

REFORM

A photograph of an orange plastic pill bottle lying on its side, with several white, oval-shaped pills scattered on a light-colored surface. The background is a soft, out-of-focus white.

Powering the UK's approach to AMR: the future of AMR policy

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ABOUT

Reform would like to thank BD for kindly supporting this paper.

Reform

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ACTIONS TO ADDRESS THE THREAT OF AMR

ACTION: NHS England, in collaboration with NICE, should urgently commission a national assessment of the clinical and cost-effectiveness of using rapid diagnostic tools. As part of this assessment, differences in the effectiveness of using diagnostics to support prescribing in primary and secondary care should be considered.

ACTION: NHS England should centrally purchase diagnostic tools, to more rapidly increase the percentage of prescriptions that are supported by a diagnostic test, drawing on evidence collected from the national assessment and Wales' use of a central budget for diagnosing respiratory tract infections.

ACTION: Public health departments should work with charities and patient organisations to develop AMR awareness campaigns in the vein of those delivered during the COVID-19 pandemic, which highlight the experience of individuals living with drug-resistant infection and their families. As far as possible, these campaigns should be led by local Directors of Public Health, to increase the trust that local communities have in AMR messaging.

ACTION: A high-level AMR committee should be formed of permanent secretaries from the Department of Health and Social Care, the Department of Food, Environment and Rural Affairs, the Head of AMR at NHS England, and Chief Executives of the UK Health Security Agency and the Veterinary Medicines Directorate. This group should meet at an appropriate frequency to track progress against the Government's twenty-year vision for AMR, promote cross-government coordination, and assess present and future social and economic impacts posed by AMR.

ACTION: To drive AMR preparedness and health security coordination at Cabinet Level, the Government should create a subcommittee of the National Security Council dedicated to assessing progress against the five-year action plan and twenty-year vision for AMR, and discuss future risks to health security. A named minister for health security should convene the subcommittee.

INTRODUCTION: AMR, “the silent pandemic”

Without sufficient and timely action worldwide, drug resistance will have deeper and even farther-reaching consequences for all countries’ health systems and the world economy than COVID-19”

Professor Dame Sally Davies, UK Special Envoy on AMR, Foreword to ‘Powering the UK’s response to AMR’ (*Reform*)

Illnesses caused by drug resistant infections are responsible for a huge and growing burden of death, disability, and prolonged illness globally. A recent study in the *Lancet* found that in 2019, 1.27 million deaths were directly attributable to antimicrobial resistance (AMR), almost twice as many as previously suspected – making it deadlier than HIV or malaria.¹

A *Reform* report published in 2020 highlighted the threat of AMR, and made clear the health and economic consequences of failing to address “critical gaps” in our approach.² It cited the O’Neill Review on AMR, which calculates that a failure to find proactive solutions to slow the rise of resistance would cost the global economy \$100 trillion between 2016 and 2050.³ It also pointed to the deep implications of not having enough effective antibiotics to use in future, meaning many treatments, from cancer chemotherapy to hip replacements (which are prone to infection), could become too dangerous to undertake.⁴

Progress has been notably faster in some areas than others. For example, there has been a large reduction in the sale of antibiotics for use in food-producing animals, down 52 per cent on 2014.⁵ The NHS has also been able to roll out two new antibiotics, developed through an innovative, ‘subscription-style’ reimbursement model – which pays companies a fixed fee based on the value these drugs provide to the NHS, rather than on sales volume.⁶ In contrast, witnesses to the Science and Technology Select Committee this June described progress on the uptake of diagnostic technology, needed to help clinicians make appropriate prescribing decisions and help support AMR surveillance, as “persistently disappointing” and “woeful”.⁷

The cross-cutting nature of the risks posed by AMR and its causes shows the importance of coordinating efforts between government departments, executive agencies (for example, the Veterinary Medicines Directorate), local and national organisations. Government is already

¹ Antimicrobial Resistance Collaborators, ‘Global Burden of Bacterial Antimicrobial Resistance in 2019: A Systematic Analysis’, *The Lancet* 399, no. 10325 (January 2022).

² Claudia Martínez, *Powering the UK’s Approach to Antimicrobial Resistance* (*Reform*, 2020).

³ Jim O’Neill, *Tackling Drug-Resistant Infections Globally: Final Report and Recommendations* (Review on Antimicrobial Resistance, 2016).

⁴ Martínez, *Powering the UK’s Approach to Antimicrobial Resistance*.

⁵ UK-VARSS, *UK Veterinary Antibiotic Resistance and Sales Surveillance Report 2020* (Veterinary Medicines Directorate, 2021).

⁶ Mark Parkins and David Glover, ‘How the “NHS Model” to Tackle Antimicrobial Resistance (AMR) Can Set a Global Standard’, Blog, 18 December 2020.

⁷ Jim O’Neill, ‘Oral Evidence: Antimicrobial Resistance’ (HC 231, 22 June 2022).

committed to this in principle, through its 'One Health' initiative, which was adopted in 2013, and encompasses human, animal and environmental factors in the development of AMR.⁸ However, a 2019 independent evaluation of the five-year AMR action plan in place between 2013 and 2018 found that cross-organisation working was "not always present" and where it was effective, tended to be based on "established and long-standing relationships".⁹

Reform's 2020 report also called for building on the momentum generated by COVID-19, which spawned "new approaches to preventing, controlling and monitoring" infections, and for the Government to direct it towards a renewed focus on AMR. Attendees at a roundtable hosted by *Reform* in October similarly argued that, given the link between AMR, longer hospital stays, and more complex treatment pathways, an effective response to AMR will be central to the COVID-19 recovery.

