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Task Force 01

FIGHTING INEQUALITIES, POVERTY, AND HUNGER

Impactful Approaches for Antimicrobial Resistance (AMR)

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Abstract

Antimicrobial resistance (AMR) has been considered one of the top global public health problems by the World Health Organization (WHO) since 1998. Nowadays, AMR is one of the major global health challenges, directly resulting in the deaths of more than 1.2 million people in 2019 (Antimicrobial Resistance Collaborators, 2022). By 2050, AMR could cause around 10 million deaths per year, exacerbating poverty and inequities, especially in low-income countries (LMIC) (World Bank, 2017). AMR is a natural process that happens over time through genetic changes in pathogens. Its emergence and spread are accelerated by human activity, mainly the misuse and overuse of antimicrobials to treat, prevent, or control infections in humans, animals, and plants (O'Neill, 2014).

In order to guarantee global sustainable access to effective antibiotics, protecting consumers and the environment, it is necessary to adopt an 'end-to-end approach' to antibiotic research and development to ensure that all regulatory changes, incentives, and interventions from the earliest stages of research to production, procurement, and use enable the end goal of ensuring sustainable access to affordable, high-quality and effective antibiotics, diagnostics, and vaccines for all.

It is also important to understand that AMR is a challenge that requires the One Health approach - an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals, and ecosystems - integrating the local, regional, national, and global levels — with the goal of achieving optimal health outcomes by recognizing the interconnection between people, animals, plants, and their shared environment (Collignon, 2013). In this way, it is necessary that all countries develop 'One Health national action plans on AMR,' adopting an overarching vision to have one goal across all sectors to work towards. Antibiotic resistance is inherently a cross-sectoral 'One Health' problem, requiring a 'whole of government' approach.



The countries should also commit to collect surveillance data from different sources (humans, animals, agricultural produce, meat, soil, and other environmental sources), which allows for meaningful analysis of cross-sectional data that can be used to inform international, national and local policies and practices.

Diagnoses of the issue

WHO defines AMR as the “ability to a microorganism prevents the action of an antimicrobial”. As a result, treatments become ineffective and infections become persistent and even incurable. Some resistance characteristics also apply to medicines used in treatment of viral, parasitic or fungal diseases. In that regard, AMR poses as a threat to human and animal health, food security and safety, as well as adverse environmental impacts (WHO, 2014).

Resistance arising in one geographical location or species can spread with ease to other geographical locations through movements of food, water, animals, and/or people; it can spill over into other species, impacting all the countries (FAO, 2016). The containment of AMR requires a global approach combined at the national and local level with concerted actions that span the policy and regulatory spheres and with preventive actions and engagement with communities.

A systematic analysis has shown that the global burden of diseases associated with drug-resistant infections assessed across 88 pathogen–drug combinations in 2019 was an estimated 4.95 million (95% UI 3.62–6.57) deaths, of which 1.27 million (0.911–1.71) deaths were directly attributable to drug resistance. In other words, if all drug-resistant infections were replaced by no infection, 4.95 million deaths could have been prevented in 2019, whereas if all drug-resistant infections were replaced by drug-susceptible infections, 1.27 million deaths could have been prevented. Compared with all underlying causes of death in Global Burden of Disease (GBD) 2019, AMR would have been the third leading GBD Level 3 cause of death in 2019 on the basis of the counterfactual of no infection. Additionally, the analysis showed that AMR all-age death rates were highest in some low and middle-income countries (LMIC), making AMR not only a major health

problem globally but a particularly serious problem for some of the poorest countries in the world (Antimicrobial Resistance Collaborators, 2022).

WHO, the Food and Agriculture Organization (FAO), the World Animal Protection (WAP), and numerous other groups and researchers agree that the spread of AMR is an urgent issue requiring a global, coordinated action plan to address (FAO, 2016; Prestinaci, Pezzotti, Pantosti, 2015; WHO, 2021).

Recommendations

AMR is a multisectoral problem encompassing the interface between humans, animals, and the environment. The fact that human and veterinary health, food and feed production systems, and agroecological environments all contribute to and are affected by AMR indicates the need for a multisectoral and multidimensional 'One Health' approach to curb its occurrence. It involves a coordinated, collaborative, multidisciplinary , and cross-sectoral approach. Therefore, everybody - in all sectors and disciplines, including the G20 group - should be engaged in the reaffirmation of the Global Action Plan. This includes the development and/or the implementation of national actions on AMR by all countries and the development of an international network to monitor the data and reach out to the advances of AMR actions around the world.

The following main axes must be related to the AMR actions listed below to be adopted by countries:

- Improve awareness and understanding of AMR and related threats through effective communication, education, and training:
 - Develop public communication programs that target different audiences in human and animal health and agricultural practice, as well as consumers. The inclusion of the use of antimicrobial agents and resistance in school curricula will promote better understanding and awareness from an early age.
 - Making AMR a core component of health, veterinary and agricultural professional education, training, and certification will contribute to ensure proper understanding and awareness among professionals.
 - Guarantee the inclusion of AMR in high-level meetings of G-20 and other international discussions and meetings.

