Appendix A: Approach and methodology

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.

Overall approach

There were four stages to the research project as set out below.

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 experts and practitioners on antimicrobial resistance	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 research	a. Scoping focus groups To build an understanding in countries where less existing data and resources are available
	b. Quantitative testing and prioritization To test messages among the public to identify the messages that perform strongest overall and among key groups
	c. Qualitative testing and refinement To refine the best-performing message language and combine messages to develop a compelling narrative that maximises awareness and prioritisation

1. Methodology

This section sets out a detailed methodology for each project stage. All research and analysis was conducted by Brunswick Group (https://www.brunswickgroup.com).

Advisory panel

At the beginning of this project, an advisory group was set up, consisting of a small group of experts and practitioners on antimicrobial resistance. The project team were then able to consult with this group and draw on their expertise at various stages of the project. This included providing initial input into the objectives and approach, sharing views on the development of frames and messaging and sharing thoughts on initial findings. This guidance has been incredibly valuable, and the project team would like to take this opportunity to thank this group for their input.

While this group were important in shaping and guiding the project, the specific ideas and recommendations in the report should not be attributed to individual members of the advisory group or the organisations they represent.

Wider antimicrobial resistance network

At key moments over the course of the project, a wider group of experts and practitioners on antimicrobial resistance were engaged with – via a series of webinars. These webinars offered an opportunity to share initial findings with this group, who provided observations and feedback. This guidance was valuable in shaping the subsequent stages of the project and reporting and recommendations.

Academic review

The project team would also like to thank Professor Jennifer Hudson, Head of Department & Professor of Political Behaviour at University College London, for her methodological guidance and for ensuring that the recommendations in the report are based on rigorous communications research.

Geographic scope

The research encompassed seven countries: UK, US, Germany, Japan, India, Thailand, Kenya.

These countries were chosen to ensure the research 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 coverage of key hubs of international influence on antimicrobial resistance, major contributors to global antibiotic consumption, as well as countries with notably increasing and decreasing levels of antibiotic consumption. A more detailed rationale for the selection of these countries is set out in the table below.

Table: Rationale for country inclusion

Region	Country	Rationale
Global North	UK	• A hub of influence on antimicrobial resistance, with many experts based here • The UK Government has taken a leadership role on antimicrobial resistance – e.g. The Review on Antimicrobial Resistance
	Germany	• A hub of influence on antimicrobial resistance, with many experts based here • Germany's 2017 G20 presidency saw the prioritisation of antimicrobial resistance as an issue to be addressed • Antibiotic use has increased in the last 15 years[1]

[1] Eili Y. Klein, Thomas P. Van Boeckel, Elena M. Martinez, Suraj Pant, Sumanth Gandra, Simon A. Levin, Herman Goossens, Ramanan Laxminarayan. (2018). Global increase and geographic convergence in

	USA	• A hub of influence on antimicrobial resistance, with many experts based here • A major contributor to global antibiotic consumption[2]
	Japan	• A hub of influence on antimicrobial resistance, with many experts based here • Particular government focus on antimicrobial resistance (in light of Japan's aging population), and holder of the 2019 G20 presidency • Notable decrease in antibiotic consumption – Japan has reported one of the steepest falls in antibiotic consumption of any country since 2000[3]
Global South	India	• A major contributor to global antibiotic consumption[4] • Antibiotic use has increased in the last 15 years[5]
	Thailand	• Decrease in antibiotic consumption – consumption has fallen slightly, bucking the trend of many LMCs in the region[6] • Thailand was the co-host to the 2018 global Call to Action on AMR
	Kenya	• Host to the ReAct conference on tackling antimicrobial resistance in Africa in November 2018

It should be noted that there are important regions that this research does not cover, notably South America, the Middle East, Russia and China. We would of course welcome further research here. But we believe that the recommendations in our report, based on research in these seven countries, do have applicability more broadly.

Stage 1: Desk research

Conducted September – October 2018

A review of existing research on public understanding of antimicrobial resistance and current thinking on messaging. This stage was designed to ensure that the project into account the existing body of research on public attitudes to antimicrobial resistance and how the issue is communicated. It was essential that this project built upon previous work, as well as avoided duplication of existing research.

A high-level review of existing research was conducted. This focused on English language research covering the public's awareness, understanding and attitudes towards antimicrobial resistance, and also the frames that are used when communicating.

Identification of source materials:

- Materials identified by the Wellcome Trust
- Materials found through Brunswick's research, which included JSTOR and Google Scholar searches for relevant publications in English

A full list of sources is set out below in Section 3 of this document.

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antibiotic consumption between 2000 and 2015. Proceedings of the National Academy of Sciences, 201717295; DOI: 10.1073/pnas.1717295115

[2] Ibid

[3] Ibid

[4] Ibid

[5] Ibid

[6] Ibid

Stage 2: Media & social media analysis

Conducted October – November 2018

a. Media analysis

Analysis of mainstream print and online news coverage of antimicrobial resistance in the UK, US, Germany, India and Japan. The UK, US and Germany were included given that these are key hubs on the issue of antimicrobial resistance, where much of the conversation happens. India and Japan were included in order to provide insight into how this issue is covered in countries beyond this Global North hub of influence.

This stage was designed to understand the nature of the media conversation and identify the journalists and news outlets shaping public opinion. Key questions posed were:

- How much coverage does antimicrobial resistance generate in the media?
- On which aspects of antimicrobial resistance are the media focusing?
- Has the media's attention on antimicrobial resistance shifted over time, and if so how?
- Which news outlets and journalists are generating the most news stories about antimicrobial resistance?
- Which people and organisations are mentioned most often in media coverage of antimicrobial resistance?

Methodology:

UK, US, Germany

- The findings for the UK, US and Germany were based on an in-depth analysis of 1,621 news items published in the 12 months to 31st July 2018.
- They included news stories, opinion pieces, feature articles and other relevant content published by a broad range of UK, US and German mainstream print and online sources (excluding broadcast).
- The news items were identified in the Factiva news database and on the web using custom search queries and then manually screened to identify those which were mostly about antimicrobial resistance. Duplicate articles, including those syndicated to multiple news outlets, were included in the analysis.
- Topic maps and charts were generated using Quid, an analytics tool that clusters text-based data using natural language processing. The clustering was reviewed by a Brunswick Insight analyst who generated the topic names and descriptions.
- This approach delivered a comprehensive analysis of mainstream media coverage), but it should be noted that this does not include broadcast content, nor some specialist publications or blogs. A full list of the search queries and media sources used is included in Section 4 of this document.

Japan & India

- The findings for Japan and India were based on a manual analysis of media coverage of antimicrobial resistance published in the 12 months to 31st July 2018.
- The news items were identified in the Factiva news database, using a similar set of search queries to those in the UK, US and Germany. These articles were then reviewed and analysed by a Brunswick Insight analyst.
- In Japan, analysis covered Japanese-language media. In India, analysis was restricted to English-language media only, so does not include local language media.
- As for the UK, US and Germany, this analysis covers mainstream media sources only, and excludes broadcast content.

b. Social media analysis

Analysis of public social media conversation about antimicrobial resistance in the UK, US and Germany. The aim of this analysis was to understand how antimicrobial resistance is talked about in public social media and identify the key voices (people, media and organisations) driving these

conversations. As for the media analysis, analysis focused on these three countries given that this is where much of the conversation about antimicrobial resistance currently takes place.

Key questions posed were:

- How much content do social media users post about antimicrobial resistance?
- What do the users say about antimicrobial resistance – on which aspects are they particularly focused?
- Which users are the most active in the conversation about antimicrobial resistance?

Methodology:

The research was undertaken in October 2018 by Brunswick analysts working in partnership with consultants from the Centre for Analysis of Social Media (CASM) at the University of Sussex.

The report's findings are based on an analysis of around 500,000 public tweets published in the 12 months to 10th October 2018. The analysis focused on Twitter specifically because it's the preferred social network of influencers and offers the largest publicly accessible dataset for analysis. It should however be noted that Twitter users are not representative of the general population.

The tweets were captured using an analytics tool called Sysomos and then analysed using Method52, CASM's proprietary software platform that employs machine learning to analyse unstructured data.

A two-phase approach was used. A full list of the search parameters used is included in Section 4 of this document.

Phase 1: identifying relevant tweets for analysis

Analysis stage	**Number of tweets / users**
Custom search queries used to capture initial dataset of English- and German-language tweets from past 12 months	1.5m tweets by 583k users
Dataset cleaned to remove junk data (e.g. spam tweets) as best possible	1.2m tweets by 393k users
Classifiers deployed to isolate tweets from users with an identifiable location (note: many Twitter users do not provide a location, which explains the reduction in number of tweets)	684k tweets by 239k users
Tweets from users based in the UK, US and Germany identified within the geo-located dataset	Tweets for analysis: UK: 149k tweets by 40.1k users US: 243k tweets by 99.1k users DE: 5.7k tweets by 2.7k users

Phase 2: Analysing the tweets to generate insights

Analysis stage	Action
Analysis of data samples	Manual analysis of samples of the UK, US and German tweets, to identify prominent topics and themes in the tweets.
Automated topic identification using machine learning	A series of classifiers were then trained to identify these topics and themes and deployed them across the entirety of each dataset. A sample of those tweets which were not categorised by the classifiers were also manually analysed, to understand what they focused on.
Identification of most active tweeters and volume	Another series of classifiers were trained to identify the most active tweeters overall, as well as for each of the topics and themes we'd identified. A separate search was also conducted to benchmark the volume of antimicrobial resistance-related coverage to that about epidemic preparedness and global warming.
Reporting	Report with key findings generated.

Stage 3: Interviews with experts and practitioners on antimicrobial resistance

Conducted December 2018 – March 2019

In-depth interviews with experts and practitioners working on antimicrobial resistance. The aims of this phase were:

- To explore and map the communications challenges faced by those who communicate on antimicrobial resistance.
- To explore experiences of talking about the issue and the challenges faced.
- To source ideas on the best (and worst) ways to promote understanding and prioritisation of the issue, and thereby to help develop a set of frames for testing with the wider public.

Respondent identification:

- The first stage was to identify the audience of experts and practitioners, in collaboration with Wellcome and informed by the influencer mapping conducted in stage 2.
- It was essential that this phase of the research covered a wide range of perspectives and voices, both in terms of region and background.
- Interviews included representation from the Global North and Global South, as well as individuals who hold a more global perspective, in light of the project's aim to find a global solution to this challenge. It was important to ensure the Global North was covered in detail given that much of the debate on antimicrobial resistance is currently centred here. It was also important to ensure representation from the Global South, where concerns and challenges around antimicrobial resistance focus on very different issues to those in the north, and this is also where the burden of antimicrobial resistance is highest.
- It was also key to ensure that the interviews included experts and practitioners from a range of different backgrounds and areas of experience (as set out in the table below).

Methodology:

- In-depth, semi-structured interviews were conducted with 33 respondents (for breakdown by region and audience see table below)
- Interviews were 30-45 minutes in duration
- Interviews conducted by Brunswick researchers, via telephone
- Conducted on an anonymous basis
- Fieldwork dates: mid-December 2018 to mid-March 2019

Table: Breakdown of interviews by region and audience type

	Number of interviews
Overall	33
Region breakdown	
North	14
South	11
Global	8
Audience breakdown	
1. Scientific community	9
2. Media	3
3. Private sector	3
4. Public health experts	7
5. NGOs	5
6. Policy makers	5
7. Funders	1

Table: Full list of respondents

Name	Organisation
Amit Khurana	CSE
Anand AnandKumar	Bugworks
Christine Ardal	Institute of Public Health, Norway/EU Joint Action on AMR and HCAI
Christine Czerniak	FAO
Clare Chandler	London School of Hygiene and Tropical Medicine
Damiano de Felice	Access to Medicine Foundation
Daniel Berman	Nesta
Direk Limmathurotsakul	Mahidol Oxford Tropical Medicine Research Unit
Ed Whiting	Wellcome Trust
Fergus Walsh	BBC
Frank Wafula	Strathmore University
Haile Getahun	IACG
Iruka Okeke	University of Ibadan, Nigeria, SEDRIC Board
Jacqueline Alvarez	UNEP
Jason Gale	Bloomberg
John Rex	Wellcome in-house expert
Katherine Fleming-Dutra	CDC
Kathy Talkington	Pew Charitable Trusts
Kevin Outterson	CARB-X, Boston University School of Law
Lance Price	Antibiotic Resistance Action Center, George Washington University

Laura Marin	JPIAMR
Madlen Davies	Bureau for Investigative Journalism
Marc Mendelson	South African Dept of Health
Matthew Stone	World Organisation for Animal Health
Mirfin Mpundu	ReAct Africa
Nick Day	Mahidol Oxford Tropical Medicine Research Unit
Nick Feasey	Malawi Liverpool Wellcome Centre
Sally Davies	UK Department of Health
Serufusa Sekidde	GSK
Sharon Peacock	London School of Hygiene and Tropical Medicine
Souha Kanj Shararah	American University of Beirut
Thomas Cueni	IFPMA
Toru Kajiwara	Japan Ministry of Health, Labour and Welfare

Stage 4: Public research

The public research consisted of three phases, as set out below.

