Addressing antimicrobial resistance: we know enough to act

Policy Brief

The Academy of Medical Sciences

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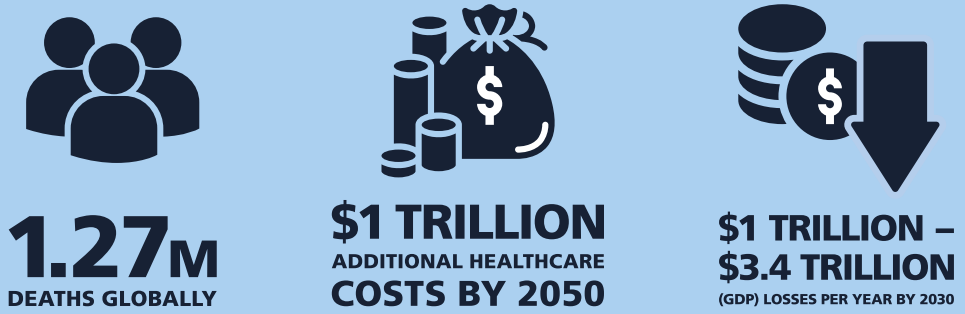
Introduction

A policy workshop with experts from India and the UK has identified a range of areas where action against antimicrobial resistance (AMR) should be intensified.

The rise and spread of AMR is already having an impact globally, in terms of both human and economic costs. AMR threatens our ability to treat infections and if not addressed, is a challenge that will get worse in the future.



In 2019, 1.27 million deaths globally were directly attributable to AMR, out of a total of approximately 4.95 million deaths associated with AMR. The economic impact of AMR is also significant and is estimated to cost US$ 1 trillion of additional healthcare costs by 2050, and US$ 1 trillion to US$ 3.4 trillion gross domestic product (GDP) losses per year by 2030[1], due to additional treatment costs and lost productivity. This burden does not fall equally across the world and, similarly to the climate crisis, **drug-resistant infections disproportionately impact the poorest and most marginalized groups in society**.

To assess the current challenges and explore emerging opportunities, the **Indian Council of Medical Research (ICMR)** and the **UK Academy of Medical Sciences** held a policy workshop focusing on AMR interventions, in May 2024. This workshop was part of an India–UK programme on AMR, which aimed to share knowledge and create opportunities for collaboration between both countries. It followed an interdisciplinary One Health symposium on AMR with case study presentations from a range of experts from India and the UK, also hosted in partnership with the ICMR and UK Academy.

During the workshop, participants emphasized the need to address the inequalities related to AMR. Solutions to and research for addressing AMR must not lead to increased inequalities and should consider the relative impacts by gender, ethnicity, and socioeconomic status. Actions to address existing inequalities can have wide-reaching benefits not only in tackling AMR but also other health, social and economic benefits.

1. World Health Organization (2023). *Antimicrobial resistance*. https://www.who.int/news-room/fact-sheets/detail/antimicrobial-resistance

Priority policy areas

Participants identified several policy areas where action should be prioritized:

Embed AMR as part of the broader public health agenda and intensify investment in and access to interventions that reduce infection rates in humans and animals.

AMR has been considered in isolation for too long, despite its connections to poverty and access to fundamental human rights such as clean water and healthcare. Efforts to integrate AMR within the broader public health agenda will reinforce the case for prioritizing and investing in infection prevention and control (IPC) measures in communities. This includes through improving infrastructure for accessing clean water and sanitation/hygiene (WASH) services – particularly applicable in the Indian context – and enhancing healthcare provisions such as vaccination.

Create empowered accountable coordinating structures spanning human health, animal, and environmental sectors at subnational, national, and international levels.

An effective response to AMR requires leadership from governing bodies and coordinated action across multiple sectors. This may involve rethinking the structure of current governing bodies and where AMR sits within them. It is essential that development and implementation of AMR control strategies are sufficiently funded and are based on robust cross-sectoral overarching governance mechanisms and accountability frameworks at the subnational, national, and international level. The integrated action plan developed by Kerala State was felt to be an exemplary model incorporating effective cross-sector integration and strong monitoring and accountability mechanisms.[2]

Develop a national regulatory framework to ensure appropriate use of antimicrobials in humans and animals, supported by effective systems for monitoring antimicrobial use.

Every use of an antimicrobial increases the risk of selection for resistant microbes. Systems are needed to ensure the appropriate, evidence-based use of antimicrobials in humans and animals, coupled with access to rapid and affordable diagnostics. National monitoring systems that integrate disparate data sets are needed to track antimicrobial use in human and animal settings to ensure a coordinated approach and to provide a reliable estimate of antimicrobial use. This regulation must not increase inequalities in access to antibiotics, and other systems (which enable good WASH and IPC standards, for example) must be in place to ensure there is no unnecessary loss of life. The Global Antimicrobial Stewardship Accreditation Scheme (GAMSAS) was presented as an example of an accreditation scheme that promotes antimicrobial stewardship in healthcare services globally, as well as contributing to global data collection and surveillance.[3]

2. Government of Kerala (2018). *Kerala antimicrobial resistance strategic action plan.* https://cdn.who.int/media/docs/default-source/searo/india/antimicrobial-resistance/karsap-keralaantimicrobialresistancestrategicactionplan.pdf?sfvrsn=ccaa481a_2
3. Sneddon J, *et al.* (2024). *Accreditation of antimicrobial stewardship programmes: addressing a global need to tackle antimicrobial resistance. JAC-Antimicrobial Resistance*, **6(1)**, dlae007

Empower primary healthcare and communities to take increased action against AMR, backed up by education of all stakeholders supporting health and wellbeing at this level.

