



# Wellcome Global Monitor

Questionnaire Development Information  
for Covid-19 Report

Wave II: 2020

2020

GALLUP

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# Section I: Introduction

**The first wave of the 2018 Wellcome Global Monitor survey focused on understanding how people around the world think and feel about health, science and scientists, a key area of interest to Wellcome<sup>1</sup>. This included examining levels of trust in science and scientists, interest in and engagement with science and health, attitudes to vaccines and attitudes towards science in relation to other key institutions in society – such as religion and government. The results and analyses from the first wave<sup>2</sup> helped increase understanding and build a foundation for the next wave of this research: the 2020 Wellcome Global Monitor survey.**

This report describes the research approach and guiding principles used to design the Covid-19-related questions regarding attitudes to science and health for Wave II of the Wellcome Global Monitor<sup>3</sup>. The approach to the design of the science- and health-related questions mirrors the steps used during the questionnaire development stage of the first wave, which included:

1. A literature review on the subjects of interest, including any previous surveys conducted on the topics.
2. Internal stakeholder interviews at Wellcome Trust.
3. External stakeholder interviews with subject matter experts.
4. Synthesis of findings from the first three steps to develop the first draft of the questionnaire.
5. Cognitive testing of the questionnaire and using the results to refine the questionnaire.
6. Pre-testing of the questionnaire and using the results to further refine the questionnaire.
7. Finalisation of the questionnaire for the 2020 Wellcome Global Monitor.

Each step of this process was conducted while working closely with internal stakeholders at Wellcome Trust (Wellcome) to ensure that alignment with the organisation's goals and aspirations for the project was achieved.

One of the key considerations when designing the questionnaire was determining which questions would form the 'core' items, i.e., questions that will be repeated when monitoring trends and patterns consistently over time. It will always be necessary to include these core questions because they are central to perceptions of science and are relevant to Wellcome's mission and work. Approximately one-third of the 2020 questionnaire consists of repeated or slightly modified items, and the remainder comprises new items. New modular items explore other topics that are relevant to Wellcome's priority areas – including measuring public perceptions of and attitudes towards mental health (please note that the development of the mental health questions is discussed in another report, entitled Questionnaire Development Information for Mental Health Report, which is in the Downloads section of the Wellcome website), whether people believe their national leaders value the opinions of scientists, views about climate change and whether people seek health information on social media – as well as items relating to the Covid-19 pandemic, which Wellcome requested adding in spring 2020. Sections III and V of this report discuss these issues in detail.

## Topics covered in Wave I and Wave II of the Wellcome Global Monitor

### Wellcome Global Monitor repeating items/topics

Trust in scientists/doctors	Religion and science
Trust in neighbours	Jobs and science
Trust in major institutions	Perceived knowledge of science
Inclusion of benefits of science	Confidence in hospitals

### Wellcome Global Monitor Wave I (2018) focus areas

Trust in sources of information about health or medicine  
 Attitudes towards vaccines  
 Recently sought information about health/science  
 Like to learn more about health/science

### Wellcome Global Monitor Wave II (2020) focus areas

Mental health (anxiety or depression\*)  
 - Global perceptions of the importance of mental health for overall wellbeing  
 - Global perceptions of the role of science in finding solutions to anxiety or depression  
 - How people around the world who have experienced anxiety or depression manage these problems  
 Use of social media and seeking health-related information on social media  
 National leaders valuing science/scientists' opinions  
 Climate change  
 Covid-19

\* Defined in the survey as 'anxiety or depression', meaning a person was so anxious or so depressed that they could not continue with their regular daily activities as they normally would for two weeks or longer.

The next section briefly summarises the main findings from the literature review, which was conducted on the questionnaire-related topics.

# Section II: Questionnaire-related literature review

## Public engagement with science and health

The 2018 Wellcome Global Monitor featured several items which measured personal engagement with science and health, including two questions which asked individuals if they had tried to find information about health or science in the past 30 days. For the 2020 wave of the survey, Wellcome was interested in exploring new sub-topics related to engagement with science and health, including:

- Whether or not people believe political leaders care about science ('science and government').
- 'Controversial' scientific topics and their impact on attitudes towards science.
- The opportunity people have to lead a healthy life.
- Developing a scale which measures knowledge of specific scientific facts.

This section of the literature review briefly explores the first three of these items – science and government, the impact of scientific controversies on overall attitudes towards science, and the opportunity people have to lead a healthy life. An examination of the final point – measuring knowledge of scientific facts – appeared in the 2018 Wellcome Global Monitor Questionnaire Development Report; and, while some questions were cognitively tested again for the 2020 Monitor (see Section IV), it was decided not to include them in the second wave of the project.

## Science and government

This section focuses on the relationship between science and government. This relationship is complex and can manifest itself in many ways. Historically, the relationship between these two spheres of society was relatively limited: 'government support for science was based on largely transitory wartime exigencies' (Butos & McQuade, 2006). However, the first and second World Wars' indelibly changed this dynamic, not only among the belligerent nations but for governments around the world (Hobsbawm, 1994).

In the decades since those conflicts, 'science policy' has become something of a norm among high income countries (UNCSTAD, 2016). Despite some variation, science policy is usually designed to serve three larger objectives: growing a country's economic capabilities, strengthening its national defence and boosting the

general welfare of its citizens (Salami & Soltanzadeh, 2012). The most commonly used measures of national science policy include (Butos & McQuade, 2006):

- Providing public (government) funds for scientific research and development (R&D).
- Funding research institutions more generally (such as colleges or universities).
- Funding training or education.
- Loosening legal constraints on scientific research.

Of these measures, R&D is perhaps the most commonly studied from a public opinion standpoint. In its Science and Engineering Indicators 2018 report, for instance, the National Science Foundation (NSF) cites polls measuring public opinion about funding scientific research in countries such as China, Chile, a number of European countries and the USA<sup>4</sup>. As the NSF shows, support for this type of spending is relatively broad across high-income countries, middle-income countries and low-income countries alike.

Despite this strong, relatively consistent support, the extent to which governments are willing to finance research and development often moves in tandem with economic cycles (Sargent, 2018). In its 2020 report, UNESCO observes a recent trend among high-income countries, whereby public support for research and development has increased while the actual amount of spending has fallen (UNESCO, 2015).

The 2020 Wellcome Global Monitor can advance this research further by investigating the relationship between the public's trust in science and their support for government financing of scientific research endeavours.

Other research into the relationship between science and government has focused more broadly on the role of science and scientists in the public affairs of a country, especially on whether people believe science should play a larger role in specific areas. This research has largely been conducted in Europe and the U.S. In general, the results have been mixed – they indicate that people generally support the idea of scientists playing a role in the political sphere, but this support can diminish if specific details are given. For example, in the U.S., the idea that climate change scientists would play a role in public policy on that issue has been controversial historically.

There has been little research on public perceptions of whether or not the political leaders of a country value science and scientific advice at a personal level. One poll in the U.S.<sup>5</sup> asked Americans whether they would prefer political leaders to make decisions based on their (the leaders') personal beliefs or scientific evidence; the latter option received overwhelming support.

## Controversial science topics

In a 1959 poll of U.S. adults, one of the first surveys to measure public attitudes to science, an overwhelming majority of Americans believed science had brought benefits to their lives<sup>6</sup>. Nearly sixty years later, the Wellcome Global Monitor found that 70% of people around the world said science benefits people like them. But although public opinion is favourable about science in general, research has found that people can be highly sceptical or even hostile to specific scientific research programmes.

