



Editorial

Creating political commitment for antimicrobial resistance in developing countries

Apart from being a serious health challenge in human and animal health, antimicrobial resistance (AMR) is impacting the global economy as well as development. AMR has been recognized by the policy makers worldwide as an immediate challenge that requires aggressive and coordinated response from the global community. Accordingly, AMR has been a subject for discussion and swift action in the United Nations General Assembly¹ and several other economic and political fora. Intercountry technical agencies, namely the World Health Organization (WHO)², the Food and Agriculture Organization of the United Nations (FAO)³ and the World Organisation for Animal Health (OIE)⁴, have been continuously advocating with their Member States to mount an effective response to this burgeoning problem. The WHO Global Action Plan on AMR⁵ was developed and endorsed by the World Health Assembly in 2015. The FAO and OIE also endorsed it in the same year and called on all countries to develop their respective national action plans on AMR within two years.

AMR affects vital components of human development

According to O'Neill report⁶, every year, about 700,000 people worldwide succumb to infections due to resistant pathogens and this number shall climb to 10 million by 2050⁶ if adequate measures are not taken in a time-bound and organized manner. As expected, countries that have inadequate resources, skills and awareness shall suffer most. The economic impact of AMR is staggering. Till 2050, the cost of inaction to combat AMR shall approximate USD \$100 trillion with a decline in global gross domestic product on 3.5 per cent; 28 million people are likely to be pushed into poverty due to AMR⁷. The World Bank also estimates that the global food security shall also

get impacted due to an estimated reduction in food-producing animals by 7.5 per cent⁷.

It is well-established that people who are hospitalized with infections due to resistant pathogens stay longer in the hospitals, warrant additional investigations and require treatment with expensive and at times potentially toxic drugs. Health system as well as such patients will have to spend substantially more money on treatment thus having an adverse effect on the society. The governments may be thus forced to divert funds from other development projects to healthcare facilities to provide effective treatment services. Epidemiologically, these patients act as reservoirs of pathogens for a much longer time thus facilitating sustained transmission of infections.

Significant progress has been made in the past few decades in containing HIV infection, TB and malaria. Emergence and spread of resistant causative agents of these diseases can negate the progress made and undo the huge investments that have gone into controlling these diseases. AMR may hamper efficient implementation of the universal health coverage (UHC) which is considered as an ambitious public health programme with the potential to reduce poverty⁸.

It is estimated that by 2020 there would be a 60 per cent increase in the global meat demand⁹. This increase is due to improved economic condition of millions of people in the developing world who demand proteins of animal origin to keep themselves and their families healthy. Lesser availability of food of animal origin shall diminish accessibility along with an increase in its price thus hitting poor communities hardest. The safety and purity of food may become questionable. At present, huge quantities of antibiotics are used as growth promoting agents in animals as a cheap replacement of sanitation and clean environment.

This is single biggest driver of AMR. Success stories from several European countries¹⁰ in eliminating the growth-promoting use of antibiotics need to be adopted by all countries.

Non-human sources of antibiotics, resistant bacteria and resistant genes found in aquaculture, wastewater from agriculture and waste products from pharmaceutical act together as a conducive environment for the transmission of genes between several organisms including pathogens thus generating multi drug-resistant pathogens¹¹. This is hitherto neglected area that needs immediate attention of regulatory authorities as well as scientists. The environment is key to the spread of resistance by these mechanisms and issues related to it must be holistically addressed. It needs to be emphasized that multidrug/poly-resistant organisms have been existing in nature for billions of years, they harbour such genes for their survival from other organisms which produces antibiotics/other biochemical moieties for supremacy in environment. Most of them are not pathogens and proper aseptic procedures/precautions can prevent such infections. Many antibiotics are being used unnecessarily and without scientific evidence, especially in intensive agriculture and the veterinary sector. Colistin, an antibiotic of the last resort for humans, is still being used in food-producing animals. With the emergence of colistin-resistant bacteria in China¹² and its rapid spread to several other countries, the world is at risk of losing the last life-saving antibiotic for some severe infections. This is a warning that other important antibiotics may also become ineffective.

The way forward: Strong political commitment

Because AMR is a complex, multi-sectoral problem, there are no easy solutions. Stopping its spread requires strong political commitment that enables local evidence-based solutions since the factors that contribute to it are context-specific. National and international cross-sectoral coordination mechanisms that engage all government agencies, the private sector, civil society and professional groups need to be harmonized to address AMR.

Addressing the rising threat of AMR requires a holistic and multi-sectoral implementation in the true spirit of the One Health approach¹³ integrating mainly human and animal health, and encompassing a wide array of environmental concerns. Containing AMR requires a whole-of-society approach, with major roles for political, financial, technical, regulatory,

programmatic and educational actors. The government, the private sector, academia, the pharmaceutical industry, communities, civil society and international partners will have to cooperate and collaborate on a sustainable basis to combat AMR by keeping the issue high on national development agendas.

A stepwise approach to a national strategy implemented through a well thought out and adequately funded programme with a focus on the generation of evidence to guide action, guided by a contextualized and prioritized roadmap, blessed by the top political and administrative authorities will be the appropriate approach. The comprehensive programme should include several actions directed towards improved healthcare infrastructure; ethical drug promotion; surveillance of AMR and antibiotic use in all sectors, prudent antibiotic use in humans and animals; effective infection prevention and control practices; antibiotic stewardship programmes in all healthcare facilities; and appropriate management of patients with resistant organisms through an efficient health system.

