Reframing resistance

How to communicate about antimicrobial resistance effectively

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Contents

Introduction

The growing momentum around the world to tackle antimicrobial resistance is inspiring. As a doctor, researcher and an advocate for action I've met hundreds of people working ferociously hard to create new antibiotics, protect patients from drug-resistant diseases, and reduce unneeded consumption of these drugs. This work helps, but so far it hasn't made enough of an impact – we haven't seen a new type of antibiotic introduced in the last 30 years, and more and more people are being harmed by these infections each year. Decision makers in politics, business, and civil society are increasingly aware of the scale of the problem the world faces, but that isn't being met with sufficient action at the highest levels. More needs to be done, more quickly, to protect the medical advances we've made over the last hundred years.

At Wellcome, helping to transform the world's approach to antimicrobial resistance is a priority for us. We are working to sustain and coordinate global action, to speed up development, trials and delivery of new treatments and diagnostics, and to provide robust evidence that can inform national and global strategies.

One area where we identified a need for evidence is communication. Overcoming antimicrobial resistance will require public support – and that means that all of us working in this field have to help the public to understand the problem and the need for action. To do this, we must identify and use the most effective language.

This research project has one simple goal: to help anyone interested in communicating about this vital global issue to do so based on the best available empirical evidence. From reviewing existing research, interviewing experts, and conducting new qualitative and quantitative research with the public in seven countries, it's clear that some approaches hinder understanding and reduce motivation, whereas others clarify and motivate.

Our approach was informed by a burgeoning evidence base, pioneered by scholars like Daniel Kahneman and George Lakoff, about how to effectively communicate, or frame, complex issues like antimicrobial resistance or climate change. This work demonstrates that the way in which issues are explained and presented can make a huge difference to their impact – upon understanding, upon attitudes and upon behaviour. For example, one randomised controlled trial showed that using a 'virus' metaphor to describe crime increased support for reformative policies but swapping it for a 'beast' metaphor increased support for punitive measures. The facts in each presentation were identical, but the metaphor changed people's responses.

I wish the facts simply spoke for themselves, but the evidence is clear – they don't. As a community, we have to carefully choose the words we use to explain and advocate on this vital issue or risk it being put on the list of issues too hard to understand or solve. This report and accompanying practitioner checklists are designed to increase your chances of success.

Whether you're a patient, a carer, a clinician, an economist, a scientist, a politician, a film maker, a teacher, a journalist or an activist, I hope this research can help you and, in doing so, increase the pace of action around the world.

I for one am committing here to applying the findings to my communication.

Dr Jeremy Farrar

Director, Wellcome Trust

Executive summary

How an issue is 'framed' – explained and presented through specific themes and angles – can influence how it is received by an audience. It can mean that people are more likely to understand, engage with and support action on an issue or, on the contrary, oppose it.

Global action to address drug-resistant infections is not happening at the scale and urgency needed. Action among political leaders can be strengthened with public support. But public understanding of antimicrobial resistance and its impact is currently limited. We can change this by communicating more powerfully.

Through this research, we sought to identify the most effective way to frame this issue to increase public comprehension and persuade the public and policy makers of the case for action. We conducted a multi-phase project, based on quantitative and qualitative research with members of the public in seven countries, to test the efficacy and impact of different communication frames.

The five principles

Our research showed that there are universal themes that can be used effectively across countries.

We identified five principles for communicators when talking to the public about antimicrobial resistance:

1. Frame antimicrobial resistance as undermining modern medicine.

Framing the issue as undermining modern medicine helps the public understand the breadth of the impact antimicrobial resistance has currently and could have in the future. This should be coupled with examples of routine procedures and common illnesses and injuries that could be affected by antimicrobial resistance.

2. Explain the fundamentals succinctly.

Simple, straightforward and non-technical explanations of antimicrobial resistance are necessary and effective in increasing understanding of the issue. It is important we explain that microbes develop resistance, not individuals, and also that our explanations include the part that human activity is playing in accelerating the issue.

3. Emphasise that this is a universal issue; it affects everyone, including you.

Explain that this is a universal issue, but one in which anyone could be affected. We need to increase the sense of personal relevance, and responsibly highlight the risk that antimicrobial resistance poses to all.

4. Focus on the here and now.

Make it clear that antimicrobial resistance is currently having a significant impact – and that this impact will become increasingly severe if action is not taken. This is more effective than pointing to what could happen in five or ten years.

5. Encourage immediate action.

We can boost the impact of communications on antimicrobial resistance by framing the issue as solvable. Crucially, this needs to be accompanied by a clear and specific call to action.

Whenever possible, these principles should be used in combination, to maximise impact.

We encourage experts and practitioners working on antimicrobial resistance to use these principles to inform public communications. Together, by using this language collectively and cohesively, our communications can have more impact – we can help increase public understanding of and encourage more action on antimicrobial resistance.

Read the full report and access the practical toolkit at www.wellcome.ac.uk/reframing-resistance

Endorsements

"Every time we communicate about antimicrobial resistance we have the potential to inspire allies or drive apathy through the language and messages we use. By basing our communications in evidence – as we would be required to do for any other intervention we develop – we can better unlock the huge potential we have as advocates to more effectively galvanise support for the antimicrobial resistance cause and stimulate action. Guidance on best practice has been sorely needed for some time, and I applaud Wellcome's investment in this vital area of research."

Professor Dame Sally Davies,
UK Special Envoy on antimicrobial resistance

"Effective evidence-based communication is as important as scientific evidence itself. We need more research to understand how to communicate in a way that generates support for antimicrobial resistance. We have seen the impact effective communication can make in HIV/AIDS and polio campaigns; both the programs benefited tremendously from the right messaging."

Dr Kamini Walia, Senior Scientist,
Epidemiology & Communicable Diseases Division,
Indian Council of Medical Research, India

"Antimicrobial resistance is a profoundly complex issue and how we talk about it can be the difference between inertia and action. As a global community, it is our responsibility to use informed approaches in language and context to communicate more effectively on antibiotic resistance and this report provides evidence to bridge the gap between what we say, why we say it, and how we say it."

Dr Hanan Balkhy,
Assistant Director-General, Antimicrobial resistance, World Health Organization

"Behaviour and social change start with understanding and lie at the heart of mitigating drug-resistant infections. Our ability to communicate in language and imagery that is understandable and non-threatening to all, is critical to achieving this shared goal. Only by undertaking contextually-appropriate communication research, can we harness the true power of language, to meet our goals."

Marc Mendelson, Professor of Infectious Diseases and Head of the Division of Infectious Diseases & HIV Medicine, Groote Schuur Hospital, University of Cape Town, South Africa; President of the International Society for Infectious Diseases

"The prudent and responsible use of antimicrobials requires change in the behaviour of veterinarians, aquatic animal health professionals, farmers, farm workers, in fact, all actors in the food value chain, including retailers and consumers. Information on what these groups know about antimicrobial resistance, what they believe, and what it would take to drive infection prevention, biosecurity and responsible antimicrobial use throughout the food system is invaluable. It sounds intuitive, but framing research is fundamental to communicating using appropriate language."

Dr Matthew Stone, Deputy Director General, World Organisation for Animal Health (OIE)

"The current language used around antimicrobial resistance is full of complexity and jargon. We need more evidence on how to communicate effectively about antimicrobial resistance, especially when working across different countries and languages."

Dr Direk Limmathurotsakul, Head of Microbiology at Mahidol-Oxford Tropical Medicine Research Unit (MORU), Mahidol University, Thailand

"How we talk about antimicrobial resistance matters, not just when presenting scientific findings, but equally when communicating about vaccination, biosecurity and other food production practices that reduce AMR risks. Research on framing is one of many sources of evidence that may make our conversations more effective in gaining public understanding and support for best practices – in the medical arts, in food production and beyond. FAO looks forward to seeing how Wellcome's research may contribute to our ongoing efforts to apply evidence-based insights to AMR communication for a safer, healthier planet."

Dr Juan Lubroth, FAO Coordinator on AMR & Chief Veterinary Officer, Food and Agriculture Organization of the United Nations

"Our goal is to prevent unnecessary death and suffering from AMR, especially among the most vulnerable— newborn babies in low-resource settings. Using research to inform communications around AMR to achieve the greatest impact is no different than formulating a vaccine to be as effective as possible."

Dr Padmini Srikantiah, Antimicrobial Resistance Strategy Lead, the Bill & Melinda Gates Foundation

Why do we need to reframe antimicrobial resistance?

The importance of framing

The language we use matters when communicating about any issue. How an issue is 'framed' can influence how it is received by an audience – different framing can make people more (or less) likely to understand, engage with and support action on an issue.

Framing is not only about how we as experts and practitioners working on an issue communicate with each other, the public, or directly with political decision makers; it is also about how each of those groups communicates, and about how issues are covered in the media and wider conversations. From equal marriage to climate change and plastics, media coverage and social media conversation play a critical role in shaping public opinion and helping or hindering political progress.

There are many examples of debates where attempts have been made to reframe a conversation, from climate change to mental health to smoking. For example, the underlying facts about smoking were widely known since at least the 1970s, but it was not until the 21st century when governments began to implement tight restrictions. This corresponded with a reframing of the issue away from the rights of the smoker or the impact on their own health and towards second-hand smoke and passive smoking.[1]

The importance of language and framing is especially true when communicating on a topic like antimicrobial resistance – a complex, invisible problem with multiple drivers, full of complicated terminology that is difficult to understand.

Excellent work has been conducted looking both at public understanding of antimicrobial resistance and how we as experts and practitioners working on antimicrobial resistance communicate on the issue, including by the WHO and other organisations.[2] This work builds on those studies, testing additional frames in new contexts, particularly in the Global South, which has often been neglected in studies like these.

The issue

Antimicrobials, including antibiotics, are among the world's most important discoveries and they underpin modern healthcare. But they are becoming less and less effective as a result of antimicrobial resistance, which is now one of the biggest health issues facing the world. It is estimated that more than 700,000 people die every year from drug-resistant infections.[3] This is a problem that will get progressively worse unless we change the ways we develop and use antibiotics and other antimicrobials.

The issue of antimicrobial resistance is gaining traction on the global political stage, shown by its prominent position on the agendas of G7 and G20 leaders' meetings in recent years. Yet while there is political will at a relatively high level, translating that will into concrete action remains a challenge. We have seen pockets of pioneering work, but progress is not happening fast enough or at the scale needed to address the problem. And to date, antimicrobial resistance is not an issue that the public is championing or calling for policy makers to take action on, in the way that issues such as climate change or plastics are.

Drawing on evidence from past successful advocacy approaches, consistent use of an evidence-based, rigorously tested approach to communicating on antimicrobial resistance will help address this by increasing public understanding and public support for political action.

Our objectives

The aims of this research were to establish the most effective ways of talking about antimicrobial resistance that:

- increase public comprehension of the problem of antimicrobial resistance

- persuade the public that antimicrobial resistance is something that should be the focus for political action.

This research is focused on optimal ways to clearly explain antimicrobial resistance and encourage broad support for action. It was not designed to develop optimal ways to persuade specific groups (such as clinicians, farmers or patients) to take specific actions (such as adopt new stewardship approaches). Nevertheless, many of the findings of this research may be also relevant for campaigners working in these areas. The principles outlined in this report provide a foundation on which to build further communication about specific behaviour changes.

Our approach

To answer these questions, we conducted a significant multi-phase project, based on a robust research process. The key stages are summarised

Table 1.0: Our approach

Project stage	Objective
1. Desk research	To interrogate existing data and resources to understand what framing is currently used and its efficacy
2. Media and social media analysis	To analyse how the issue is currently being covered and discussed
3. In-depth interviews with stakeholders	To explore how the experts and practitioners working on antimicrobial resistance communicate and perceptions of what is effective and not effective at increasing understanding and support for political action
4. Public message testing	Quantitative and qualitative research with the general public to test and refine messaging

above, and a detailed methodology is included in an appendix to this report (Appendix A).