In the late 20th century, for instance, significant portions of the public in many countries became increasingly apprehensive 'about major social problems in which science appears to play a major role', including nuclear warfare and environmental degradation (Hobsbawm, 1994). Unsurprisingly, key scientific facts or theories – whether established for a relatively long time (natural selection) or newer topics such as climate change/global warming – became increasingly contested or outright denied by many people (Mann et al., 2016). Some evidence suggests that another area of scientific research – genomics – is controversial with the general public<sup>7</sup>.

There is also concern that tenuous research claims are sometimes communicated to the public with an unwarranted degree of certainty, particularly in the field of public health, and are often contradicted by other studies (Sumner et al., 2016). This could give many people the impression that scientific expertise is constantly in flux and, therefore, unreliable as a source of indisputable facts.

A historical, cross-national study of major science-related controversies identified three common features<sup>8</sup>:

1. Conflicts concerning the beliefs, values and interests of individuals and organisations (rather than simply a need for scientific knowledge) are central to the debate.
2. The public perceives uncertainty in the science, in its implications or as a result of its communicators making different – and sometimes contradictory – statements in the public sphere.
3. The voices of organised interests and influential individuals are amplified in public discourse, making it difficult for the state of the scientific evidence to become clearly known.

However, it seems that scientific findings which appear to be incompatible with a person's moral, ethical or political values tend to be the most controversial. A number of scientific findings (or topics) have been shown in past survey research to be especially controversial, including climate change, evolution, nuclear energy, the origins of the universe and genetic engineering (Nisbet and Markowitz, 2016). Research conducted in the U.S. suggests alleged controversies such as climate change tend to represent the clash between science and the political values of a person; and evolution represents the clash between science and religious values (Pew Research, 2009).

## Ability to live a healthy life

Another topic that Wellcome is interested in is whether or not people feel they have the opportunity to lead healthy lives. 'Health equity' is a related concept. According to WHO<sup>9</sup>, health equity is the absence of avoidable, unfair or remediable differences among groups of people – whether those groups are defined socially, economically, demographically, geographically or by other means of stratification. This 'equity in health' implies that, ideally, everyone should have a fair opportunity to attain their full health potential and that no one should be disadvantaged such that they are prevented from achieving it. Therefore, 'equity' denotes an equal opportunity to be healthy based on fairness, not 'sameness'.

Health equity is often inferred from questions about perceived health status and access to health-inducing factors (e.g., good food, exercise/walking, access to clinics, etc.) as well as from official data, such as food consumption patterns across different demographic groups. This implies that multiple items would be required to measure health equity in a robust, meaningful manner; there is no evidence that past research has attempted to use single-item measures for this purpose. Cognitive interviews and pre-testing will therefore be especially important when evaluating the potential effectiveness of any single-item measure of healthy equity designed for the 2020 Wellcome Global Monitor.

However, Wellcome's key interest is not assessing health equity but measuring public perceptions of health equity – that is, whether or not people feel they have the opportunity, or ability, to lead healthy lives. The aim is to find out whether people believe that everyone in a particular society has the opportunity to live a healthy life, in general, without specifying what a 'healthy life' means, or whether it is limited by factors such as income, education level, personal characteristics, etc.

## Section III: Stakeholder interviews

As part of the questionnaire development process, Gallup researchers conducted interviews with a number of internal stakeholders from the Wellcome team as well as with several external stakeholders, who were identified as subject matter experts. Both types of stakeholders were selected through independent research and suggestions made by the Wellcome team.

Each type of stakeholder interview was included to serve a specific purpose. Internal stakeholder interviews with members of the Wellcome team helped clarify the research objectives of the second wave of the study, particularly how those objectives fit in with Wellcome's broader portfolio of work and how these team members envision the data will be useful and utilised. On the other hand, the external stakeholder interviews aimed to collect more knowledge and expertise on the topics under study – particularly to learn which questions they and their wider research communities would find the most useful and insightful.

Gallup consultants interviewed a total of nine external subject matter experts: Somnath Chatterji (WHO), Priscilla Idele (UNICEF), Devora Kestel (World Health Organization), Tiffany Lohwater (American Association for the Advancement of Science), Elisha London (United for Global Mental Health), Vikram Patel (Harvard University), Shekhar Saxena (Harvard University), Guy Thwaites (Oxford University Clinical Research Unit) and Peter Varnum (World Economic Forum).

The external stakeholders were asked to share their thoughts on a second topic: public engagement with science and health. The main findings from these interviews are summarised below:

- It may be useful to explore what 'high trust' in science and scientists means to people from a practical viewpoint. How can we understand and use high levels of trust in science and scientists to benefit society, and how does that trust manifest itself in different countries and cultures?
- In principle, investigating public engagement with science is challenging because a lot of people feel that they are not interested in engaging with science. This part of the research should therefore explore how people get involved with practical applications of science- and health-related discoveries.
- It may be helpful to explore why some categories of experts are more trusted than others (e.g., doctors and nurses).

The feedback and recommendations from the experts who were interviewed as part of the research process provided vital insights, especially for the development of the mental health items. The experts contributed substantially to the research team's understanding of the topics under study and helped identify some areas of interest to the research community and practitioners while maintaining the focus on Wellcome's specific aims for the survey. The feedback also helped refine some of the items relating to public engagement with science and health. Altogether, the expert interviews were invaluable in shaping the final questionnaire for the 2020 Wellcome Global Monitor.

# Section IV: Cognitive interview and pre-testing

## Key objectives of cognitive interview testing

The first draft of the questionnaire was developed in close collaboration with the Wellcome team, with substantial input from the literature review, previous surveys on the selected topics and interviews with internal and external subject matter experts. Next, Gallup conducted cognitive interviews to test the newly developed items for the 2020 questionnaire in order to identify any issues with the comprehension of each question.

Cognitive interview testing involves conducting in-depth semi-structured interviews with respondents across different, key demographics. The aim is to explore the respondents' thought processes when they answer in order to assess how they understand each question and arrive at their answer.

The main purpose of cognitive interview testing is to explore how well questions perform – are the people being interviewed understanding and interpreting them correctly (i.e., as they were intended to be understood)? And are the concepts being asked about being captured accurately and therefore resulting in responses that would be reliable and accurate? Respondents go through four basic stages when answering a question:

1. Comprehending the question
2. Retrieving information from memory
3. Evaluating the information
4. Providing a response in the format requested

Inaccurate responses to survey questions often involve misunderstanding the question, a memory error occurring when someone is retrieving the relevant information in an attempt to answer the question, an error happening when someone is working out what answer to give when the information that has been retrieved is insufficient to answer the question, and bias being introduced by the respondent's desire to give a socially acceptable response.

Cognitive interviews are particularly important for multicultural studies because respondents in different countries have different cultural norms and customs, which can affect how they interpret a given question.

Even within the same country, respondents sometimes interpret the same question in the same language differently, due – for example – to different levels of education or residing in different regions. This is particularly the case where terminology in a questionnaire may not be common or easily understood. As a result, cognitive interview participants should always include a mix of genders, ages, education levels and socioeconomic statuses and should take place in urban as well as rural locations.

During a cognitive interview, specially trained qualitative interviewers administer the survey questions using a variety of methodologies and probes. The cognitive testing exercise is a means to analyse feedback from respondents and identify problem questions, or other aspects of the survey, so adjustments can be made before the questionnaire is finalised. In addition, the cognitive interview process helps identify questions that could potentially alienate respondents (e.g., by asking about particularly sensitive topics) or be burdensome to answer, risking low response rates.