The health system must also ensure equitable access to antibiotics, their optimal use at all levels, surveillance and effective regulatory mechanisms. Insufficient access to antibiotics remains a major concern in many resource-poor settings. The number of children dying because of inadequate access to simple affordable antibiotics is around a half million per year¹⁴. The rational use of resources based on need, by all segments of society, will save many lives and ensure the best returns from antibiotic use. AMR thus has strong linkages with the tenets of universal health coverage, which can provide a strong platform to antibiotic stewardship across all settings where antibiotics are used. Efficient implementation of UHC by ensuring sustained access and rational use of affordable antibiotics can significantly contribute to minimizing AMR. The promotion of best practices focused on asepsis will also bring rich dividends and reduce unnecessary use of antibiotics and antiseptics which further complicate the scenario.

Surveillance of AMR and antibiotic consumption is an ideal indicator for monitoring the dynamics of AMR and providing information on trends and magnitude. These activities require appropriate infrastructure, skilled human resources and accepted methodologies for the continuous generation of reliable data on the burden of AMR and the impact of interventions. Reductions in resistance and in consumption of

antibiotics are desired outcomes. The WHO has established the Global AMR Surveillance System to foster standardized surveillance and monitor global trends in AMR¹⁵.

Poor quality antimicrobial preparations facilitate the emergence of resistance. The functional regulatory mechanisms are prerequisites to assure the availability of drugs that are potent, safe, sold in ethical ways and prescribed in accordance with evidence-based guidelines. Many developing countries may need international support for the establishment of efficient regulatory systems in the health and veterinary sectors. The availability of antibiotics without prescription, along with prevailing myths on how to take antibiotics, has fuelled rampant misuse of these medicines by communities that are not aware of AMR and its ramifications.

AMR cannot be solved by the development of new classes of antimicrobial medicines alone. However, new drugs against multi-resistant pathogens are still needed to reduce the burden of diseases and to have access to effective therapeutic options against infections. Discovery, development and distribution of novel antimicrobials and associated business models face unique technical, financial, and ethical challenges. Because drug development is a resource-intensive process, the developed world must lead in this area. It is also critical that new drugs are made affordable for the developing world. There has been a steep decline in R&D of new classes of antibiotics during the past three decades¹⁶; this situation must be swiftly reversed.

The collaboration between the pharmaceutical industry and academia, encouraged by national authorities, can reignite the development of new classes of antimicrobials or alternatives to keep pace with the emergence of resistance. Public-private partnerships must be explored and encouraged, especially with respect to regulatory activities, to strengthen the interface between industry and academia and to accelerate the availability of affordable antibiotics.

The private sector plays a significant role in delivering healthcare to people in many countries. In some settings, including India, more than two-third of all healthcare, even to the poorest people, is provided by private and other non-State actors. All these extensively use antibiotics and thus have a potential role in containing the spread of AMR. Any national effort directed towards AMR should necessarily engage the private sector in both thought process and action to achieve tangible results.

The education of professionals (health, animal health and dentistry) is also important. Continuing education and inclusion of this subject in the curriculum of graduate education will inculcate behaviour change that will enable optimal use of antimicrobials. Professional associations can provide a valuable platform for imparting information and ensuring best practices in the prudent use of these medicines by providing guidelines and updating them periodically especially in settings where antimicrobial susceptibility services are not available, but antibiotics should be accessible to people and practitioners to save lives.

Self-medication by consumers and failure to adhere to recommended regimens is widespread, especially in developing countries. Consumers often have poor understanding about antimicrobial medicines and the diseases these are used to treat. However, changing human behaviour to ensure optimal use of medicines is extremely challenging. It requires concerted efforts using the skills of behavioural scientists to change norms and practices. Civil society that is firmly engaged with communities can play a vital role in facilitating behavioural change in the use of antimicrobial medicines. The role of civil society in national planning and implementation activities is also essential. Mass media have a powerful voice that is heard by most people. The need for sustained partnerships with mass media cannot be overemphasized.

The most developing countries need technical and financial support. International development partners can provide invaluable facilitation of activities in countries where resources or expertise is limited.

Conclusion

AMR is the biggest threat the world is facing in control of infectious diseases. It already affects the entire world. Further, the cost of inaction may culminate in a horrific post-antibiotic era. Combating AMR requires sustained national efforts and worldwide collaboration to generate the resources needed to preserve the efficacy of antimicrobials and to create new diagnostic and therapeutic tools to protect the health of all people, as enshrined in the UN Sustainable Development Goals and articulated in paragraph 26 of the political declaration on these goals¹⁷. It is a battle that must be vigorously fought and won. Strong political commitment at highest level in all developing countries is a prerequisite and key to success.

Conflicts of Interest: None.

Rajesh Bhatia^{1,*}, Vishwa Mohan Katoch² & Hajime Inoue³

¹WHO Regional Office for South East Asia,
²Indian Council of Medical Research,
 Department of Health Research, Ministry of Health
 & Family Welfare, New Delhi, India &
³WHO Headquarters, Geneva, Switzerland
 *For correspondence:
 drrajesh.bhatia1953@gmail.com

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