United Nations Environment Programme
9 March 2023

Committee of Permanent Representatives
Subcommittee Meeting
Thursday, 23 February 2023
14:00 – 17:00 (GMT+3)
Conference Room 1, United Nations Office at Nairobi
Hybrid meeting

Agenda item 4: Secretariat briefing on the UNEP report "Bracing for Superbugs: Strengthening environmental action in the 'One Health' response to antimicrobial resistance".

This note serves as an information background document on key messages on "Bracing for Superbugs: Strengthening environmental action in the 'One Health' response to antimicrobial resistance" for consideration of agenda item 4, whereby the Subcommittee will be provided a briefing on the UNEP report "Bracing for Superbugs: Strengthening environmental action in the 'One Health' response to antimicrobial resistance."

This document among other things identifies key actions and solutions including:

- Environmental monitoring and surveillance, disclosure, and transparency, including at every stage in the supply chains and governance structures.
- Establish international standards for what are good microbiological indicators of AMR from environmental samples, which can be used to guide risk reduction decisions and create effective incentives to follow such guidance.
- Collaborative immediate action by all stakeholders, especially Environment Ministries, to prevent and minimize environmental pollution to address the AMR crisis.
- Response must be based on One Health approach, recognizing the interdependence of human, animal, and plant health and environment, at the global, regional, and local levels from all sectors, stakeholders, and institutions.

Following the briefing, Member States and Stakeholders are invited to engage in an exchange of views with the Secretariat on the report.

Bracing for Superbugs: strengthening environmental action in the One Health response to antimicrobial resistance

Key Messages

What are antimicrobials?
Antimicrobials – antibiotics, antivirals, antifungals and antiparasitics – are medicines widely used to prevent and treat infections in humans, aquaculture, livestock, and crop production.

What is antimicrobial resistance (AMR)?
AMR occurs when microorganisms such as bacteria, viruses, parasites or fungi become resistant to antimicrobial treatments to which they were previously susceptible.

Increasing use and misuse of antimicrobials and other microbial stressors (e.g. the presence of heavy metals and other pollutants) creates favourable conditions for microorganisms to develop resistance.

Impact of AMR

- The World Health Organization (WHO) lists AMR among top 10 threats for global health.
- Limiting the emergence and spread of AMR is critical to preserving the ability to treat diseases, reduce food safety and security risks, and protect the environment.
- Without effective antimicrobials, modern medicine would struggle to treat even mild infections among humans, animals, and plants.
- In 2019, it is estimated that 1.27 million deaths were directly attributed to drug-resistant infections globally, and 4.95 million deaths worldwide were associated with bacterial AMR (including those directly attributable to AMR). Estimates suggest that by 2050 up to 10 million additional direct deaths could occur annually. That is on par with the 2020 rate of global deaths from cancer.
- In the next decade, AMR could result in a GDP shortfall of at least USD 3.4 trillion annually and push 24 million more people into extreme poverty.

AMR and the environment

- Global attention to AMR has mainly focused on human health and agriculture sectors, but there is growing evidence that the environment plays a key role in the development, transmission and spread of AMR and is a key part of the solution to tackle AMR.
- A multi-dimensional lens is required to understand AMR's development, transmission and spread in the environment.
- AMR is closely linked to the triple planetary crisis of climate change, biodiversity and nature loss, and pollution and waste, driven by human activity, unsustainable consumption and production patterns.
- Increased use and misuse of antimicrobials and other microbial stressors, such as pollution, create favourable conditions for microorganisms to develop resistance both in humans and the environment from sources such as sewage.
- Prevention is at the core of the action and environment is a key part of the solution to tackle AMR.

Climate change and AMR

- The climate crisis and AMR are two of the greatest and most complex threats the world currently faces. Both have been worsened by, and can be mitigated by, human action.
- Higher temperatures can be associated with increases in AMR infections, and extreme weather patterns can contribute to the emergence and spread of AMR.
- Antimicrobial impacts on microbial biodiversity may affect the cycles of carbon and methane, which are directly involved in regulating earth's climate.

Biodiversity loss and AMR

- Land-use changes and climate change alter soils' microbial diversity in recent decades, and microbes inhabiting natural environments are sources of pharmaceutical discovery.
- Municipal solid waste landfills and open dumps are prone to wildlife and feral animal interaction and can contribute to the spread of AMR.
- There is no evidence currently for the increase of AMR accelerating biodiversity loss.