For the cognitive interview testing of the Wellcome Global Monitor Wave II questionnaire, Gallup recruited individuals from varying demographic backgrounds and examined respondent comprehension, item relevance from a respondent perspective, the suitability of each set of response options and the flow of the instrument. In total, 101 individuals across 10 culturally and linguistically diverse countries participated in the cognitive interview tests. The countries were selected to reflect different levels of economic development, cultures and geographies: Colombia (10), Egypt (10), France (10), India (10), Indonesia (10), Kenya (10), Nigeria (10), South Africa (10), Thailand (10) and Vietnam (11).

The testing process identified adjustments and refinements that were implemented to reduce the rate of 'don't know' or 'refused' responses and help ensure respondents would feel comfortable answering each question. Importantly, changes to the questionnaire reviewed in this section were universally implemented – that is, these changes were made to the entire survey, which was originally produced in English and then translated into other languages.

## Main topics covered by the cognitive interviewing questionnaire

The cognitive interviews were typically 40-100 minutes in duration, with an average of 60 minutes across all countries. They included not only a wide array of topics but also many more questions than could ultimately be included in the final questionnaire. This approach allowed the Wellcome team to gain additional insights into how all of the questions performed, even if they were ultimately not selected for this wave and only provided an opportunity for additional analytical testing (e.g., the comprehension of specific technical terms like 'climate change'). All items investigated that were in a respondent's own words were excluded from the final questionnaire.

With very few exceptions, the topics covered in the cognitive interviews were related to potentially new questions for the 2020 questionnaire. This is because the 'core' questions, i.e., those that will be repeated in each wave to monitor trends and changes over time regarding key topics of interest for Wellcome – had already been tested in the first wave of the study in 2018<sup>10</sup>.

In addition to questions about mental health, the 2020 Wellcome Global Monitor questions tested in cognitive interviews can be grouped into the following main topics:

**Open-ended general questions.** These questions required respondents to answer in their own words, and they were asked to measure comprehension of terms such as 'science', 'scientists', 'observation' and 'testing', not to test the questions themselves. One new question was added in this series to ask about the impact of science on various aspects of people's lives.

**Health equity, health science research and access to health care.** This group of questions explored what people think scientists should study to improve people's health, whether people feel they have the same opportunity to live a healthy life as others in society, ease of access to satisfactory medical and health care and whether or not men and women felt their gender prejudiced their access to health services.

**Beliefs about government use of science.** These questions aimed to assess whether or not people think the government values science and the advice of scientists, both in general and as part of their decision-making process.

**Factual science knowledge questions.** A few questions were asked to determine the extent of people's factual knowledge of science, such as asking whether the Earth revolves around the sun, whether antibiotics are used to treat bacteria or viruses, whether the oxygen that we breathe comes from plants, and the meaning of human evolution.

**Climate change and global warming.** A short series of questions was included to understand what people think and feel about climate change and global warming.

**Demographics.** Key demographic characteristics were captured during interviews to help analyse and understand the results. These included gender, age, education, rural/urban residence, income grouping (high, middle or low) and questions on use of social media.

## Summary of Wellcome Global Monitor cognitive interview findings

Given the wide range of topics covered in the cognitive interview questionnaire, the findings were vital in determining which questions to include in the final questionnaire in the light of Wellcome's priorities for the survey. Gallup used a similar process to the one described in Section III of the Questionnaire Development Report for the 2018 Wellcome Global Monitor, including:

- Removing or improving questions that were not well understood or that caused respondent burden.
- Retaining questions which measure topics that are research priority areas for Wellcome.
- Modifying questions to ensure the concepts or topics were well understood.
- Retaining questions which can be meaningfully asked in all countries surveyed.

A summary of the findings by topic is presented on the next page.

## Open-ended general questions

Across several of the above-listed topics, Gallup asked respondents open-ended questions for which the responses were verbatim (free-text). These questions were designed to obtain a better understanding of how people understand certain terms and gave an indication of how well questions on these topics might be understood by respondents. The findings were very informative in shaping the wording of the final items; however, none of the open-ended questions were included in the final questionnaire, due to the impracticalities of recording and translating individual responses from 100+ languages in the final survey (which would be conducted in 113 countries and territories in 2020).

The open-ended general questions that were asked at the beginning of the questionnaire included:

- What does the word “science” mean to you?
- In your opinion, what does it mean to study something scientifically?
- What do you think “observation” means in the context of science?
- What do you think “testing” means in the context of science?

Broadly, most respondents had a general idea of what ‘science’ means. However, it was challenging for some people with a low education level to understand the concepts of ‘science’, ‘scientists’ and associated terminology. This finding mirrors that of the first wave of the Monitor in 2018.

With regard to being asked what the word ‘science’ means to them, many people mentioned words such as ‘research’, ‘knowledge’, ‘discovery’ and ‘technology’. For some respondents, science was associated with forecasting the future or, as one respondent in Thailand said, the ability “to make the impossible become possible”. At a country level, people in Egypt, Thailand and Indonesia were the most likely to find this question challenging to answer, especially those with a lower education level.

Many responses to the question about what it means to study something scientifically included terms such as ‘learning’, ‘gaining knowledge’, ‘conducting research’, ‘testing’, ‘observation and reflection’, and ‘using equipment such as a microscope’ – although the term ‘studying’ also prompted some people to mention school or education. Others indicated that they did not know what this meant but still tried to provide an answer.

Similar results were noted for the question about the meaning of the words ‘observation’ and ‘testing’. A minority of respondents found it challenging to tell the difference between ‘science’ and ‘scientist’ when they were referenced in the context of a single

question. As with other questions, these challenges tended to be experienced more by people with a lower level of education.

In addition to asking the questions listed above, interviewers read out the definition of ‘science’ that was used in the first wave of the Monitor so it could be verified that the definition was still generally well understood and valid. The definition also proved helpful in the analysis of people’s responses to certain questions.

This definition of ‘science’ is as follows:

*When I say ‘science’, I mean the understanding we have about the world from observation and testing. When I say ‘scientists’, I mean people who study the planet Earth, nature and medicine, among other things. How much did you understand the meaning of ‘science’ and ‘scientists’ that was just read? A lot, some, not much, or not at all?*

The findings were similar to those from the testing in the first wave: the definition was less understood by people with a very low level of education, but in general it worked well<sup>11</sup>. This indicated that using the same definition again in Wave II of the Monitor is suitable and reliable.

## Impact of science

Given some of the results of the first wave of the Wellcome Global Monitor – such as those relating to items about how inclusive the benefits of science are – it was decided to test a more general question asking about people’s perceptions of the impact of science on various aspects or domains of their lives.

The question asked whether people thought that developments in science have had a mostly positive impact, mostly negative impact or no impact at all on the following aspects or domains of their lives: personal health, standard of living, employment opportunities, quality of the local environment and security of the country.

In general, this item worked well and the answers were in line with one of the main general findings of the testing both in 2020 and in 2018 – the main challenge was that some people with a lower level of education did not fully understand the phrase ‘developments in science’.

Ultimately, it was decided to retain some of the domains in the final questionnaire – those that performed well in the testing – but to leave out others, especially given space constraints relating to the length of the final questionnaire (which is designed to have an equivalent number of questions to the number usually included in a 10-minute survey).

## Public engagement, health equity, health science research and access to healthcare items

Several new items were asked in the cognitive interview testing around the topics of public engagement with science and health and people's ability to access medical care and healthcare. Most of these questions were exploratory and open-ended, as the Wellcome team wanted to test how well the items performed at this stage and then consider possible fixed-word answer options based on the individually worded responses for those that performed well.

