



Antimicrobial resistance: a global one-health problem for all ages

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Antimicrobial resistance (AMR) has been declared a major threat to global health, with the potential to reverse advances in treating disease, and impeding other global priorities including human development. The urgent menace of AMR has been recognized by the World Health Organisation Global Action Plan in 2015 [1], the 2016 United Nations General Assembly unanimous commitment to tackle AMR [2], and the Association of Southeast Asian Nations (ASEAN) 2017 declaration on AMR [3]. AMR has been highlighted as a major health and economic challenge, with the consequences of failing to meet that challenge falling upon our children and grandchildren. Not only will children bear the burden of rising AMR, they are especially at risk now due to a number of factors. In many studies, children and the elderly are the highest consumers of antimicrobials [4]. In addition, frequently inappropriate doses in children mean that they are receiving sub-therapeutic doses, maximizing the chance of encouraging resistant organisms to flourish. The normal behaviour of early childhood also encourages the spread of resistant organisms between children. Finally, their lifetime risk of exposure to resistant organisms is higher than adults.

The challenge posed by AMR includes scientific, economic, communication, and information components [5]. Scientific challenges include the lack of knowledge at the time of prescribing whether antibiotics are needed at all, as well as which antimicrobial, what dose and for how long. Economic challenges include the lack of incentive for discovery researchers and industry to invest in new

antimicrobials, as well as the widespread use of antibiotics in agriculture, animals, and aquaculture. Other economic issues include equity in availability not only of antimicrobials, but also of vaccines and effective alternatives to antibiotics. Communication challenges include how to inform the community and health care workers when antimicrobials are not indicated. Information components include the lack of knowledge (surveillance) in many settings what the resistant status of organisms are to common antimicrobials.

Initial steps to combat AMR are beginning to emerge. The concept of a whole-of-system “One-Health” approach has been embraced to address all aspects of antimicrobial use and consequences [6]. These steps revolve around guiding principles of: improved awareness and understanding of AMR; improving surveillance and research; reducing the incidence of infection; optimizing the use of antimicrobials, and; developing the economic case to equitably address development of new antimicrobials, improved infection diagnostic tools, vaccines, and alternative interventions. Critically, these include efforts to control the use of antimicrobials in farming and livestock.

Economic initiatives include the Global Antimicrobial Resistance Research Innovation Fund jointly established by China and the UK. The majority of governments at the 70th World Health Assembly reported that a multi-sectoral AMR plan was established or in development. However, disadvantaged countries were less likely to have a plan [7].

The World Society for Pediatric Infectious Diseases (WSPID) is a coalition of all of the regional pediatric infectious diseases societies. The WSPID declaration on AMR in this issue of the journal was ratified at its Shenzhen Congress in December 2017. The declaration highlights the guiding principles for combating AMR globally, and provides illustrations of how it and its member societies can assist in combating AMR, and improving the future for those most at risk of AMR, our children.

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