A very brief definition of AMR

Antimicrobial resistance, AMR, occurs when microbes – bacteria, viruses and fungi – change over time and become unresponsive to the medicines commonly used to treat them.¹⁰ This is a natural process, caused by the exposure of microbes to antimicrobial drugs.¹¹ However, it can be accelerated by the misuse of antimicrobials: for example, if they are prescribed when not strictly necessary (in human or animal settings), in the wrong dosage, or if patients fail to complete their recommended course of prescription.¹²

Yet as resistance develops through exposure to antimicrobials, even responsible prescribing contributes to AMR. As one witness to the Science and Technology Select Committee put it, bacteria "do not distinguish" between appropriate and inappropriate prescriptions.¹³ Hence, reducing the spread of infections and especially those commonly treated with antimicrobials, is also vital to managing AMR. The safety of water supplies, quality of sanitation systems and population-level hygiene are all important in this regard.¹⁴

Finally, no new class of antibiotic has reached the market since the late 1980s (the two new antibiotics sponsored through the NHS' subscription model are based on a class, known as cephalosporins, discovered in the 1940s), with approval of novel therapies falling eight-fold since then.¹⁵ In this context, drug resistance is an even more acute threat. Patients who need

⁸ Veterinary Medicines Directorate, *UK One Health Report: Joint Report on Antibiotic Use and Antibiotic Resistance, 2013-2017*, 2019.

⁹ Elizabeth Eastmure et al., *Evaluation of the Implementation of the UK Antimicrobial Resistance (AMR) Strategy, 2013-2018* (Policy Innovation and Evaluation Research Unit, 2019).

¹⁰ World Health Organization, 'Antimicrobial Resistance', Webpage, 17 November 2021.

¹¹ Francesca Prestinaci, Patrizio Pezzotti, and Annalisa Pantosti, 'Antimicrobial Resistance: A Global Multifaceted Phenomenon', *Pathog Global Health* 109, no. 7 (October 2015).

¹² Enrique Castro-Sánchez et al., 'What Are the Factors Driving Antimicrobial Resistance? Perspectives from a Public Event in London, England', *BMC Infectious Diseases* 16, no. 1 (September 2016).

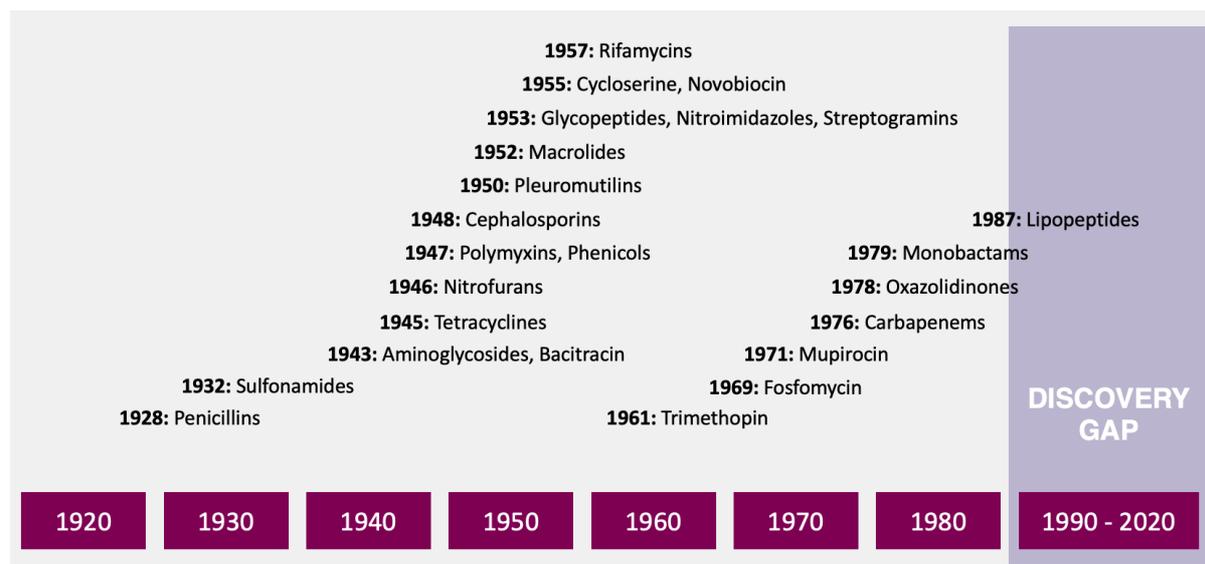
¹³ Mark Woolhouse, 'Oral Evidence: Antimicrobial Resistance' (HC 231, 22 June 2022).

¹⁴ World Health Organization, 'Antimicrobial Resistance'.

¹⁵ HM Treasury, *G7 Finance Ministers' Statement on Actions to Support Antimicrobial Development, 2021.*; OECD, *Antimicrobial Resistance: Policy Insights*, 2016.

urgent treatment (for example, those suffering from sepsis, a bloodstream infection which kills 40,000 in the UK a year) have been given extremely broad spectrum, ‘last resort’ antibiotics (that act against more than one infection) for some time.¹⁶ Once resistance develops, fewer drugs are available for these vital treatments. As then Prime Minister David Cameron pointedly explained in 2014, this risks an “almost unthinkable scenario” in which “antibiotics no longer work, and we are cast back into the dark ages of medicine”.¹⁷

Figure 1: Discovery of novel antibiotics



Source: ReAct Group, *Few antibiotics under development*, 2015

1. THE UK’S RESPONSE TO AMR

The UK has long been at the forefront of tackling AMR: publishing our first national strategy and action plan in 2000; updating this with a cross-sector, ‘One Health’ strategy for AMR as early as 2013; and publishing comprehensive surveillance, drug use and resistance reports every year since 2014.¹⁸

With the publication of the O’Neill Review in 2016, which set out practical steps to tackle the rise of drug resistance globally, the UK cemented its position as a world leader in addressing

¹⁶ University of Bristol, ‘Proteomics to Improve Genomics-Based Antimicrobial Susceptibility Testing’, Webpage, 2022.