Questions that were asked on this topic as part of the cognitive interview testing included:

- What does the term 'medical scientist' mean to you?
- What does the term 'health scientist' mean to you?
- In a few words, could you please tell me what you think scientists should study or work on in order to improve your personal health?
- In a few words, could you please tell me what you think scientists should study or work on in order to improve your family's health?
- In general, do you feel you have the same, better or worse opportunity to live a healthy life as most people in this country?
- If you needed medical and health care, how easy would it be for you to get care at the following places – a hospital, local clinic, mobile clinic, traditional healer/traditional medicine, pharmacy, other (please specify)?
- In general, how easy is it for you to access medical and health care when you need it?
- As a woman [or a man], overall, how satisfied are you with the medical and health care you have received?

The results showed that many people thought medical scientists meant 'doctors'. Others thought they are people who do medical research or study medications or diseases. Several people did not know the meaning of the words 'medical scientist' and could not distinguish between a 'medical scientist' and a 'health scientist'.

In response to the question asking what people thought scientists should study or work on in order to improve personal or family health, most people mentioned medication. Others mentioned the environment and finding a cure and/or treatment for diseases such as cancer. Many must have felt that asking about personal health and family health as two separate questions was repetitive, as the responses overlapped.

As mentioned above, the questions requiring respondents to answer in their own words were included to better understand which areas of health and medical research people think benefit them (or their families) personally. None of the questions in this section were included in the final questionnaire for this wave of the Monitor; they were mainly included in the testing for exploratory reasons. The limited space available in the final questionnaire was also a factor in this decision.

## Government and science items

The cognitive interview questionnaire included a few questions relating to what people thought the government's attitude towards scientific advice is, whether or not the government values the expertise of scientists and the importance of the government supporting science.

The questions tested for this topic included:

- How much do you think the leaders in the national government value the opinions and expertise of scientists?
- How much do you think national government leaders should rely on the advice of the following groups when considering important policy decisions – scientists, religious leaders, business leaders, wealthy people, health professionals, ordinary people in the country?
- In your opinion, do the leaders in the national government think that supporting science is very important, somewhat important, not very important or not important at all?
- How important is it to you that leaders in the national government are knowledgeable about science – very important, somewhat important, not very important or not important at all?

Overall, most of the items tested well, but Wellcome decided that the essence of the topic could be captured with fewer questions, given space considerations. Therefore, only the first question was retained in the final questionnaire.

## Science knowledge Items

Three topics were explored in this section of the cognitive interview questionnaire: general factual science knowledge, as proxied by a few questions; climate change; and human evolution.

### The following factual science knowledge question was tested:

- Please tell me if you think the following statements are definitely true, probably true, probably false, or definitely false. If you don't know, please say so:
  - The Earth revolves around the sun.
  - The oxygen we breathe comes from plants.
  - Smoking is a leading cause of some forms of cancer.
  - It is the mother's genes that decide whether a baby is a boy or a girl.
  - Electrons are smaller than atoms.
  - The four seasons on Earth are caused by the moon's rotation around the Earth.
  - Antibiotics kill viruses as well as bacteria.
  - Anyone can experience mental health problems.

### The following climate change questions were tested:

- Thinking about the issue of climate change, how well do you feel you understand this issue?
- What do you think is causing climate change – human activities, natural causes or both?
- Do you think climate change is a major threat, a minor threat, or not a threat to people?

### The following evolution questions were tested:

- Do you think humans have evolved to their current form from other living things over millions of years, or not?
- Which of the following statements comes closest to your view on the origins and development of human beings?
  - Human beings have developed over millions of years from other forms of life, but God guided the process.
  - Human beings have developed over millions of years from other forms of life, but God had no part in the process.
  - God created human beings pretty much in their present form at one time within the last 10,000 years.

With regard to the factual science knowledge questions, this section felt like a test for most people and made them feel uncomfortable, even though they were assured by the interviewers that it was not a test.

The term 'climate change' was also not easily understood, especially by respondents with a low level of education and rural respondents. Many thought 'climate change' meant a change in season. It was therefore decided that a simple definition needed to be added to the final questionnaire.

Similarly, the term 'evolved' (relating to human evolution) was not well understood by people with a low education level. Moreover, the second question on evolution was not well understood in most of the countries. The response options were too lengthy and complex for most respondents, and it was noted that all the response options given assumed God is real – which could lead to a non-response by some respondents who would need an answer option which did not make that assumption.

Overall, given the discomfort caused to respondents when asked these questions, it was decided not to include any of the factual science knowledge items or the items relating to human evolution in the final questionnaire. The climate change questions were retained and, as mentioned above, definitions for climate change and global warming were added to the final questionnaire.

## Social media items

Two items regarding the use of social media were included in the questionnaire for analytical purposes. This was deemed important, given the emerging literature about the impact of social media use on mental health, particularly for young people.

The questions were:

- Do you use social media, such as Facebook or Instagram [or local equivalent]?
- About how often do you use social media?

Both items on social media worked well in the testing and, given Wellcome's focus on public engagement with science and health – including how people access and obtain information about health – another item was added to the final questionnaire asking people how often they see information about health on social media.

## **Finalising the questionnaire for pre-testing**

The number of items chosen for cognitive testing far exceeded the available space in the survey for the second wave. Thus, a process was put in place to determine which topics and items would remain in the questionnaire for pre-testing. This process first entailed an analysis of the data from wave one, and items that had less impact on the analysis and subsequent report were removed. Second, stakeholders decided on key priority areas of interest in wave two – this helped inform decisions later on in the process. Next, the cognitive testing results were shared with key stakeholders. Topics and items that were not well understood during cognitive testing and did not relate to priority areas were removed. With only the most important items remaining, stakeholders voted on items in the cognitive interviews that they thought were the most relevant to key priorities. The items that received the most votes were scrutinised to refine item wording and make final decisions on what would be included in the questionnaire.

## **Pre-testing of Wellcome Global Monitor: summary of results**

A pre-test is a small-scale version of a study that is conducted in preparation for the full-scale survey. Pre-testing is helpful to estimate survey timing and refine translations, item response options, survey logic (i.e., skip patterns and question order), programming, interviewer instructions and consent. Importantly, pre-testing can highlight areas where logistical and practical challenges might arise, and it should inform the interviewers of the receptivity of the respondents to the survey. Therefore, contrary to the feedback on the cognitive testing interviews, the feedback on pre-testing centres more on the operational and logistical aspects of survey implementation rather than on any cognitive aspects.

The Wellcome Global Monitor Wave II questionnaire was pre-tested in 10 countries: Colombia, Thailand, Indonesia, Egypt, India, Vietnam, France, South Africa, Nigeria and Kenya. These countries were the same as the ones included in the cognitive testing phase of this research, providing a robust test of the survey in a diverse set of geographies, cultures and languages. At least 50 respondents were selected in each country, according to a balanced mix of key demographic characteristics including geographic location (urban/rural), gender, age, education level and income. In some countries, the language of the interview was also a criterion for the recruitment of respondents. Local partners identified respondents through targeted recruiting and suspended recruitment once all the desired quotas had been met.

Most interviews were conducted at the respondents' residence for the face-to-face mode of survey implementation. In this case, the surveys were conducted using a Paper-and-Pencil Interviewing mode (PAPI). In France, respondents were interviewed over the phone, as the mode of implementation in the Gallup World Poll there is computer-assisted telephone interviewing (CATI). Gallup conducted an additional 11 interviews using the Gallup panel to determine the length of the survey in English via phone interviews.