The public message testing (Stage 4) was conducted in seven countries: UK, US, Germany, Japan, India, Thailand and Kenya. These countries were chosen to ensure we captured a broad range of perspectives on the issue. A key consideration here was to include countries that cover both the Global North and South. Countries were also selected to ensure we included key hubs of international influence on antimicrobial resistance, major contributors to global antibiotic consumption, and countries with notably improving and worsening levels of antibiotic consumption.

A more detailed rationale for the selection of these countries is included in Appendix A.

The qualitative public research encompassed a total of 18 focus groups, conducted with 'media engaged' members of the public (defined as those who watch, read or listen to the news on a regular basis). The rationale was that these are the people who are most likely to engage with the issue of antimicrobial resistance and who are most likely to come into contact with messaging. The quantitative research was conducted with a total of 12,169 people, composed of nationally representative samples in each of the seven countries.[4]

[1] Baumgartner FR, Berry JM, Hojnacki M, Leech BL, Kimball DC. Lobbying and Policy Change. University of Chicago Press; 2009.

[2] WHO. Antibiotic resistance: Multi-country public awareness survey. 2015.
Mendelson M, Balasegaram M, Jinks T, Pulcini C, Sharland M. Antibiotic resistance has a language problem, Nature 2017; https://wellcome.ac.uk/sites/default/files/exploring-consumer-perspective-on-antimicrobial-resistance-jun15.pdf.

[3] Review on Antimicrobial Resistance. Tackling Drug-Resistant Infections Globally: Final Report and Recommendations. 2016.

[4] Nationally representative sample of adults by age, gender and region in US, UK, Germany, India, Thailand, Japan. Panel population representative sample of adults by age, gender and region in Kenya. For full details on respondent and sample profiles, see Appendices A & B.

It's time for a universal frame

Where are we now

Our research shows that experts and practitioners working on antimicrobial resistance feel that the way the issue is currently communicated is problematic. And there is an extensive base of evidence from research with the public that shows that there is indeed a problem.

Issues with current communications include:

- **Multiple terms:** different experts and practitioners working on antimicrobial resistance talk about the issue using multiple different terms (e.g. 'antimicrobial resistance', 'drug-resistant infections', 'superbugs', 'antibiotic resistance'). This means that the public do not immediately recognise this as one issue as they hear it presented as multiple different things.[5]

- **Multiple frames:** a variety of different frames are used to explain what antimicrobial resistance is and to explain its impact.[6] For example, common impact frames include war, death, economic effects and impact on healthcare.

- **Disjointed media coverage:** coverage of antimicrobial resistance tends to be driven by specific disease areas and specific outbreaks, rather than looking at the issue overall. This makes it difficult for the public to immediately connect the different aspects of the issue; for example, they might not make the link between reports of a superbug outbreak in hospitals with outbreaks of drug-resistant malaria.[7]

- **A low-volume and specialist conversation on social media:** the most active voices in social media conversation about antimicrobial resistance are a relatively small number of technical experts and institutions. This means that antimicrobial resistance is not a mainstream conversation on social media. There is also a relatively low volume of conversation, compared with issues like climate change.[8]

Overall, public understanding and awareness of antimicrobial resistance and its impact is low. This is seen both across existing research and in the results from our own quantitative and qualitative research.[9] The public do not see the true scale and severity of antimicrobial resistance, and therefore it is not an issue the public is calling for political action on.

We believe that a more coherent, evidence-based approach to communications on this issue is key to increasing public understanding and support for action. This section of the report will look at each of these challenges in more detail.

a. Multiple terms are currently used to describe the issue

There is a wide range of terms used by both experts and practitioners working on antimicrobial resistance and the media to describe the problem – including 'antimicrobial resistance', 'drug-resistant infections', 'superbugs', 'antibiotic resistance' and 'antibiotic tolerance'. Not only are multiple terms used, these terms are often seen as technical or complicated by the public (e.g. 'antimicrobial') or are shortened by experts and communicators to even less familiar acronyms (e.g. 'AMR', 'DRI').[10]

Issue experts highlight the challenge presented by terminology

"I think that the terminology is a problem. I think that we're in a field where we have too many things that kind of mean the same thing, but not quite, which means that in a technical sense they're not exactly interchangeable, but when you step out of the technical bubble, most people don't understand any of them, so I think that's problematic."

Issue expert, scientific community

"We change these terms and we completely confuse the listeners and yes, it's distracting … these terms really matter a lot. They cause a lot of misunderstanding and miscommunication at the end of the day because of the terminologies that are used."

Issue expert, policy maker

b. A variety of frames, including war, apocalyptic and human impact (i.e. deaths) are used to explain the issue and impact of antimicrobial resistance

There is a wide range of frames that are used to explain the issue of antimicrobial resistance, and to describe its impact. Our analysis of existing research into communicating antimicrobial resistance, our interviews with issue experts and our analysis of media and social media coverage of the issue show the range of frames that are used.

The table below summarises frames that are currently being used. In simple terms, a frame is a pattern of thought or behaviour that people use to understand information. Framing is the way in which an issue or idea is presented to an audience, and the specific aspects of the issue that a message focuses on, which can shape the way that the recipient perceives that information.[11]

Chart 1.0: Media coverage in the UK, US & Germany uses multiple terms for antimicrobial resistance at very different frequencies [12]
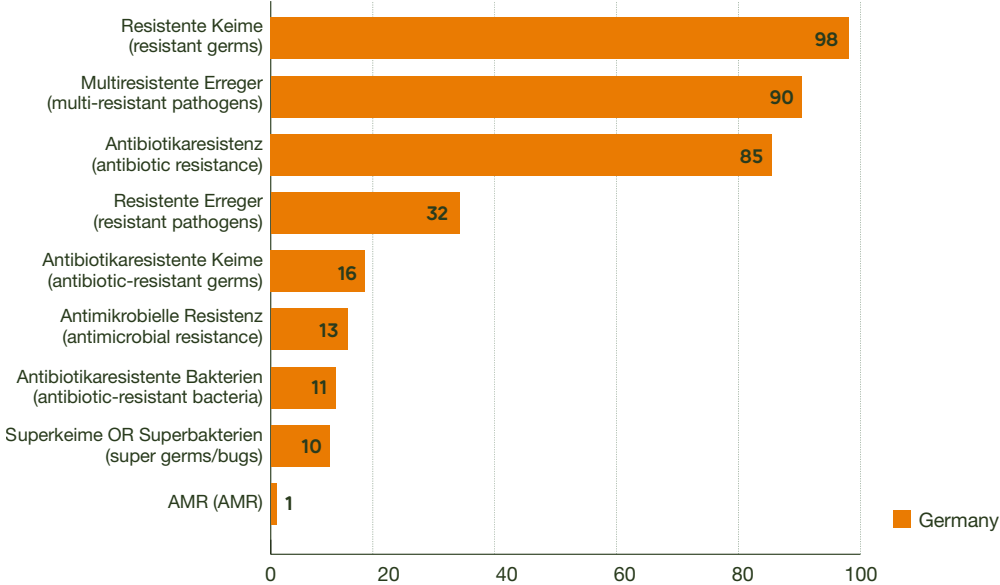
Number of articles mentioning each term (US, UK)

Term	UK	US
Superbugs	359	107
Antibiotic resistance	349	153
Antimicrobial resistance	199	53
Drug-resistant infections	126	32
Antibiotic-resistant bacteria	62	74
AMR	64	9
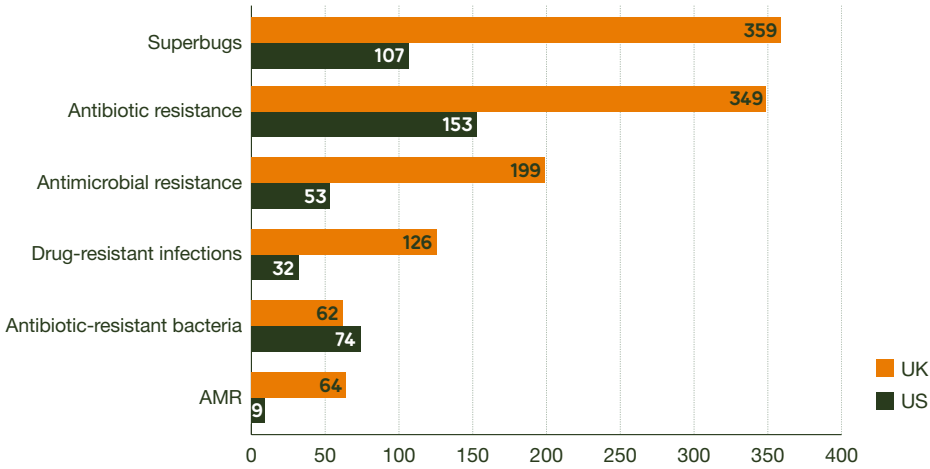
Number of articles mentioning each term (Germany)

Term	Germany
Resistente Keime (resistant germs)	98
Multiresistente Erreger (multi-resistant pathogens)	90
Antibiotikaresistenz (antibiotic resistance)	85
Resistente Erreger (resistant pathogens)	32
Antibiotikaresistente Keime (antibiotic-resistant germs)	16
Antimikrobielle Resistenz (antimicrobial resistance)	13
Antibiotikaresistente Bakterien (antibiotic-resistant bacteria)	11
Superkeime OR Superbakterien (super germs/bugs)	10
AMR (AMR)	1

Based on 901 (UK) 366 (US) and 354 (German) news items about AMR published in the year to 31 July 2018. Chart shows number of articles mentioning each term.

Table 2.0: Frames used in communications about antimicrobial resistance[13]

Topic	Frame	Examples
What is happening		
Antibiotics becoming ineffective	Antibiotics stop working	The drugs don't work, antibiotics are no longer able to treat many bacterial infections
Behaviour of bacteria	Human & societal qualities	Clever, outwitting us, selfish, monstrous, purposive quality of mutation
		Superbug as a comic book villain
	Scientific inevitability of resistance	Natural evolutionary process; cannot stop developing antibiotics, because bacteria will not stop developing new forms of resistance
Our relationship with bacteria	Symbiosis	Balancing good and bad bacteria
	War	Invasion, battle, combat, attack, threat, arms race vs. bacteria, bacteria as the enemy
	Interconnected world	Microbes know no borders, the 'threat' of immigration
Why it is happening		
Use of antibiotics (& antimicrobials) in humans	Appropriate/inappropriate use	Prudent, responsible, judicious use vs. abuse, irrational, immoral, wasteful use
	Overuse	Excessive use – individually and collectively
	Increased use	Antibiotic consumption has increased
	Precious resource	A targeted silver bullet that should be protected
	Last resort	Effective if necessary, harmful if abused. Last line of defence
Use of antibiotics in humans & animals	One Health	Use in farming, industry, contamination of the environment
		Consumption of antibiotics through food
Production of antibiotics	Market failure	The market is not delivering the right incentives
		Resistant bacteria are developing faster than new antibiotics
		Reasons for market failure: governments, pharmaceutical companies etc.
Ideological	Consumerism	Overuse to maintain lifestyle; individualism vs responsible citizenship
		AMR as a product of privatisation and neglect of health systems
	Pharmaceuticalisation	Treatment always entailing use of pharmaceuticals
		Neglecting other health necessities, e.g. healthy living conditions
	Risk-averse culture	Overuse and inappropriate use fuelled by concern about risk – i.e. the practice of defensive medicine
	Clean living	Eating clean; cleanliness in the home
Impact of AMR		
Scale of impact – breadth beyond health	Apocalyptic	Antibiotic apocalypse; back to the dark ages Pandemics, epidemics
	Comparable impact	Climate change; financial crisis
	Economic	Economic damage – numbers and projections – global & national
		Cost to healthcare, return on investment in AMR interventions
	Farming & food security	Threatening farming, food supply
		Calls for clean 'antibiotic-free meat'
	Global development and poverty	Increase in global poverty
		The poor will be disproportionately affected
	Security & travel	Travel and tourism could be compromised
	Wider environment	Contamination of the environment, rivers
Scale of impact – health	Deaths	Numbers and projections; 10m deaths every year by 2050
		Threat to the infrastructure of medicine
	Medical systems	Modern medicine is impossible without antibiotics
		Ability of healthcare system to cope with extra cost, longer stays
	Medical progress	Set back progress made in other areas of medicine
		Link to other disease areas: TB, HIV, STIs, malaria
	Relatable healthcare	Routine procedures & surgeries become more dangerous
		Minor ailments become more severe Increased cost of healthcare, increased length of treatment
Who it affects	Everyone globally	Across borders
	Immediate	Friends and family; next generation – children
	One health	Humans, animals, environment
	Vulnerable	Young, old, immunocompromised, poorest

Table 3.0: Frames being used in media coverage of AMR

Frame	Example headlines
Scale of impact: economic	Superbugs pose a dangerous, $65 billion threat to the US health-care system
Scale of impact: medical systems	Antibiotic resistance could spell end of modern medicine, says chief medic Antibiotic resistance: Huge fears for 'end of modern medicine
Scale of impact: deaths	10 million lives could be lost to superbugs – so how far have we got in the race to beat them? Antibiotic Resistance Could Take Us Back To The Days Where 40%Of Us Died of Infections Taking antibiotics unnecessarily could cause more DEATHS thank diabetes and cancer COMBINED
Scale of impact: comparable impact	Superbugs 'are going to wipe us out before climate change does,' expert warns 'Why antibiotic resistance is now our planet's biggest health issue'
Scale of impact: apocalyptic	How antibiotic resistance could take us back to the 'dark ages' 'Antibiotic apocalypse': doctors sound alarm over drug resistance
Who it affects: vulnerable	E.coli in children: Doctor's fears as antibiotics stop working Statins have power to help elderly fight off killer superbug

[5] Appendix C: Qualitative research.