¹⁷ Department of Health and Social Care and Prime Minister’s Office, ‘Prime Minister Warns of Global Threat of Antibiotic Resistance’, Press Release, 2 July 2014.

¹⁸ Department of Health, *UK Antimicrobial Resistance Strategy and Action Plan*, 2000.; Public Health England, *UK One Health Report: Joint Report on Human and Animal Antibiotic Use, Sales and Resistance*, 2013.; UK Health Security Agency, *English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR)*, 2021.

the threat of AMR.¹⁹ The previous year, AMR was added to the UK’s National Risk Register for Civil Emergencies, alongside risks such as “catastrophic terror attacks”, “major industrial accidents”, and “pandemic influenza”.²⁰

1.1 Current approach

The UK’s most recent five-year action plan for AMR, launched in 2019, underpins our current approach to AMR, and is focused on three strategic aims:

- Reducing the need for, and unintentional exposure to, antimicrobials (primarily through minimising the spread of infection)
- Optimising use of antimicrobials (in humans, animals and agriculture, such as through improved laboratory capacity, leading to better surveillance); and
- Investing in innovation, supply and access (for example, of vaccines, diagnostics and therapeutics)

A number of targets were included, to help track progress against these aims. For example, by 2024, the UK ought to have reduced antimicrobial use in humans by 15 per cent by 2024, and to have halved healthcare associated ‘Gram-negative’ blood stream infections (which are responsible for more than two thirds of healthcare associated deaths) by the same year.²¹

Though progress has been encouraging in general practice (which accounts for the majority of total prescribing), with a 16 per cent reduction in antibiotic consumption by 2021, in other community settings, and inpatient and outpatient secondary care, numbers have remained static or have been moving in the wrong direction (see Figure 1).

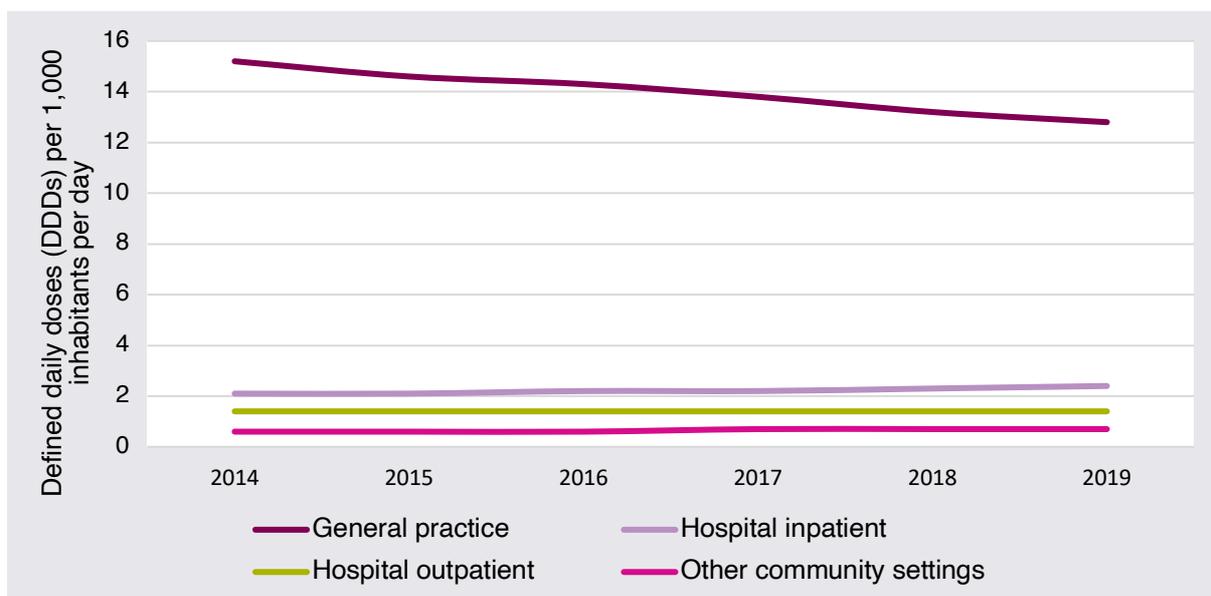
Other targets in the action plan focused on reducing the use of antibiotics in food-producing animals by a quarter (which has, encouragingly, already been met); and being able to report on the percentage of prescriptions supported by a diagnostic test by 2024 (still far from being met).

¹⁹ Editorial Board, ‘UK Shows Leadership on Anti-Microbial Resistance’, *Financial Times*, 28 January 2019.

²⁰ Cabinet Office, *National Risk Register of Civil Emergencies*, 2015.

²¹ Department for Environment, Food and Rural Affairs and Department of Health and Social Care, *Tackling Antimicrobial Resistance 2019–2024: The UK’s Five-Year National Action Plan*, 2019.; University of Bristol, ‘Control of Antibiotic Permeability’, Webpage, 2022.

Figure 2: Antibiotic prescribing, by provider setting



Source: UK Health Security Agency, *English Surveillance Programme for Antimicrobial Utilisation and Resistance (ESPAUR)*, 2021

This year, an addendum to the action plan was released, designed to reflect policy learnings from the COVID-19 pandemic, as well as progress made against earlier ambitions and targets. It represents a substantial update, rewording 93 commitments made in the action plan, while introducing 17 new commitments.²²

There is welcome recognition in the new commitments that reducing antibiotic consumption means a) improving access to diagnostics, to know when antibiotics are really needed, and for how long, and b) enhancing prevention of common infections, like urinary tract infections (UTIs), that are frequently treated with these drugs. In total, nearly half (41 per cent) of the new commitments refer specifically to improving procedures around, and clinical confidence in, diagnostics, or to better management of UTIs.²³

1.1.1 Long term ambitions

The Government's 20-year strategy for AMR published in 2019, 'Controlled and Contained', is more ambitious still. Committing to a series of five-year action plans, it pledges to "contain and control" resistance, through a step change in patient care and safety, infection control, research innovation, animal health and welfare, and so on.²⁴ This would mean that, by 2040, the UK has the "lowest rates of infection in humans in the world", and a "real-time" monitoring

²² Department of Environment, Food and Rural Affairs and Department of Health and Social Care, *Tackling Antimicrobial Resistance 2019 to 2024: Addendum to the UK's 5-Year National Action Plan*, 2022.