Secondary and tertiary healthcare has been a major focus of AMR control and there is a need to strengthen actions and interventions at the primary care, pharmacy, and community levels to minimize infectious disease burdens and ensure appropriate wider antimicrobial use. This requires concerted efforts to ensure that all those contributing to healthcare in these settings, formally and informally, are aware of key AMR issues and their responsibilities, and have the capacity to promote good antimicrobial practice, supported by easily accessible technological and systems innovations such as rapid diagnostics at the point of care. Initiatives such as Superheroes Against Superbugs were discussed in the group as an example to demonstrate how creative approaches can engage and raise awareness among young people, as part of efforts to mobilize community action in support of AMR objectives.[4]

Strengthen veterinary support and develop coordinated AMR-limiting husbandry practices across various sub-sectors.

The food-animal sector plays a key role in tackling AMR. In farming and aquaculture, policies and practices on antimicrobial use need to consider potential impacts on human medicine. Multiple initiatives could be envisaged, including an expansion of veterinary capacity, incorporating a strong focus on optimizing antimicrobial use, and creation of multi-stakeholder collaborations to identify and implement antimicrobial-sparing husbandry strategies. The ethnoveterinary project run by India's National Dairy Development Board, which encouraged farmers to use plant-based products for common infections rather than antibiotics, illustrates that reduced antibiotic use is possible without causing farmers any economic hardship.[5]

4. Superheroes Against Superbugs (2024). https://sasuperbugs.org/
5. Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture & Farmers Welfare, Government of India (2017). *Annual Report 2016-17.* https://www.dahd.nic.in/sites/default/files/NDDB_AR_2016-17_Eng.pdf

Priority research areas

Workshop participants also identified several priority research areas aimed at addressing knowledge gaps and supporting targeted interventions to mitigate AMR threats.

Understand the origins and spread of AMR genes and microbes within the One Health framework.

The key factors driving the emergence of drug resistance and spread of AMR genes remain incompletely understood. A deeper, evidence-based, systems-level understanding of these factors, across different areas of medicine, the animal sector and the environment, would help identify where interventions could achieve greatest impact. Given their differing context, studies such as those using genomics are needed in India and the UK, as well as collaborative studies, to deepen understanding of factors affecting the spread of AMR genes.[6]

Develop a systems-based analysis to identify potential policy levers and points of intervention for AMR action.

Across One Health domains, a complex combination of stakeholders have important roles to play in addressing AMR. Systems-based mapping of stakeholders and their interactions, in both the UK and India, could provide a holistic picture of the AMR landscape, suggesting possible points of engagement with stakeholders and intervention. It can also serve as a tool for examining potential unintended consequences of interventions such as anticipating failures and inequities.

Integrate more economic modelling into AMR frameworks to inform AMR research and decision-making.

To align with policymaking, AMR research needs to have a greater focus on economic considerations, including cost-effectiveness and cost–benefit analyses. This approach will help to identify priority interventions and will generate stronger cases for policy interventions and support prioritization within the political cycle. These efforts will require interdisciplinary collaborations and close engagement with policymakers not just in India and the UK, but also globally.

6. Baker K, *et al.* (2024). *Evidence review and recommendations for the implementation of genomics for antimicrobial resistance surveillance: reports from an international expert group.* The Lancet Microbe **4(12)**, e1035-9

Target research to support behavioral change in the agricultural and veterinary sectors aimed at reducing routine antimicrobial use.

Antimicrobial use is deeply embedded in many areas of the agriculture and veterinary sectors, including growth promotion, disease prevention and treatment. Rationalizing antimicrobial use in animals will require an understanding of the key factors underpinning current practices, the consequences of switching to alternatives, and the effectiveness of incentives or sanctions in encouraging behavior change. These factors are likely to be context specific, so complementary studies are needed in both Indian and UK settings. Interdisciplinary collaboration between veterinarians, farmers, policymakers, and researchers from India and the UK will be essential for developing practical and sustainable strategies.

These priority policy and research areas demonstrate that **we do know enough to act** and given the scale and potential impact of AMR, immediate action is needed, requiring strong political will and investment. Participants also noted that **this list was not exhaustive, with many urgent actions still needed**, such as minimizing antimicrobials in wastewater, and the promotion of translational research to develop innovative diagnostics, vaccines and antimicrobial peptides.

Further case studies discussed at the India–UK AMR and One Health symposium preceding this policy workshop can be found in the full report, published in Autumn 2024.

Annexes

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