- Strengthen the knowledge and evidence base through surveillance and research and the monitoring of AMR use:

- Actions and investments to tackle antimicrobial resistance should be supported by clear rationales for their benefit and cost-effectiveness. National governments, intergovernmental organizations, agencies, professional organizations, nongovernmental organizations, industry, and academia have important roles in generating such knowledge and translating it into practice.

- Adopt an 'end-to-end approach' to antibiotic research and development (R&D) to ensure that all regulatory changes, incentives, and interventions from the earliest stages of research to production, procurement, and use enable the goal of ensuring sustainable access to affordable, high-quality and effective antibiotics, diagnostics, and vaccines for all.

- Increase low-and middle-income countries' involvement in global R&D and production of antibiotics.

- Ensure that initiatives to control the use of antimicrobials in animal health are based on scientific evidence.

- Reduce the incidence of infection through effective sanitation, hygiene, and infection prevention measures:

- Improve water, sanitation, and hygiene (WASH) infrastructures, in particular in health-care facilities.

- Recognize the influence of social determinants of health, especially those related to development challenges, on national capabilities to respond to AMR.

- Increase global vaccination coverage and ensure affordable access to critical vaccines with the potential for lowering antibiotic use.

- Strengthen infection prevention and control (IPC) efforts and initiate systematic monitoring at the global level to track national IPC.
- Strengthen governance on AMR:
 - Develop strategies to strengthen global and national governance mechanisms that ensure political prioritization of AMR.
 - Develop studies on regulatory approaches to AMR.
 - Develop studies on the use of antimicrobials and the economic impact of a reduction in the use of antimicrobials as growth promoters when using possible alternatives.
- Develop a publicly accessible repository of scientific and technical information on AMR and other data relevant to the agenda.
- Advance on revision and/or development of legislation that meets international guidelines/standards, and to strengthen national and regional regulatory capacity on AMR-related areas.
- Create accountability mechanisms that allow civil society and communities to monitor the advance of AMR programs.
- Promote good practices in food and agriculture systems and the prudent use of antimicrobials:
 - Develop and apply educational and training materials on responsible use of antimicrobials, the importance of preventing infections in animals, biosecurity, good agricultural practices, and other measures to control the spread of resistant microorganisms throughout the food chain and the environment.
 - Develop the economic case for sustainable investment that takes into account the needs of all countries and develop strategies to increase investment in new medicines, diagnostic tools, vaccines, and other interventions:



- Develop studies about the economic impact assessments and socioeconomic burden of AMR, as well as the cost of doing nothing against the cost and benefit of action.
- Invest in the development of new antimicrobial medicines, as well as in diagnostic tools and vaccines.

Scenario of outcomes

Despite the development of proposals and initiatives to combat AMR over the last few years, progress has been slow in part because of inadequate monitoring and reporting at national, regional, and global levels and, in another part, because of inadequate recognition of the need for urgent action.

Effective strategies for coping with AMR also involve topics of greater sensitivity, especially for LMICs, such as offering new medicines to replace resistant drugs, reducing the extensive use of antimicrobials in agriculture, and creating a global investment innovation fund. These are themes with potentially large impacts on LMIC because, regarding the development and supply of new medicines, there is a natural concern about their price. Decoupling research and development costs from price and sales volume is, for this reason, fundamental to facilitating equitable and reasonably priced access to new medicines, vaccines, and diagnostics. This position, however, does not find consensus, especially among countries developed with large pharmaceutical industries.

On the one hand, the pharmaceutical industry justifies the gap in innovation due to low incentives for the development of innovative medicines and diagnostic methods; on the other hand, the most vulnerable populations with limited access to health systems suffer from problems resulting from low investment and reduced commercial interest, due to the high price for developing new drugs. In turn, governments in LMIC lack financial and technological mechanisms that shorten the distances between suppliers and demanders of these health supplies.

Restricting or banning the use of antibiotics in animal production is also a controversial topic, with hard progress between countries due to interference from agribusiness. Since 2016, the European Union has banned the use of antimicrobials as growth promoters in

agriculture. The European Union is the largest food importer in the world, although a significant part of the food imported by its members comes from other European countries. For this reason, the possible European restriction on imports from foreign markets that continue to use additives of this type could represent a favor to European producers.

Thus, conflicts of interest between global health, pharmaceutical industry and agribusiness can represent an obstacle to the consolidation of a definitive perspective on this agenda at a global level. The proposed approach to tackling AMR, marked by its multisectoral nature, adds challenges to the search for consensus.

The balance between the effectiveness of antimicrobials and expanding access to medicines, vaccines, and diagnostic methods is a fundamental part of promoting universal access to health. Added to this scenario are the challenges of building and implementing national plans to combat AMR in a coordinated and objective manner. It is up to countries to promote the improvement of antibacterial resistance surveillance, collaboration between networks and research centers in this matter, and the integration between human and animal health.

It is necessary to continue expanding dialogue between countries, civil society, communities, academia, and different sectors of government on this matter, in addition to monitoring and improving existing national and international actions. Maintaining political commitment and allocating financial resources for the implementation of impactful approaches will be essential to ensure the effective fulfillment of commitments on AMR.

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