²³ Ibid.

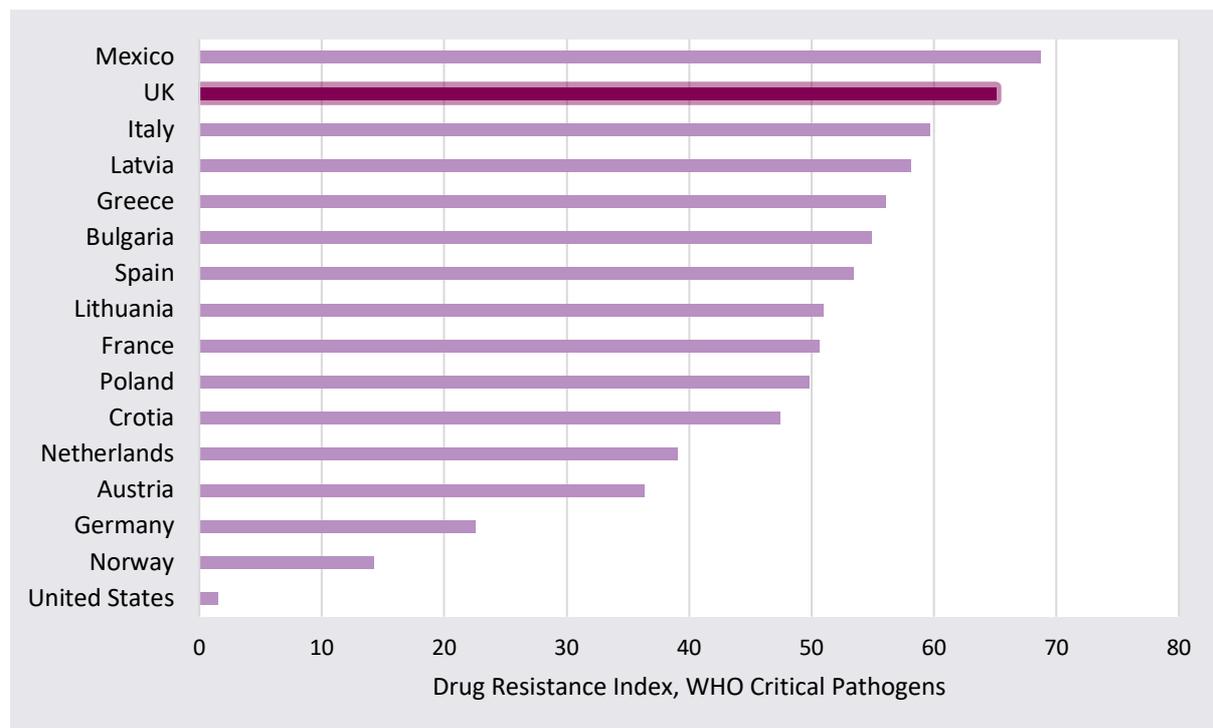
²⁴ HM Government, *Controlled and Contained: The UK's 20-Year Vision for Antimicrobial Resistance*, 2019.

system, provided by “fully integrated, standardised and comprehensive One-Health surveillance”.²⁵

One area in which these long-term ambitions are already being realised is in “identifying and promoting innovative sources and models of finance and investment”.²⁶ This year, the UK launched a world-first ‘subscription’ model of reimbursement, to encourage pharmaceutical companies to invest in drug development. It pays these companies £10 million a year, for up to ten years, to supply a new antibiotic to the NHS. Crucially, the contract is based on the value the drug provides the NHS, as measured by quality-adjusted life years (QALY), rather than sales volume. This means it acts as a ‘pull incentive’ to justify research and development spending.

Two antibiotics have already been assessed by NICE (the National Institute for Health and Care Excellence) to meet the value for money threshold and are currently in development.²⁷ Similar schemes are now being explored in the United States and European Commission.²⁸

Figure 3: Drug Resistance Index, UK versus comparator countries



Source: Centre for Disease Dynamics, Economics and Policy, *Understanding Antibiotic Resistance*, 2017; Index combines antibiotic consumption metrics with resistance data to “compare aggregate resistance across time and between countries”

²⁵ Ibid.

²⁶ Ibid.

²⁷ Clive Cookson, ‘UK Launches World-First “Subscription” Model for Antibiotic Supply’, *Financial Times*, 12 April 2022.

²⁸ HM Treasury, *G7 Finance Ministers’ Statement on Actions to Support Antimicrobial Development: Annex A*, 2021.

Reducing the spread of infections that may need to be treated with antibiotics, and ensuring they are only prescribed when really necessary, should be the priority. But as *Reform's* 2020 report argued, AMR cannot be “solved nor reversed, only managed”.²⁹ Since the UK is already afflicted by higher rates of drug resistance than many countries (see Figure 2), finding further ways to incentivise the development of new antibiotics will also be key to securing a future in which the worst effects of AMR are contained.³⁰

2. PROGRESS SINCE 2020

The *Reform* report published in 2020 laid out seven proposals that Government should explore, to seize on “untapped opportunities” in the fight against AMR. These are presented in the table below, with an assessment of the progress made towards their completion.

In red are recommendations that have not been undertaken; in amber, recommendations that are in progress by Government, or been committed to or implemented in a different form; and in green are recommendations that have been committed to or implemented in full.