Specific participant profiles are included in the methodology for each phase. However, all phases focused on people who are more likely to have engaged with the topic of antimicrobial resistance (i.e. seen, read or heard about the issue in the media), or who are or more likely to engage in the future.

The decision to focus on this audience was a reflection of the aims of the project – i.e. to increase understanding of antimicrobial resistance and support for action on this issue. Therefore, the research focused on members of the public who are more likely to engage in conversations around this issue and come into contact with potential messaging and media coverage.

Copies of the research materials (questionnaire, discussion guides and example screener questionnaires) are included in Section 6 of this document.

a. Scoping focus groups

Conducted March 2019

Exploratory focus groups conducted in two countries – Kenya and Thailand – to develop foundational understanding. In these two countries existing published information on public attitudes to, and understanding of, antimicrobial resistance was more limited (than in other countries). The aim of these groups therefore was to address this knowledge gap and:

- To gauge general levels of health and scientific literacy
- To assess understanding of key terms and phrases
- To explore awareness and understanding of antimicrobial resistance

Methodology:

- Two focus groups were conducted in Thailand and Kenya with members of the general public.

Table: Focus group approach by country

Country	Location	No. of groups	Age splits	Language	Date
Thailand	Bangkok	2	22-35 / 36-50	Thai	7th March 2019
Kenya	Nairobi	2	22-35 / 36-50	English	20th March 2019

Participant profile:

- Focus group participants were media engaged members of the public, defined as those who watch, read, or listen to the news on a regular basis.
- In each country, the groups were split by age based on the hypothesis that this would be the most relevant demographic split in terms of use of, and attitude towards, antibiotics, as well as most appropriate in terms of group dynamics.

b. Quantitative testing and prioritization

Conducted June 2019

Quantitative online surveys of the public in the seven countries, designed to benchmark awareness and perceptions, test messages and identify notable differences between countries and demographic, behavioural or attitudinal groups. More specifically, the aims of this stage were to:

- Measure existing levels of awareness and understanding around:
    - Health and science terms generally
    - Antimicrobial resistance terms specifically
    - Usage of antibiotics
    - The concept of antimicrobial resistance – what it is and the perceived significance of the threat posed
- Message testing:
    - Identify the messages that are most and least effective at increasing public understanding and support for action on antibiotic resistance
    - Highlight considerations for developing messages further in qualitative research
- Evaluate the best performing messages at a global level, as well as analysing group-specific strengths for tailoring, by:
    - Demographics – age, gender, education, country
    - Behaviours – usage and understanding of antibiotics
    - Attitudes – current perceptions of antibiotic resistance as a significant health issue

Methodology:

- Online quantitative survey of the public in seven countries (UK, US, Germany, Japan, India, Thailand, Kenya)
- Audience: All survey participants were members of online panels. Samples were nationally representative of adults by age, gender and region in the US, UK, Germany, India, Thailand and Japan. In Kenya, the sample was representative of the panel population by age, gender and region.
- Fieldwork dates: June 2019
- Survey language:
    - UK, US, Kenya, India – English
    - Thailand – Thai
    - Germany – German
    - Japan – Japanese
- Sample: the sample size was approx. 2,000 per country (and approx. 1,000 in Thailand and Kenya). While population sizes vary substantially across the countries researched, the primary aim of the research was to gain a global understanding rather than a granular country-by-country view. These sample sizes represent a robust basis for analysis for the messages that work best both overall, while also identifying any regional differences.

Table: Sample size and margin of error by country

Country	N-size	Margin of error at 95% confidence level
UK	2,023	±2.18%
US	2,040	±2.17%
Germany	2,010	±2.19%
Japan	2,057	±2.17%

India	2,020	±2.19%
Thailand	1,013	±3.08%
Kenya	1,006	±3.09%
Total	**12,169**	±0.89%

Sample profile & implications for analysis:

- An online survey by its nature will capture a more online and connected audience – a difference that is particularly acute in countries from the Global South.
- One key implication is that the sample is more educated than a truly nationally representative sample – significantly so in the Global South (as shown in the table below).

Table: Sample breakdown by education level in each country

Education level	UK	US	DE	JP	IN	TH	KY
Non-degree	75%	50%	73%	50%	12%	27%	36%
Degree	25%	50%	27%	50%	88%	73%	64%

Response patterns

- When analysing results, particularly when comparing results geographically, it is important to take into account cultural differences in response patterns. Extensive academic research has shown that response styles vary between different countries due to cultural differences.[7] For example, survey respondents may be more or less likely to give extreme responses (at either end of a response scale) or to give responses in the middle of a response scale.
- For example, in this study respondents in Japan were more likely give the answer 'don't know' than respondents in other countries. When analysing the findings, these cultural differences were taken into account.

c. Qualitative message development

Conducted July – August 2019

Qualitative research with the public in seven countries designed to refine the best-performing messages from the quantitative research to increase public understanding and support for action on antimicrobial resistance. More specifically, the aims of this stage were to:

- Refine message language:
  - Identify the best language to communicate message concepts
  - Test the application of alternate frames to messaging
- Develop messages and identify what local adaption was needed:
  - Identify the strongest proof points to communicate messages
  - Highlight any country-specific nuance that may be required
- Develop a narrative:
  - Understand the most effective way to combine messaging that delivers increased awareness and prioritisation of the issue
  - Evaluate the narrative's performance against four key criteria: engaging, credible, relevant, urgent

Methodology:

- Two focus groups were conducted in each of the seven countries with members of the general public.

[7] Baumgartner, Hans and Jan-Benedict E.M. Steenkamp (2001) "Research Styles in Marketing Research: A Cross-National Investigation": Journal of Marketing Research.

Table: Focus group approach by country

Country	Location	No. of groups	Age splits	Language	Date
US	New York	2	22-40 / 41-65	English	7th August 2019
UK	London	2	22-40 / 41-65	English	6th August 2019
Germany	Munich	2	22-40 / 41-65	German	6th August 2019
Kenya	Nairobi	2	22-35 / 36-50	English	6th August 2019
India	Delhi	2	25-40 / 41-60	English	1st August 2019
Thailand	Bangkok	2	22-35 / 36-50	Thai	2nd August 2019
Japan	Tokyo	2	22-40 / 41-65	Japanese	29th July 2019

Participant profile:

- As for the scoping focus groups, participants were media engaged members of the public, defined as those who watch, read, or listen to the news on a regular basis.
- In each country, the groups were split by age as based on the hypothesis that this was the most relevant demographic split in terms of use of, and attitude towards, antibiotics, as well as most appropriate in terms of group dynamics.

2. Development of frames & messages

This section outlines the process by which the frames and messages were developed for testing. It also sets out the messages developed and tested at each stage of the project

Message development process:

Project stage	Research conducted	Output
1	**Desk research** Review of existing research on public understanding of antimicrobial resistance and current thinking on messaging	Initial list of frames and messages used in communications about antimicrobial resistance (see **table A**)
2	**Media & social media analysis** Analysis of media coverage of antimicrobial resistance (UK, US, DE, JP, IN) and social media conversation (UK, US, DE)	Example articulations of messages
3	**Interviews with experts and practitioners on antimicrobial resistance** Capturing views of existing messaging and sourcing additional messages / articulations of messages	Expanded list of frames and messages, drawing on feedback from experts and practitioners
	Messaging workshop Joint workshop with the Wellcome and Brunswick project teams to review the messages and feedback	Messaging framework (see **table B**) Agreed set of messages to be tested in quantitative public testing
4	**Quantitative message testing** Online survey testing agreed message list (see **table C**)	Identification of most compelling messages across the seven countries
	Qualitative message development Focus groups to develop and refine the best-performing messages from the quantitative testing (see **table D**)	Refined set of messages, including most effective language to use Narrative statement that maximises awareness and support for action

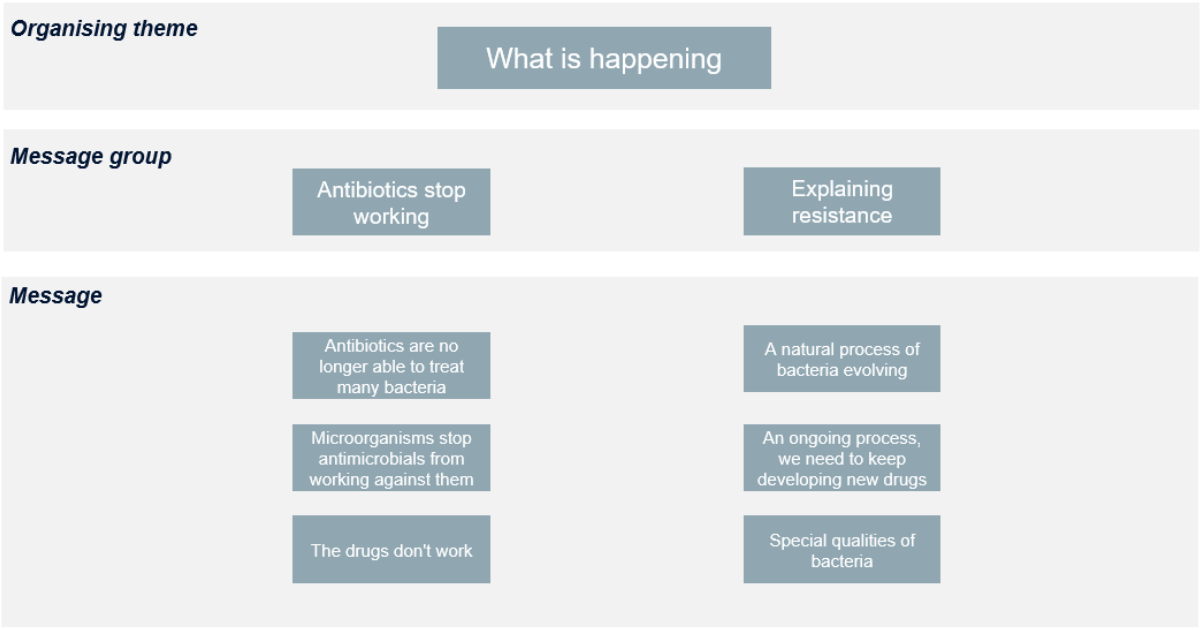
Table A: Comprehensive list of frames and messages used in communications about antimicrobial resistance (developed from desk research)

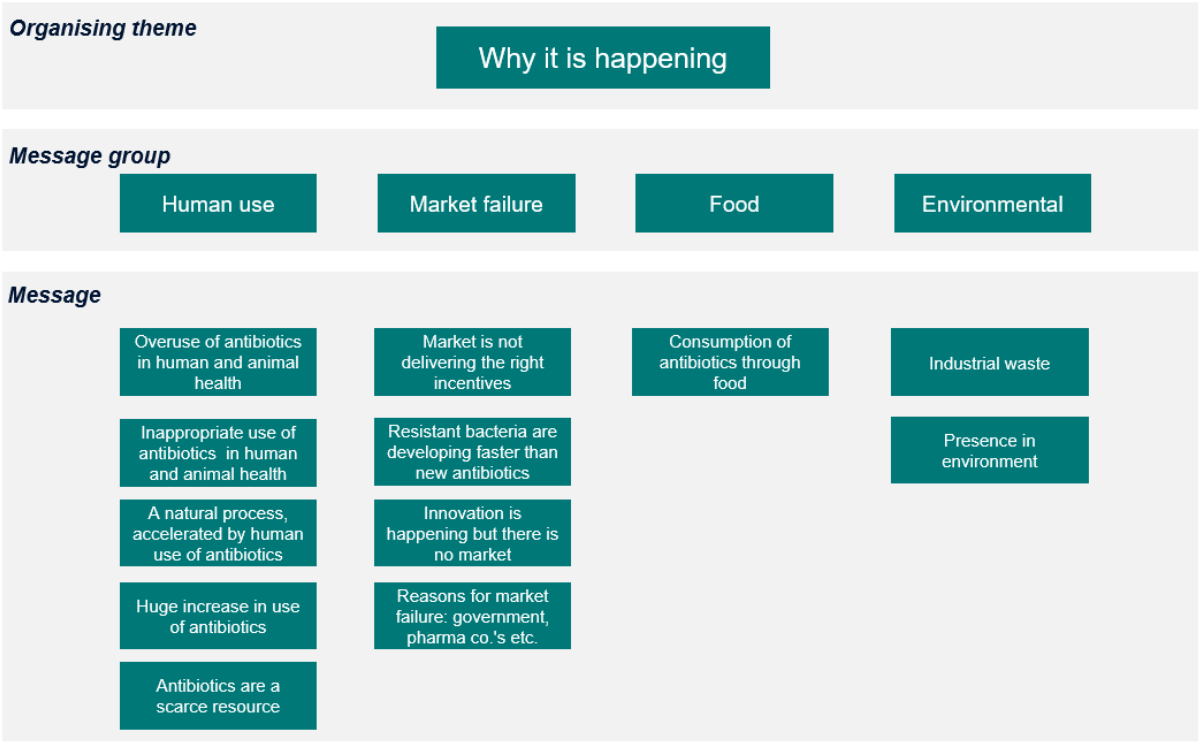
The source list for this table is included in Section 3 of this document.