Pollution and AMR

- Biological and chemical pollution sources contribute to AMR development, transmission, and spread.
- Three economic sector value chains profoundly influence AMR's development and spread:
  - Pharmaceuticals and other chemicals manufacturing
  - Agriculture and food including terrestrial animal production, aquaculture, food crops or those providing inputs such as feed, textiles, ornamental plants, biofuels, and other agricultural commodities.
  - Healthcare delivery in hospitals, medical facilities, community healthcare facilities and in pharmacies where a range of chemicals and disinfectants are used.

Global governance increasingly recognizes AMR's environmental dimensions

There has been growing attention to AMR from national governments, the private sector, and civil society. Internationally, the Quadripartite Alliance (FAO, UNEP, WHO, WOAH) coordinates action: The AMR Multi-Partner Trust Fund (2019), The Global Leaders Group created to advocate political action on AMR (2020), The Call to Action on AMR (2021), The Multi-Stakeholder Partnership Platform (2022) and the UN General Assembly resolution (2022) committing to a high-level AMR meeting in 2024.

Solutions

While the environment's significance in AMR remains understudied, actions required are clear.

- Environmental monitoring and surveillance, disclosure, and transparency, including at every stage in the supply chains and governance structures.
- Establish international standards for what are good microbiological indicators of AMR from environmental samples, which can be used to guide risk reduction decisions and create effective incentives to follow such guidance
- Collaborative immediate action by all stakeholders, especially Environment Ministries, to prevent and minimize environmental pollution to address the AMR crisis.
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Pharmaceutical sector:

- Strengthen regulatory frameworks and inspection systems, incentives, and subsidies for implementing upgrades in the manufacturing process.
- Ensure adequate waste and wastewater containment and treatment, and incorporate waste management into standard operating procedures used in the production of antimicrobials with a lifecycle approach.
- Further voluntary industry initiatives for reducing and managing discharge of antimicrobial compounds and applying it across manufacturing and supply chains.
- Promote sustainable procurement and reimbursement systems for manufacturers.

Food and agriculture:

- Revaluate antimicrobials limits and AMR development in food, soil, aquatic environment.
- Limit use and reduce discharges to protect water sources from pollutants, resistant microorganisms, and antimicrobial residue contamination.
- Improve the management of fertilizers of faecal origin.
- Apply infection control and prevention measures.
- Avoid in agriculture the use of antibiotics that correspond to those used as a last resort in human medicine.

Healthcare:

- Improve access to high-quality and sustainable water sources and sanitation.
- Install hospital-specific wastewater treatment systems, especially in locations without modern community wastewater treatment plants.
- Leverage hospital stewardship and infection prevention control programmes to limit environmental contamination by AMR pollutants.
- Ensure the safe and sustainable disposal, procurement, management, and treatment of antimicrobial medicines and disposal of healthcare facilities' hazardous waste.

Environmental governance

- Integrate environmental considerations into AMR National Action Plans and integrate AMR into national plans on chemical pollution management, nature and biodiversity, climate change.
- Identify policies and legislation to develop guidance to support management actions to reduce and minimize environmental releases of pollutants impacting AMR.
- Strengthen research and innovation frameworks for reducing use of antimicrobials and minimizing environmental releases of antimicrobials/resistant microorganisms.
- Strategies to prevent and respond to pandemics have benefits to addressing AMR.

Financing, innovation, and capacity to support environmental action

- Realign incentives in the three key economic sectors to reduce use of antimicrobials.
- Make the business case for public and private sector collaboration to guarantee sustainable funding, and invest in reducing environmental AMR risks.
- Eliminate harmful subsidies in agriculture, sustainable public procurements, green bonds.

Future data, information and knowledge needs

- Develop and integrate surveillance approaches, including transparency in data collection for AMR, AMU and antimicrobial residues across all One Health sectors.
- Clarify the role of the environment as affected by human activity (e.g. pollution) on AMR.
- Understand the relative importance (exact nature and magnitude) of each pollution source in causing global and regional exposure and the contribution to AMR in the environment and in local and specific ecosystem contexts.