Figure 4: Summary of progress

Original recommendation	State of play	
<p>DHSC should develop an engagement plan to strengthen policymakers’, healthcare professionals’ and the public’s understanding of the impact of vaccines on antimicrobial stewardship and their role in addressing AMR.</p>	<p>No engagement plan has been developed. However, in 2021, DHSC and NICE held a multi-stakeholder workshop, which covered the potential of vaccines to reduce the UK’s reliance on antibiotics.³¹</p>	
<p>NHS England and NHSE/I, in collaboration with NICE, should urgently commission a national assessment of the clinical and cost-effectiveness of tools like point-of-care diagnostics to inform future reimbursement models.</p>	<p>No national assessment of the clinical and cost effectiveness of point-of-care diagnostics has been undertaken.</p>	

²⁹ Martínez, *Powering the UK’s Approach to Antimicrobial Resistance*.

³⁰ Clive Cookson, ‘How Will UK’s Fixed-Fee Scheme for Antibiotics Help Tackle the Growing Health Crisis?’, *Financial Times*, 12 April 2022.

³¹ The Academy of Medical Sciences, *Antimicrobial Resistance Research: Learning Lessons from the COVID-19 Pandemic*, 2022.

<p>The AMR Diagnostic Partnership Board should focus on improving existing practice and closing well-recognised gaps in clinical care.</p>	<p>The addendum to the five-year action plan contains a revised commitment to influence the development of commissioning requirements so that “good clinical practices for reducing AMR” are “incentivised in their content”.³²</p>	
<p>Health Education England (HEE) should evaluate strategies to ensure that the extensive technical and clinical expertise of hospital staff in relation to point-of-care testing (POCT) is leveraged in the community.</p>	<p>NHS England’s latest guidance on POCT in the community does not include advice to leverage the expertise of hospital staff.³³</p>	
<p>DHSC should support the development and use of open source prescribing tools to enhance AMR surveillance and national antimicrobial stewardship efforts. NHS Digital should conduct an audit of existing data sources relevant to antimicrobial and diagnostic stewardship, and define appropriate information governance frameworks to support their use.</p>	<p>The use of analytic tools for AMR surveillance and stewardship is patchy across healthcare settings.³⁴ However, a commitment has been made to develop standardised diagnosis codes for infection, and ensure new electronic prescribing systems have codes to support AMR surveillance – both elements of which will be subject to audit.³⁵</p>	
<p>Public Health departments should work with charities and local patient organisations to create an awareness and education campaign highlighting the experiences of individuals living with drug-resistant infections and their families.</p>	<p>Awareness campaigns are a core part of the UK’s approach, for example through ‘Antibiotic Guardians’, which increased dramatically in number in 2020.³⁶ But they tend to focus on responsible antibiotic consumption rather than the experience of living with a drug-resistant infection.</p>	

³² Department of Environment, Food and Rural Affairs and Department of Health and Social Care, *Tackling Antimicrobial Resistance 2019 to 2024: Addendum to the UK’s 5-Year National Action Plan*.

³³ NHS England, *Point of Care Testing in Community Pharmacies: Guidance for Commissioners and Community Pharmacies Delivering NHS Services*, 2022.

³⁴ Eastmure et al., *Evaluation of the Implementation of the UK Antimicrobial Resistance (AMR) Strategy, 2013-2018*.

³⁵ Department of Environment, Food and Rural Affairs and Department of Health and Social Care, *Tackling Antimicrobial Resistance 2019 to 2024: Addendum to the UK’s 5-Year National Action Plan*.

³⁶ Office for Health Improvement and Disparities, *AMR Local Indicators - Produced by the UKHSA*, 2022.

<p>The Department of Health and Social Care should support a national fund to pilot, evaluate and develop pragmatic and scalable community engagement approaches to tackle AMR.</p>	<p>UKRI has contributed to a research hub, based at the University of Leeds, which is investigating community engagement approaches to tackling AMR in LMICs.³⁷</p>
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As the table above demonstrates, progress since the publication of the report two years ago has been mixed – although there are welcome commitments in the Government’s addendum to the five-year action plan that, if implemented, would go a long way towards improving our understanding of AMR and antibiotic stewardship across healthcare settings.

The commitment to influence commissioning requirements, for example, so that they embed good clinical practice for reducing AMR, is especially welcome. Where progress has been more disappointing is in increasing the use of diagnostic testing, including point-of-care testing to support prescribing choices; improving public engagement; and cross-government working on AMR.

These areas for improvement are taken in turn below.

2.1 Diagnostic testing

2.1.1 Lessons from COVID-19

COVID-19 demonstrated the immense value of rapid testing: for people to know when they are sick, change their behaviour to protect others, and seek additional support if needed, but also, crucially, for surveillance. Through diagnostic testing, it is possible to track the spread of infection through local communities, including new variants or strains, create trend data over time, and deliver targeted interventions where rates of prevalence are unusually high.

AMR, which already directly kills 51,000 people a year in Western Europe, requires a similar resolve.³⁸ Surveillance will be essential to monitoring the threat of AMR and coordinating our policy response to it. The UK’s special envoy on AMR, Dame Sally Davies, makes the same comparison, referring to AMR as a “silent pandemic”.³⁹ Attendees at a roundtable hosted by *Reform* noted that AMR is potentially even more complex than COVID-19, owing to the many known (and unknown) factors that drive it, and further highlighting the value of effective data collection and surveillance.

The way in which diagnostic capacity can be scaled up at pace was another key learning from the pandemic, with a network of ‘Lighthouse laboratories’ quickly established across the

³⁷ CE4AMR, *Community-Focused One-Health Approach to AMR*, 2021.

³⁸ Andrew Gregory, ‘Antimicrobial Resistance Now a Leading Cause of Death Worldwide, Study Finds’, *The Guardian*, 20 January 2022.