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 • Antimicrobial resistance 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		
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, ROI from investment in antimicrobial resistance 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
	Medical systems	• Threat to the infrastructure of medicine, • 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 B: Message framework developed following interviews with experts and practitioners on antimicrobial resistance





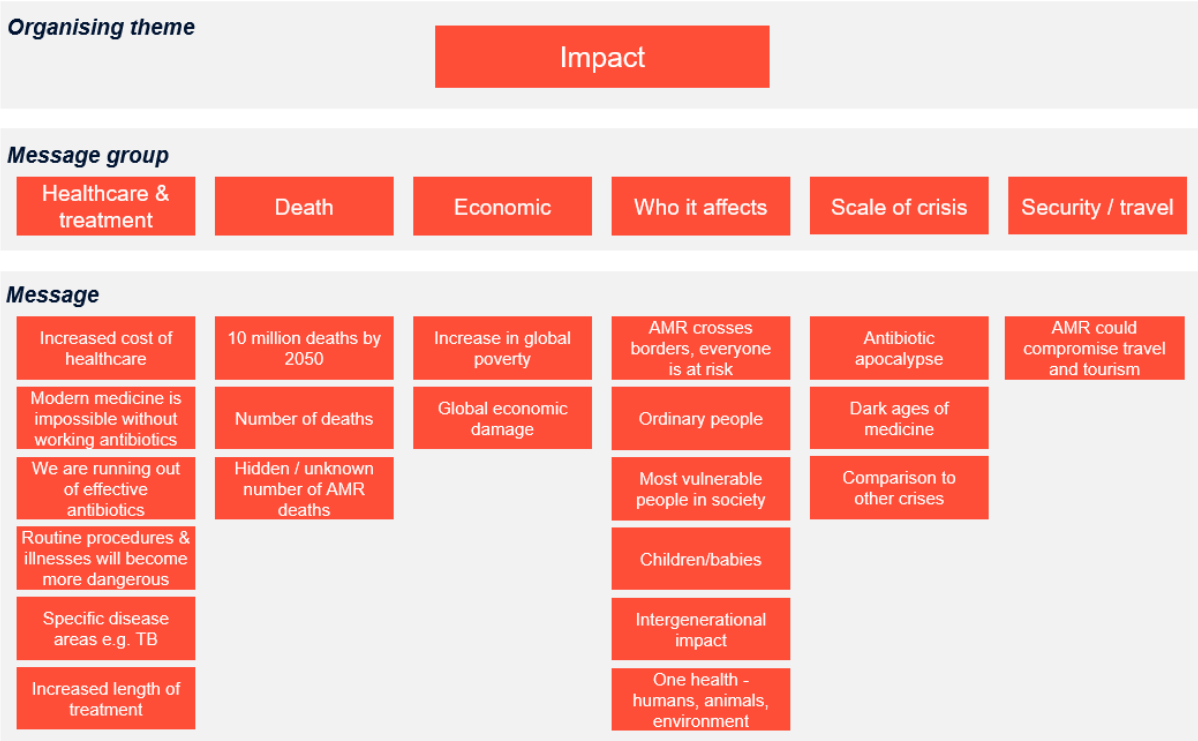


Table C: Messages tested in quantitative research

Frame	Message
What is happening	
Antibiotics stop working	a. Antibiotics that save lives are no longer working
	b. The drugs don't work
	c. Medicines are losing the war against bacteria
Explaining resistance	d. 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
	e. Germs are very smart and adapt very quickly to become resistant to medicines
Why it is happening	
Human use	a. Antibiotics are overused in humans and animals, which has resulted in them becoming less effective in treating illnesses [Exclusive to message b]
	b. Antibiotics are used inappropriately in humans and animals, which has resulted in them becoming less effective in treating illnesses [Exclusive to message a]
	c. Germs will always look for ways to survive and resist new drugs, but the way we are using antibiotics is accelerating this process
Market failure	d. We need new antibiotics because the current ones are becoming less effective, but pharmaceutical companies are not developing new antibiotics as it is not profitable for them
	e1. We are not developing new antibiotics fast enough which means that we don't have new drugs to fight antibiotic-resistant bacteria [Exclusive to message e2]

	e2. We are not developing new antibiotics fast enough which means that we don't have new drugs to fight antibiotic-resistant bacteria. But we have developed them before, and we can do so again. [Exclusive to message e1]
	f. Only two new types of antibiotics have been introduced in the last 40 years, so we don't have the new drugs we need to fight antibiotic-resistant bacteria
Environmental	g. Human activity can pollute the environment (soil, rivers, oceans) with antibiotics, which speeds up the spread of antibiotic resistance
	h. When waste from industrial production of antibiotics gets into the environment, this speeds up the spread of antibiotic resistance
Impact	
Healthcare & treatment	a. People will have to pay for more treatments and longer stays in hospital
	b. People will take longer to recover from operations and illnesses
	c. Modern medicine is impossible without antibiotics that work
	d. 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
	e. The progress that has been made in treating diseases such as cancer will be set back decades if we don't have antibiotics that work
	f. 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
Death	g. It is estimated that, by 2050, 10 million people will die every year due to antibiotic resistance
	UK h1. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance which is equivalent to the population of Leeds
	US h2. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance which is equivalent to the population of Portland, Oregon
	DE h3. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance which is equivalent to the population of Frankfurt
	JP h4. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over five years, that is equivalent to the population of Yokohama
	IN h5. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over ten years, that is equivalent to the population of Hyderabad
	TH h6. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over ten years, that is equivalent to the population of Bangkok
	KE h7. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over five years, that is equivalent to the population of Nairobi
Economic	i. By 2050, antibiotic resistance could cause global economic damage on the same scale as the 2008 financial crisis
	j. Antibiotic resistance could push up to 28 million people into poverty by 2050
	k. Antibiotic resistance could severely affect international trade and tourism, and damage the economies of countries around the world

Who it affects	l. Antibiotic-resistant germs know no borders; antibiotic resistance threatens everyone wherever you live
	m. Antibiotic resistance threatens the most vulnerable people in society – the very young, the elderly and those with weakened immune systems that are less able to fight infections and other diseases
	n. Antibiotic resistance will impact our children and grandchildren – currently treatable diseases will become life threatening for future generations
	o. Antibiotic resistance is a threat to both human and animal health and could have a major impact on farming and food production
Scale of the crisis	p. Growing resistance to medicines means that we are facing an antibiotic apocalypse where currently treatable infections and injuries will kill once again [PROG: Exclusive to message q]
	q. 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 [PROG: Exclusive to message p]
	r1. Antibiotic resistance is one of this generation's greatest problems [PROG: Exclusive to messages r2/r3]
	r2. Like climate change, antibiotic resistance is one of this generation's greatest problems [PROG: Exclusive to messages r1/r3]
	r3. Antibiotic resistance is one of this generation's greatest problems, but we can make a difference if we take action now [PROG: Exclusive to messages r1/r2]
Security / travel	s. Foreign travel and tourism will become much riskier as they will increase the risk of spreading antibiotic-resistant diseases

Table D: Messages tested in qualitative research

What is happening & why it is happening
B1. 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
B2. Antibiotics are overused in humans and animals, which has resulted in them becoming less effective in treating illnesses
B3. Germs will always look for ways to survive and resist new drugs, but the way we are using antibiotics is accelerating this process
VARIATION = B4. The germs that cause illnesses adapt and change over time, meaning they become resistant to medicines
VARIATION = B5. The germs that cause illnesses adapt and change over time, meaning that the medicines that save lives are no longer working
Impact
C1. 'Antibiotic resistance threatens farming and food production' Antibiotic resistance is a threat to both human and animal health and could have a major impact on farming and food production
C2. 'Antibiotic resistance slows recovery from operations and illness' People will take longer to recover from operations and illnesses
C3. 'Routine surgery, common diseases and injuries made more dangerous by antibiotic resistance'

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
C4. 'TB once again killing due to antibiotic resistance' 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
C5. 'The world is facing an antibiotic apocalypse' Growing resistance to medicines means that we are facing an antibiotic apocalypse where currently treatable infections and injuries will kill once again
C6. 'Antibiotic resistance could take us back to the dark ages' 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
Narrative statement
D1. 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. We are speeding up this process through our overuse of antibiotics, which has resulted in them becoming less effective in treating illnesses. Everyone is threatened by antibiotic resistance, in particular the most vulnerable people in society – the very young, the elderly and those with weakened immune systems that are less able to fight infections and other diseases. But if we take action now, this is a problem we can solve.

3. Source list

Below is a full list of sources used in Stage 1 of the project (desk research).

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4. Media & social media analysis: searches and sources

Media analysis: search queries

The search queries shown below were used to identify relevant news coverage in Factiva for the UK, US and Germany media analyses. Additional, manual web searches were performed using keywords in these queries, to capture news published by media sources not in Factiva's database.

A similar set of search queries were used for the media analysis in Japan and India.

UK & US	hlp=((antimicrobial* OR antibiotic* OR antimalarial* OR antibacterial* OR antiviral* OR drug* OR multidrug* OR multi-drug* OR salmonella OR malaria OR leprosy OR TB OR Tuberculosis OR STD* OR gonorrhoea OR gonorrhoea OR STI OR "sexually transmitted" OR AIDS OR HIV OR pneumonia OR difficile) AND (resist* OR overuse OR overprescrib*)) OR hlp=(antimicrobial resistance OR ABR OR superbug* OR super bug* OR MRSA) OR ("World Antibiotic Awareness Week" OR "European Antibiotics Awareness Day" OR "keep antibiotics working" OR "Davos declaration" OR "Carb X" OR "super gonorrhoea" OR "super gonorrhea")
Germany	((hlp=(+"antimicrobial resistance" OR +"ABR" OR +"MRSA" OR +"VRE" OR +"MRGN" OR "Multiresistente Erreger" OR "Antibiotikaresistenz*" OR "Superbug" OR "Super bug" OR "Super Gonorrhö" OR "Super Gonorrhoe" OR "World Antibiotic Awareness Week" OR "European Antibiotics Awareness Day" OR "Antibiotika Tag" OR "Davos Declaration" OR "CARB X" OR "Combating Antibiotic Resistant Bacteria Biopharmaceutical Accelerator" OR "Globale Partnershaft für Antibiotika Forschung und Entwicklung" OR "GARDP" OR "Global Antibiotic Research and Development Partnership" OR (("Resistance" OR "Resistenz" OR "Resistenzen" OR "Resisten" OR "Resistente" OR "Überbeanspruchung" OR "zu viel verschreiben") AND (Antimikrobiell* OR antifungiell* OR Antibiotik* OR Antibakteriell* OR Antiviral* OR Antimalaria* OR Medikament* OR Multi* OR Mehrfach* OR Malaria* OR "HIV" OR "AIDS" OR "Tuberkulose" OR "TB" OR Geschlechtskrankheit* OR "Sexuell übertrag*" OR "STI" OR STD* OR Gonorrh* OR "Tripper" OR Salmonelle* OR "Influenza" OR "Lungenentzündung" OR "Clostridium difficile"))) and wc>0)) NOT "Aston Martin"

