

POSITION STATEMENT

Antimicrobial resistance



Antimicrobial resistance

Overview

- > **Microbes are constantly evolving and will continue to develop resistance to antimicrobial products. There are a number of useful approaches to mitigate the potential health, social and economic impacts of antimicrobial resistance (AMR). These include: devise strategies to reduce the selective pressure on microbes; retain the efficacy of current antimicrobial products through good practice; and develop new products, tools and technologies.**



Containing and controlling AMR requires coordinated, global action across all sectors. The first global commitment was agreed in 2015, when Member states of the World Health Organization, Food and Agriculture Organization and World Organisation for Animal Health endorsed a Global Action Plan on AMR¹. The momentum continued in 2016, with the global independent AMR review chaired by Lord O'Neill² and the historic political declaration on AMR at the UN General Assembly. More recently, the UN Secretary General has established a global *ad hoc* Interagency Coordination Group on AMR which has developed a 'Framework for Action' that situates AMR in the context of Sustainable Development Goals.

The UK Government has long been an advocate for tackling AMR, with a national strategy and action plan in place since 2000. In 2013, the government reinforced this approach with a 'One Health' perspective and published a 5-year (2013–2018) strategy for tackling AMR across human and animal health³. The UK government has recognised an issue as significant and multifaceted as AMR will not be addressed in a single 5-year plan and has published a national action plan (2019–2024)⁴ alongside a 20-year vision for AMR⁵, to build on the achievements made so far. Over the next 20 years, the UK has set out to produce a series of 5-year UK national action plans that will align with the latest global plans and objectives, for a vision of a world in which AMR is effectively contained, controlled and mitigated.

This year, the COVID-19 pandemic has presented additional challenges for healthcare professionals managing patients with infections. Now, more than ever we need global action to prevent infections including COVID-19, whilst reducing inappropriate antimicrobial use and ensuring antimicrobial stewardship⁶.

One Health

SfAM welcomes the work that the UK government has done to secure AMR on the global agenda, not just as a health issue, but as a 'One Health' issue with significant social and economic impact.



It is absolutely vital that research on the transmission, pathology and prevalence of AMR is carried out within the 'One Health' agenda. Following a 'One Health' approach ensures that interdisciplinary collaborations in all aspects of human and animal health take into account impacts on the environment. Applied microbiologists are involved in both human and animal health, and SfAM promotes a 'One Health' approach by encouraging and utilising those members' expertise to help tackle the various issues surrounding AMR.

Applied microbiology is uniquely able to contribute to tackling AMR in three areas in particular:

1. Reducing unintentional exposure

The widespread use of antimicrobials, particularly antibiotics, has accelerated the spread of AMR in microbes. Reducing the unintentional exposure of humans, animals and environments to antimicrobial products and drug-resistant organisms is important in reducing the risk of AMR developing and spreading.



Improving IPC practices remains high on the political agenda. The rise in incidence of infections, particularly those with Gram-negative bacteria including carbapenem-resistant strains, is of growing concern. To strengthen the prevention and control of priority infections will require a systematic approach that

supports research to better understand the routes and transmission of drug-resistant infections and further improve surveillance.

To further emphasise this 'One Health' issue – just as lowering the burden of human infection minimises the use of antimicrobials and the risk of AMR, so too does lowering the burden of animal infection. Through improving the overall health status of animals, we can significantly reduce the need for antimicrobials. Supporting animal husbandry practices that prevent endemic diseases is also of great importance. Applied microbiologists are uniquely placed to work closely with the veterinary profession to identify best practices for infection control.

There is an increased need to better understand how AMR spreads between and among humans, animals and the environment. This is of particular concern with regard to food safety and security within the UK, which is not only a worry for policymakers and professionals but also, increasingly, the public. Microbiologists working with food industry actors are fundamental to collecting and sharing surveillance data to monitor the spread of resistance through the food chain.