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## 2020 Wellcome Global Monitor pre-test interviews

Country	N	Mode	Language
Colombia	51	Face-to-face	Spanish
Thailand	53	Face-to-face	Thai
Indonesia	50	Face-to-face	Bahasa, Indonesian
Egypt	50	Face-to-face	Arabic
India	58	Face-to-face	Bengali, Hindi, Marathi, Tamil, Telugu
Vietnam	63	Face-to-face	Vietnamese
France	50	Telephone	French
South Africa	50	Face-to-face	English
Nigeria	50	Face-to-face	English, Yoruba
Kenya	52	Face-to-face	Swahili/Kiswahili, English
United States	11	Gallup Panel (Telephone)	English

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The main findings from the pre-test interviews were:

1. Following the changes made to the questionnaire after the cognitive interview testing, the Wellcome Global Monitor questionnaire was estimated to average 10 minutes in length – indicating no further changes needed to be applied to the survey for timing purposes.
2. No difficulties were identified relating to skip patterns, the order of the questions, programming, coding, interviewer instructions or consent.
3. While the questions were generally understood and easy to administer, specific cases of translation challenges were discovered that helped refine the survey.
4. As with the first wave of the Monitor, the results suggest that individuals from lower socioeconomic backgrounds are less likely to offer an opinion on items touching on technical terms and topics about science and scientists. This was also true for items about climate change/global warming/evolution.
5. In general, there were slightly higher rates of Don't know/Refused responses on the mental health items, perhaps due to the sensitive nature of the topic.
6. As an alternative science education item in place of the original (Wave I) education item, Gallup tested an open-ended item that can be coded by the survey administrators instead of using closed-ended responses. Testing has found that this allows for an easier capture of the final level of formal education at which a person learned about science and it takes less time to administer.

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# Section V: Covid-19 module addition

## Introduction

For Wellcome Trust, the Covid-19 crisis brought a new urgency for action. After initially deliberating about whether to cancel its 2020 Wellcome Global Monitor (WGM) due to the situation and the inability to administer interviews face to face, Wellcome decided to continue fieldwork via telephone in 113 countries and territories. This allowed time for the team to consider and ultimately incorporate new questions relating to Covid-19.

In May 2020, Wellcome commissioned Gallup to develop and field a global survey exploring what people around the world think and feel about various issues related to Covid-19, including assessing how the pandemic has affected support for global health initiatives. It was agreed that this module, designed to be fielded alongside the second wave of the Wellcome Global Monitor/Gallup World Poll, would be no longer than 1 minute and 20 seconds in duration<sup>12</sup>.

In advance of the questionnaire development, Wellcome identified three key research questions of interest, listed below.

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## Research questions

### Priority one

To what extent do the public think those in authority are basing decisions about Covid-19 on science?\*

How do people believe their government should prioritise a coordinated, global response to future Covid-like pandemics versus a focus on the health of their own citizens first?

\*Initially this question was phrased as 'How have key players handled the pandemic? How are they trusted? (e.g. Is government using/taking advice from science?)' It later evolved into the research question presented in the above table.

## Questionnaire-related literature review

Due to time constraints – and the unprecedented nature of the Covid-19 crisis – Gallup did not complete a full literature review of the concepts and topics of interest for this module of questions, as has been done for previous waves of the Wellcome Global Monitor.

However, Gallup did conduct a thorough review of Covid-19-related questions being asked at that time in nationally representative surveys to get a sense of how these questions were being asked, the topics they were covering and the findings they were yielding. This review allowed Gallup to identify existing methodological red flags in terms of question wording and to get a sense of whether any of these existing questions were addressing Wellcome's research priorities.

In total, Gallup reviewed nearly 100 Covid-19-related questions from nationally representative surveys. These questions were fielded, in total, in over a dozen countries, though most were asked in the United States. While these questions inquired about many different aspects of public perceptions, knowledge and behaviours relating to Covid-19, none of them directly addressed Wellcome's global research priorities. General examples of survey questions reviewed by Gallup include items that asked respondents to rate how worried they were about Covid-19; how much they trusted information they received about Covid-19 from various actors, including governmental officials, the media or health officials; what actions people had taken (such as cancelling travel plans or avoiding going out in public) to protect themselves from being infected by Covid-19; and how people rated key government officials' handling of the crisis (at local and national levels).

## Cognitive interview and pre-testing

### Cognitive interviews:

#### administrative details and objectives

The cognitive interviews were conducted in Egypt, India, Kenya, Lebanon, Nigeria, South Africa, the United States and Venezuela. In total, 80 individuals were interviewed as part of the process in May 2020. In light of the pandemic, all interviewing took place by telephone.

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## Wellcome Global Monitor Covid-19 Supplemental Items Cognitive Testing

Country of testing, number of participants (N), mode of interview and language of interview

Country	N	Mode	Language
Egypt	10	Telephone	Arabic
India	10	Telephone	Hindi, Bengali
Kenya	10	Telephone	Swahili
Lebanon	10	Telephone	Arabic
Nigeria	10	Telephone	English, Yoruba
South Africa	10	Telephone	English, Sesotho
United States	10	Telephone	English
Venezuela	10	Telephone	Spanish
<b>Total</b>	<b>80</b>	<b>Telephone</b>	<b>N/A</b>

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Like the cognitive interview testing for the 2020 Wellcome Global Monitor module, the overriding objective of the testing process was to explore how well questions perform – the aim was to determine whether people understood and interpreted the questions correctly. Cognitive interviews are particularly important for multicultural studies because respondents in different countries have different cultural norms, customs and languages, which can affect how they interpret a given question.

Due to the time pressures, the Covid-19 module was pilot tested and, consequently, the work of testing the questionnaire was truncated into cognitive testing. In normal circumstances, cognitive interviews – which ask probe and follow-up items to better gauge cognition and understanding – are not the appropriate format to estimate the overall length of the survey module.

The results of the cognitive interviews are discussed on an item-by-item basis on the following page.

## Survey items results

### Q1 series

How much do you trust the advice about how to stay safe from the [insert country-specific term for coronavirus, Covid-19] that comes from each of the following sources? A lot, some, not much, not at all (DK/Refused)

<b>Q1A</b>	The national government
<b>Q1B</b>	International health organisations
<b>Q1B_ALT</b>	The World Health Organization (WHO)
<b>Q1C</b>	Doctors and nurses in [insert country]
<b>Q1D</b>	Religious leaders
<b>Q1E</b>	Journalists in [insert country]
<b>Q1E_ALT</b>	Media
<b>Q1F</b>	Friends and family
<b>Q1G</b>	Scientists in [insert country]

This series of questions focuses on Priority Two research concepts, namely ‘Trust in sources of information (or platforms where messages are shared/given)’. On average, the entire question series took longer to administer than the target length for the entire Covid-19 submodule.

Beyond the length of the items, the interviews revealed important comprehension issues, with a minority of respondents finding some items hard to

understand, especially Q1A (where 20% of cognitive interview participants said they had ‘a lot’ or ‘some’ difficulty answering the question) and Q1B (where 31% encountered this type of difficulty). In general, comprehension issues were more common among respondents with a lower education level.

On an item-by-item basis, Gallup made the following recommendations on the basis of the cognitive interview results.

