



How medical microbiologists and virologists can meet the objectives in the UK government's 5-year action plan to tackle antimicrobial resistance

In April 2024, the UK government released its second UK 5-year action plan to tackle antimicrobial resistance (AMR).

The plan, *Confronting antimicrobial resistance 2024–2029*, is organised under 4 themes:¹

- theme 1: reducing the need for, and unintentional exposure to, antimicrobials
- theme 2: optimising the use of antimicrobials
- theme 3: investing in innovation, supply and access
- theme 4: being a good global partner.

Themes 1 and 2 include outcomes that aim to reduce exposure to antimicrobials through infection prevention and control (IPC) measures, the strengthening of surveillance, the use of new diagnostic tests and raising awareness to improve the use of antimicrobials.

Meeting these outcomes will rely heavily on the expertise of medical microbiologists and virologists, who are responsible for the provision of diagnostic services and advice to clinicians, including IPC measures, and the provision of expertise to public health services, including infection surveillance.

Themes 3 and 4 are also of vital importance in tackling AMR and are also supported by the Royal College of Pathologists.

Theme 3 explains how the government will work across the public sector, regulators, academia and industry to fund and deliver innovative scientific research to develop vaccines, diagnostics, antimicrobials and alternative therapies for both people and animals.

Theme 4 outlines how the UK government will work closely with global leaders to reduce AMR through international research collaborations and agreed ways of measuring progress, including sharing of data and best practice.

A recent focus of the College's international work has been on international cooperation, collaboration and the sharing of good practice in addressing AMR. The College delivered a [Global Antimicrobial Resistance Webinar series](#) and an International Pathology Day conference with UK and international speakers sharing perspectives on addressing AMR from their respective countries.

What is AMR?

AMR occurs when antimicrobial medicines, such as antibiotics, no longer work against microorganisms such as bacteria, viruses, fungi and parasites. This is a global issue accelerated by the inappropriate use of antimicrobials and poor IPC.

Why is AMR a risk to our health?

We rely on antimicrobial medicines to treat diseases like TB, HIV/AIDS, malaria, bloodstream infections, sexually transmitted infections, urinary tract infections and chest infections. We also rely on them to prevent and reduce the risk of infections for a range of medical treatments, such as routine surgery and chemotherapy. AMR makes infections harder to treat and increases the risk of disease spread, which can, in serious cases, lead to severe illness and death.



The current picture

The World Health Organisation (WHO) lists AMR as the third leading cause of mortality in the world. Globally, over 1 million deaths annually are directly attributable to bacterial AMR, and 5 million deaths indirectly. WHO also predicts that AMR will cause 39 million deaths worldwide over the next 25 years, equivalent to over 3 deaths every minute.²

In England, antibiotic-resistant bacterial infections are on an upward trajectory, and after falling in 2020 during the COVID-19 pandemic, they have continued to rise and are now higher than pre-2019 levels. Resistance to key antibiotics remains high, with over 40% of *Escherichia coli* (*E. coli*) bloodstream infections being resistant to co-amoxiclav, a key antibiotic used to treat serious infections.³

However, infection is a small clinical specialty in the NHS, encompassing clinical microbiology, clinical virology and infectious diseases. It accounts for fewer than 2% of the consultant workforce and, overall, there is a 20% shortfall in consultant clinical microbiologists and a 14% shortfall in consultant clinical virologists.⁴

This has a significant impact on the ability of the workforce to undertake IPC and antimicrobial stewardship measures. It undermines 24/7 on-call support, which is required for the safe management of patients with sepsis, hospital-associated infections and other complicated infections.

The role of diagnostic tests

The national action plan involves commitments to optimise prescribing of antimicrobials including antibiotics, through better diagnostics. This is welcomed as rapid diagnostic processes can reduce the time taken to identify infections and determine the correct antimicrobial to use.

Fast and accurate molecular tests that can detect a variety of infections reduce turnaround times and allow appropriate treatment to start sooner. This means that patients with transmissible infections can be isolated earlier, reducing an infection's ability to spread and the subsequent use of antimicrobials.

However, while there are new diagnostic tests available, College members report that NHS procurement processes lengthen the time taken to implement them, often involving



several layers of bureaucracy and multiple papers and/or business cases to be written. Funding is also variable between hospitals, creating a postcode lottery.

In addition, point-of-care tests (POCT) that are performed for a patient by a healthcare professional outside a conventional laboratory setting, for example in a GP practice, A&E or a community setting (e.g. in a patient's home) require the oversight of central pathology laboratories.

The benefits of rapid testing are not felt everywhere. Centralisation of laboratories has, in some networks, led to prolonged turnaround times when tests are held in the main laboratory where specimens must be transported to. This increases the number of days patients spend on broad-spectrum antimicrobials, potentially affecting the time to effective treatment.

