



Antimicrobial resistance: A growing threat to global health

Context

Antimicrobial resistance (AMR) — when microorganisms mutate and develop the ability to withstand the effects of medicines designed to kill them — contributes to at least 700,000 deaths globally every year.^[1] By 2050, this figure could stand at 10 million — with most lives lost in low and middle income countries (LMICs)^[2] — and AMR could cost the global economy US\$100 trillion (£805 billion).^[3]

Although AMR is a naturally occurring phenomenon, the scale and speed with which microbes are developing resistance has accelerated in recent years. This is due to a range of human and environmental factors, including:

- increased use of antimicrobial drugs (contact between the microbe and the drug drives mutation)
- unregulated dispensing of drugs and misuse of medicines
- poor quality and falsified drugs

- overuse and misuse of antimicrobials in animal husbandry, livestock and aquaculture
- environmental contamination with drugs
- overreliance on antimicrobials to control infection
- poor attention to hygiene and infection control, exacerbated by a lack of access to safe water and sanitation.

AMR threatens to reverse decades of progress across the health and environmental sectors. Medicines to treat bacterial (e.g. tuberculosis or pneumonia), parasitic (e.g. malaria), viral (e.g. HIV) and fungal (e.g. *Candida auris*) infections are all vulnerable. To add to the threat, there are very few new antimicrobials being developed; only one major new class of antibiotics has been identified since 1987.^[4] Without effective antimicrobials to prevent and treat infections, surgery becomes riskier, prolonged sickness will negatively impact human and animal productivity, and treatment costs will soar. Without urgent action, millions of lives will be at risk and economies will suffer.



Options for tackling AMR

Given the multifaceted nature and impact of AMR, in 2015 a cross-sectoral 'One Health' approach was endorsed by a Tripartite Collaboration between the World Health Organization (WHO), the Food and Agricultural Organization and the World Organization for Animal Health. This collaborative, multidisciplinary and holistic approach to improving health and wellbeing is especially appropriate for tackling threats that are not confined by geographical or physiological borders, such as AMR. It will see stakeholders from various sectors — including human and animal health, aquaculture, agriculture, water, sanitation and hygiene, environmental health and food security — jointly pursue initiatives to ensure that antimicrobials continue to be effective for treating human and animal diseases, to promote their responsible use, and to guarantee good quality medicines are available globally.

Studying the acceptability and usability of new pneumonia diagnostic aids

Frontline health workers in LMICs tend to diagnose pneumonia through manually counting children's respiratory rate (RR), which often leads to misdiagnosis and inappropriate treatment. Our findings from training frontline health workers in Ethiopia and Nepal to use an automated RR counter (Phillips ChARM) and a multimodal pulse oximetry-RR device (Masimo Rad-G) to classify and treat fast breathing — a symptom of pneumonia — suggest that such diagnostic aids could improve the accuracy of pneumonia diagnosis and, thus, contribute to reducing AMR.^[5]

Our position

As a leading technical organisation specialising in the prevention, control and treatment of malaria and other communicable diseases, we are gravely concerned about the impact of AMR on public health, including ongoing malaria control and elimination efforts. While more people in LMICs are currently dying from a lack of access to appropriate treatment than from AMR,^[6] this is likely to change unless a One Health approach and strong coordination mechanisms are fully embedded at local, national and global levels.

To this end, we fully support the objectives set out in the Global Action Plan on AMR:

- to improve awareness and understanding of AMR
- to strengthen knowledge through surveillance and research
- to reduce the incidence of infection
- to optimise the use of antimicrobial agents
- to develop the economic case for sustainable investment, while also increasing investments in innovations (e.g. medicines, tools, vaccines and other interventions).^[7]

Based on these objectives, we believe that to tackle AMR the global community urgently needs to:

- **support LMIC governments to develop and implement evidence-informed national AMR action plans.** Without these, countries will struggle to achieve universal health coverage (UHC).
- **invest in increased surveillance** to monitor and respond better to AMR patterns, drivers and epidemiological trends. This may require building LMICs' capacity for surveillance — including quality-assured laboratory testing and routine data reporting — and for data-informed decision making. National surveillance efforts should also be aligned with WHO's Global Antimicrobial Resistance Surveillance System to improve global coordination and increase the likelihood that trends are spotted and acted upon early.

- **support the regulation of antimicrobial quality and use.** Only quality-assured antimicrobials should be dispensed following a prescription from a trained health professional, as the unregulated sale of drugs over the counter is associated with misuse.^[8] Administration of antimicrobials in community-based primary healthcare programmes should follow diagnostic and treatment algorithms that have been validated to achieve high care quality in that setting. Communities should also be sensitised to how to access and use drugs correctly within the new regulatory environment.
- **support the development and use of accurate diagnostic aids,** such as rapid diagnostic tests and automated respiratory rate counters, to correctly diagnose febrile diseases and determine the most appropriate treatment regimes.
- **invest in community-based primary healthcare programmes** to simultaneously achieve UHC and improve the rational use of drugs. High-quality, integrated community case management, especially when combined with community mobilisation, is an effective way to ensure that remote and marginalised communities have access to accurate diagnosis — based on diagnostic aids — and treatment for common childhood diseases such as pneumonia and diarrhoea. This approach will also reduce the incorrect prescription of medicines by informal care providers and the misuse of medicines by community members.
- **invest in and implement social and behaviour change activities** at the community level to increase awareness of AMR, shape related social norms and change contributing behaviours. More research is needed to identify what drives behaviour — on both supply and demand sides — and how collective action approaches can be scaled up and sustained.
- **fund the development and roll out of new vaccines and treatments** to prevent the outbreak of deadly diseases and reduce the pressure on existing antimicrobials.

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