[6] Wernli D, Jørgensen PS, Morel CM et al .Mapping global policy discourse on antimicrobial resistance. BMJ Global Health 2017;2:e000378.

Khan MS, Durrance-Bagale A, Legido-Quigley H et al. LMICs as reservoirs of AMR: a comparative analysis of policy discourse on antimicrobial resistance with reference to Pakistan. Health Policy and Planning 2019; 34(3):178–87.

[7] Appendix B: Media analysis.

[8] Appendix B: Social media analysis.

[9] WHO. Antibiotic resistance: Multi-country public awareness survey. 2015.

[10] Appendix C: Qualitative research.

[11] Druckman JN 2001. The implications of framing effects for citizen competence. Political Behavior 2001;23(3):225–56.

Lakoff G. The Political Mind. Penguin; 2009.

[12] Analysis based on mainstream media sources in the UK, US and Germany (including national newspapers; key regional newspapers; news or opinion magazines; TV/radio broadcasters; news agencies; or web-only news. For full list of sources see Appendix B: Media analysis.

Westen D. The Political Brain. Public Affairs; 2008.

[13] For full references see Appendix A: Methodology.

The net result is that the public are likely to hear or see a range of different framings of antimicrobial resistance and its impact from different sources – such as the media, public health authorities and healthcare professionals. In this context, it is not surprising that there is low understanding of the issue and widespread misconceptions, with people often not knowing what antimicrobial resistance is or believing that people rather than microbes build up resistance.[14]

c. Disjointed and outbreak-driven coverage

The way that antimicrobial resistance is covered in the media can also be unhelpful in driving public understanding.

Our analysis of media coverage in the UK, US and Germany shows that coverage is typically driven by specific disease areas and outbreaks. This is not unusual in global health, but it means that coverage of antimicrobial resistance often appears disjointed

and fragmented when seen only through a disease- or outbreak-specific lens, and it is difficult for the public to make connections between different stories on the issue – for example connecting MRSA in hospitals with super-gonorrhoea with antibiotics in the food chain and the search for new antibiotics.
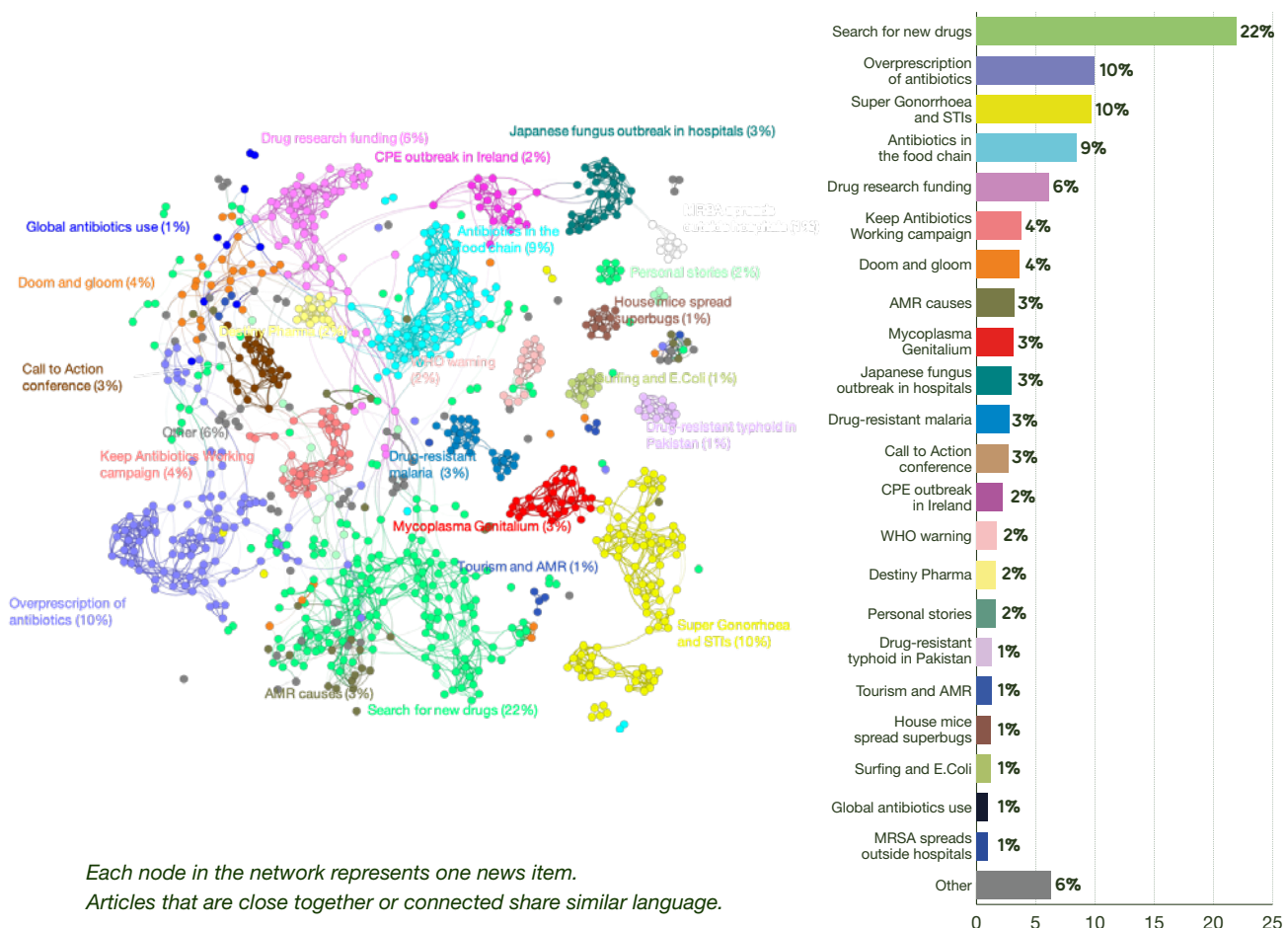
It is also notable that the volume of media coverage of antimicrobial resistance varies considerably between countries. Analysis shows that the volume of antimicrobial resistance-related coverage is much higher in the UK than in the US or Germany.[16]

d. A specialist, not mainstream, social media conversation

Our analysis of social media conversation shows that discussion of antimicrobial resistance tends to be a specialist conversation.

Conversation in the US is driven by institutions, and while individual users drive more activity in the UK and Germany, they too tend to be from a

Chart 2.0: Map of UK media coverage of antimicrobial resistance over a 12-month period showing the fragmented nature of coverage[15]

Each node in the network represents one news item.
Articles that are close together or connected share similar language.

Search for new drugs	22%
Overprescription of antibiotics	10%
Super Gonorrhoea and STIs	10%
Antibiotics in the food chain	9%
Drug research funding	6%
Keep Antibiotics Working campaign	4%
Doom and gloom	4%
AMR causes	3%
Mycoplasma Genitalium	3%
Japanese fungus outbreak in hospitals	3%
Drug-resistant malaria	3%
Call to Action conference	3%
CPE outbreak in Ireland	2%
WHO warning	2%
Destiny Pharma	2%
Personal stories	2%
Drug-resistant typhoid in Pakistan	1%
Tourism and AMR	1%
House mice spread superbugs	1%
Surfing and E.Coli	1%
Global antibiotics use	1%
MRSA spreads outside hospitals	1%
Other	6%

specialist medical background, including pharmacists, infection specialists and microbiologists.

Moreover, the overall volume of conversation about antimicrobial resistance is relatively low, compared to other more high-profile issues such as climate change. The result is that the conversation is not mainstream or one that many social media users beyond experts and practitioners working on antimicrobial resistance are likely to engage with.

[14] Wellcome Trust. Exploring the consumer perspective on antimicrobial resistance. 2015.

[15] See Appendix B for full findings from media and social media analysis.

[16] Appendix B: Media analysis.

Chart 3.0: News volume comparison over a 12-month period showing the UK media published more than twice the volume of antimicrobial resistance stories than the US and German media
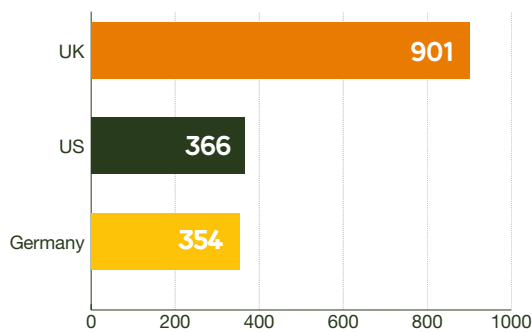
Data note: Analysis of 901 (UK) 366 (US) and 354 (German) news items about AMR published in the year to 31 July 2018. See Appendix B for full source list

Chart 4.0: Twitter volume comparison

English-language tweets

German-language tweets
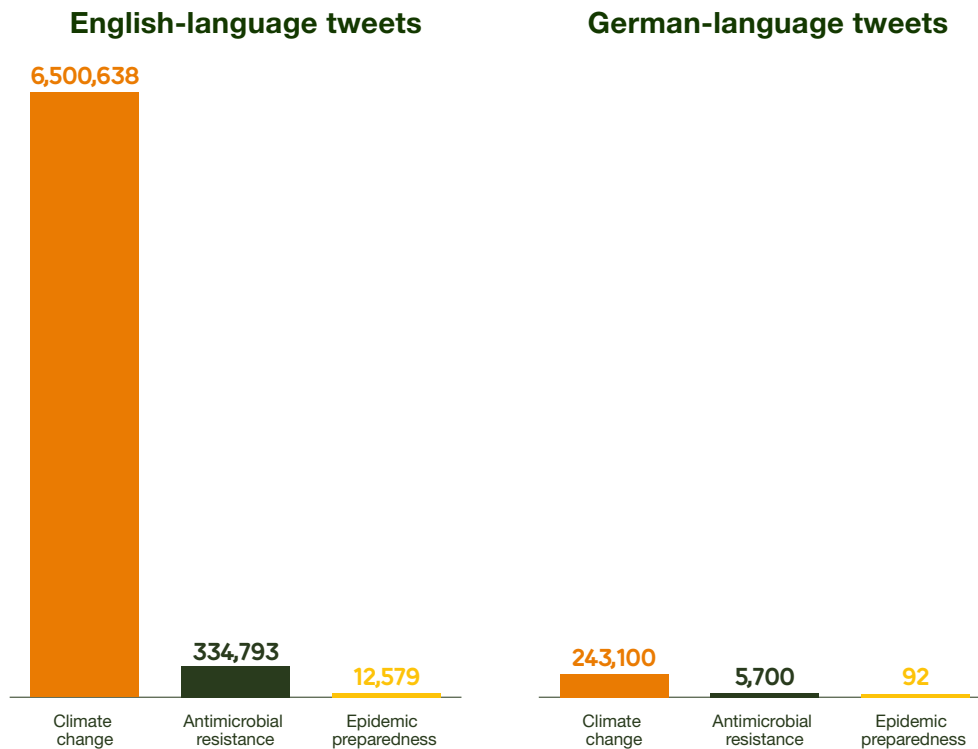
Note: Analysis of English- and German-language tweets published between 10th October 2017-10th October 2018. The charts are based on simplified search queries for popular Twitter hashtags associated with the three topics. See Appendix B for full list of search queries.