### Gallup’s recommendations for the Q1-series items

Based on cognitive interview results

Number	Label	Gallup recommendation
<b>Q1A</b>	The national government	Though some people found this question hard to understand, Wellcome believed it was an extremely important question to ask and thus should be kept.
<b>Q1B</b>	International health organisations	Do not use this option – use Q1B_ALT instead.
<b>Q1B_ALT</b>	The World Health Organization (WHO)	Keep this over Q1B, as respondents are more likely to recognise – and understand – the description World Health Organization than the vaguer term ‘international health organisations’.
<b>Q1C</b>	Doctors and nurses in [insert country]	To stay consistent with the Wellcome Global Monitor, keep this option.
<b>Q1D</b>	Religious leaders	If this item or response option is chosen, Gallup has no issue including it in the final survey.
<b>Q1E</b>	Journalists in [insert country]	Due to consistency with the Wellcome Global Monitor – which has a core item which asks individuals to rate their level of trust in ‘journalist (in this country)’ – a lower difficulty score and respondents’ reactions, Gallup recommends Q1E over Q1E_ALT (if this item is chosen).
<b>Q1E_ALT</b>	Media	Q1E recommended over Q1E_ALT.
<b>Q1F</b>	Friends and family	If this item or response option is chosen, Gallup has no issue including it in the final survey.
<b>Q1G</b>	Scientists in [insert country]	If this item or response option is chosen, Gallup has no issue including it in the final survey.

## Q2 series

Thinking about the [insert country-specific term for coronavirus, Covid-19] outbreak, to what extent do you think the following base their decisions on scientific advice? A lot, some, not much, not at all (DK/Refused)

Q2A	The national government
Q2B	Friends and family
Q2C	International health organisations
Q2C_ALT	The World Health Organization (WHO)

This question series addresses a research objective of the highest priority to Wellcome, as identified earlier. Namely, this question series looks at how people assess how other people or organisations have handled the pandemic and whether these actors take advice from science.

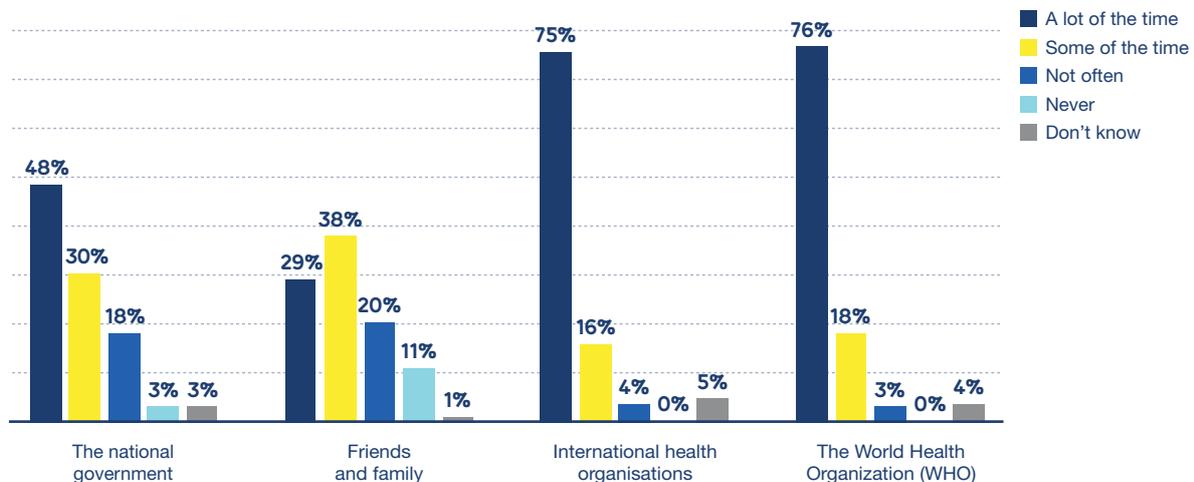
Nearly one-fifth of all cognitive interview participants encountered at least 'some difficulty' when answering each of the questions. The use of the word 'outbreak' confused some respondents and did not translate well in some situations. Additionally, the term 'scientific advice' was not well understood by some respondents, causing some of them to ask for further clarification or request that the interviewer repeat the question.

A final source of confusion – for some participants as well as some interviewers – was why the question stem did not more closely mirror Q1. Several interviewers recommended that the Q1 and Q2 series be worded in a similar way and ask about the same group of groups. The phrase 'international health organisations' was also a source of confusion for respondents – given that it refers to a vague concept rather than a specific body like the World Health Organization. As a result, Gallup recommends that the question should only refer to the World Health Organization and that the 'international health organisations' option is removed.

## Cognitive interview results for Q2-series items

(pooled, cross-country data)

Q2. Thinking about the [insert country-specific term for coronavirus, Covid-19] outbreak, to what extent do you think the following base their decisions on scientific advice? A lot of the time, some of the time, not often, or never.



Gallup recommended that the question wording refer to the 'World Health Organization' only and remove the 'international health organisations' option. More broadly, Gallup's recommendation with respect to this series of questions is to simplify and shorten it. The complex stem, combined with a 4-point scale and multiple options, caused difficulties in how well respondents understood this question series and how

they answered each item. Gallup proposed changing the wording from 'Thinking about the [insert country-specific term for coronavirus, Covid-19] outbreak, to what extent do you think the following base their decisions on scientific advice?', to 'In general, how much do you think each of the following make decisions about [insert country-specific term for coronavirus] based on scientific advice?'

### Q3 series

Which of the following statements comes closer to your feelings about dealing with the [insert country-specific term for coronavirus, Covid-19]? The government of [insert country]

- 1            Should prioritise cooperating with other nations
- 2            Should only focus on the people in this country

This question stems from Wellcome's active role in the pandemic; it has been trying to ensure that all countries – and people – have equitable access to Covid-19 vaccines, testing and treatment.

(Both = 35%, 1 = 33%, 2 = 32%). This indicates that respondents felt countries should both cooperate with other nations and focus on their own people, rather than one versus the other.

Respondents were asked to select one statement as their answer – statement 1 or statement 2 – but if a respondent replied 'both', then the interviewer recorded this. Despite the instruction given, the majority of respondents said 'both'

Gallup recommended removing this item, based on the results in the preceding paragraph. Note that this question focused on the then-unfolding Covid-19 pandemic, whereas Question 4 (which is covered in the table below) focuses on future disease outbreaks.

### Q4 series

Which of the following statements comes closer to your feelings about what should be done after the [insert country-specific term for coronavirus, Covid-19] crisis ends?

- 1            The government of [insert country] should support other countries to prevent and cure diseases wherever they occur
- 2            The government of [insert country] should focus on preventing and curing diseases only if they start infecting people in this country

Question 4 examined a Priority One research topic: whether the general public want their national government to fight future diseases and viruses at the global or domestic level. As with Q3, respondents were forced to choose between one of the two statements rather than indicating how much they supported each of the two statements.

second statement. However, Gallup's review of the cognitive interview results found that the item was difficult to understand due to its length and complexity. Twenty-eight per cent of all respondents indicated that they had at least 'some' difficulty answering the question. In Kenya, nearly all respondents said they had such difficulty.

Overall, a majority of respondents (58%) expressed their support for the first statement (the government should support other countries to prevent and cure diseases wherever they occur); 41% opted for the

Many respondents also indicated that they wanted to answer 'both', an option which was not accepted for this question, since the question was designed to force respondents to choose between the two

options to get a sense of which option respondents favoured on balance. This is problematic, as a survey question that does not offer the full range of plausible response options may force respondents to select an answer choice that does not fully represent their opinion.