Media analysis: UK news sources

TV & radio broadcasters	BBC News (web), Sky News (web), Channel 4 News (web), ITV News (web)
National newspapers - broadsheets	Financial Times (print and web), Guardian & Observer (print and web), i (print and web), Independent (Digital edition and web), Telegraph (print and web), Times/Sunday Times (print and web)
National newspapers - tabloids	Mail (multiple editions, print and web), Sun (print and web), Star (print and web), Express (print and web), Mirror & People (print and web)
Key regional newspapers	City AM (print and web), Metro (print and web), London Evening Standard, (print and web), Belfast Telegraph (print), Birmingham Mail (print), Coventry Telegraph (print), Daily Echo (print), Dorset Echo (print), East Anglian Daily Times (print), Eastern Daily Press (print), Evening Gazette (print), Grimsby Evening Telegraph (print), Hull Daily Mail (print), Lancashire Evening Post (print), Lancashire Telegraph (print), Leicester

	Mercury (print), Lincolnshire Echo (print), Liverpool Echo (print), Manchester Evening News (print), Nottingham Evening Post (print), Oxford Mail (print), Scarborough News (print), Scunthorpe Evening Telegraph (print), Shields Gazette (print), Evening Chronicle, Newcastle (print), Herald (print), Irish News (print), Journal Newcastle (print), Scotsman (print), Western Mail (print), Western Daily Press (print), Yorkshire Evening Post (print), Yorkshire Post (print)
Newswires	Bloomberg UK (newsfeed and web), Reuters UK (newsfeed and web) Press Association (newsfeed)
News and opinion magazines	Economist (print and web), New Statesman (print), Prospect (print), WIRED UK (web)

Media analysis: US news sources

TV & radio broadcasters	NBC/MSNBC (transcripts and web), CBS (transcripts and web), ABC (transcripts and web), Fox (transcripts and web), CNN (transcripts and web), PBS (transcripts and web), NPR (transcripts and web)
National newspapers	New York Times (print and web), Wall Street Journal (print and web), Washington Post (print and web), USA Today (print and web)
Key regional newspapers	Arizona Republic (print), Atlanta Journal-Constitution (print), Austin American-Statesman (print), Baltimore Sun (print), Boston Globe (print), Boston Herald (print), Charlotte Observer (print), Chicago Sun-Times (print), Chicago Tribune (print), Cleveland Plain Dealer (print), Columbus Dispatch (print), Dallas Morning News (print), Denver Post (print), Detroit Free Press (print), Fort Worth Star-Telegram (print), Honolulu Star-Advertiser (print), Houston Chronicle (print), Indianapolis Star (print), Kansas City Star (print), Las Vegas Review-Journal (print), Los Angeles Times (print), Mercury News – CA (print), Miami Herald (print), New York Daily News (print), New York Post (print), Newsday - NY (print), Oregonian (print), Philadelphia Inquirer (print), Pittsburgh Post-Gazette (print), San Antonio Express-News (print), San Diego Union-Tribune (print), San Francisco Chronicle (print), Seattle Times (print), St. Louis Post-Dispatch (print), Star Ledger - NJ (print), Star Tribune - MN (print), Tampa Bay Times (print)
Newswires	Bloomberg US (newsfeed and web), Reuters US (newsfeed and web), Associated Press (newsfeed)
News and opinion magazines	New Yorker (print), Newsweek (print and web), Economist (print and web), Atlantic (web), Nation (web), Mother Jones (print and web), WIRED US (web)
Web-only news	HuffPost, BuzzFeed, Slate

Media analysis: German news sources

TV & radio broadcasters	ARD (transcripts and web), Bayerisches Fernsehen (transcripts and web), Das Erste (web), Deutsche Welle (web), MDR (web), NTV (transcripts), N24 (transcripts and web), SWR (transcripts and web), Tagesschau (transcripts and web), WDR (transcripts and web), ZDF (transcripts and web)
National newspapers	Bild / Bild am Sonntag (print and web), Börsen Zeitung (print), Die Welt (print and web), Die Zeit (print and web), Frankfurter Allgemeine Zeitung (print and web), Handelsblatt (print and web), Süddeutsche Zeitung (print and web), Tagesspiegel (print and web), TAZ (print and web), Die Welt / Welt Kompakt (print and web)
Key regional newspapers	Aachener Nachrichten (print), Aachener Zeitung (print), Abendzeitung München (print), Allgemeine Zeitung (print) Allgemeine Zeitung Mainz (print), Augsburger Allgemeine (print) B.Z. (print), B.Z am Sonntag (print), Berliner Kurier (print), Berlin Morgenpost (print and web), Berliner Zeitung (print), Frankfurter Rundschau (print and web), Hamburger Abendblatt (print and web), Hannoversche Allgemeine Zeitung (print and web), Heilbronner Stimme (print), Kölner Stadt-Anzeiger (print), Kölnische Rundschau (print), Leipziger Volkszeitung (print and web), Märkische Allgemeine Zeitung (print and web), Mitteldeutsche Zeitung (print), Neue Presse (print and web), Nordbayerische Nachrichten (print), Nordwest Zeitung (print), Nürnberger Nachrichten (print), Rheinische Post (print), Sächsische Zeitung (print), Stuttgarter Nachrichten (print and web), Südthüringer Zeitung (print), Südwest Presse (print), Weser Kurier (print), Westdeutsche Zeitung (print), Wiesbadener Kurier (print), Wiesbadener Tagblatt (print), Wolfsburger Allgemeine (print and web)
Newswires	dpa-AFX ProFeed (newsfeed and web) Reuters (newsfeed and web)
News and opinion magazines	Capital (print and web), Focus (print and web), manager magazine (print and web), Spiegel (print and web), Stern (print and web), Wirtschaftswoche (print and web)
Web-only news	n-tv.de, t-online, HuffPost

Social media analysis: UK & US search parameters

The search query shown below was used to capture the initial set of 1.5m Tweets.

Search topic	Posts about antimicrobial resistance by social media users based in the UK and US
Media source	Twitter
Language	English
Date range	10 October 2017 to 10 October 2018
Search query	((superbug* OR "super bug" OR "super bugs" OR MRSA OR "Super gonorrhoea" OR "Super gonorrhea" OR "World Antibiotic Awareness Week" OR "European Antibiotics Awareness Day" OR "Keep antibiotics working" OR "Davos declaration" OR "CARB-X" OR "Carb X" OR "#antimicrobial resistance" OR "#antibioticresistance" OR "#stopsuperbugs" OR "#onehealth" OR "#onehealthday" OR "#superbugs" OR "#superbug" OR "#mrsa" OR "#antimicrobialstewardship" OR "#antibioticguardian" OR "#drugresistance" OR "#worldantibioticawarenessweek" OR "#ctaantimicrobial resistance17" OR "#faar" OR "#beantibioticsaware" OR "#abresistance" OR "#eaad" OR "#waaw" OR "#waaw2017" OR "#waaw17" OR "#antibioticsawarenessweek" OR "#antibioticawarenessweek" OR "#keepantibioticsworking" OR "#usaaw17" OR Abx OR "#abx" OR "drug-resistant" OR "drug-resistance" OR "antibiotic-resistance" OR "antibiotic-resistant" OR ((((antimicrobial resistance OR ABR OR antibiotic* OR antimicrobial* OR antibacterial* OR antiviral*) AND (resist* OR "stop working" OR "not working" OR overuse* OR overprescribe* OR overprescrip* OR ineffective)) OR ((drug* OR multidrug* OR "multi drug" OR "multi drugs" OR malaria* OR HIV OR AIDS OR Tuberculosis OR TB OR STD OR STI OR "sexually transmitted" OR "sexually transmit" OR "transmitted sexually" OR "sexual transmission" OR Gonorrhoea OR Gonorrhea OR salmonella OR pneumonia OR difficile OR "Clostridium difficile" OR "C. diff" OR "Mycoplasma genitalium" OR MG) AND resist*)))) AND lang:EN) AND NOT ("andrea mitchell" OR andreamitchell OR mitchellreports OR from:mitchellreports OR to:mitchellreports OR "ABX tokens" OR kavanaugh OR "insulin resistant" OR "insulin-resistant" OR "barrick" OR "covesting" OR "option trades" OR trades OR currencies OR "you already know how to fly" OR "crack vs opioid")

Social media analysis: Germany search parameters

The search query shown below was used to capture the initial set of 17.8K Tweets

Search topic	Posts about antimicrobial resistance by social media users based in Germany
Media source	Twitter
Language	German
Date range	10 October 2017 to 10 October 2018
Search query	(("++antimicrobial resistance" OR "MRSA" OR "++VRE" OR "Multiresistente Erreger" OR "Antibiotikaresistenz" OR "superbug" OR "super bug" OR "Super Gonorrhö" OR "Super Gonorrhoe" OR "World Antibiotic Awareness Week" OR "European Antibiotics Awareness Day" OR "Globale Partnerschaft für Antibiotika-Forschung und Entwicklung" OR "Antibiotika Tag" OR "Carb X" OR #vre OR #GARDP OR #antimicrobial

	resistance OR #antibiotikaresistenzen OR #multiresistenz OR #multiresistenteerreger OR #DART2020 OR #antimicrobialresistance) OR (Antimikrobiell* AND resist*) OR (Antifungiell* AND resist*) OR (Antibiotik* AND resist*) OR ((Antibakteriell* AND resis*) OR (Antiviral* AND resis*) OR (Antimalaria* AND resis*) OR (Medikament* AND resis*) OR (multi* AND resis*) OR (malaria* AND resis*) OR (salmonelle* AND resis*) OR ("TB" AND resis*) OR ("tuberkulose" AND resis*) OR ("HIV" AND resis*) OR ("AIDS" AND resis*) OR ("STD" AND resis*) OR ("STI" AND resis*) OR (gonorrh* AND resis*) OR ("Lungenentzündung" AND resis*) OR ("Clostridium difficile" AND resis*)))

Social media analysis: volume benchmarking search parameters

The search queries shown below were used to generate the volume benchmarking analysis (comparing antimicrobial resistance to epidemic preparedness and climate change).

Search topics	Posts containing popular #hashtags for antimicrobial resistance, epidemic preparedness or climate change	
Media source	Twitter	
Language	English (UK & US) & German (Germany)	
Location	UK, US and Germany	
Date range	10 October 2017 to 10 October 2018	
Search queries	UK & US	Germany
Antimicrobial resistance	((("#superbugs" OR "#antibioticresistance" OR "#stopsuperbugs" OR "#antimicrobial resistance" OR "#antimicrobialresistance") AND lang:EN) AND NOT ("andrea mitchell" OR andreamitchell OR mitchellreports OR from:mitchellreports OR to:mitchellreports))	((("#antibiotikaresistenz" OR "#antibiotika-resistenzen" OR "#multiresistenteerreger" OR "#Multi-resistenz" OR "#MRSA") AND lang:DE) AND NOT ("aston martin"))
Epidemic preparedness	((“#preventepidemics” OR “#a4epr” OR “#endepidemics” OR “#outsmartepidemics” OR (“#healthsecurity” AND (epidemic* OR pandemic* OR outbreak*))) AND lang:EN)	(("#preventepidemics" OR "#a4epr" OR "#Epidemien" OR “#outsmartepidemics” OR ("Epidemien" AND "bekämpfen") OR ("Gesundheits-sicherheit" AND (Epidemie* ODER Pandemie* ODER Ausbruch*))) AND lang:DE)
Climate change	((“#climatechange” OR ”#climateaction” OR ”#globalwarming” OR “#ipcc” OR “#climatechangeisreal”) AND lang:EN)	((“#Klimawandel” OR ”#Klimawirkung” OR “#klimaschutz” OR ”#globaleErwärmung” OR “#ipcc”) AND lang:DE)

5. How relevant diseases were identified for each market

Section 1b of the full report ('Frame antimicrobial resistance as undermining modern medicine: Reinforce the undermining medicine frame by tailoring examples to your context') includes a table setting out the most prevalent diseases affected by drug-resistant infections in each of the seven countries covered by the research. The version of the table below includes source references.