The impact of AMR within the environment is an area requiring greater emphasis. It is clear that without a deeper understanding of AMR in the environment, including the sources, pathways and exposure risks to humans, animals and ecosystems, effective interventions to minimise





environmental spread will not be achievable. The research of environmental microbiologists can help reduce the evidence gaps and improve understanding of the hazards and risks from AMR in the environment.

2. Optimising use

As well as infection prevention and reducing unintentional exposure to antimicrobials, we must optimise the use of antimicrobials for infections that are unavoidable. Overuse, misuse and use of inappropriate concentrations of quality-assured antimicrobials are known drivers of AMR. In human medicine, sub-optimal use of antimicrobials (including misdiagnosis and over prescription) is one of the main drivers of AMR in the UK, despite the antimicrobial stewardship programmes in place in both primary and secondary care settings.

As in humans, the suboptimal use of antimicrobials in both veterinary practice and agriculture adds to the global rise and spread of AMR. To strengthen antimicrobial stewardship in humans and animals, microbiologists can play a vital role in increasing public awareness of AMR and reducing the expectations of antibiotics. Optimising use not only requires effective stewardship to be embedded across human and animal health and agriculture, but this must be informed through robust surveillance systems, utilising a 'One Health' approach.



3. Driving innovation

Reducing unintentional exposure and optimising the use of antimicrobials will ultimately slow down the increase and spread of resistance. Yet, the evolution of resistance will inevitably lead to more resistance. For this reason, investment into research (including basic research) is essential, not only for the development of new therapeutics but also to inform effective AMR interventions and strategies.



It is absolutely vital that we continue to develop and strengthen our scientific capacity to conduct high-quality research in AMR and improve the scientific skills in microbiology-related fields and disciplines. Microbiologists can offer considerable expertise in the fight against AMR, from identifying the emergence and spread of resistance to the development of new therapeutics and vital rapid diagnostics at the point of care.

The scientific challenges of developing new antimicrobials are prominent, with slow antibiotic pipelines and high financial costs. To support the development of new antimicrobials and establish more robust pipelines, collaborative partnerships that provide a link between UK researchers and industry must be established and further investment must be made into AMR research in academia, through UKRI and other funding agencies.

Our aims

1. Drive global advocacy and AMR agenda



SfAM's members' experiences across 'One Health' fields expose the breadth and depth of issues and, more importantly, highlight areas where policy can play a vital role. Stakeholders can visually identify AMR research developments and gaps in research, industry and funding via SfAM's AMR membership landscape map.

2. Collaborate

SfAM, as a member of the Learned Society Partnership on Antimicrobial Resistance (LeSPAR), collaborates with policymakers and relevant stakeholders to ensure policies, resource allocations and actions are based on scientific evidence and primarily for the benefit of the wider public. SfAM aims to promote global collaborations and encourages policymakers to take a global view when planning interventions.

3. Promote

SfAM is committed to using its members' expertise for the benefit of the wider public. Since its membership spans across AMR sectors, SfAM promotes trusted information and advice for tackling the spread of AMR. By showcasing SfAM members' research on AMR in animals, humans, the environment, innovation and emerging technologies, SfAM aims to promote members' work with key stakeholders and bridge research and industry.

4. Support membership

SfAM seeks to ensure that early career scientists choosing to transition into this area of work do so with some confidence of a long-term career working on the science behind antimicrobial technologies and strategies.



About SfAM

SfAM is the oldest microbiology society in the UK, serving microbiologists around the world. As the voice of applied microbiology, SfAM works to advance, for the benefit of the public, the science of microbiology in its application to the environment, human and animal health, agriculture and industry. It works in collaboration with other organisations to ensure evidence-based policymaking and, in partnership with Wiley, publishes five internationally acclaimed journals. Value for money and a modern, innovative and progressive outlook are the Society's core principles. A friendly society, SfAM values integrity, honesty and respect, and seeks to promote excellence and professionalism and to inspire the next generation of microbiologists.

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References

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