Gallup recommended making statements 1 and 2 separate items and converting the answer options for each to an agreement scale. This allowed respondents to simply rate to what extent they agreed with each statement, rather than forcing them to pick one over the other.

## Final Covid-19 module

After reviewing the cognitive interview results, Gallup presented its recommendations on how to revise the Covid-19 module to Wellcome on 27 May 2020. The primary goal of the meeting was to reduce the length of the module, but in a way that maintained Wellcome's research priorities and goals.

- Wellcome agreed that Q1 (How much do you trust the advice about how to stay safe from the [insert country-specific term for coronavirus, Covid-19] that comes from each of the following sources?) should be dropped from the survey, as it measured a second-tier research priority.

- Wellcome decided to retain Q2 (In general, how much do you think each of the following make decisions about [insert country-specific term for coronavirus] based on scientific advice?) but requested slight alterations to the groups measured in the sub-items, both to incorporate feedback from the cognitive interviews and to better align with Wellcome's research objectives.
- Wellcome agreed to drop Q3 (Which of the following statements comes closer to your feelings about dealing with the [insert country-specific term for coronavirus, Covid-19]? The government of [insert country] should prioritise cooperating with other nations OR the government of [insert country] should only focus on the people in this country).
- Wellcome agreed to revise Q4 (Which of the following statements comes closer to your feelings about what should be done after the [insert country-specific term for coronavirus, Covid-19] crisis ends?) from a forced-choice format to an agreement scale for each of the two statements.

The final submodule appears below.

## Final Wellcome Global Monitor Covid-19 submodule

Question number	Question	Response options
<b>Q15_1</b>	In general, how much do you think each of the following make decisions about [insert country-specific term for coronavirus] based on scientific advice? A lot, some, not much, or not at all? How about:	1 = A lot 2 = Some 3 = Not much 4 = Not at all [5 = Don't know, 6 = Refused]
<b>Q15_1A</b>	The national government	
<b>Q15_1B</b>	Friends and family	
<b>Q15_1C</b>	The World Health Organization (WHO)	
<b>Q15_1D</b>	Doctors and nurses in this country	
<b>Q15_1E</b>	Religious leaders	
<b>Q15_2</b>	I am now going to read you two statements, for each statement please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. How about:	1 = Strongly agree 2 = Somewhat agree 3 = Somewhat disagree 4 = Strongly disagree [5 = Don't know, 6 = Refused]
<b>Q15_2A</b>	After [insert country-specific term for coronavirus, Covid-19] crisis ends, the government of [insert country] should spend money to help other countries prevent and cure diseases WHEREVER they occur.	
<b>Q15_2B</b>	After [insert country-specific term for coronavirus, Covid-19] crisis ends, the government of [insert country] should spend money on preventing and curing diseases ONLY if they pose a risk to people in THIS country	

Please note that Wellcome subsequently purchased from Gallup the results for the following Covid-related questions that Gallup ran in its Worldpoll and which were included in the report and datasets. However, Wellcome was not involved in the cognitive testing and piloting of these questions.

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<b>WP21757</b>	In general, to what extent has your own life been affected by the [insert local term for coronavirus] situation?	A lot Some Not at all (Never heard of it) (Don't know) (Refused)
<b>WP21758</b> <b>WP21759</b> <b>WP21760</b> <b>WP21761</b>	Have you experienced each of the following as a result of the [insert local term for coronavirus] situation?	Temporarily stopped working at your job or business. Lost your job or business. Worked less hours at your job or business. Received LESS money than usual from your employer or business.
<b>WP21768</b>	Vaccines are given to people to help prevent specific diseases. If a vaccine to prevent [insert local term for coronavirus] was available right now at no cost, would you agree to be vaccinated?	Agree Not Agree Don't know Refused

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# Appendix I: Wave II items compared with Wave I

	New/Modified/Same compared to Wave I
How much do you, personally, know about science? Do you know a lot, some, not much, or nothing at all?	Same
In this survey, when I say 'science' I mean the understanding we have about the world from observation and testing. When I say 'scientists' I mean people who study the planet Earth, nature and medicine, among other things. How much did you understand the meaning of 'science' and 'scientists' that was just read? Did you understand ALL of it, SOME of it, NOT MUCH of it, or NONE of it?	Same
What is the highest level of education where you LAST learned about science?	Modified
In (country), how much confidence do you have in the hospitals and health clinics? A lot, some, not much, or none at all? If you don't know, please just say so.	Modified (expanded response scale)
How much do you trust each of the following? Do you trust them a lot, some, not much, or not at all? If you don't know, please just say so. How about _____?	Same
The people in your neighbourhood.	Same
The national government in this country.	Same
Scientists in this country.	Same
Journalists in this country.	Same
Doctors and nurses in this country.	Same
People who work at [Country equivalent term for Charitable organisations/NGOs] in this country.	Same
[Traditional healers or country equivalent] in this country.	Same
In general, would you say that you trust science a lot, some, not much, or not at all?	Same
In general, how much do you trust scientists to do the following things....? Do you trust them a lot, some, not much, or not at all? If you don't know, please just say so. To find out accurate information about the world.	Same
In general, how much do you trust scientists to do the following things....? Do you trust them a lot, some, not much, or not at all? If you don't know, please just say so. Do their work with the intention of benefiting the public?	Modified (question wording). Original wording asked about scientists who work for colleges/universities as well as scientists who work for companies
In general, how much do you think the leaders in the national government value the opinions and expertise of scientists? A lot, some, not much, or not at all?	New
In (country), do you think the work that scientists do benefits most, some, or very few people?	Same
In (country), do you think the work that scientists do has benefited people like you a lot, a little, or not at all?	Modified (response scale). Scale was modified to be 3-point, similar in degree to question above
Overall, do you think that science and technology will increase or decrease the number of jobs in your local area in the next five years?	Same

	New/Modified/Same compared to Wave I
Would you say developments in science have had a mostly positive impact, a mostly negative impact, or no impact at all on the following things in your life? – Your personal health.	New
Would you say developments in science have had a mostly positive impact, a mostly negative impact, or no impact at all on the following things in your life? – The quality of the environment in your local area or the city where you live.	New
Have you heard about climate change or global warming before today?	New
Thinking about the issue of climate change or global warming, how well do you feel you understand this issue? Would you say you understand it very well, fairly well, not very well, or not at all?	New
Do you think climate change is a major threat, a minor threat, or not a threat to people in this country right now?	New
Have you used social media, such as Facebook, WhatsApp, Twitter, Instagram or [INSERT LOCAL COUNTRY-SPECIFIC SOCIAL MEDIA APPS] in the past 30 days?	New
About how often do you use social media?	New
How often do you see information about health on social media? All of the time, most of the time, some of the time, or never?	New
Generally speaking, if science disagrees with the teachings of your religion, which would you believe? Science or the teachings of your religion?	Modified (question wording). Originally consisted of two questions, and for space considerations was combined into one item
In general, how much do you think each of the following make decisions about coronavirus based on scientific advice? A lot, some, not much, or not at all? How about: The national government.	New – COVID module
In general, how much do you think each of the following make decisions about coronavirus based on scientific advice? A lot, some, not much, or not at all? How about: Friends and family.	New – COVID module
In general, how much do you think each of the following make decisions about coronavirus based on scientific advice? A lot, some, not much, or not at all? How about: The World Health Organization (WHO).	New – COVID module
In general, how much do you think each of the following make decisions about coronavirus based on scientific advice? A lot, some, not much, or not at all? How about: Doctors and nurses in this country.	New – COVID module
In general, how much do you think each of the following make decisions about coronavirus based on scientific advice? A lot, some, not much, or not at all? How about: Religious leaders.	New – COVID module
I am now going to read you two statements, for each statement please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. How about: After [insert country-specific term for coronavirus, Covid-19] crisis ends, the government of [insert country] should spend money to help other countries prevent and cure diseases WHEREVER they occur.	New – COVID module
I am now going to read you two statements, for each statement please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. How about: After [insert country-specific term for coronavirus, Covid-19] crisis ends, the government of [insert country] should spend money on preventing and curing diseases ONLY if they pose a risk people in THIS country.	New – COVID module

