fields; and
- Develop and implement antimicrobial stewardship policies and protocols in fixed and mobile animal health facilities that include responsible and sustainable use of antimicrobials and effective waste management approaches.

2 IMPROVED SURVEILLANCE AND DATA AVAILABILITY

Countries should:

- Strengthen One Health surveillance of antimicrobial use in, and discharges of antimicrobials and AMR determinants from, food systems, human health systems and manufacturing facilities, as well as in sewage systems. This should be done taking into account factors such as the need to build on existing systems, cost-effectiveness, data comparability and key knowledge gaps relating to the fate, concentration and impact of discharges on the environment and organisms in the environment (e.g. soil microbes, aquatic organisms). Priority should be given to collecting data that can support targeted action, such as enhanced understanding of risks to human and animal health and the environment and release pathways into the environment, and supporting the development of guidance on waste management approaches and antimicrobial discharge limits; and
- Promote industry data disclosure, transparency and public access to waste and wastewater management data and mitigation practices in order to build credibility and public confidence. Data disclosure could initially be made to regulators and independent third parties (for example as part of certification schemes), followed by efforts to enable wider public access to increase awareness and understanding, contribute to ongoing studies and reflect environmental standards in procurement practices.

3 IMPROVED DISCHARGE MANAGEMENT

In general, all countries should:

- Reduce the need for antimicrobial use through implementation of effective infection prevention and control measures in all sectors, including water, sanitation and hygiene (WASH), vaccination, biosecurity and animal husbandry and welfare measures;
- Develop, implement and monitor systems for proper segregation, treatment and/or disposal of antimicrobials and antimicrobial-containing substances in all sectors (including antimicrobial feed and human and animal waste);
- Develop mechanisms for collection and proper disposal of unused and expired antimicrobials from individuals and organizations; and
- Ensure availability of affordable and environmentally safe incinerators and innovative technologies for destruction and degradation of unused or expired antimicrobials.

In general, relevant **international technical organizations and their partners** should develop guidance and showcase best practices on proper waste management practices across sectors.

In food systems:

All countries should:

- Create and implement manure, wastewater, runoff and farm waste management plans, SOPs, guidance, standards and measures such as composting for manure and its application into agriculture fields; and
- Implement evidence-based manure management approaches so that manure can continue to be safely used as a natural fertilizer in agriculture fields and support agro-ecological farming practices while minimizing the risks of transfer of antimicrobial resistant bacteria or antimicrobial resistance determinants.

International technical organizations should:

- Expedite the development of tools and guidance to support the implementation of the Codex Code of practice to minimize and contain foodborne AMR and Guidelines on Integrated Monitoring and Surveillance of Foodborne Antimicrobial Resistance along the food chain (e.g. food processing and production facilities, wet markets, slaughterhouses) to minimize the impacts of antimicrobial discharge into the environment.

Companies involved in the slaughter and processing of food animals should:

- Assess current food production practices to implement measures to reduce discharges of by-products, including biocides, into the environment and comply with legal standards and requirements.

In the manufacturing sector:

Manufacturing companies should:

- Commit to prevention and management measures to minimize the impacts of manufacturing discharges into the environment. This can be done through effective waste management technologies and practices, adoption and implementation of the [common antibiotic manufacturing framework](#) and the proposed independent certification schemes of the AMR Industry Alliance.

All stakeholders should:

- Evaluate options and support efforts to create an enabling environment that influences and supports investment through incentives and efforts in pharmaceutical waste management without jeopardizing access to antimicrobials. Such evaluations may include an assessment of sustainable procurement policies, inclusion of environmental considerations in good manufacturing practices, environmental risk assessment before antimicrobial authorization and an independent product-certification scheme.

4 RESEARCH AND DEVELOPMENT

International technical, financing and research and development organizations and partners should:

- Enhance and coordinate research for a comprehensive understanding of risks to human and animal health from the environmental presence of antimicrobials, resistance microbes and mobile genetic elements in discharges, as well as potential hot spots, environmental impacts and antimicrobial resistance pathways, and mitigation measures;
- Promote research and development across public and private sectors into cost-effective and greener waste management technologies including methods to remove antimicrobial residues, resistance genes and resistant organisms and other tools (e.g., climate-sensitive incinerators and measurement technologies) and standardized monitoring methods, and support mainstreaming of best practices in process and waste management across sectors; and
- Develop policy briefs on antimicrobial resistance and organize policy dialogues among policymakers to support evidence-based policymaking.