³⁹ *Ibid.*

country by a range of private and public suppliers.⁴⁰ The Academy of Medical Sciences has noted that, not only does this scale-up offer lessons to government, but also that existing facilities – like the Rosalind Franklin laboratory at Leamington Spa – could be repurposed for AMR research and surveillance.⁴¹

As others have highlighted, the flurry of innovation that produced a number of different diagnostic tests for COVID-19, much of which occurred in the UK, could be leveraged to “deliver more tools for tracking AMR in different settings”.⁴² This would further cement the UK’s leading role both in tackling AMR, and more broadly as a life sciences innovator.

2.1.2 Applying these lessons to AMR

In addition to surveillance, but equally vital to managing AMR, diagnostic testing can enable clinicians to know which drugs an infection is likely susceptible to, whether it is effective for a patient to continue receiving antibiotics, or if a better outcome would be achieved (clinically, or in terms of reducing antibiotic consumption) by switching to a different drug.⁴³

When O’Neill published his review in 2014, he described diagnostic technology as an “essential” part of tackling AMR.⁴⁴ Diagnostics also featured prominently in *Reform’s* 2020 report. Yet the commonplace use of ‘subjective’ prescribing, in which a doctor exercises their professional judgement – i.e. a “very educated guess” – to dispense antibiotics, remains.⁴⁵

Meanwhile the challenges to more widespread use of diagnostic testing – complex and often lengthy regulatory pathways for approving new technologies, few evaluations of the potential clinical and cost benefits of diagnostics, and mostly fragmented purchasing arrangements for diagnostic test equipment – all referenced in *Reform’s* 2020 report, also feature in evidence given to the Science and Technology Committee this June.⁴⁶ O’Neill described progress on the uptake of diagnostics as “woeful” and “persistently disappointing”.⁴⁷

Because of the difficult trade-offs involved in dispensing antibiotics – between patient safety, outcomes and stewardship – particularly in secondary care where these choices carry greater risks, it is not possible to reach much lower levels of prescribing without improving diagnostic capacity.⁴⁸

⁴⁰ The Academy of Medical Sciences, *Antimicrobial Resistance Research: Learning Lessons from the COVID-19 Pandemic*.

⁴¹ *Ibid.*

⁴² *Ibid.*

⁴³ O’Neill, *Tackling Drug-Resistant Infections Globally: Final Report and Recommendations*.

⁴⁴ *Ibid.*

⁴⁵ O’Neill, ‘Oral Evidence: Antimicrobial Resistance’.

⁴⁶ Science and Technology Committee, ‘Oral Evidence: Antimicrobial Resistance’ (HC 231, 22 June 2022).; Martínez, *Powering the UK’s Approach to Antimicrobial Resistance*.

⁴⁷ *Ibid.*

⁴⁸ O’Neill, ‘Oral Evidence: Antimicrobial Resistance’.

As *Reform's* previous report argued, however, the importance of point-of-care testing as a means of reducing reliance on antibiotics is at odds with the UK's current approach, in which costs of diagnostic tools usually accrue "in different parts of the healthcare system to where benefits are gained".⁴⁹ In primary care for example, rapid diagnostics are often seen as the more costly and time-consuming alternative to prescribing antibiotics "just in case".⁵⁰

The O'Neill review also identifies this challenge, arguing that whereas the "near-term costs" of diagnostics are incurred by individual doctors or patients (because it is more time consuming and expensive to test for drug susceptibility), the benefits of conserving antibiotics and slowing the spread of resistance "accrue to society at large".⁵¹

Conversely, an independent evaluation of the previous action plan found that in Wales, which has a central budget for diagnosing respiratory tract infections, there has been a wide roll out of point-of-care diagnostic testing in primary care.

Reform's 2020 report called on NHS England together with NICE to urgently assess the cost and clinical effectiveness of tools like point-of-care diagnostic testing. It also argued that the clinical expertise of hospital staff should be leveraged for point-of-care community testing. Neither of these has been acted on. In the long-term, it will also be important to review the regulatory pathway to approving new diagnostic technologies, to spur innovation and, as far as possible, lower the costs associated with diagnostic research and development.

As part of an urgent assessment, NHS England and NICE should consider the possibility of more centralised purchasing arrangements for diagnostic tools, looking to best practice from other countries to support the Government's commitment to a "rapid uptake of diagnostics" in the UK.⁵²

ACTION: NHS England, in collaboration with NICE, should urgently commission a national assessment of the clinical and cost-effectiveness of using rapid diagnostic tools. As part of this assessment, differences in the effectiveness of using diagnostics to support prescribing in primary and secondary care should be considered.

ACTION: NHS England should centrally purchase diagnostic tools, to more rapidly increase the percentage of prescriptions that are supported by a diagnostic test, drawing on evidence collected from the national assessment and Wales' use of a central budget for diagnosing respiratory tract infections.

⁴⁹ Martínez, *Powering the UK's Approach to Antimicrobial Resistance*.

⁵⁰ O'Neill, *Tackling Drug-Resistant Infections Globally: Final Report and Recommendations*.

⁵¹ Ibid.

⁵² Department of Environment, Food and Rural Affairs and Department of Health and Social Care, *Tackling Antimicrobial Resistance 2019 to 2024: Addendum to the UK's 5-Year National Action Plan*.

2.2 Public engagement

2.2.1 Lessons from COVID-19

The response to COVID-19 demonstrated the power of approaches that directly engage the public in design, implementation, and evaluation, rather than working in a purely top-down way. Securing buy-in from people is foundational to the legitimacy of public health. The massive data-sharing that occurred during COVID-19, to track the infection and support research, relied on consent – and when lockdowns were effective, it was because the public recognised their value, committing to protect the health of their friends, neighbours and the wider public.

Public engagement was the necessary condition from which the rest of the policy response flowed.