Table: Most prevalent diseases affected by drug-resistant infections by country with source references

Country	Most common diseases affected by drug-resistant infections	Source
US	Pneumonia, Diarrhoea/ Colitis, Gonorrhoea	https://www.cdc.gov/drugresistance/biggest-threats.html
UK	Gonorrhoea	https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2018.23.23.1800287 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/806118/hpr1919_stis-ncsp_ann18.pdf
Germany	MRSA, Tuberculosis	https://www.zeit.de/wissen/gesundheit/2014-11/multiresistente-keime-mrsa-antibiotika-massentierhaltung-keimkarte https://www.rki.de/SharedDocs/FAQ/Krankenhausinfektionen-und-Antibiotikaresistenz/FAQ_Liste.html https://europepmc.org/abstract/med/25970119 https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0217597
Kenya	Salmonella, Typhoid, Tuberculosis	https://www.nytimes.com/2019/04/07/health/antibiotic-resistance-kenya-drugs.html https://www.borgenmagazine.com/the-fight-against-tuberculosis-in-kenya/
India	Sepsis, Tuberculosis, Typhoid	https://www.thebureauinvestigates.com/stories/2018-11-14/babies-hit-the-hardest-by-indias-antibiotic-resistance-crisis https://www.cdc.gov/ncezid/stories-features/global-stories/protecting-newborns-in-india.html https://www.who.int/tb/data/GTBreportCountryProfiles.pdf?ua=1 https://apps.who.int/iris/bitstream/handle/10665/112642/9789241564748_eng.pdf;jsessionid=EA73DEF1834FA048C504D81EFC87D801?sequence=1 https://resistancemap.cddep.org/AntibioticResistance.php
Thailand	Tuberculosis, Malaria	https://apps.who.int/iris/bitstream/handle/10665/112642/9789241564748_eng.pdf;jsessionid=EA73DEF1834FA048C504D81EFC87D801?sequence=1 https://www.bmj.com/content/358/bmj.j2423
Japan	MRSA	https://wwwnc.cdc.gov/eid/article/6/6/00-0604_article

6. Research materials

Included below are copies of the research materials used in the public research.

a. Scoping focus groups: screener questionnaire

Example screener questionnaire used in Kenya (with country-specific elements highlighted)

We are calling to invite a select group of people to participate in a focus group about interesting and important issues being discussed and debated in society today. We are interested in speaking with people who don't mind sharing their views and personal experiences with others. As a way of saying thank you for sharing your time with us, we will be offering an incentive to those who participate.

Q1. Would you say this describes you?

Yes	CONTINUE
No	TERMINATE

Q2. Which of these best describes where you live? (Country-specific)

In the Nairobi Metropolitan Region	1	CONTINUE
Outside the Nairobi Metropolitan Region	2	TERMINATE

Q3. What is your gender?

Male	1	CONTINUE – ENSURE EQUAL SPLIT IN EACH GROUP
Female	2	CONTINUE – ENSURE EQUAL SPLIT IN EACH GROUP

Q4. Which of the following ranges includes your age?

18-21	1	TERMINATE
22-35	2	CONTINUE – RECRUIT FOR GROUP 1 – ENSURE A MIX OF AGES
36-50	3	CONTINUE – RECRUIT FOR GROUP 2 – ENSURE A MIX OF AGES
51-65	4	TERMINATE
66 or above	5	TERMINATE

Q5. What is the highest level of education you have completed? (Country-specific)

No formal education		TERMINATE
Primary School		TERMINATE
Did not graduate from high school		TERMINATE
High school		CONTINUE – ENSURE A MIX IN EACH GROUP
Some tertiary education or diploma qualification		CONTINUE – ENSURE A MIX IN EACH GROUP
Undergraduate bachelor's degree		CONTINUE – ENSURE A MIX IN EACH GROUP
Post-graduate degree		TERMINATE

Q6. Which of the following best describes your current employment status?

Employed full-time	1	CONTINUE – GO TO Q7
Employed part-time	2	CONTINUE – GO TO Q7
Self-employed	3	CONTINUE – GO TO Q7
Retired	4	CONTINUE – GO TO Q8
Student	5	TERMINATE
Unemployed	6	TERMINATE
Other	7	TERMINATE

Q7. What is your occupation?
[RECORD VERBATIM]

Q8. Can you tell me if you or anyone in your immediate family works in any of these occupations or industries?

Motor industry	1	CONTINUE
Retail	2	CONTINUE
Teaching	3	CONTINUE
Accountancy	4	CONTINUE
Advertising/PR	5	TERMINATE
Market research	6	TERMINATE
Media – TV, radio, newspapers	7	TERMINATE
Healthcare	8	TERMINATE
Pharmaceutical	9	TERMINATE
Veterinary	10	TERMINATE
Farming	11	TERMINATE
None of the above	12	CONTINUE

Q9. Which of the following ranges includes your PERSONAL monthly income? (Country-specific)

Up to KES 50,000	1	TERMINATE
KES 50,000 – KES 99,999	2	CONTINUE
KES 100,000 – KES 149,999	3	CONTINUE
KES 149,999 – KES 199,999	4	TERMINATE
KES 200,000 - KES 299,999	5	TERMINATE
KES 300,000 - KES 399,999	6	TERMINATE
KES 400,000 - KES 499,999	7	TERMINATE
KES 500,000 and above	8	TERMINATE

Q10. How frequently do you watch, read or listen to news from the following outlets?
MUST CONSUME NEWS FROM 2+ of the FOLLOWING EVERY DAY/3-4 TIMES A WEEK/ONCE A WEEK TO CONTINUE

(Country-specific)	Everyday	3-4 times per week	Once a week	Once or twice a month	Never
The Star	1	2	3	4	5
Daily Nation	1	2	3	4	5
Business Insider	1	2	3	4	5
Standard	1	2	3	4	5
Kenya Broadcasting Corporation	1	2	3	4	5
Financial Times	1	2	3	4	5
Bloomberg BusinessWeek	1	2	3	4	5
Reuters	1	2	3	4	5
The Wall Street Journal	1	2	3	4	5
BBC News	1	2	3	4	5
CNN News	1	2	3	4	5
CNBC	1	2	3	4	5
Al Jazeera	1	2	3	4	5
Business Weekly	1	2	3	4	5
The Economist	1	2	3	4	5

Q11. Which of the following types of news are you interested in? [Select all that apply]

	Yes	No	
International news	1	2	CONTINUE – RECORD FOR REFERENCE
National news	1	2	

Local news	1	2	
Health news	1	2	
Science news	1	2	
Environmental news	1	2	
Technology news	1	2	

Q12. How is your health in general?

Very good	1	CONTINUE – RECORD FOR REFERENCE & ENSURE A MIX IN EACH GROUP
Good	2	
Fair	3	
Bad	4	
Very bad	5	

Q13. When did you last take the following types of medicine? (Country-specific)

	In the last week	In the last month	In the last 6 months	More than 6 months ago	Never
Antibiotics (e.g. Augmentin and Zinnat)	1	2	3	4	5
Antivirals	1	2	3	4	5
Anti-inflammatories	1	2	3	4	5

Focus Group Participant Screening Questions:

Q14. Have you ever participated in a focus group?

Yes	1	ASK Q15
No	2	SKIP TO QUALIFICATION SCRIPT

Q15. How recently did you participate in your last focus group?

Less than three months ago	1	TERMINATE
Three to six months ago	2	CONTINUE
More than six months ago	3	CONTINUE

CLOSE

b. Scoping focus groups: discussion guide

Introduction (5 minutes)

Hi everyone, my name is [NAME] and I will be your moderator this morning/afternoon. Thank you for taking the time to be here.

We're going to be talking about issues relating to health today. All opinions are welcome so please be courteous of others in the room, speak loudly, and avoid side conversations. We will be together for approximately 90 minutes.

I want to disclose a few things about the room. This facility is equipped with microphones and a video camera; this enables us to know what was said, not who said what. There is a two-way mirror behind me. My colleagues are behind the glass and are taking notes because I won't be able to remember everything that gets said tonight.

Everything you say will be treated on a completely anonymous and confidential basis and nothing that you say in our conversation will be attributed back to you in any way when we are looking at our results.

So with that, let's get started with some introductions around the table. If you could tell me:

- Your name
- What you do for work
- Something you like to do in your spare time

[RESPONDENT NAME] do you want to start?
[RESPONDENTS INTRODUCE THEMSELVES]

Thanks, now to start us off…

A. General perceptions of health (10 minutes)

1. On a piece of paper, please write down the three biggest health issues facing the world? We will then discuss them as a group
   [Moderator note: ask participants to share what they have written with the group]
   a. And what about the biggest health issues facing Kenya?

2. What makes you think these are the biggest health issues?
   a. PROBE: immediacy / how widespread they are / type of disease or health challenge.

3. Where do you usually hear about the health issues you have described?
   a. PROBE**:** friends/family, newspapers, TV
      [Moderator note: if newspapers or TV, then ask for specific PUBLICATIONS or CHANNELS]

B. Approaches to ill health (10 minutes)

Now, I'd like us to think about health from a personal perspective, and we will talk about how you and your family deal with health issues

1. Now I'd like to think about when you or someone in your family starts to feel ill – for example, they might have a cough, muscle aches, fatigue, diarrhea or a fever. At what stage would you seek advice?
   a. Who would you go to for advice? And why?
   b. [If not mentioned] Would you seek advice from:
      i. The internet?
      ii. Friends and family?
      iii. A doctor?
      iv. A pharmacist?
      v. A traditional medicine practitioner?

vi. A community healthcare worker?
vii. A priest or religious leader?

2. At what stage would you usually start to take medication?
    a. In what situations do you think it is appropriate to take medicines?
        i. PROBE: belief that the medicine will work / be effective, because it has worked before or for others, because someone [doctor, pharmacist, friend, family member, internet] advised them to take it
    b. In what situations do you think it is NOT appropriate to take medicine?
        i. PROBE: concerns around taking medicines, advisors
        ii. Have you ever been refused or told not to take medicine?
    c. At what stage of an illness do you think it is most effective to take medicine? Why?
    d. Are there certain medicines you prefer?

C. Medicines (25 minutes)

I'd now like to talk in a bit more detail about medicines

1. [FLIPCHART] I'd now to talk a bit about illnesses and the medicines used to treat them.
    a. For each illness, please can you tell me IF you would use a medicine to treat it, and if so, WHICH MEDICINE you might use:
        i. A common cold
        ii. Malaria
        iii. A headache
        iv. An infected cut or wound
        v. Pneumonia
        vi. Stomach pain or sickness
    b. For each:
        i. Why would you use this?
        ii. [Probe] – would it be a one-off dose or would it require a longer period of treatment?

2. As you might know, medicines fall into different categories. Can you tell me if any of the medicines we have just spoken about are any of the following:
    a. Antibiotics?
    b. Anti-inflammatories?

3. Thinking about <u>antibiotics</u> – such as Amoxil and Norfloxacin – specifically, what types of illness are they used to treat?

4. When did you last use an antibiotic?
    a. Where did you get the antibiotics from?
        i. Listen for: prescribed by a doctor, recommended by a pharmacist, acquired from a friend / family member / other
    b. How effective was the antibiotic?
    c. Did you have any concerns about taking the antibiotic?

D. Awareness & impact of AMR (35 minutes)

1. Have you ever heard of the term 'antimicrobial resistance' or 'antibiotic resistance'?
    a. Where have you heard this term?
    b. What does this term mean to you? Can you explain what it means?
    c. Have you heard any other terms used to describe this issue?
        i. Probe**:** superbugs / drug resistant infections

2. I'd now like to share some information about antimicrobial resistance with you, and then we will discuss.

    [Read] Antimicrobial resistance (or antibiotic resistance) occurs when some of the germs that cause infections resist the effects of the medicines used to treat them.

a. Have you heard about this before?
b. What is your reaction to this information?
c. What questions do you have?

3. Are you aware of any of the following campaigns? [Handout A]
    a. Kenya
        i. ReAct Africa Antibiotic Awareness Week
        ii. World Antibiotic Awareness Week
        iii. Antibiotic Guardian
    b. What is your reaction to these materials? Why?

4. What impact do you think antimicrobial resistance could have?
    a. If antibiotics (such as Amoxil and Norfloxacin) stopped working, what would that mean for you and your family?
    b. What would be the impact on this city? This country? The world?
    c. What is the impact now? And what will be the impact in the future (e.g. in 10 years' time)?