Five principles for communicating about antimicrobial resistance

A key finding from the research was that there are universal themes that resonate effectively across all the countries included in this study. This means that we can identify overarching principles to be used when communicating on antimicrobial resistance. This section of the report sets out the five principles, and the evidence these recommendations are based on.

We encourage experts and practitioners working on antimicrobial resistance to use these principles to inform public communications. Whenever possible, these principles should be used in combination, to maximise impact.

Together, by using this language, our communications can help increase public understanding of this issue and encourage more action.

1. Frame antimicrobial resistance as undermining modern medicine

The most compelling frame in our research was the undermining of modern medicine by antimicrobial resistance. This frame helped the public understand the breadth of impact antimicrobial resistance has currently and could have in the future. This repositioned the issue, from being one comparable with other specific disease priorities, to one with relevance across a range of different priorities – the result being that antimicrobial resistance was considered not only to be serious but an issue requiring more urgent action.

Effective communications about antimicrobial resistance need to demonstrate how it is a cross-cutting threat across all of medicine (beyond specific disease areas), which sets back and undermines treatments that we have come to rely on. This should be illustrated using multiple examples that are relevant to the audience being addressed.

a. Antimicrobial resistance is more motivating when the impact across a range of diseases and medical procedures is understood

As set out earlier in this report, current communication around antimicrobial resistance is often focused on specific disease areas, including in media coverage and social media conversation. Qualitative research shows that this positioning is not helpful in encouraging the public to see the urgency of taking action against antimicrobial resistance. When viewed as one of several health issues, antimicrobial resistance is often viewed as serious, but not seen as a priority issue to be addressed. There are numerous other health issues – such as cancer, obesity, mental health, air pollution – that feel more urgent and more personally relevant to most members of the public. These are also issues that are covered more frequently in the media, and in a less disjointed way, than antimicrobial resistance.

The public find the issue of antimicrobial resistance hard to relate to

"I think antibiotic resistance is important, but I think the other topics are more global in my opinion and antibiotic resistance is more relevant for a certain target group."

Public, Germany

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"[Antimicrobial resistance might be] a problem but people are not aware of it. The others are mainstream, and media is spreading it, but this one – not many people know about it unless they read about it."

Public, Kenya

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"I think [antimicrobial resistance] is important but lesser, because people who have cancer have [a higher] severity level. This [antimicrobial resistance] is severe but not as severe."

Public, Thailand

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"I ranked clean water and air pollution as a higher priority because they're both necessary to live."

Public, Japan

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"Air pollution leads to most of other things. It's a broader thing, when air is polluted, it affects all in one go."

Public, India

To overcome this we should position antimicrobial resistance as a cross-cutting threat across disease areas and other health issues, we should position antimicrobial resistance as a cross-cutting threat. In our public testing of messages describing the impact of antimicrobial resistance, messages that focused on the concept of modern medicine being undermined resonated widely. Showing how antimicrobial resistance could undermine modern medicine and take us back to a time where common infections and routine surgery could prove fatal is a concept that cuts through. This was the case across all countries.

This concept emerged as the compelling component in several messages tested, including a message highlighting that people are dying once again from tuberculosis, two 'apocalyptic'-framed messages describing how currently treatable infections could kill again, and also a message that focused on routine surgery and common diseases becoming more dangerous. These messages tested strongly in the quantitative research (as shown in the chart below).

Messages tested:

- Tuberculosis (TB) was a disease that had been brought under control by antibiotics; however, the spread of antibiotic-resistant TB means many people are once again dying from this disease

- Growing resistance to medicines means that we are facing an antibiotic apocalypse where currently treatable infections and injuries will kill once again

- If we do not take action against antibiotic resistance, we will return to the dark ages of medicine where currently treatable infections and injuries will kill once again

- Having routine surgery such as caesarean sections or hip replacements will become life threatening, and complications from common diseases such as diabetes and injuries or cuts will become harder to manage

Chart 5.0: Several of the messages that tested strongly in the quantitative research focused on the concept of modern medicine being undermined by antimicrobial resistance [17]

Q: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed? (% great/to some extent) (Showing nets - % great / some extent minus % a little / not at all)
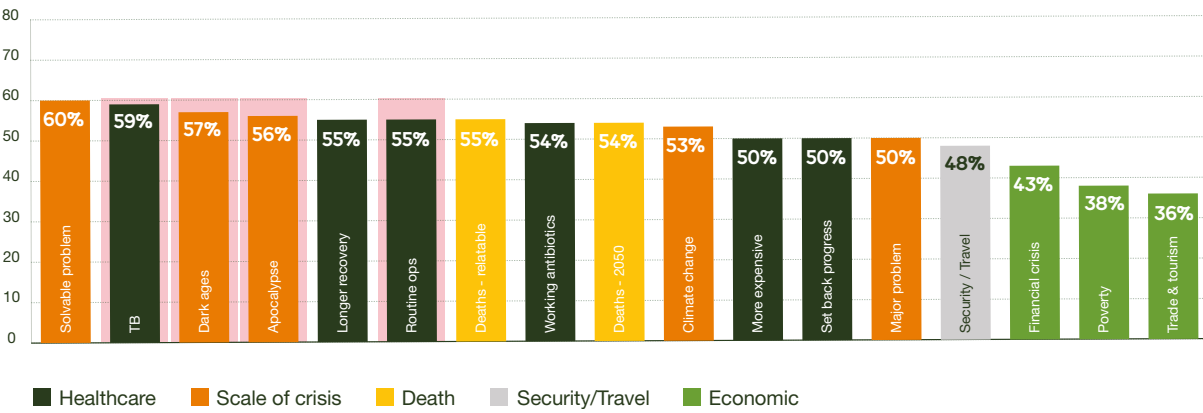
Base: All respondents shown each message (4,051-6091).

[17] For full messages see appendix A.

These messages also tested strongly in the qualitative research. There were two key reasons why they are compelling. Firstly, the concept of 'going back in time' and of antimicrobial resistance undermining modern medicine resonated across countries. While the sensationalist tone of the more apocalyptic messaging was a cause for some scepticism and can reduce credibility, the core idea of treatable infections and injuries killing once again was compelling. This concept helped people understand the need for action on this issue. (The pros and cons of apocalyptic messaging are covered in more detail on page 27.)

The idea of antimicrobial resistance setting us back in time is compelling

"It's interesting in the fact that all of our developments and progress over the years, and medical advances, all of a sudden, you know, we're thrown back two, three, four, five hundred years."

Public, UK

"I think it is something that all of us should pay attention to. In the past we fought, and we won. But nowadays we are fighting in the same old way and we lose. This really hits me hard."

Public, Thailand

"When antibiotics were not there, it was very difficult to manage diseases."

Public, India

"The idea of treatable infections and injuries killing people once again is terrifying to me."

Public, Japan

Secondly, the qualitative research highlighted how the idea of setting back progress can be made more powerful by illustrating the breadth of the impact of antimicrobial resistance. Citing multiple examples of the diseases or procedures affected helps increase the impact of this messaging, by framing antimicrobial resistance as a cross-cutting threat with a far-reaching impact. By contrast, if messaging focuses on a single disease or procedure this does not convey the same breadth of impact (instead appearing limited to one area) and potentially reduces personal relevance by giving fewer opportunities to connect with issues that matter to our audience.

By highlighting the broad impact of antimicrobial resistance, we can tap into the standing of other disease areas – from cancer to diabetes to HIV. By citing the impact of antimicrobial resistance on several of the public's existing health concerns in this way, this helps communicate the need for action to be taken.

Positioning antimicrobial resistance as a cross-cutting threat is compelling

"It is an important topic, after all. I think how banal we think that an appendicitis is, or other routine surgery where just minor things are removed from your body, like if you have tonsillitis, the tonsil's removed. The harmless things that we don't think of, like removing tonsils, that could become a threat."

Public, Germany

"Probably everyone we know has been on antibiotics in the last couple of years because they've got a bad flu, or they've got tonsillitis. Those things used to be massive killers, but not anymore, and if we go back to a place where they are as serious as they used to be, it's just going to be a very horrible place to be living, I think."

Public, UK

"[Antimicrobial resistance would have a bigger impact] if we associate it with killer diseases."

Public, Kenya

"[Explaining that antimicrobial resistance could impact patients with cancer or HIV/AIDS] would make me feel like it's more of a priority. I think if you say there's a limited pool of resource to go to different diseases, and we're saying we could, for example, you put your money into cancer, but in twenty years that work is going to be undone because the antibiotics aren't going to work, for example … that would then make me think, 'Okay, we need to deal with this'."

Public, UK

Focusing on a single disease or procedure is less motivating

"I think it is specific for only TB and doesn't refer to other germs. If I don't have such illness, I won't read it."

Public, Thailand

"It feels like TB is not relatable or it doesn't have an impact in today's day and age because it has been pretty much cured."

Public, US

"It's talking of one disease [TB] and it affects a small percentage."

Public, Kenya

"I don't personally relate to caesarean sections or hip replacements."

Public, Japan

In summary, our communications should focus on how antimicrobial resistance could undermine modern medicine and take us back in time, while also positioning it as bigger than one disease. These two elements need to be combined to resonate most strongly with the public; if not combined, the individual messages will be less effective.

b. Reinforce the undermining medicine frame by tailoring examples to your context

As set out above, when communicating the impact of antimicrobial resistance on modern medicine, we should illustrate our arguments with examples of routine procedures and common illnesses and injuries that could be affected by this issue. In order for messages to resonate, the examples we use should be tailored to ensure that they are of most relevance to the specific audience being addressed. We need to tailor examples both by country, and by demographic group – for example using examples that will feel relevant to parents, older people, men, women or other specific groups.

Tailoring examples to the audience makes messaging more relevant

"The reason I picked that [message] is because, to me, this covers everybody. I mean I don't know anybody that doesn't fall into one of these categories. That they either have had or will have surgery or they have a common disease, in other words, it spoke to me in terms of concrete things that I could find a person I know pretty much to fit every single category here, that's why I picked that one."

Public, US

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"Nowadays, Thai people have [a] higher possibility to undergo an operation from diabetes or from road accidents while travelling. It can happen to anyone easily."

Public, Thailand

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"It's not about a specific condition like TB, it's about something that can happen every day. Like, in hospital, 'I just broke a hip, everything's fine, and three days later I'm dead because I caught a hospital germ.' I read that because, yes, it's something that could affect me personally, any time."

Public, Germany

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"I placed a high interest in [the message] because common diseases and injuries are more likely to happen to me and the people around me."

Public, Japan

So, what examples should we as communicators use? Across the qualitative research, there were a range of suggestions of diseases or procedures that respondents felt were relevant to them. These included wisdom tooth extractions, tonsillitis, appendicitis and injuries from accidents.

We recommend that communicators should give examples of the most common procedures, illnesses and injuries that are affected by antimicrobial resistance in the country where they are communicating, or among the demographic groups they are communicating with. This will maximise the potential relevance to our audiences.