COVID-19 also showed that engagement can lead to better policy outcomes: giving policymakers a different and deeper understanding of the trade-offs involved in their decisions. The terms of reference for the COVID-19 inquiry points to many of these trade-offs, including the impact public health had on various demographic groups, other public services, and society's most vulnerable.⁵³

2.2.2 Applying these lessons to AMR

Raising public awareness is a key feature of the UK's five-year plan for AMR. *Reform's 2020* report highlighted a number of initiatives in this area, designed to engage the public ("Keep Antibiotics Working", "Antibiotic Awareness Week"), healthcare professionals and the animal health and environmental sectors.⁵⁴

However, these initiatives are typically limited in scope to explaining how drug resistance can develop, and "improving public understanding of AMR".⁵⁵ They also tend to focus on reducing the spread of infection – and managing public expectations about what antibiotics can deliver, and when prescribing antibiotics is appropriate.⁵⁶

Whilst this is important, and there is evidence to suggest these initiatives can effectively raise awareness of AMR and contribute to more responsible antibiotic use, as *Reform's 2020* report argued, affecting long-term behaviour change will require a more substantive approach.

The report recommended that government launch a campaign highlighting the experiences of individuals living with drug-resistant infections and their families. This has so far not been implemented. As COVID-19 demonstrated, public health messaging is most effective when it successfully links medical advice to the 'real-life' experiences (for example, of suffering from

⁵³ Cabinet Office, *UK COVID-19 Inquiry: Terms of Reference*, 2022.

⁵⁴ Martínez, *Powering the UK's Approach to Antimicrobial Resistance*.

⁵⁵ Department for Environment, Food and Rural Affairs and Department of Health and Social Care, *Tackling Antimicrobial Resistance 2019–2024: The UK's Five-Year National Action Plan*.

⁵⁶ *Ibid.*

infection or knowing someone who has) of the population it is trying to reach.⁵⁷ A joint report by the Health and Social Care, and Science and Technology Committee, also observed that certain communities are more likely to trust messaging from local leaders, such as Directors of Public Health, than central government.⁵⁸

Crucially, public health messaging should not be regarded as separate from efforts to increase the use of diagnostic testing or introduce new therapeutic treatments and vaccines. Rather, creating the political will for change across any of these areas means engaging the public on the practical aspects of all of them.

There should also be a continued effort to communicate the seriousness of the risks to human life posed by AMR, broadening general public awareness, and reinforcing messaging around appropriate and inappropriate use of antibiotics.

ACTION: Public health departments should work with charities and patient organisations to develop AMR awareness campaigns in the vein of those delivered during the COVID-19 pandemic, which highlight the experience of individuals living with drug-resistant infection and their families. As far as possible, these campaigns should be led by local Directors of Public Health, to increase the trust that local communities have in AMR messaging.

2.3 Cross-Government working

2.3.1 Lessons from COVID-19

Attendees at the *Reform* roundtable explained that, owing to the uncertain effects of, and contribution made by, each driver of drug resistance (across the animal, human, and environmental sectors), controlling AMR relies on highly joined up cross-government working.

COVID-19 was a case study in the importance of having a single galvanising ‘mission’, and focus on outcomes, for cross-departmental collaboration.⁵⁹ Systems, institutions and services were forced to innovate to meet new demands, whilst policy development accelerated – often bypassing usual processes – to keep pace. The need to reduce the spread of the virus, and still deliver core services, became “everyone’s business”.⁶⁰

This mission also benefited, in large part, from the creation of new structures – including the Vaccine Taskforce – which helped coordinate efforts between government, outside experts and the private sector, to achieve rapid change.⁶¹ Similarly, a Ministerial Panel formed from

⁵⁷ Health and Social Care Committee and Science and Technology Committee, *Coronavirus: Lessons Learned to Date*, HC 92 (London: The Stationery Office, 2021).

⁵⁸ Ibid.

⁵⁹ Science and Technology Committee and Health and Social Care Committee, ‘Oral Evidence: Coronavirus: Lessons Learnt’, *House of Commons* HC 877 (9 December 2020).

⁶⁰ Martínez, *Powering the UK’s Approach to Antimicrobial Resistance*.

⁶¹ Science and Technology Committee and Health and Social Care Committee, ‘Oral Evidence: Coronavirus: Lessons Learnt’.

representatives of the Department for Business, Energy and Industrial Strategy, HM Treasury, the Cabinet Office, and the Department of Health and Social Care ensured that the approval of new vaccines, when developed, could be fast-tracked.⁶²

Additionally, real-time data, shared by default and linked to existing datasets, made it easier for departments, civil servants and ministers to 'speak the same language' and track progress against the headline target of controlling the virus.⁶³

Clearly, there are aspects of this model, enabling greater flexibility than is ordinarily possible in the Whitehall machine, that owe their existence to the unique circumstances of governing through a global crisis. However, to avoid the worst consequences of AMR, which is already rising rapidly across the world, the UK cannot afford to wait until the next public health crisis to embed the lessons of cross-government working learnt during the pandemic.

2.3.2 Applying these lessons to AMR

Despite references to collaborative governance structures through a 'One Health' approach, and attendees at *Reform's* roundtable noting important progress in this area, an independent evaluation of government's previous action plan found that implementation varied between England and the devolved administrations. In particular, the evaluation "did not find evidence of governance arrangements that bring together national and local representatives from across the health system for AMR in England".⁶⁴

Exceptions to this, including the Defra Antimicrobial Resistance Coordination (DARC) group and the AMR Diagnostics Board, are typically focused on sector-based improvements, rather than combatting AMR in the round.⁶⁵

Reform's 2020 report referenced a recommendation made by the British Society for Antimicrobial Chemotherapy (BSAC), to have a named Cabinet Office minister with specific accountability for drug-resistant infections – to "coordinate delivery of prevention objectives" between relevant departments.⁶⁶ Attendees at *Reform's* roundtable in October also reflected that blurred lines of Ministerial accountability are a barrier to coordinating strategy, that could be counteracted by the appointment of a new minister, if not for AMR, then for global health security.