5. [HANDOUT B] I have here a list of some of the areas in which antimicrobial resistance might have an impact. Please take a moment to look at this list, and then we will discuss as a group.
    a. What impacts do you think antimicrobial resistance might have in these areas?
    b. Which of these impacts do you find most concerning? Why?

For handout	**Moderator prompts (use as needed)**
Patients	*Patients not recovering from infections*
Treatment of specific diseases	*Antibiotics no longer effective in treating certain diseases*
Operations and surgery	*Routine surgery like hip replacements or caesarean sections become life threatening. Which operations would you worry about most if they were no longer possible?*
The healthcare system	*Higher costs as patients stay in hospital for longer and need more intensive care*
Businesses and workplaces	*Negative impact on businesses and employment*
Kenya's economy	*Economy would suffer and people would be pushed into poverty*
Farming and food production	*Decline in livestock production*
Travel and tourism	*Foreign travel becomes riskier as it increases the risk of spreading antimicrobial resistance*

E. Wrapping up (5 minutes)

1. Thinking back to the health issues that we identified at the start of our discussion, how important do you think antimicrobial resistance is compared to the other health issues?
    a. Is it more or less important than [name some]?
    b. Why?

2. Is there any particular information about antimicrobial resistance that you would like to have?
    a. What would you like to know?

3. Do you have any final comments?

CLOSE

c. Quantitative testing and prioritization: questionnaire

Demographics

PROG: ASK ALL. SINGLE CODE
S1. What is your gender?
1. Male
2. Female
3. Other (Please specify)
98. Prefer not to say

PROG: ASK ALL. SINGLE CODE
S2. Which of the following ranges includes your age?
1. Under 18 [TERMINATE]
2. 18-24
3. 25-34
4. 35-44
5. 45-54
6. 55-64
7. 65+

PROG: ASK ALL. SINGLE CODE
S3. What is the highest level of education you have completed?
TAILOR ANSWER CODES FOR EACH MARKET
Primary school or below
Lower-secondary graduate
Upper-secondary graduate
Vocational school graduate
University graduate
Post-graduate (masters)
Post-graduate (doctorate)

PROG: ASK ALL. SINGLE CODE
S4. Which area do you live in?
TAILOR REGION ANSWER CODES FOR EACH MARKET

PROG: ASK ALL. SINGLE CODE
S5. Which of the following ranges includes your personal monthly/annual household income?
TAILOR INCOME ANSWER CODES FOR EACH MARKET

PROG: ASK ALL. SINGLE CODE
S6. How frequently do you watch, read or listen to news from the following outlets?
PROG: FOR RESPONSE OPTIONS, SEE TABLE BELOW
PROG: SINGLE CODE GRID
ANALYSIS: MUST SELECT OPTIONS 01 EVERY DAY / 02 MOST DAYS FOR TWO OR MORE OUTLETS TO BE CLASSIFIED AS MEDIA ENGAGED

PROG: GRID ACROSS.
1. Every day
2. Most days
3. Only sometimes
4. Never

UK	US	Germany	India
1. The Daily Telegraph/ The Sunday Telegraph	1. The New York Times 2. Washington Post 3. USA Today	1. Süddeutsche Zeitung	1. The Indian Express 2. The Hindu

2. The Times/The Sunday Times 3. The Guardian/The Observer 4. The Financial Times 5. The Independent 6. The i 7. Wall Street Journal 8. The Spectator 9. The Economist 10. New Statesman 11. Total Politics 12. BBC News 13. ITV News 14. Channel 4 News 15. Sky News 16. The Today Programme 17. Newsnight 18. Daily Politics 19. Question Time	4. The Wall Street Journal 5. The Financial Times 6. Bloomberg 7. Forbes 8. Fortune 9. Business Insider 10. Time 11. The New Yorker 12. The Economist 13. Bloomberg Businessweek 14. CNN 15. Fox News 16. MSNBC 17. CNN 18. BBC 19. NBC Nightly News 20. CBS Evening News 21. ABC World News Tonight	2. Frankfurter Allgemeine Zeitung (FAZ) 3. Bild 4. Die Welt 5. Die Tageszeitung (Taz) 6. Frankfurter Rundschau 7. Handelsblatt 8. Börsenzeitung 9. Der Tagesspiegel 10. Der Spiegel 11. Focus 12. Stern 13. Die ZEIT 14. heute journal 15. Tagesthemen 16. RTL Nachtjournal 17. Deutschlandfunk	3. The Times of India 4. Hindustan Times 5. Mumbai Mirror 6. The Telegraph 7. The Economic Times 8. Business Standard 9. Hindu Business Line 10. Financial Express 11. Mint 12. Financial Times 13. India Today 14. Outlook 15. The Caravan 16. The Week 17. CNN-News18 18. CNBC TV18 19. NDTV 24x7 20. NDTV India 21. ET Now

Kenya	Thailand	Japan
1. The Star 2. Daily Nation 3. Business Insider 4. Standard 5. Kenya Broadcasting Corporation 6. Financial Times 7. Bloomberg BusinessWeek 8. Reuters 9. The Wall Street Journal 10. BBC News 11. CNN News 12. CNBC 13. Al Jazeera 14. Business Weekly 15. The Economist	1. Krungthep Turakij 2. Manager Daily 3. Post Today 4. Bangkok Post 5. The Nation 6. Financial Times 7. Bloomberg BusinessWeek 8. Reuters 9. The Wall Street Journal 10. BBC News 11. CNN News 12. Thai Rath 13. Daily News 14. Khoa Sod 15. Thansettakij 16. Matichon	1. Asahi Shimbun 2. Yomiuri Shimbun 3. Mainichi Shimbun 4. Sankei Shimbun 5. Nihon Keizai Shimbun 6. Nikkan Kogyo Shimbun 7. Fuji Sankei Business i. 8. Jiji News 9. Nikkei Sangyo Shimbun 10. Nikkei MJ 11. Shukan Economist 12. Nikkei Business 13. Diamond Weekly 14. Toyo Keizai 15. President 16. AERA 17. Courrier Japon 18. Shukan Asahi 19. Shukan Bunshun 20. Nikkei CNBC 21. NTV News 24 22. TBS News Bird 23. Close Up Gendai 24. Nichiyo Toron 25. Asamade Nama TV 26. Jiji Hodan

Section A: Context

PROG: ASK ALL
A1. Have you heard of any of the following terms?
PROG: SINGLE CODE GRID. RANDOMISE A-I

	Yes	No
a. Bacteria	1	2
b. Germs	1	2
c. Microbes	1	2
d. Infection	1	2
e. Illness	1	2
f. Disease	1	2
g. Drugs	1	2
h. Medicines	1	2
i. Antibiotics	1	2

PROG: ASK ALL WHO HAVE HEARD OF ANTIBIOTICS (QA1i CODE 1)
A2. Do you know what antibiotics are?
PROG: SINGLE CODE
1. Yes
2. No (skip to QA7)

PROG: ASK ALL WHO KNOW WHAT ANTIBIOTICS ARE (QA2 CODE 1)
A3. When did you last take antibiotics?
PROG: SINGLE CODE
1. In the last month
2. In the last 6 months
3. In the last year
4. More than a year ago
5. Never
99. Can't remember

PROG: ASK ALL WHO HAVE TAKEN ANTIBIOTICS (QA3 CODES 1-4)
A4. Thinking back to when you last took antibiotics, where did you get the antibiotics from?
PROG: SINGLE CODE
1. Medical store or pharmacy – with a prescription from a doctor or nurse
2. Medical store or pharmacy – without a prescription from a doctor or nurse
3. Stall or hawker [Kenya, Thailand, India only]
4. The internet
5. Friend or family member
6. I had them saved up from a previous time
7. Somewhere/someone else
99. Can't remember

PROG: ASK ALL WHO KNOW WHAT ANTIBIOTICS ARE (QA2 CODE 1)
A5. Which of these conditions do you think can be treated with antibiotics?
PROG: SINGLE CODE GRID. RANDOMISE A-L

	Yes	No	Don't know
a. HIV/AIDS	1	2	99
b. Gonorrhoea	1	2	99
c. Bladder infection or urinary tract infection (UTI)	1	2	99
d. Diarrhoea	1	2	99
e. Cold and flu	1	2	99
f. Fever	1	2	99
g. Malaria	1	2	99
h. Measles	1	2	99
i. Skin or wound infection	1	2	99
j. Sore throat	1	2	99
k. Body aches	1	2	99
l. Headaches	1	2	99

PROG: ASK ALL WHO KNOW WHAT ANTIBIOTICS ARE (QA2 CODE 1)
A6. Please indicate whether you think the following statements are 'true' or 'false'
PROG: SINGLE CODE GRID. RANDOMISE A-D

	True	False	Don't know
a. It's okay to use antibiotics that were previously given to a friend or family member, as long as they were used to treat the same illness	1	2	99
b. It's okay to buy the same antibiotics, or request these from a doctor, if you're sick and they helped you get better when you had the same symptoms before	1	2	99
c. You can stop taking antibiotics if your symptoms are improving	1	2	99
d. It is important to consult a qualified healthcare professional (doctor, nurse, pharmacist) before taking antibiotics	1	2	99

Analysis note: answers in yellow denote correct answers (used to calculate 'antibiotic understanding')

- *Survey respondents were classified as having 'high antibiotic understanding' if at least three quarters of their responses to both questions were correct.*
- *Respondents were classified as having 'low understanding' if less than half of their responses to both questions were correct.*

PROG: ASK ALL
A7. Have you heard of any of the following terms?
PROG: SINGLE CODE GRID. RANDOMISE A-F

	Yes	No
a. Antibiotic resistance	1	2
b. Superbugs	1	2
c. Antimicrobial resistance	1	2
d. AMR	1	2
e. Drug-resistant infections	1	2
f. Antibiotic-resistant bacteria	1	2

PROG: ASK ALL ANSWERING 'YES' AT QA7a
A8a. Where did you hear about the term: 'antibiotic resistance'?
PROG: MULTICODE. RANDOMISE 1-4
1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio, social media)
5. Specific campaign (please specify which campaign)
6. Other
99. Can't remember

PROG: ASK ALL ANSWERING 'YES' AT QA7b
A8b. Where did you hear about the term: 'superbugs'?
PROG: MULTICODE. RANDOMISE 1-4
1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio, social media)
5. Specific campaign (please specify which campaign)
6. Other
99. Can't remember

PROG: ASK ALL ANSWERING 'YES' AT QA7c
A8c. Where did you hear about the term: 'antimicrobial resistance'?
PROG: MULTICODE. RANDOMISE 1-4
1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio, social media)
5. Specific campaign (please specify which campaign)
6. Other
99. Can't remember

PROG: ASK ALL ANSWERING 'YES' AT QA7d
A8d. Where did you hear about the term: 'AMR'?
PROG: MULTICODE. RANDOMISE 1-4
1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio, social media)
5. Specific campaign (please specify which campaign)
6. Other
99. Can't remember

PROG: ASK ALL ANSWERING 'YES' AT QA7e
A8e. Where did you hear about the term: 'drug resistant infections'?
PROG: MULTICODE. RANDOMISE 1-4

1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio, social media)
5. Specific campaign (please specify which campaign)
6. Other
99. Can't remember

PROG: ASK ALL ANSWERING 'YES' AT QA7f
A8f. Where did you hear about the term: 'antibiotic-resistant bacteria'?
PROG: MULTICODE. RANDOMISE 1-4
1. Doctor or nurse
2. Pharmacist
3. Family member or friend (including on social media)
4. Media (newspaper, TV, radio, social media)
5. Specific campaign (please specify which campaign)
6. Other
99. Can't remember

PROG: ASK ALL
A10. How significant or otherwise do you consider the threat to the world today from each of the following issues?
PROG: SINGLE CODE GRID. RANDOMISE A-F

	Very significant threat	Fairly significant threat	Little threat	No threat at all	Don't know
a. Air pollution	1	2	3	4	5
b. Lack of access to clean water	1	2	3	4	5
c. Cancer	1	2	3	4	5
d. Antibiotic resistance	1	2	3	4	5
e. Epidemics and pandemics	1	2	3	4	5

PROG: ASK ALL
A11. Please indicate whether you think the following statements are 'true' or 'false'
PROG: SINGLE CODE GRID. RANDOMISE A-G

	True	False	Don't know
a. Antibiotic resistance occurs when your body becomes resistant to antibiotics and they no longer work as well	1	2	99
b. Antibiotic resistance occurs when bacteria become resistant to antibiotics and they no longer work as well	1	2	99
c. If bacteria are resistant to antibiotics, it can be very difficult or impossible to treat the infections they cause	1	2	99
d. Antibiotic resistance is an issue that could affect me or my family	1	2	99
e. Antibiotic resistance is an issue in other countries but not here in my country	1	2	99
f. Antibiotic resistance is only a problem for people who take antibiotics regularly	1	2	99
g. Bacteria which are resistant to antibiotics can be spread from person to person	1	2	99

Section B: What is happening

PROG: Display to all
PROG: INTRO TEXT: You will now see some statements about antibiotic resistance, explaining what is happening. Please read each statement carefully and then answer the questions that follow.