A lack of diagnostic tests hinders the ability of clinicians to contribute to infection surveillance. This surveillance is critical to investigating and controlling community outbreaks of infections, such as measles or strep A, which can lead to serious infection (e.g. scarlet fever).

AMR impacts groups differently and the national action plan includes commitments to tackle the health disparities and health inequalities associated with AMR.³ Surveillance will be key to target interventions where they are most needed.

Recommendations

The College has outlined a set of recommendations that will support clinicians to meet key outcomes in the plan to reduce infection rates and support the optimal prescribing of antimicrobials.

For the government

The UK government should provide funding to support investment in the following:

- laboratory and infection specialist staff. Funding is needed to grow a workforce that can focus on high-quality clinical management of patients with infection, the surveillance needed to detect and track resistance, and implementation of good AMS and IPC. An increase in national training numbers for infection specialties is urgently needed to ensure the medical workforce can meet demand.



- an expansion in medical microbiology and virology specialist training for clinical scientists. A collaborative, multidisciplinary team is needed for infection management that should also include laboratory scientists, infection specialists, pharmacists, and IPC and ward-based clinicians all working together.
- laboratory infrastructure and buildings, increasing the built environment to help accommodate and implement increased diagnostic testing.
- automation and digitisation of diagnostic tests, so accurate and timely results are provided while maximising resources in terms of staffing.

For the NHS

- Remove the barriers that prevent the speedy procurement of diagnostics to ensure equal access to tests across the UK. Standardising and restructuring processes to remove unnecessary paperwork and ensuring the criteria for the procurement of new diagnostics and surveillance systems is clearly set out could avoid delays in procurement.
- Introduce rapid, accurate diagnostic tests in sites that do not have access to daily transport. Ensuring these tests are onsite will provide quicker results, reducing the time patients are on broad-spectrum antimicrobials. (The use of broad-spectrum antimicrobials can lead to the emergence of AMR.)
- Standardise diagnostic testing processes across NHS organisations to ensure they provide minimum diagnostic testing services to all patients. This will ensure patients receive the same standard of care irrespective of where they live. Differences in the way advice on results is recorded between hospitals (i.e. what treatment is required if an infection is present) makes communication between clinicians and the interpretation of results difficult. Standardising the range of tests available for common infections will help ensure that the right antibiotic for the right duration is prescribed. This will help embed a culture of AMS and reduce AMR. Minimum standard procedures were set out in a [document](#) produced by the British Infection Association, the Royal College of Pathologists and the Royal College of Physicians.
- Establish a robust quality control system for POCT and ensure it is adequately resourced in terms of staffing and governance procedures.



- Encourage all UK laboratories to attain United Kingdom Accreditation Service (UKAS) accreditation, to ensure consistent quality of processes.
- Ensure compatible LIMS (Laboratory Information Systems) and EPR (Electronic Patient Records) suppliers are used within pathology networks. This will help infection specialists to efficiently review and advise on all patients in the hospitals they cover and provide remote access to patient records, reducing the risk of transcription error and patient harm. Access to good EPR systems allows infection specialists to capture and monitor antibiotic prescriptions, and see which patients are on antibiotics and for how long. Subsequently, they can better advise clinicians on how to prescribe more appropriately and have greater oversight of the use of antimicrobials across their local NHS.
- Ensure IT connectivity that allows for rapid and responsive communication, enabling laboratories to communicate results to each other quickly and securely.

References

1. Department for Health and Social Care, The Scottish Government, Welsh Government, Department for Environment, Food & Rural Affairs, Department of Health (Northern Ireland) and Department of Agriculture, Environment and Rural Affairs (Northern Ireland). *Confronting antimicrobial resistance 2024 to 2029*. Published May 2024. Available at: <https://assets.publishing.service.gov.uk/media/664394d9993111924d9d3465/confronting-antimicrobial-resistance-2024-to-2029.pdf>
2. World Health Organization. *Global leaders set first targets to control antimicrobial resistance crisis*. Published September 2024. Available at: www.who.int/europe/news/item/27-09-2024-global-leaders-set-first-targets-to-control-antimicrobial-resistance-crisis
3. UK Health Security Agency. *English surveillance programme for antimicrobial utilisation and resistance (ESPAUR). Report 2023 to 2024*. London, UK. Published November 2024. Available at: <https://assets.publishing.service.gov.uk/media/6734e208b613efc3f1823095/ESPAUR-report-2023-2024.pdf>



4. Lawrence S, Aggarwal D, Davies A, Partridge D, Ratnaraja N, Llewelyn MJ. The State of Hospital Infection Services in the UK: National Workforce Survey 2021. *Clin Infect Pract* 2022;15:100151.