	In Wave 1 ONLY
Do you think studying diseases is a part of science?	Old
Do you think writing poetry is a part of science?	Old
Have you, personally, ever, learned about science at primary school?	Old
Have you, personally, ever, learned about science at secondary school?	Old
Have you, personally, ever, learned about science at college/university?	Old
Have you, personally, tried to get any information about science in the past 30 days?	Old
Have you, personally, tried to get any information about medicine, disease, or health in the past 30 days?	Old
Would you, personally, like to know more about science?	Old
Would you, personally, like to know more about medicine, disease, or health?	Old
In (country), do you have confidence in each of the following, or not? How about Non-governmental organizations or Non-profit organisations.	Old
How much do you trust SCIENTISTS working in colleges/universities in this country to do each of the following? To do their work with the intention of benefiting the public. Do you trust them to do this a lot, some, not much, or not at all?	Old
How much do you trust SCIENTISTS working in colleges/universities in this country to do each of the following? To be open and honest about who is paying for their work. Do you trust them to do this a lot, some, not much, or not at all?	Old
Now, thinking about companies – for example, those who make medicines or agricultural supplies – how much do you trust SCIENTISTS working for COMPANIES in this country to do each of the following? To do their work with the intention of benefiting the public. Do you trust them to do this a lot, some, not much, or not at all?	Old
Now, thinking about companies – for example, those who make medicines or agricultural supplies – how much do you trust SCIENTISTS working for COMPANIES in this country to do each of the following? To be open and honest about who is paying for their work. Do you trust them to do this a lot, some, not much, or not at all?	Old
Overall, do you think that science and technology will help improve life for the next generation?	Old
Which of the following people do you trust MOST to give you medical or health advice?	Old
In general, how much do you trust medical and health advice that the government gives? A lot, some, not much, or not at all?	Old
In general, how much do you trust medical and health advice from medical workers, such as doctors and nurses, in this country? A lot, some, not much, or not at all?	Old
A vaccine is given to people to strengthen their body's ability to fight certain diseases. Sometimes people are given a vaccine as an injection, but vaccines can also be given by mouth or some other way. Before today, had you ever heard of a vaccine?	Old
Do you strongly or somewhat agree, strongly or somewhat disagree or neither agree nor disagree with the following statement? Vaccines are important for children to have.	Old
Do you strongly or somewhat agree, strongly or somewhat disagree or neither agree nor disagree with the following statement? Vaccines are safe.	Old
Do you strongly or somewhat agree, strongly or somewhat disagree or neither agree nor disagree with the following statement? Vaccines are effective.	Old
(If respondent is a parent) To the best of your knowledge have any of your children ever received a vaccine that was supposed to prevent them from getting childhood diseases such as (examples), or not?	Old

# Appendix II. Wellcome rationale for questions

Question	Rationale
In general, how much do you think the leaders in the national government value the opinions and expertise of scientists? A lot, some, not much, or not at all?	The aim is to understand how people perceive the political status of scientists in their country.
Would you say developments in science have had a mostly positive impact, a mostly negative impact, or no impact at all on the following things in your life? Your personal health/ quality of environment in local area/city where you live.	These questions (personal health/quality of environment) explore the perceived benefit of science specifically on people's personal health (Wellcome's ultimate area of concern as an organisation) and benchmarks it against the perceived benefit to their local environment.
Have you heard about climate change or global warming before today? Thinking about the issue of climate change or global warming, how well do you feel you understand this issue? Do you think climate change or global warming is a major threat, a minor threat, or not a threat to people in (response in SA/WP5) right now?	The purpose of these questions is to focus on people who have different beliefs about science and how responses to these questions relate to levels of trust in scientists and perceived knowledge about science.
Have you used social media, such as Facebook, WhatsApp, Twitter, Instagram or [insert local country-specific example of social media apps] in the past 30 days?	This explores use of social media. Given increasing use of social media as a channel contributing to misinformation about health, this question will be a useful covariate for other questions such as those relating to trust, as well as for the questions about mental health.
About how often do you use social media?	Similar to rationale above but can be used to explore whether intensity of use is related to other results, for example, better/ worse mental health.
How often do you see information about health on social media?	In addition to social media in general, Wellcome is interested in its use specifically for information about health, since it also provides an opportunity for better information and engagement with health research – this question refers to that interest.
Generally speaking, if science disagrees with the teachings of your religion, which do you believe? Science or the teachings of your religion?	Wellcome wants to find out whether people think science and religion disagree, and – if they do – which one they tend to trust more.
In general, how much do you think each of the following make decisions about coronavirus based on scientific advice? A lot, some, not much, or not at all? How about: The national government, friends and family, the World Health Organization (WHO), doctors and nurses in this country, religious leaders.	Wellcome wants to learn how the public evaluate the extent to which these actors are making decisions about Covid-19 based on science.
I am now going to read you two statements, for each statement please tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. How about: After [insert country-specific term for coronavirus, Covid-19] crisis ends, the government of [insert country] should spend money to help other countries prevent and cure diseases WHEREVER they occur. After [insert country-specific term for coronavirus, Covid-19] crisis ends, the government of [insert country] should spend money on preventing and curing diseases ONLY if they pose a risk people in THIS country.	Given the importance of global cooperation in developing and treating current and future pandemics such as Covid-19, Wellcome wants to know how on board the public are with this.

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## Endnotes

1. See <https://wellcome.ac.uk/reports/wellcome-global-monitor/2018>
2. All the results, analyses and data from the survey are published at: <https://wellcome.ac.uk/reports/wellcome-global-monitor/2018>
3. Please note that questions were also asked about mental health. How these were developed is discussed in the Questionnaire Development Information for Mental Health Report, which is published at [wgm2020-questionnaire.pdf \(wellcome.org\)](https://www.wellcome.org/wgm2020-questionnaire.pdf)
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[https://www.who.int/social\\_determinants/en/](https://www.who.int/social_determinants/en/)  
[https://www.who.int/gho/health\\_equity/handbook/en/](https://www.who.int/gho/health_equity/handbook/en/)  
<http://pubdocs.worldbank.org/en/676591503324870867/HealthEquityCh2.pdf>
10. For the results please see: [https://wellcome.ac.uk/sites/default/files/wellcome-global-monitor-questionnaire-development-report\\_0.pdf](https://wellcome.ac.uk/sites/default/files/wellcome-global-monitor-questionnaire-development-report_0.pdf)
11. Please see the results of the testing of the first wave of the Wellcome Global Monitor (including the questions that are repeated in Wave II) here: [https://wellcome.ac.uk/sites/default/files/wellcome-global-monitor-questionnaire-development-report\\_0.pdf](https://wellcome.ac.uk/sites/default/files/wellcome-global-monitor-questionnaire-development-report_0.pdf)
12. As delivered in English.

**Wellcome supports science to solve the urgent health challenges facing everyone. We support discovery research into life, health and wellbeing, and we're taking on three worldwide health challenges: mental health, global heating and infectious diseases.**

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