PROG: TEST THREE MESSAGES WITH EACH RESPONDENT [RANDOMISE]
PROG: DISPLAY STATEMENTS RANDOMLY, ONE STATEMENT PER SCREEN
PROG: DISPLAY BOTH QUESTIONS ON SAME PAGE AS EACH STATEMENT

B1. To what extent does this statement help you to understand what is happening with antibiotic resistance?
PROG: SINGLE CODE
1. To a great extent
2. To some extent
3. A little
4. Not at all
99. Don't know

B2: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed?
PROG: SINGLE CODE
1. To a great extent
2. To some extent
3. A little
4. Not at all
99. Don't know

Section B messages [Test 3 messages with each respondent]

1. Antibiotics stop working	*a. Antibiotics that save lives are no longer working*
	b. The drugs don't work
	c. Medicines are losing the war against bacteria
2. Explaining resistance	*d. 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*
	e. Germs are very smart and adapt very quickly to become resistant to medicines

Section C: Why it is happening

PROG: Display to all
PROG: INTRO TEXT: The following statements explain why antibiotic resistance is happening. Please read each statement carefully and then answer the questions that follow.

PROG: TEST FIVE MESSAGES WITH EACH RESPONDENT [RANDOMISE – ENSURE EACH RESPONDENT SEES ONE VERSION OF STATEMENT E]
PROG: DISPLAY STATEMENTS RANDOMLY, ONE STATEMENT PER SCREEN
PROG: DISPLAY BOTH QUESTIONS ON SAME PAGE AS EACH STATEMENT

C1: To what extent does this statement help you to understand why antibiotic resistance is happening?
PROG: SINGLE CODE
1. To a great extent
2. To some extent
3. A little
4. Not at all
99. Don't know

C2: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed?
PROG: SINGLE CODE
1. To a great extent
2. To some extent
3. A little
4. Not at all
99. Don't know

Section C messages [Test 5 messages with each respondent]

1. Human use	*a. Antibiotics are overused in humans and animals, which has resulted in them becoming less effective in treating illnesses [PROG: Exclusive to message b]*
	b. Antibiotics are used inappropriately in humans and animals, which has resulted in them becoming less effective in treating illnesses [PROG: Exclusive to message a]
	c. Germs will always look for ways to survive and resist new drugs, but the way we are using antibiotics is accelerating this process
2. Market failure	*d. We need new antibiotics because the current ones are becoming less effective, but pharmaceutical companies are not developing new antibiotics as it is not profitable for them*
	e1. We are not developing new antibiotics fast enough which means that we don't have new drugs to fight antibiotic-resistant bacteria [PROG: Exclusive to message e2]
	e2. We are not developing new antibiotics fast enough which means that we don't have new drugs to fight antibiotic-resistant bacteria. But we have developed them before, and we can do so again. [PROG: Exclusive to message e1]
	f. Only two new types of antibiotics have been introduced in the last 40 years, so we don't have the new drugs we need to fight antibiotic-resistant bacteria
3. Environmental	*g. Human activity can pollute the environment (soil, rivers, oceans) with antibiotics, which speeds up the spread of antibiotic resistance*
	h. When waste from industrial production of antibiotics gets into the environment, this speeds up the spread of antibiotic resistance

Section D: Impact

PROG: Display to all
PROG: INTRO TEXT: The following statements explain the current or potential impact of antibiotic resistance. Please read each statement carefully and then answer the questions that follow.

PROG: TEST TEN MESSAGES WITH EACH RESPONDENT [RANDOMISE – INC. MARKET-SPECIFIC STATEMENT H, + NOTE SPLIT SAMPLE FOR STATEMENT R]
PROG: DISPLAY STATEMENTS RANDOMLY, ONE STATEMENT PER SCREEN
PROG: DISPLAY BOTH QUESTIONS ON SAME PAGE AS EACH STATEMENT

D1: To what extent does this statement help you to understand the current or potential impact of antibiotic resistance?
PROG: SINGLE CODE
1. To a great extent
2. To some extent
3. A little
4. Not at all
99. Don't know

D2: To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed?
PROG: SINGLE CODE
1. To a great extent
2. To some extent
3. A little
4. Not at all
99. Don't know

Section D messages [Test 10 messages with each respondent]

1. Healthcare & treatment	*a. People will have to pay for more treatments and longer stays in hospital*
	b. People will take longer to recover from operations and illnesses
	c. Modern medicine is impossible without antibiotics that work
	d. 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
	e. The progress that has been made in treating diseases such as cancer will be set back decades if we don't have antibiotics that work
	f. 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
2. Death	*g. It is estimated that, by 2050, 10 million people will die every year due to antibiotic resistance*
	UK h1. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance which is equivalent to the population of Leeds
	US h2. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance which is equivalent to the population of Portland, Oregon
	DE h3. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance which is equivalent to the population of Frankfurt
	JP h4. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over five years, that is equivalent to the population of Yokohama
	IN h5. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over ten years, that is equivalent to the population of Hyderabad
	TH h6. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over ten years, that is equivalent to the population of Bangkok
	KE h7. It is estimated that 700,000 people currently die each year as a result of antibiotic resistance. Over five years, that is equivalent to the population of Nairobi
3. Econmic	*i. By 2050, antibiotic resistance could cause global economic damage on the same scale as the 2008 financial crisis*
	j. Antibiotic resistance could push up to 28 million people into poverty by 2050
	k. Antibiotic resistance could severely affect international trade and tourism, and damage the economies of countries around the world
4. Who it affects	*l. Antibiotic-resistant germs know no borders; antibiotic resistance threatens everyone wherever you live*
	m. Antibiotic resistance threatens the most vulnerable people in society – the very young, the elderly and those with weakened immune systems that are less able to fight infections and other diseases
	n. Antibiotic resistance will impact our children and grandchildren – currently treatable diseases will become life threatening for future generations
	o. Antibiotic resistance is a threat to both human and animal health and could have a major impact on farming and food production

5. Scale of crisis	*p. Growing resistance to medicines means that we are facing an antibiotic apocalypse where currently treatable infections and injuries will kill once again [PROG: Exclusive to message q]*
	q. 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 [PROG: Exclusive to message p]
	r1. Antibiotic resistance is one of this generation's greatest problems [PROG: Exclusive to messages r2/r3]
	r2. Like climate change, antibiotic resistance is one of this generation's greatest problems [PROG: Exclusive to messages r1/r3]
	r3. Antibiotic resistance is one of this generation's greatest problems, but we can make a difference if we take action now [PROG: Exclusive to messages r1/r2]
6. Security / Travel	*s. Foreign travel and tourism will become much riskier as they will increase the risk of spreading antibiotic-resistant diseases*

Section E: Competitive testing

PROG:
- IF TWO OR MORE MESSAGES ARE RATED 'TO A GREAT EXTENT' AT D2, SHOW AT E1
- IF NO MESSAGES ARE RATED 'TO A GREAT EXTENT' AT D2, BUT TWO OR MORE MESSAGES ARE RATED 'TO SOME EXTENT' AT D2, SHOW AT E1
- IF NO MESSAGES ARE RATED 'TO A GREAT EXTENT' OR 'TO SOME EXTENT' AT D2, DO NOT SHOW E1

E1. Below are the messages you said you found most convincing in making you feel that antibiotic resistance is a priority issue to be addressed. Please select the message that you think is MOST convincing from this list:
[RESPONSE OPTIONS DEPENDENT ON ANSWERS TO D2]

CLOSE

d. Qualitative message development: screener questionnaire

Example screener questionnaire used in the UK (with country-specific elements highlighted)

We are calling to invite a select group of people to participate in a focus group about interesting and important issues being discussed and debated in society today. We are interested in speaking with people who don't mind sharing their views and personal experiences with others. As a way of saying thank you for sharing your time with us, we will be offering an incentive to those who participate.

Q1. Would you say this describes you?

Yes	CONTINUE
No	TERMINATE

Thank you. I have just a few questions to ensure that we recruit the right mix of participants for the discussion. If you qualify, we will provide an incentive of [TBC] to thank you for your participation in the discussion. Also, the discussion will be entirely confidential and anonymous. Nothing you say will be associated with you as an individual. [Explain video/audio taping.]

Q2. Do you live in London? (country-specific)

Yes	1	CONTINUE
No	2	TERMINATE

Q3. What is your gender?

Male	1	CONTINUE – ENSURE EQUAL SPLIT IN EACH GROUP
Female	2	CONTINUE – ENSURE EQUAL SPLIT IN EACH GROUP

Q4. Which of the following ranges includes your age? (country-specific)

18-21	1	TERMINATE
22-30	2	CONTINUE – RECRUIT FOR GROUP 1 – ENSURE A MIX OF AGES
31-40	3	CONTINUE – RECRUIT FOR GROUP 1 – ENSURE A MIX OF AGES
41-50	4	CONTINUE – RECRUIT FOR GROUP 2 – ENSURE A MIX OF AGES
51-65	5	CONTINUE – RECRUIT FOR GROUP 2 – ENSURE A MIX OF AGES
66 or above	6	TERMINATE

Q5A. What is the highest level of education you have completed? (country-specific)

No formal qualifications	1	TERMINATE
Below GCSEs	2	TERMINATE
GCSEs or equivalent	3	TERMINATE
A-levels or equivalent	4	CONTINUE – MAXIMUM 2 PER GROUP
BTEC or HND	5	
Undergraduate degree – 3- or 4-year degree	6	CONTINUE – ENSURE A MIX IN EACH GROUP
Postgraduate – masters	7	CONTINUE – ENSURE A MIX IN EACH GROUP
Postgraduate – doctorate / Ph.D.	8	TERMINATE

Q5B. [ASK IF Q5A CODE 5/6/7] Which subject did you study at [PIPE RESPONSE IN Q5A] level?

[RECORD VERBATIM AND CHECK WITH BRUNSWICK]

[TERMINATE LIFE SCIENCE MAJORS E.G. MEDICINE, NURSING, BIOLOGY, PHARMACOLOGY, BIOCHEMISTRY, CHEMISTRY, VETERINARY, AND OTHER LIFE SCIENCE MAJORS]

Q6. Which of the following best describes your current employment status?

Employed full-time	1	CONTINUE – GO TO Q7
Employed part-time	2	CONTINUE – GO TO Q7
Self-employed	3	CONTINUE – GO TO Q7
Retired	4	CONTINUE – GO TO Q8
Student	5	TERMINATE
Unemployed	6	TERMINATE
Other	7	TERMINATE

Q7. What is your occupation?
[RECORD VERBATIM]

Q8. Can you tell me if you or anyone in your immediate family works in any of these occupations or industries?