2. Explain the fundamentals succinctly

The research showed that simple and straightforward explanations of antimicrobial resistance were most effective in increasing understanding of the issue. Helping our audiences understand resistance (particularly that microbes develop resistance, not individuals) is very important because qualitative research shows that this understanding is key to driving public support for action on antimicrobial resistance. It is also important that our explanations include the part that human activity is playing in accelerating the issue.

a. Simple explanations of resistance are key in building credibility and relevance

In our quantitative and qualitative research, messages that explain antimicrobial resistance in simple, clear terms were highlighted as being more effective at helping the public understand the problem and increasing support for action. This preference for a simple explanation of resistance was consistent across all demographic, behavioural and attitudinal groups (including age, gender, level of understanding of antibiotics, and perceived threat from antimicrobial resistance).
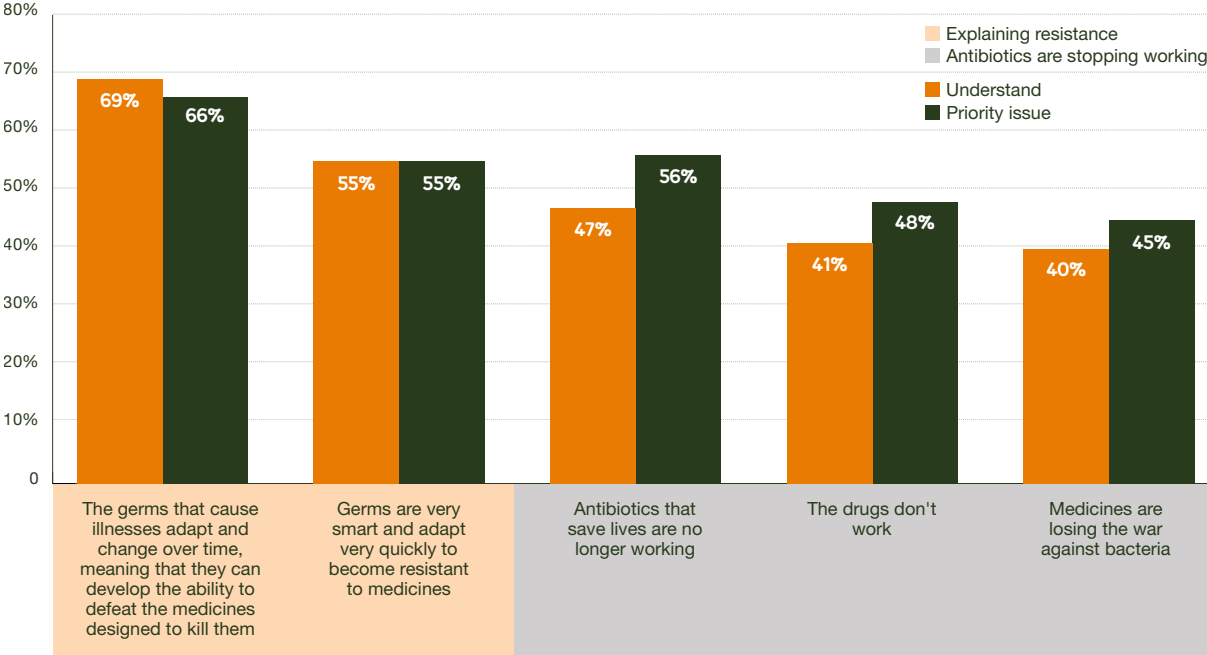
Messages tested:

• Antibiotics that save lives are no longer working

• The drugs don't work

• Medicines are losing the war against bacteria

• The germs that cause illnesses adapt and change over time, meaning that they can develop the ability to defeat the medicines designed to kill them

• Germs are very smart and adapt very quickly to become resistant to medicines

b. Avoid scientific explanations and jargon

While there is demand for a succinct explanation of antimicrobial resistance, this does not extend to demand for detailed scientific explanations. Messages should be clear, succinct and easy to understand.

Chart 6.0: A clear, simple explanation of resistance tested most strongly in quantitative research

Q: To what extent does this statement help you understand what is happening with antibiotic resistance?
Q: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed?
(Showing nets - % great / some extent minus % a little / not at all)

Legend:
- Explaining resistance
- Antibiotics are stopping working
- Understand
- Priority issue

Data:
- The germs that cause illnesses adapt and change over time, meaning that they can develop the ability to defeat the medicines designed to kill them — Understand 69%, Priority issue 66%
- Germs are very smart and adapt very quickly to become resistant to medicines — Understand 55%, Priority issue 55%
- Antibiotics that save lives are no longer working — Understand 47%, Priority issue 56%
- The drugs don't work — Understand 41%, Priority issue 48%
- Medicines are losing the war against bacteria — Understand 40%, Priority issue 45%

Base: All respondents shown each message (7,295-7,302).

Chart 7.0: Awareness of terminology – the public have significantly lower awareness of 'microbes' than 'bacteria' or 'germs'

Q: Have you heard of any of the following terms? (% answering 'yes')

Data:
- Bacteria 95%
- Germs 94%
- Microbes 83%
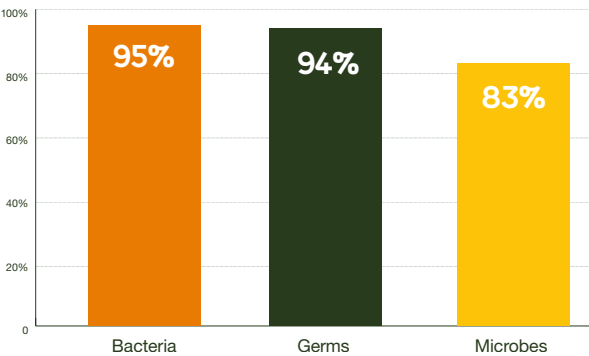
Base: All respondents (12,169)

Our in-depth interviews showed that experts and practitioners working on antimicrobial resistance recognise that it is important to communicate in a jargon-free, straightforward way, but also acknowledge that there is often a tendency to lapse into technical and scientific explanations.

Issue experts highlight a common tendency to use technical explanations

"There's an overemphasis, especially from technical experts… to rely on education as a solution to the problem, but… that's actually not an effective solution to change how people are thinking and behaving with respect to an issue."
Issue expert, policy maker

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"From an AMR perspective I feel like we can get into that rabbit hole of trying to find out the best and most accessible ways of explaining the technicalities of it. But what we need is to find a way of making sure the urgency of the issue is captured and felt by the public and politicians."
Issue expert, private sector

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"We struggle with this. I wish there were a better phrase that was a little more understandable, but we want to be accurate and it's hard to not be a little scientific in this topic."
Issue expert, NGO

An example of the tendency to use jargon is the terminology that is used when communicating about the issue. Our public testing shows that commonly used terms like 'antimicrobial' or 'microbes' do not resonate. Survey findings across countries clearly show lower levels of awareness of the term 'microbes' than of 'germs' or 'bacteria'. And even though four in five say they are aware of the term 'microbes', qualitative research revealed that this awareness often does not equate to knowledge or understanding, which is significantly lower.

Qualitative research revealed low understanding of the term 'microbial'

"I do not understand the word 'microbial'."
Public, Thailand

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"Microbial sounds so like 'microbiotic', I don't know."
Public, US

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"[Antimicrobial] it's a very technical term."
Public, India

"They should not use complicated terms like 'microbial'."
Public, Kenya

A consistent theme across the qualitative research was that messages that are clear, succinct and easy to understand are most popular. This finding supports other communications research on how to communicate complex topics effectively.[18]

Public messaging needs to be clear and simple

"For purposes of information, more will complicate. Short and precise."
Public, Kenya

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"[I liked] the simplicity of it, I think. Also, I thought it was more succinct, very clear."
Public, US

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"[This message is] my favourite because it's simple and … the sentence is clear."
Public, Germany

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"It's very clear language, anyone can understand it. It's relatable to us."
Public, India

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"I think they use simple words. No technical terms. No complicated expressions. The explanation gives a clear image. They do not use medical terms. And that makes me able to understand and have a clear image."
Public, Thailand

c. Consistently explaining that microbes develop resistance, not individuals, reinforces the relevance to everyone of antimicrobial resistance

A critical element when explaining resistance is to communicate that antimicrobial resistance is caused by bacteria and other microbes developing resistance, rather than individuals.

Our quantitative research showed that there is a widespread misconception that resistance occurs when an individual's body develops resistance to antibiotics or other antimicrobials. This was also shown by the qualitative research, which revealed the impact of holding this misconception. This was seen across countries but was especially common in the Global South.

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[18] The Narrative Project. Building public support for global development in the US, UK, France and Germany. 2014. https://www.narrativeproject.org/

This misconception is particularly problematic and a major obstacle to communicating the urgency to address antimicrobial resistance. Holding this misconception leads to a thought process that means individuals view antimicrobial resistance as a low-priority issue and one which does not personally affect them. Those who believe resistance occurs in individuals think that antimicrobial resistance can be avoided, which in turn means they tend not to feel personal jeopardy from the issue. This limits the ability of messages describing the impact of antimicrobial resistance to drive support for action.

Attributing resistance to people (rather than to bacteria) significantly reduces salience:

Logic process observed in the qualitative research:

• Antimicrobial resistance is caused by individuals taking antibiotics incorrectly > I do not take many antibiotics/I do not take antibiotics incorrectly > This is not a problem for me (or people like me)

Widespread misconception that individuals develop resistance (not bacteria), which reduces personal relevance

"If you use drugs, your body is supposed to create immunity against those diseases, but overuse makes the body resistant."

Public, Kenya

"We don't take [antibiotics] frequently. It's very less, 1-2 times in a year, so I am not prone to it [antimicrobial resistance]."

Public, India

"[Antimicrobial resistance] is quite normal, no big thing, like malaria. It's on a personal level, if you take antibiotics, your resistance will be on [the] lower side. If you are fit, your body resistance is more."

Public, India

"It doesn't affect everybody."

Public, Kenya

"Air pollution is something that is more global for everybody and, with antibiotic resistance, there are just a certain number of people that are affected."

Public, Germany

"If you take good care of yourself, take medicine and follow doctor's advice you will not have this [antimicrobial resistance]. It is something preventable."

Public, Thailand

"They gave me antibiotics for a period of about two years and I just got used to them … it just shows how quickly your body and can become used to something if you're taking it a lot."

Public, UK

"Me and my family do not often take medication. The antibiotic resistance is brought up on the news, for example how mosquitos and insects are getting resistant to antibiotics. Personally, it's not a high priority to address because I usually don't take antibiotics."

Public, Japan

Explaining resistance, and that bacteria become resistant not individuals, is therefore critical for driving public support for action on antimicrobial resistance. Understanding that bacteria become resistant helps people appreciate that antimicrobial resistance is not something that can be avoided by their own personal behaviour. Our qualitative research showed that people with this correct understanding of resistance (primarily in the Global North) approach antimicrobial resistance with a different thought process.

A correct understanding of resistance increases salience:

Logic process observed in the qualitative research:

• Antimicrobial resistance is caused by bacteria becoming resistant > Everyone is at risk from resistant bacteria (irrespective of their personal usage) >It is a universal threat

This understanding in turn helps drive prioritisation of the issue (though is often not sufficient to do so on its own). It also helps drive an appreciation that collective action is needed (rather than this being an issue linked to individual behaviour), that everyone needs to act to address this problem, and that ultimately this will need a joined-up approach on a political level.

We need to be careful not to diminish the importance of individual action and behaviour. But we need to make it clear that individuals cannot avoid the problem of antimicrobial resistance simply through healthy personal behaviour.

People who understand that bacteria become resistant (rather than individuals) are more likely to appreciate the threat posed by antimicrobial resistance

"I think antibiotic resistance, it is a big threat. It is a big problem. I think it's more contemporary, more current, than a lot of people realise and … if it actually does happen in a larger way then

I think it will be completely devastating.”

Public, UK

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“From what I've heard about antibiotic resistance, it's a serious problem for the future.”

