1. What is AMR?

Antimicrobials are used to protect human, animal and plant health from pathogenic microbes. AMR occurs when bacteria, viruses, fungi and parasites no longer respond to antimicrobial medicines. As a result, antibiotics and other antimicrobial medicines become less effective or completely ineffective in treating infections, increasing the risk of disease spread, severe illness, disability and death. 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.[5]

2. Antimicrobials as critical social infrastructure

Antimicrobials, particularly antibiotics, save lives from infectious diseases and are estimated to add an average 20 years to life expectancy around the globe.[6] Antimicrobials are a foundation of modern medicine and have become a critical part of the infrastructure of modern society, as well as a global public good.[7] It is estimated that a total of 5 million global deaths were associated with AMR in 2019, including some 1.3 million deaths that were directly attributable to bacterial AMR, exceeding the number of people who died from HIV/AIDS or malaria.[8] This is a stark reminder of the efficacy of current antibiotics. In the 2019 Global Burden of Disease (GBD) study, AMR was the third-highest underlying cause of death behind ischaemic heart disease and stroke.[9] According to the study, between now and 2050, almost 38 million people could die from drug resistance. By 2050, the annual numbers of deaths attributable to and associated with AMR could rise to 1.9 million and 8.2 million, respectively. The number of deaths directly attributable to AMR bacterial infection is expected to increase by 70 per cent between 2021 and 2046.[10] AMR could reduce life expectancy globally by 1.8 years over the next decade without proper action.[11] The "Grand Pandemic" is here.[12]

Meanwhile, no new classes of antibiotic have been discovered since the 1980s. Discovering and developing new antibiotics is challenging. It can take 10-15 years and cost more than US$ 1 billion to bring a new antibiotic to market. Many major manufacturers have pulled out of antibiotic development, while some

[5] See WHO (2023).
[6] See Hutchings, Truman and Wilkinson (2019).
[7] See World Bank (2024).
[8] See Antimicrobial Resistance Collaborators (2022).
[9] See World Bank (2024).
[10] See GBD 2021 Antimicrobial Resistance Collaborators (2024).
[11] See Global Leaders Group on Antimicrobial Resistance (2024).
[12] Ibid.

have even gone bankrupt. In the 1980s, there were 18 multinational companies committed to antibiotic research; today, there are only a handful.[13] This is because a volume-based model that supplies a large quantity at a lower price does not preserve the efficacy of precious new antibiotics, while a value-based model that provides a small quantity at a higher price does not ensure equitable and secure access to drugs for patients when they need them. The market-based system does not function for manufacturers of new antibiotics.

Global health officials are concerned that the lack of new antibiotics will exacerbate the rise in AMR.[14] To tackle this market failure, organisations such as the Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator (CARB-X) and the Global Antibiotic Research & Development Partnership (GARDP) are offering "push" incentives to support innovation and development from the early stages by lowering developers' costs and risks with financial support. Meanwhile, the United Kingdom has adopted a new "pull" payment model to reward makers of new antibiotics that have successfully proven their drugs' scientific value, viability and market relevance by awarding them government procurement contracts. Similar efforts are ongoing in Sweden, Germany and the United States of America. These programmes aim to incentivise research and innovation in the antibiotic sector by providing a guaranteed financial return and de-linking price from volume.

While global efforts to bring new antibiotics to market are crucial, preventing infectious diseases in the first place and preserving the efficacy of existing antimicrobial medicines are urgent tasks. People die from a lack of timely access to antibiotics. Globally, the 5.7 million deaths per year from treatable bacterial infections exceed those from AMR infection.[15] The majority of treatable bacterial infectious deaths occur in LMICs, so interventions to ensure timely access to quality antibiotics backed by supporting microbiology laboratory infrastructure to ensure appropriate antibacterial choice are essential in these countries (see Section 12).

[13] See Wellcome (2023).
[14] See Janković (2024).
[15] See CDDEP (2019).