Motor industry	1	CONTINUE
Retail	2	CONTINUE
Teaching	3	CONTINUE
Accountancy	4	CONTINUE
Advertising/PR	5	TERMINATE
Market research	6	TERMINATE
Media – TV, radio, newspapers	7	TERMINATE
Healthcare	8	TERMINATE
Pharmaceutical	9	TERMINATE
Veterinary	10	TERMINATE
Farming	11	TERMINATE
None of the above	12	CONTINUE

Q9. Which of the following ranges includes your household's annual total income? (country-specific)

Less than £25,000	1	TERMINATE
£25,000 – £49,999	2	CONTINUE – MAXIMUM 2 PER GROUP
£50,000 – £74,999	3	CONTINUE
£75,000 – £99,999	4	CONTINUE
£100,000 – £149,999	5	CONTINUE
£150,000 – £199,999	6	CONTINUE
£200,000 or more	7	TERMINATE

Q10. How frequently do you watch, read or listen to news from the following outlets? (country-specific)
MUST CONSUME NEWS FROM 2+ of the FOLLOWING EVERY DAY/3-4 TIMES PER WEEK TO CONTINUE

	Everyday	3-4 times per week	Once a week	Once or twice a month	Never
The Daily Telegraph/ The Sunday Telegraph	1	2	3	4	5
The Times/The Sunday Times	1	2	3	4	5
The Guardian/The Observer	1	2	3	4	5
The Financial Times	1	2	3	4	5
The Independent	1	2	3	4	5
The i	1	2	3	4	5

Wall Street Journal	1	2	3	4	5
The Spectator	1	2	3	4	5
The Economist	1	2	3	4	5
New Statesman	1	2	3	4	5
Total Politics	1	2	3	4	5
BBC News	1	2	3	4	5
ITV News	1	2	3	4	5
Channel 4 News	1	2	3	4	5
Sky News	1	2	3	4	5
The Today Programme	1	2	3	4	5
Newsnight	1	2	3	4	5
Daily Politics	1	2	3	4	5
Question Time	1	2	3	4	5

Q11. Which of the following types of news are you interested in? [Select all that apply]

	Yes	No	
International news	1	2	CONTINUE – RECORD FOR REFERENCE
National news	1	2	
Local news	1	2	
Health news	1	2	
Science news	1	2	
Environmental news	1	2	
Technology news	1	2	

Q12. How is your health in general?

Very good	1	CONTINUE – RECORD FOR REFERENCE & ENSURE A MIX IN EACH GROUP
Good	2	
Fair	3	
Bad	4	
Very bad	5	

Q13. When did you last take the following types of medicine? [RECORD FOR REFERENCE] (country-specific)

	In the last week	In the last month	In the last 6 months	More than 6 months ago	Never
Antibiotics (e.g. amoxicillin, doxycycline)	1	2	3	4	5
Antivirals (e.g. Tamiflu, Relenza)	1	2	3	4	5
Anti-inflammatories (e.g. Aspirin, Ibuprofen)	1	2	3	4	5

Focus Group Participant Screening Questions:

Q14. Have you ever participated in a focus group?

Yes	1	ASK Q15
No	2	SKIP TO QUALIFICATION SCRIPT

Q15. How recently did you participate in your last focus group?

Less than three months ago	1	TERMINATE
Three to six months ago	2	CONTINUE
More than six months ago	3	CONTINUE

CLOSE

e. Qualitative message development: discussion guide

Pre-task (as waiting to come in)

[HANDOUT 1] Below is a list of global health issues.

Health issues:

- Air pollution
- Antibiotic resistance
- Cancer
- Clean water
- HIV/AIDS
- Malaria
- Mental health
- Obesity
- Epidemic preparedness
- Smoking

a. Please read through the list, and rank them in order of which you think are most important to be addressed – so 1 = the highest priority to address; 10 = the lowest priority to address
b. Next to the issue that you ranked top (1 = the highest priority to address), please write why it is the highest priority.
c. Next to the issue that you ranked bottom (10 = the lowest priority to address), please write why it is the lowest priority.
d. Are there any global health issues that are really important that you think are missing from this list?

Introduction (5 minutes)

Hi everyone, my name is [NAME] and I will be your moderator this evening. Thank you for taking the time to be here.

We're going to be talking about issues relating to health tonight. All opinions are welcome so please be courteous of others in the room, speak loudly, and avoid side conversations. We will be together for approximately 1 hour 45 minutes.

I want to disclose a few things about the room. This facility is equipped with microphones and a video camera; this enables us to know what was said, not who said what. There is a two-way mirror behind me. My colleagues are behind the glass and are taking notes because I won't be able to remember everything that gets said tonight.

Everything you say will be treated on a completely anonymous and confidential basis and nothing that you say in our conversation will be attributed back to you in any way when we are looking at our results.

So, with that, let's get started with some introductions around the table. If you could tell me:

- Your name
- What you do for work
- What are your main sources of news and current affairs?

[RESPONDENT NAME] do you want to start?
[RESPONDENTS INTRODUCE THEMSELVES]

Thanks, now to start us off…

Global health issues and AMR (20 minutes overall)

Prioritisation (~5 minutes)

1. As you were waiting to come in, we asked you to complete an exercise ranking some global health issues by their priority to be addressed. Where did antibiotic resistance rank in your lists?
    a. Why is that?
    b. [If not top priority] What makes other issues a higher priority to address?

Terms (~7 minutes)

2. Have you heard the term 'antibiotic resistance' before?
    a. Where did you hear it?
    b. What does this term mean to you? Can you explain what it means?
    c. [Moderator – get a sense of whether there is real comprehension of the concept or whether they are simply familiar with the individual words]

[Moderator – share list of other terms for antibiotic resistance on flipchart – HANDOUT 2]

3. Have you heard any other terms used to describe this same issue?
    - Antibiotic resistance
    - Antibiotic-resistant bacteria
    - Drug-resistant infections
    - Superbugs
    - Antimicrobial resistance
    - AMR

    a. Which do you think is most easily understandable?

Understanding (~7 minutes)

4. Based on what you know, can you explain what is happening with antibiotic resistance?

5. And can you explain why it is happening?

6. What impact do you think antibiotic resistance could have?
    a. What impact is it having now? And what will the impact be in the future?
    b. Who do you think will be affected by this issue?

B. What is happening and why it is happening (15 minutes)

[HANDOUT 3] I'm now going to share some information about antibiotic resistance with you, and then we will discuss. I would like to know how well these statements help you to understand what antibiotic resistance is, and why it is happening. I would also like to discuss what questions you have and what more information you would need in order to understand what antibiotic resistance is.

[Moderator note: we want to understand which of these statements is the best initial explanation, and what questions it raises / what more information is needed]

B1. 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

B2. Antibiotics are overused in humans and animals, which has resulted in them becoming less effective in treating illnesses

B3. Germs will always look for ways to survive and resist new drugs, but the way we are using antibiotics is accelerating this process

1. First, take a moment to read the statements, then rank them in order of how well each explains what antibiotic resistance is. As you are doing this, please underline or circle any words or phrases that you do not understand.
    a. Which statement did you rank as best?
    b. Taking each message in turn:
        i. Why did you rank this as best?
        ii. What did you like about that statement?
        iii. Which words or phrases did you highlight as being hard to understand?

    c. Message specific probes:

B2:	i. What do you understand by the statement that antibiotics are overused 'in humans and animals'? What does this mean to you?
B1 & B3:	ii. This message talks about 'germs'. What do you understand to be the connection between germs and illness? iii. And what does the term 'bacteria' mean to you?

2. If someone explained antibiotic resistance to you using these statements, what questions would you have?
    a. What other information would you want to know to help you understand what is happening?

[HANDOUT 4] I also have some variations of one of the messages, that I would like to discuss.

ORIGINAL = B1. 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

VARIATION = B4. The germs that cause illnesses adapt and change over time, meaning they become resistant to medicines

VARIATION = B5. The germs that cause illnesses adapt and change over time, meaning that the medicines that save lives are no longer working

3. How do these versions compare do the original? Are they better or worse in explaining what is happening with antibiotic resistance?
    a. Message specific probes:

B4:	i. How easily understandable is the phrase 'becoming resistant to medicines'?
B5:	ii. How useful is 'medicines that save lives are no longer working' for explaining antibiotic resistance? And for prioritizing it as an issue?

C. Impact (30 minutes)

Who it affects (~10 minutes)

- Now, I want to discuss who antibiotic resistance affects. On the wall, there are groups affected by antibiotic resistance [HANDOUT 5 – pin to wall].

1.

GROUP ONE:	GROUP TWO:
• Everyone, wherever you live • Babies and children • The elderly • People with weakened immune systems that are less able to fight infections and other diseases	• Everyone, whoever you are • Babies and children • The elderly • People with weakened immune systems that are less able to fight infections and other diseases

• Vulnerable groups • Our children and grandchildren – future generations • Humans • Animals	• Vulnerable groups • Our children and grandchildren – future generations • Humans • Animals

1. How concerned are you that antibiotic resistance affects each of these groups?
    a. Put a green sticker on the group that concerns you the most.
    b. Put a red sticker on the group that concerns you the least. [Moderator note: if respondents choose 'animals', please probe on which other groups concern participants least]
    c. Probe: what do you understand by the term 'vulnerable groups'?

2. If someone told you that antibiotic resistance affected these groups, what questions would you have?
    a. What other information would you want to know to help you understand what is happening?

Consequences of AMR (~20 minutes)

- [HANDOUT 6] I now want to discuss the impact of antibiotic resistance. In the packs I'm handing out are a number of possible headlines you could read about the impact of antibiotic resistance. First, take a moment to read the headlines and the statements underneath them.

C1. 'Antibiotic resistance threatens farming and food production' *Antibiotic resistance is a threat to both human and animal health and could have a major impact on farming and food production*
C2. 'Antibiotic resistance slows recovery from operations and illness' *People will take longer to recover from operations and illnesses*
C3. 'Routine surgery, common diseases and injuries made more dangerous by antibiotic resistance' *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*
C4. 'TB once again killing due to antibiotic resistance' *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*
C5. 'The world is facing an antibiotic apocalypse' *Growing resistance to medicines means that we are facing an antibiotic apocalypse where currently treatable infections and injuries will kill once again*
C6. 'Antibiotic resistance could take us back to the dark ages' *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*

1. Please read through the sheet and rank the articles in order of which you would be most likely to read based on the headline (and statement beneath). The article you would be most likely to read should be marked number 1, and the article you would be least likely to read should be number 6.

2. Which article have you chosen as number 1 (that you would be most likely to read)?
    a. Why?

3. Which article have you chosen as number 6 (that you would be least likely to read)?

a. Why?

4. Message specific probes:

C3.	i.	What types of surgery or diseases would you be most concerned about, if antibiotics no longer worked?
C5.	ii.	What does the term ‘antibiotic apocalypse’ mean to you?
C6.	iii.	What does the term ‘dark ages of medicine’ mean to you?

5. Looking again at the sheet, which of the articles provides the strongest reason for antibiotic resistant being a priority issue that needs to be addressed? Please draw a star next to this article.
   This could be the same article you chose as number 1, or a different one.
   a. Which did you choose? Why?
   b. Is it the same you chose as number 1? Why (not)?

D. Combining messages (30 minutes)

News article creation (~20 minutes)

I now want to think about how we combine all the information we have discussed so far to communicate why antibiotic resistance is a priority to be tackled.

1. We are going to create news articles, aimed at persuading your friends and family that antibiotic resistance is an issue that we need to address now. We will work in pairs, to combine the information that we have discussed to create the articles.

2. [HANDOUT 7] As you can see on the sheets in front of you, you will need to decide on:
   a. A headline – you can use one of the headlines we have just read, or create a new headline which brings together some of the other information that we have discussed
   b. The group of people it affects – the list of the groups we discussed is displayed on the wall
   c. An idea for a piece of supporting information to show why antibiotic resistance is a priority to be tackled – for example:
      i. The experience of someone affected by antibiotic resistance
      ii. Statistics – numbers of people affected
      iii. The scale of the problem, comparing it to other global issues
      iv. Scientific explanation of what is happening and / or what is causing it
   d. An image – draw or describe a picture that would best support the article

2. Why did you choose that headline and that group of people?

3. Why did you choose that type of supporting information?

4. What image have you drawn and why?

Narrative test (~10 minutes)

[HANDOUT 8] We have prepared a longer statement to communicate what antibiotic resistance is and its impact. Read the statement and then we will discuss.

D1. 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. We are speeding up this process through our overuse of antibiotics, which has resulted in them becoming less effective in treating illnesses. Everyone is threatened by antibiotic resistance, in particular the most vulnerable people in society – the very young, the elderly and those with weakened immune systems that are less able to fight infections and other diseases. But if we take action now, this is a problem we can solve.

5. What is your reaction to this?
    a. How clear is it?
    b. What do you like? What do you dislike?
    c. Probe: explore reaction to final sentence (‘problem we can solve’)

6. To what extent does this statement make you feel that antibiotic resistance is a priority issue to be addressed?
    a. Why?

7. Is there anything missing?

E. Wrap up and close (5 minutes)

1. Thinking about all the statements we have read, do you feel you understand the problem of antibiotic resistance better now?

2. And do you think it is important that action is taken to address the issue of antibiotic resistance?
    a. Has your opinion changed since the start of our discussion?
    b. If yes – why is that?

CLOSE