Public, UK

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“I saw a report on it, and it scares me, it scares me of what could happen to us and how freely antibiotics are prescribed here … I've got a very bad immune system, I catch infections very quickly, so I'm scared more than others that this could be something that affects me.”

Public, Germany

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“It mustn't be underestimated, and I also believe it has reached Germany with multi-resistant germs, they are in certain hospitals and I think that physicians are sensitive to that.”

Public, Germany

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“It's terrible how so many antibiotics today are not working anymore and are becoming resistant and they're really worried. I mean if you read articles, they're really worried about what's going to happen with certain diseases when antibiotics aren't working for them anymore and that's why.”

Public, US

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“That is a very serious issues if antibiotics do not work on your body it would be serious because that is what we use to treat many of the illnesses and infections. If there is no drug that can deal with that, it will be difficult.”

Public, Kenya

d. An optimal name for antimicrobial resistance did not emerge, but some clear findings did

Most major social campaigns develop an umbrella term consistently used by advocates – e.g. climate change, civil rights or passive smoking. This issue currently has no such equivalent. In interviews, experts agreed with the principle that consistency is desirable, but struggled to choose a name. In English language media the six most popular terms in current usage are:

• Superbugs

• Antibiotic resistance

• Antimicrobial resistance

• Drug-resistant infections

• Antibiotic-resistant bacteria

• AMR

Given the findings above on avoiding jargon and poorly understood names, the terms 'antimicrobial resistance' and 'AMR' are problematic from a communications perspective. The research clearly showed that the word 'microbe' and the term 'antimicrobial resistance', while scientifically accurate, were not understood by the majority of public audience. We recommend avoiding them outside of scientific dialogue.[19]

The previous section shows that emphasising the role of infections is important given how many people assume the locus of resistance is human. We therefore recommend using 'resistant infections' rather than 'resistance' in isolation. For example, theterms 'drug-resistant infections' and 'antibiotic resistant infections' have the correct emphasis. Note that the singular 'infection' may be a less helpful word as it may suggest a general phenomenon rather than the concrete health threats that 'infections' describes. 'Antibiotic-resistant bacteria' is also potentially useful although 'bacteria' are less clearly understood as harmful than 'infections'. 'Antibiotic resistance' alone is less helpful so we recommend avoiding it.

The scope of antimicrobial resistance is of course broader than bacteria and antibiotics, but that narrower phrasing can help to present the topic in a more familiar way than 'antimicrobial' and 'microbe' – if the context is appropriate.

The term 'superbugs' also helpfully emphasises the role of the infections in the problem. In some contexts the term is usefully informal and colloquial, but where possible it is more effective when clearly linked to the overall issue – e.g. 'Superbugs are drug-resistant infections which…'. We recommend using this term sparingly.

Knowledge of your local context is crucial here. 'Antibiotic' does not translate well into Thai, for example, and in Kenya qualitative research has indicated the public are more familiar with specific brand names of antibiotics than the overall category.

e. Including the issue of human and animal overuse in the right way helps make the issue feel tractable

An important element to communicate when explaining the issue of antimicrobial resistance is the part that human activity is playing in accelerating the problem. Talking about overuse of antibiotics in humans and animals helps give a sense of scale and breadth to the issue.

When communications do not include the role of human activity in accelerating antimicrobial resistance, explanations can make the issue

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[19] We have decided to use antimicrobial resistance in this report as it is intended for specialists. Toolkits and public examples use more understandable terms eg drug-resistant infections.

seem inevitable and feel defeatist. Explanations that focus only on the scientific process also lack a sense of agency.

Explanations that focus only on the scientific process can feel inevitable and defeatist

*"It sounds like you can't treat it, can't solve it …
It is not motivating and sounds complicated."*
  Public, Thailand

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"It makes me think, but … it sounds so hopeless."
  Public, Thailand

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"It says they change over time and they can evolve the ability to beat medicines. It doesn't give you anything to act on."
  Public, US

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*"[This message] makes it sound like,
'Oh, this is just a natural evolution of things',
rather than maybe it's been impacted by humans."*
  Public, UK

*"[This message] is a no go, because I cannot
read in it that we can influence this, in the
way we use antibiotics."*
  Public, Germany

The concept of 'overuse' of antibiotics is a simple one that resonates with the public. Other descriptions such as 'inappropriate use' or 'the way we are using' antibiotics are often felt to be vague or ambiguous, and in need of further clarification. Terms like 'inappropriate' can also feel judgemental, in a way that 'overuse' does not.

Messages tested:

• Antibiotics are overused in humans and animals, which has resulted in them becoming less effective in treating illnesses

• Antibiotics are used inappropriately in humans and animals, which has resulted in them becoming less effective in treating illnesses

• Germs will always look for ways to survive and resist new drugs, but the way we are using antibiotics is accelerating this process

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Chart 8.0: Explaining antimicrobial resistance through human use was most compelling in quantitative testing; citing 'overuse' is more effective than 'inappropriate use'

Q: To what extent does this statement help you to understand why antibiotic resistance is happening?
Q: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed?
(Showing nets - % great / some extent minus % a little / not at all)
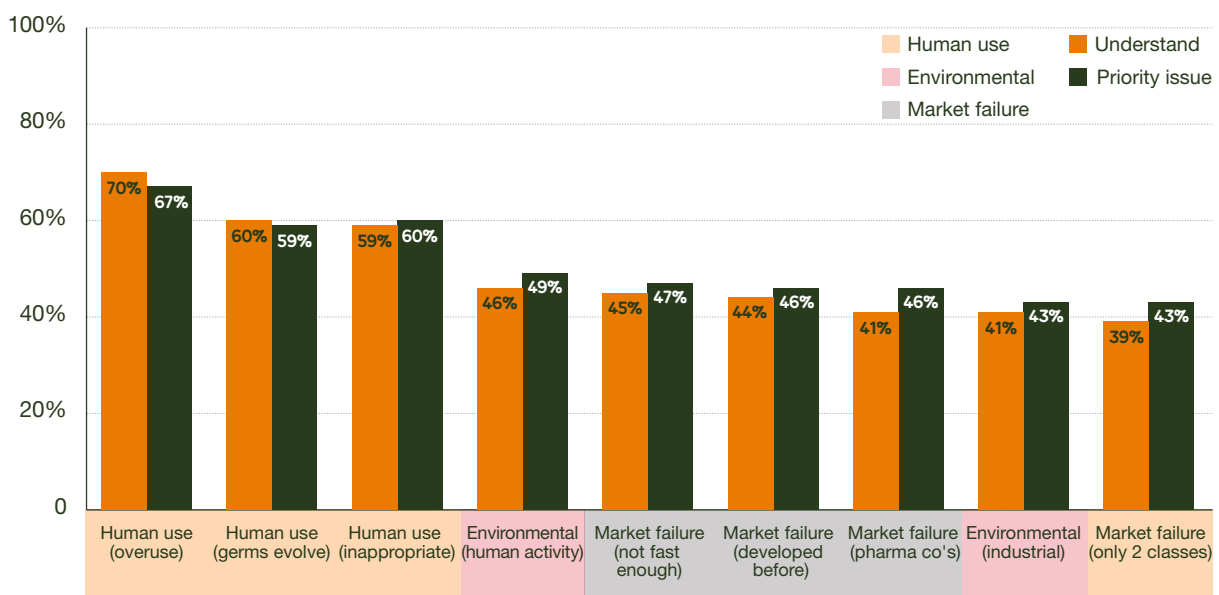
Base: All respondents shown each message (6,082-7,313).

Qualitative research further emphasised the preference for the clarity of 'overuse'

"What I had a problem with was, 'the way we are using'. It was just too broad, too general. But what's 'the way'? Overuse? Underuse? What's 'the way'?"
Public, US

"I think the word specifically 'overused' lets you know exactly what's going on."
Public, US

"The word 'overused' just made it very clear that that's the problem."
Public, UK

"I wasn't sure about 'the way we are using antibiotics'. I don't know how we currently use antibiotics."
Public, Japan

"It's very clear language, anyone can understand it. It's relative to us."
Public, India

f. Incorrectly communicating overuse can demotivate

How we talk about overuse of antibiotics is important, as this is a concept that can be interpreted in different ways depending on the audience's understanding of the issue.

Where misconceptions around resistance exist (that the individual becomes resistant, rather than microbes), 'overuse' messaging tends to be interpreted from an individual perspective. This was frequently the case in qualitative research in the Global South. When this happens, there is a danger that 'overuse' messaging can perpetuate these misconceptions.

In order to avoid this outcome, it is important that we clearly reference our collective overuse of antibiotics (rather than individual use). This should be coupled with an explanation that defines resistance as occurring in bacteria (rather than individuals).

'Overuse' can be interpreted from an individual or collective perspective

"If I over-take the drugs, it eventually stops working, so I will be told to try another drug."
Public, Kenya

"Sometimes in a hurry we take 2 [tablets] instead of 1."
Public, India

"About the word 'overuse', I would like to know what is the limit or the restrictions of the dosage. How many milligrams is considered 'overuse', or less than how many milligrams is considered 'not completing the dosage'? I would like to know what the proper amount is."
Public, Thailand

"This is something that would affect the entire world, hundreds of millions of people. Because we're actually over-taking antibiotics, we're taking them too often, too much and they're losing their effect."
Public, US

"I realise it's a growing problem. I realise that people taking antibiotics indiscriminately is going to mean resistance from them eventually."
Public, UK

g. Optimal approach to communicating human and animal overuse varies by region

When discussing overuse, citing overuse in both humans and animals (e.g. 'antibiotics are overused in humans and animals, which has resulted in them becoming less effective in treating illnesses'), is broadly understood. However, knowledge and understanding varied by country.

In Germany, awareness of prophylactic use in farming was high, and therefore including animals was important to communicating the scale of the overuse problem. Similarly, in the UK, US and Kenya, this reference was broadly understood and helped emphasise scale. It was less top-of-mind in India and Japan, but led to some understanding when respondents were prompted. However, in Thailand this reference caused some confusion, prompting questions about whether humans and animals face the same illnesses or use the same medicines.

On balance, we recommend that communicators cite overuse in both humans and animals, as although it is not completely understood by some audiences, for many it demonstrates the breadth and scale of the problem.

Understanding of 'human and animal' use varies across countries

"Apparently, giving antibiotics to animals that are going to be used for food is, like, massively widespread and has been for years."
Public, UK

"I was reading something recently about poultry and chickens being injected with antibiotics and that's actually increasing people's tolerance to it

as well, consuming food. So, the medical sector wouldn't particularly be dealing with that side of things."

Public, UK

"[The explanation of overuse] is my number one because it's humans and animals, because it appeals to both, because, well, we shouldn't lose animal problems out of sight, because that's livestock and it comes into our food chain."

Public, Germany

"A lot of animals squeeze into small spaces, so you need antibiotics to keep them halfway healthy, and then we eat these animals, and we are surprised that no antibiotics have an effect anymore. That's where efficacy is lost."

Public, Germany

"Humans and animals have different body system. When you say 'overuse', how much is considered overuse? Humans and animals take different dosage and have different responses to medicines. I wonder if what is written here is true."

Public, Thailand

3. Emphasise that this is a universal issue; it can affect anyone, including you

In order for the public to see antimicrobial resistance as an issue that needs to be addressed, we need to emphasise that this is a universal issue, and that anyone could be affected. We need to increase the sense of personal relevance and responsibly highlight the risk that antimicrobial resistance poses to all.

We can have the greatest impact if we communicate this in relatable terms that provide a human face of antimicrobial resistance.

a. Increase the sense of personal jeopardy

A major obstacle to public support for action on antimicrobial resistance is the lack of a sense of personal jeopardy. This is particularly pronounced among those who hold the misconception that antimicrobial resistance is when an individual develops resistance (as opposed to bacteria) – as there is an assumption that it can be avoided through correct antibiotic use. However, this lack of personal jeopardy is also seen among those with a better understanding of the issue, who often still struggle to see how they will be personally affected.

Across the qualitative research, responses showed that a key factor in increasing support for action was to communicate that everyone could be affected by antimicrobial resistance.