Although ministers in the Department of Health and Social Care have been accountable for areas such as 'crisis response,' 'global health security', and 'emergency preparedness', this has tended to be a small part of their overall brief (and, until Neil O'Brien's appointment last

⁶² Ibid.

⁶³ The Academy of Medical Sciences, *Antimicrobial Resistance Research: Learning Lessons from the COVID-19 Pandemic*.

⁶⁴ Eastmure et al., *Evaluation of the Implementation of the UK Antimicrobial Resistance (AMR) Strategy, 2013-2018*.

⁶⁵ Ibid.; NHS England, *Improving the Blood Culture Pathway – Executive Summary, 2022*.

⁶⁶ Martínez, *Powering the UK's Approach to Antimicrobial Resistance*.

month, one which does not specifically reference antimicrobial resistance).⁶⁷ Similarly high impact risks on the National Risk Register, like terrorism and climate change, have not only been covered by ‘named’ ministers, but in the case of the latter, this minister has at times attended cabinet.⁶⁸

Given the huge and growing impact of AMR (in terms of excess deaths, the future viability of medical procedures, lost productivity and economic output), the lack of representation of AMR at the ministerial level, compared to these equivalent threats, suggests an imbalance in policy prioritisation. This is especially striking in light of the shortcomings in the UK’s health security revealed by COVID-19.⁶⁹

Were there political will to prioritise AMR at this level, a named minister could make a real difference to stimulating cross-government action. Yet implementation in the devolved administrations occurs without this representation. Chief Executives of all trusts in Wales and Northern, for example, regularly meet with national policy officials to promote join up between strategy and local implementation.⁷⁰ In Scotland, the Scottish Antimicrobial Prescribing Group has a similar role.⁷¹

Because of the long-term prioritisation needed to tackle AMR, and broad consensus around the importance of this agenda, permanent secretaries could have an important part to play in embedding cross-government working across political cycles, particularly in trying to achieve some of the ambitions of the twenty year vision for AMR.⁷² This could be formalised through a high-level AMR operational committee, comprised of permanent secretaries from the most relevant government departments, and executives from relevant public bodies.

At the ministerial level, AMR preparedness and health security coordination could take place through a subcommittee of the National Security Council – which brings ministers together to discuss UK national security “in the round”, and how to deliver it.⁷³ This aligns with *Reform’s* previous call in ‘A State of preparedness’ to reinstate the National Security Council Threats, Hazards, Resilience and Contingencies Subcommittee, to focus on civil contingencies.

There may be alternative models to support Cabinet-level join up, but it is clear that, to make further progress on the UK’s One Health strategy, governance structures should support clearer ministerial accountability.

⁶⁷ HM Government, ‘Parliamentary Under Secretary of State (Minister for Vaccines and Public Health)’, Webpage, 2022.; HM Government, ‘Neil O’Brien MP’, Webpage, 2022; Accessed on 31 October 2022.

⁶⁸ Ione Wells, ‘New Cabinet: Who Is in Liz Truss’s Top Team?’, *BBC News*, 7 September 2022.

⁶⁹ Aidan Shilson-Thomas, Sebastian Rees, and Charlotte Pickles, *A State of Preparedness: How Government Can Build Resilience to Civil Emergencies* (Reform, 2021).

⁷⁰ Eastmure et al., *Evaluation of the Implementation of the UK Antimicrobial Resistance (AMR) Strategy, 2013-2018*.

⁷¹ *Ibid.*

⁷² HM Government, *Contained and Controlled: The UK’s 20-Year Vision for Antimicrobial Resistance*.

⁷³ HM Government, ‘National Security Council’, Webpage, 2022.; Accessed on 31 October 2022.

ACTION: A high-level AMR committee should be formed of permanent secretaries from the Department of Health and Social Care, the Department of Food, Environment and Rural Affairs, the Head of AMR at NHS England, and Chief Executives of the UK Health Security Agency and the Veterinary Medicines Directorate. This group should meet at an appropriate frequency to track progress against the Government’s twenty-year vision for AMR, promote cross-government coordination, and assess present and future social and economic impacts posed by AMR.

ACTION: To drive AMR preparedness and health security coordination at Cabinet Level, the Government should create a subcommittee of the National Security Council dedicated to assessing progress against the five-year action plan and twenty-year vision for AMR, and discuss future risks to health security. A named minister for health security should convene the subcommittee.

2.4 Conclusion

Far from being a future risk to UK health security, AMR is already having a huge impact on health services, the lives of those living with drug-resistant infections and their families, and the wider economy. As Dame Sally Davies says, “Without antibiotics we can’t have modern medicine, which underpins standard care”.⁷⁴ Failing to take bold action risks AMR becoming the ‘poor relative’ to other National Risk Register items like climate change and terrorism.

In many ways, the UK has made commendable progress, particularly reducing antibiotic use in agriculture, and adopting an innovative new subscription-style reimbursement system for the development of new drugs. Yet further progress is needed to incentivise the uptake and use of rapid diagnostics – to support appropriate prescribing – and cross-government working if we are to meet the ambitious commitments of the twenty-year vision for AMR.

The UK’s response to COVID-19 points to a number of untapped opportunities in this regard: clearly demonstrating the value of rapid, accurate diagnostic tests both to managing infection and surveillance; developing a communication strategy which citizens can relate to and trust; and creating structures that enable effective, cross-government working.

As the world looks to the UK’s approach, this briefing paper sets out some practical actions Government could implement to reduce our reliance on antibiotics and manage the risks of AMR. The most costly choice now would be to failing to build on the momentum of COVID-19 and accepting a future in which we drug resistance is a given.

⁷⁴ Alona Ferber, ‘Sally Davies: “Anti-Microbial Resistance Could Kill Us before the Climate Crisis Does”’, *New Statesman*, 17 October 2022.



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