Communicating that everyone could be affected by antimicrobial resistance increases the perceived threat

"We did want to point out that fact that it would be everybody who would be affected, because if you try and pick on certain groups, people think that they might not have a problem, and everyone's going to have a problem with it."

Public, UK

"It's not just people who are vulnerable to disease, it's everybody."

Public, Germany

"I think it was an element of, like, 'Oh wow. This is going to affect everybody.' And it was quite hard hitting."

Public, UK

"It's everyone. It's black, white, young, old, male, female, global. Because it's a global issue, if you will."

Public, US

"It's a threat to all of us, where it's about antibiotic resistance."

Public, India

However, simply saying that 'everyone is at risk' is not sufficient, as this can feel too generalised and impersonal. Such a statement (which conveys breadth) therefore needs to be combined with the personal – for example, 'we are all at risk, including you, your friends and family' – to increase personal relevance and drive prioritisation.

Communicating a sense of personal jeopardy increases the impact of messaging

"Obviously, it will affect all those vulnerable groups but, for me, the real important thing is that it really will affect everyone. It's me with my tooth infection. You don't need to be vulnerable for this to affect you."

Public, UK

"[It would feel more urgent] if the article said, 'This could affect you.' Everybody is vulnerable."

Public, US

"I feel the issue closer to me now … If researchers cannot catch up with diseases, then we, everyone, will become a vulnerable group."

Public, Thailand

"We can say what could happen if your immune system weakens, so we leave it open ended so that people can put themselves in the shoes."

Public, Kenya

The research demonstrates the usefulness of increasing the relevance of antimicrobial resistance, so that people can make a personal connection to the issue. However, there is an important distinction between salience and fear – we are not recommending that communicators should aim to provoke fearful responses.

In contrast, focusing on the impact of antimicrobial resistance on specific groups of the population can have a limiting effect on the power of messaging, by decreasing personal relevance.

In our public research, we tested messages that articulated the impact of antimicrobial resistance on different groups, such as 'vulnerable people', or children and older people. Feedback in the qualitative research showed that such messages focusing on risk to specific groups, although credible, tend to reduce the personal relevance of antimicrobial resistance to individuals themselves – and therefore their support for action on the issue. This is particularly true of 'vulnerable people', which also carries ambiguity in different countries as to who it is referring to. Interpretations of it varied, including children and older people, those with weakened immune systems, the economically vulnerable (poor, homeless, without medical insurance), the societally vulnerable (lower classes), and also people in jobs that might put them at increased risk (hospital workers).

Qualitative research showed the term 'vulnerable groups' is ambiguous and open to interpretation

"I don't quite understand what you mean by 'vulnerable groups'. There are people who can't go to the hospital for financial reasons, or because they live in areas that lack adequate health care. It could be due to reasons beyond their control. It's not clear who they're referring to."

Public, Japan

"It is the elderly. It is babies and children. It is people with weak immune systems. It is all that together. So, it was more of an encompassing term."

Public, UK

"I would consider babies and children, the elderly, people with weak immune systems, people that don't have the resources to get the help they need. I think all of those would be [vulnerable]."

Public, US

"[I want] to know definitions of 'vulnerable populations', and why they're more at risk. Like, a list of groups or circumstances."

Public, US

"I think it encompasses the elderly and babies but also probably economic vulnerability, people who don't have health insurance, rural people, etc."

Public, US

"'Vulnerable people in society', it sounds like disadvantaged people … like they are looking down upon these people."

Public, Thailand

"['Vulnerable people' means] people who live in slums."

Public, India

"People who don't have resources."

Public, India

"They need to tell us they are vulnerable to what."

Public, Kenya

b. Use human stories to show the face of antimicrobial resistance

A key part of making antimicrobial resistance feel like an issue that can affect everyone is to communicate in relatable terms. This is important because most people either do not know anyone affected by antimicrobial resistance, or do not immediately connect specific issues (like hospital superbugs) with the broader issue.

This is a theme that emerged strongly in our interviews with experts and practitioners working on antimicrobial resistance, who identified the need for human stories that they feel could cut through. There were several references to campaigns that are thought to have done this well (e.g. Sepsis UK).

Issue experts highlighted the need for, and effectiveness of, human stories

"I think what would be ideal, or what we try to do, is use human stories as much as possible, because that's what people relate to. So, people can imagine their own grandmother or their own child in hospital with an infection. So, if you have somebody, another human that's having that experience, then they can relate to it, rather than talking in, sort of, scientific, abstract medical terms."

Issue expert, media

"A personal story is more concrete than the 10 million [deaths] numbers. Emotional, that's why, your mother, father, brother, family, that's emotional. We haven't really found the storytelling, which means, if you really want to make the AMR issue stick, you need to become better in storytelling."

Issue expert, private sector

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"You have to individualise it. You have to make it something which they can relate to, in terms of their personal life and experience. That's much more valuable. So, those sorts of stories are more valuable than just shroud-waving with numbers."

Issue expert, scientific community

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"The various sepsis campaigns in the UK, over the last three or four years, have done quite well on [communicating impact]. They've increased awareness of sepsis as a problem by using survivors and the families of those who didn't survive, photographs and stories and what happened … It seemed to me to be hitting home much better than just saying, 'sepsis kills as many people as prostate cancer does'."

Our public research supports this, showing that messages and news articles that provide the human face of antimicrobial resistance are more effective. People both understood and were compelled to tell others about the issue of antimicrobial resistance through personal anecdotes and individual stories.

Qualitative research highlighted the importance of personal or human stories

"I saw the news. Some actress died. Another one also got infected with TB and has not recovered yet. People in other countries also got infected. That's why I want to read more. Because I have seen people got infected."

Public, Thailand

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"My mother has a knee problem, but she refused to undergo an operation because she was afraid of infections. And there are some people who cannot walk anymore after the operation. That's why I think it is priority issue. It happened to someone close to me."
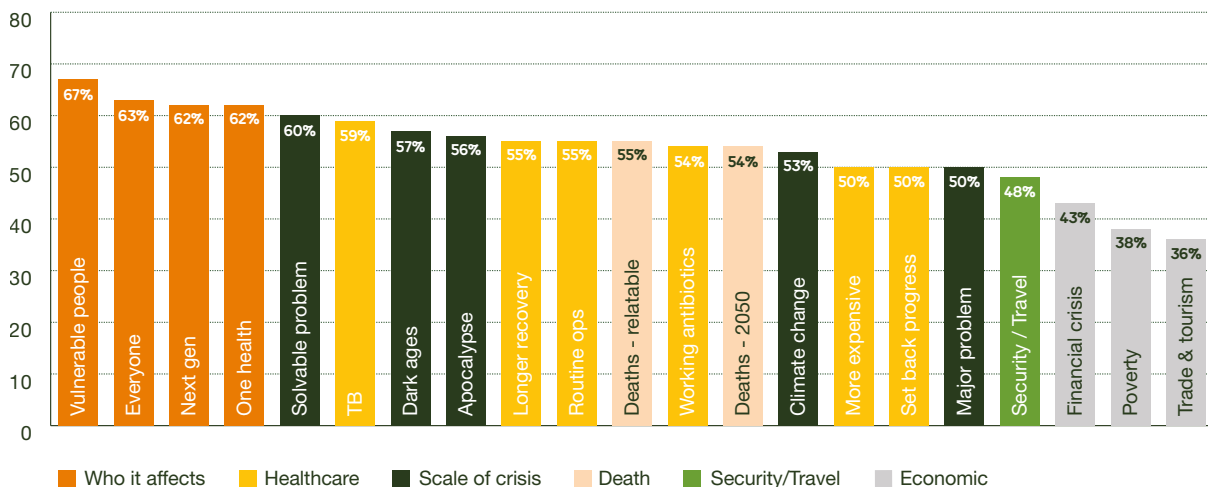
Public, Thailand

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"It should be like a case study that talks about some people with some disease."

Public, Thailand

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Chart 9.0: Messages focusing on numbers of deaths are less compelling as headline messages than messages focusing on the impact on individuals

Q: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed? (% great/to some extent)
(Showing nets - % great / some extent minus % a little / not at all)

Who it affects — Vulnerable people 67%, Everyone 63%, Next gen 62%, One health 62%
Healthcare — TB 59%, Longer recovery 55%, Routine ops 55%, Working antibiotics 54%, More expensive 50%, Set back progress 50%
Scale of crisis — Solvable problem 60%, Dark ages 57%, Apocalypse 56%, Climate change 53%, Major problem 50%
Death — Deaths - relatable 55%, Deaths - 2050 54%
Security/Travel — Security / Travel 48%
Economic — Financial crisis 43%, Poverty 38%, Trade & tourism 36%

Legend: ■ Who it affects ■ Healthcare ■ Scale of crisis ■ Death ■ Security/Travel ■ Economic

Base: All respondents shown each message (4,051-6091).

"This person looks like he is about to die, his stomach is swollen."

Public, Kenya, while designing images for a newspaper article on antimicrobial resistance

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"My mother-in-law had a hospital germ. When you visited her, you had to cover up. It wasn't a problem for her, but for the visitors…So, she's got the germ, can't get rid of it, and this is why the visitor has to be protected, because, for her, that's a threat, she's just got it."

Public, Germany

"I saw it from my uncle, he had surgery on a heart valve and got MRSA and they were trying different antibiotics, he's got to stay in hospital for two months to see that it heals, that's really awful."

Public, Germany

By contrast, numbers and statistics generally resonate less strongly with the public. Quantitative testing shows that, among the messages describing the impact of antimicrobial resistance, those that focus on numbers (for example numbers of deaths, current or projected) do not resonate strongly as headline messages.

The chart on the previous page shows how effective two messages using numbers are at increasing support for action (one that focuses on the global deaths estimate by 2050 and one with a more relatable frame breaking that figure down to an annual figure that is compared with a city in the respondents' country). There was little difference in how the global figure performed compared to the more relatable version, and both messages lagged some way behind the messages focusing on the impact of antimicrobial resistance on individuals. Large numbers and statistics can often lack tangible meaning for individuals, both in terms of conveying the overall scale of a problem as well as its personal relevance. This is particularly true when used as projections of future impact, which tend to lack the urgency to drive support for immediate action.

However, while statistics and data are less effective as headline messages, qualitative feedback showed that there is demand for such information – but that this should be used more as supporting evidence, to provide context and scale, rather than being the primary focus of messaging.

Messages tested:

- It is estimated that, by 2050, 10 million people will die every year due to antibiotic resistance
- It is estimated that 700,000 people currently die each year as a result of antibiotic resistance which is equivalent to the population of [city – tailored to country]

4. Focus on the here and now

Current communications around antimicrobial resistance often focus on projections and catastrophic warnings. However, our findings show that this is less effective than focusing on the current impact of antimicrobial resistance.

a. Catastrophic framing captures attention – but lacks credibility

Messages using catastrophic framing are often used when talking about the impact of antimicrobial resistance. In our public research, we tested two common examples – the terms 'antibiotic apocalypse' and taking us back to the 'dark ages of medicine'.

Messages tested:

- Growing resistance to medicines means that we are facing an antibiotic apocalypse where currently treatable infections and injuries will kill once again
- If we do not take action against antibiotic resistance, we will return to the dark ages of medicine where currently treatable infections and injuries will kill once again

These two messages both tested well in the quantitative research. However, when explored in more detail in the qualitative research, feedback showed that these messages can be a double-edged sword. On the positive side, these messages are effective at capturing attention and conveying a sense of urgency. However, the catastrophic language referring to apocalypse and the dark ages actually reduces the credibility of the messages, with the public often viewing them as sensationalist and exaggerated, which in turn leads to scepticism and ultimately undermines the impact of the message. These terms were frequently referred to in the qualitative research as being typical of 'clickbait' headlines.

Qualitative research also highlighted other challenges with using these messages. For example, the term 'dark ages' is problematic as interpretations vary widely across countries – from the Middle Ages in Europe, to the AIDS crisis in Kenya. The term 'antibiotic apocalypse' also presents problems, with the concept of an 'apocalypse' not being universally understood, particularly in the Global South.

Apocalyptic messaging can prompt scepticism or confusion

"I didn't know what 'apocalypse' was."

Public, India

"[Antibiotic apocalypse] is like some kind of clickbait which leads you to some advertisement."

Public, Thailand

"[Apocalypse] is attention-grabbing, but still, it's something you look at, okay, 'apocalypse' may be a bit too much. So, I'm interested how they get to that judgement, how they chose the word 'apocalypse'."
Public, Germany

"I didn't understand the word 'apocalypse' and it sounded a little exaggerated. It didn't interest me."
Public, Japan

"The word 'dark ages' sounds so nonsense. What is this? Do you want to educate anyone here?"
Public, Thailand

"I find the word 'apocalypse' just too sensationalist. I possibly would not read that just because the word's such a turn-off."
Public, UK

"There's such a marked difference, so, I think the term 'dark ages', I think of like, hieroglyphics and caveman era. So, I don't think resistance will take us back there. Not with as much technology as we have present day."
Public, US

"The explanation is okay but that 'dark ages' is not working."
Public, Kenya

b. Projections lack urgency; we need to show the current impact of antimicrobial resistance

Many communications about the impact of antimicrobial resistance refer to its impact in the future, often focusing on the economic or human impact by 2030 or 2050. Such projections – focusing on 2050, or even the next three to five years – do not have the urgency needed to drive support for action on antimicrobial resistance. Projections lead to people thinking that antimicrobial resistance is an important issue, but crucially, not one that needs immediate action. In addition, projections often (though not always) reference numbers and statistics, which, as set out above, generally resonate less strongly with the public.

Talking about future impact can also be undermined by a belief in the ability of scientists to solve such problems. In our qualitative research, this was particularly pronounced in India, where respondents displayed confidence that the problem could be solved.

A clear theme emerging from the qualitative research was that in order for the public to see the need for action on this issue, they need to understand the effects of antimicrobial resistance now. So, we need to make it clear that antimicrobial resistance is currently having a significant impact – and that this impact will become increasingly severe (if action is not taken).

Qualitative research showed the importance of communicating the current impact of antimicrobial resistance – otherwise it is seen as a future issue (and often there is confidence that the problem will be solved)

"It may happen in the future, but I don't see it as an issue that will be affecting me anytime soon."
Public, Japan

"I think antibiotic resistance is an issue, but I think we have at least ten, twenty years before it becomes, like, a huge enough problem, that affects a lot of people."
Public, US

"Like we have with climate change, do we have a tipping point, do we have, like, we've got five years to sort this before we're at a point where it's going to be catastrophic? I think that's really important."
Public, UK

"They will develop cure for HIV and AIDS, it's done in England. So, things will change [on antimicrobial resistance too]."
Public, India

5. Encourage immediate action

A key finding of the research was that we can boost the impact of communications on antimicrobial resistance by framing the issue as solvable – and that crucially this needs to be accompanied by a clear and specific call to action.
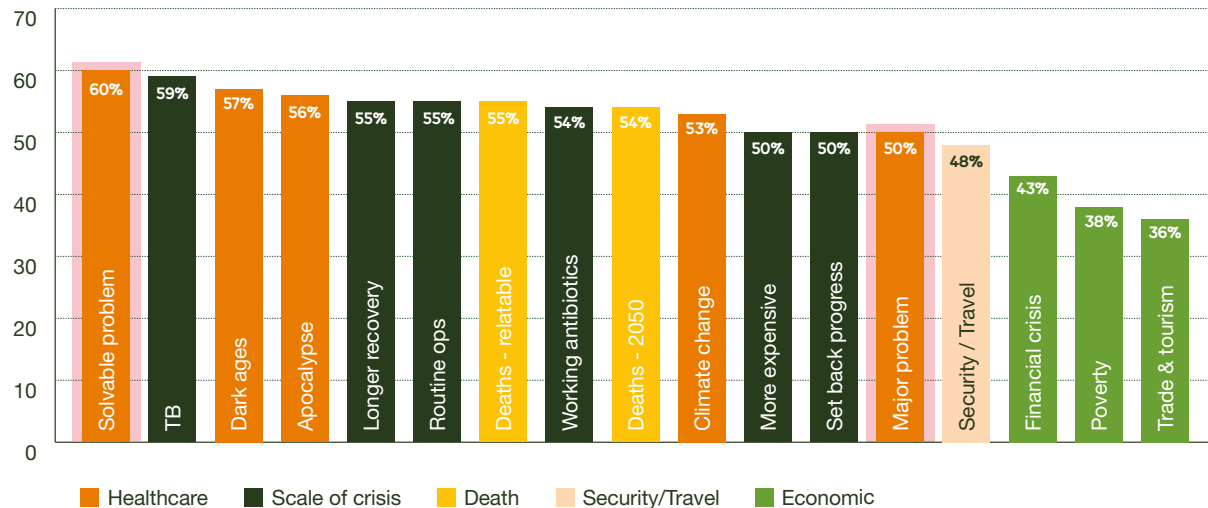
a. Framing antimicrobial resistance as solvable encourages engagement

Quantitative research included testing the impact of adding a 'solvable' frame to messages. The message 'antibiotic resistance is one of this generation's greatest problems' was tested in isolation and with the addition of text describing the problem as solvable ('but we can make a difference if we take action now').

The addition of a 'solvable' frame had a significant positive impact on the effectiveness of the message in increasing support for action on antimicrobial resistance: it increased the resonance of the message by 10 percentage points. This was supported by the qualitative research, which showed that positioning the problem as solvable encourages engagement with

Chart 10: The addition of text describing antimicrobial resistance as solvable increases the effectiveness of messaging

Q: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed? (% great/to some extent) – (Showing nets - % great / some extent minus % a little / not at all)

Category	Value
Solvable problem (Healthcare)	60%
TB (Scale of crisis)	59%
Dark ages (Healthcare)	57%
Apocalypse (Healthcare)	56%
Longer recovery (Scale of crisis)	55%
Routine ops (Scale of crisis)	55%
Deaths - relatable (Death)	55%
Working antibiotics (Scale of crisis)	54%
Deaths - 2050 (Death)	54%
Climate change (Healthcare)	53%
More expensive (Scale of crisis)	50%
Set back progress (Scale of crisis)	50%
Major problem (Healthcare)	50%
Security / Travel (Security/Travel)	48%
Financial crisis (Economic)	43%
Poverty (Economic)	38%
Trade & tourism (Economic)	36%

Legend: ■ Healthcare ■ Scale of crisis ■ Death ■ Security/Travel ■ Economic

Base: All respondents shown each message (4,051-6091).

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the issue and gives cause for optimism. This prevents antimicrobial resistance from appearing to be an intractable problem – which can often lead to people disengaging or dismissing an issue.

Messages tested:

• Antibiotic resistance is one of this generation's greatest problems
• Antibiotic resistance is one of this generation's greatest problems, but we can make a difference if we take action now

b. Understanding what can be done about the problem is motivating

When we frame the issue as solvable, we also need to be clear about the specific actions that are needed. In the qualitative research, when told that the issue is solvable, participants immediately wanted to know what specific actions were needed and who needs to take them. This was a consistent theme across all groups.

In fact, we found that stating that the issue is solvable without articulating a call to action can actually have a detrimental effect – and risks undermining the urgency of the problem. This can lead to assumptions that it is already being addressed and prompt a sense of complacency.

What this call to action might be will of course depend on the purpose and audience for any particular piece of communication.

The importance of including a clear and specific call to action

"'If you take action now', it's a bit foggy. But if we take action now, so how? Is that today, tomorrow, in two weeks, in three years? I'm missing the action, what can I do? What can everybody do in concrete terms?"
Public, Germany

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"If we take action now, what action are we taking?"
Public, Kenya

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"I do not understand the part that says, 'take action now'. I do not understand what action [needs] to be taken."
Public, Thailand

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"[Doctors] made this whole thing happen to begin with. So, what do you mean, 'take action now'? 'Why were you doing that in the first place?' is my question."
Public, US

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"I'm not sure who has to take action, whether it's us or the medical organisations."
Public, Japan

Conclusion

Summary of findings

We have identified five key principles for communicating about antimicrobial resistance. Together, by using this language, our communications can have more impact – and we can help increase public understanding and encourage political action.

The five principles:

1. Frame antimicrobial resistance as undermining modern medicine

2. Explain the fundamentals succinctly

3. Emphasise that this is a universal issue; it affects everyone, including you

4. Focus on the here and now

5. Encourage immediate action

We propose a new narrative on antimicrobial resistance, applying these five principles and drawing on the research findings to be as effective as possible. This is broken down into:

• A 'headline' frame, which is the most effective hook for capturing people's attention on this issue and acts as a platform for further communications.

• A 'longform' frame, which is how to talk about antimicrobial resistance beyond the headline in order to drive public understanding and support for action on this issue.

Headline narrative:

Common infections and injuries that were once easily treatable are becoming more dangerous and killing once again. This is because of drug-resistant infections which are undermining modern medicine.

Longform narrative:

Infections become drug-resistant when the bacteria that cause them adapt and change over time, developing the ability to resist the drugs designed to kill them.

The result is that many drugs – like antibiotics – are becoming less effective at treating illnesses. Our overuse of antibiotics in both humans and animals is speeding up this process.

Without working antibiotics, routine surgery like hip replacements, common illnesses like diarrhoea, and minor injuries from accidents, even including cuts, can become life-threatening.

People are already dying from drug-resistant infections, and as more drugs stop working, more lives will be put in danger. Drug-resistant infections can affect anyone; we are all at risk of infections from drug-resistant bacteria.

We can solve this problem. By taking action now to develop new drugs, and to make sure the drugs we already have stay effective, we can protect ourselves, our families and our communities.

Why is this frame most effective?

• It positions antimicrobial resistance as undermining modern medicine. This was the most compelling frame in our research. It combines the threat from antimicrobial resistance and its relevance across a wide range of procedures, illnesses and injuries, with the resulting setback to medicine that we have come to rely on.

• It includes a straightforward explanation of resistance. Helping our audiences understand resistance (particularly that bacteria develop resistance, not individuals) is key to driving public support for action on antimicrobial resistance. It is also important that our explanations include the part that human activity is playing in accelerating the issue. 'Overuse' is a concept that is generally understood and citing use in both humans and animals helps demonstrate the breadth and scale of the problem.

• It positions antimicrobial resistance as a universal issue, affecting everyone. This increases the sense of personal relevance and highlights the risk that antimicrobial resistance poses to all.

• It focuses on the here and now. In order for the public to see the need for action on this issue, we need to make it clear that antimicrobial resistance is currently having a significant impact – and that this impact will become increasingly severe (if action is not taken).

• It encourages action now. We can boost the impact of communications on antimicrobial resistance by framing the issue as solvable – but it is vital that this is accompanied by a clear and specific call to action.

How to use these frames

The frames we as communicators use are constructed through the decisions we make about what language to use. Sometimes these are conscious decisions, sometimes they are unconscious decisions.

This research and the principles set out in this report are designed to enable communicators to be more intentional and strategic in how we communicate about antimicrobial resistance. By using these principles, we can reframe the conversation around antimicrobial resistance, and communicate in a way that increases both public understanding and support for political action. We invite and encourage you to adopt these recommendations, and also to share them with your colleagues and allies in the field.

Wellcome encourages all communicators to use or adapt the language in this report for advocacy, patient communications or education. No citations or special permissions are needed for these public-facing communications. For other uses of this material, such as incorporating the recommendations into training or other communications resources, please reference the research. Suggested citation: Wellcome 2019 Reframing Resistance

To learn more about Wellcome's work on antimicrobial resistance and the research that informs these recommendations, please visit: www.wellcome.ac.uk/reframing-resistance

We are happy to receive feedback, questions and ideas relating to this report, and we are keen to work with others to drive effective action and build a public mandate for change. Email us on drugresistantinfections@wellcome.ac.uk with the subject header 'Reframing Resistance'.

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