Research Report

Wellcome Trust Monitor Report
Wave 3

Tracking public views on science and biomedical research

April 2016

wellcome trust

Wellcome Trust Monitor: Wave 3

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Ipsos MORI

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Foreword

The Wellcome Trust Monitor was launched to build our understanding of the societal context of the research that we fund. Through it, we hope to understand and track over time the public's interest in, attitudes towards, experience and knowledge of science, with a particular focus on biomedical topics. The wave 3 Monitor uses a rigorous and robust methodology to achieve data that is representative of the UK adult population. This survey marks a departure from previous waves by interviewing only adults (young people will be interviewed separately in 2016); however, the sample size has increased allowing richer analysis. By following the same methodology, this wave of the Monitor enables comparisons with the previous two waves, in 2009 and 2012 respectively.

Our aspiration for the Wellcome Trust Monitor is to provide a rich resource for many audiences. We hope academics and students will explore the data further, examining for instance the language people use to describe their understanding of antibiotic resistance, or the relationship between aspects of scientific knowledge and confidence in taking health-related decisions. Policy-makers can learn about public attitudes towards sharing medical data for research purposes, what guides this, and what concerns people have about it.

Science journalists, engagers and communicators can learn, as can we at the Wellcome Trust, about how the public interact with science, and what their preferences are for engagement.

The full SPSS datasets of all three waves are available through the UK Data Service. The wave 3 dataset can be accessed at: https://discover.ukdataservice.ac.uk/catalogue/?sn=7927

The Wellcome Trust website, at www.wellcome.ac.uk/monitor, hosts:

- the reports for all three waves of the Monitor;
- Excel tables presenting the core data from waves 2 and 3 (data can be reached from the corresponding tables in the report);
- infographic sheets illustrating findings of interest from waves 2 and 3; and
- links to publications related to wave 1.

We greatly encourage others to use these resources.

The findings of the research show that our work exists in a receptive public climate. The majority of the public are interested in medical research and many want to hear from scientists about the work they are doing. Nonetheless, more can be done to ensure that our ideas are accessible to the public and that everyone, independent of who they are or where they come from, can engage with science and medical research.

Clare Matterson

Director of Strategy

Wellcome Trust

April 2016

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
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Executive Summary

Knowledge, interest and engagement

The public express high levels of interest in medical research. Around three-quarters of the public say they are interested in medical research, which is a high level of interest, consistent with previous waves. Women, older adults, those with higher educational qualifications, and those who know more about science are more likely to be interested in medical research.

The public are particularly interested in the development of new drugs, vaccines and treatments, as well as mental health. The proportion expressing interest in mental health has increased from 48 per cent in 2012 to 55 per cent in 2015.

Around two in five of the public say they have actively tried to find out information about medical research in the past year. People are most commonly trying to find medical advice about illnesses affecting themselves or a family member. The internet is by far the most popular method for finding information, with search engines most likely to be the first port of call, as opposed to specific websites run by the NHS or other organisations.

Television is the dominant medium by which people happen to come across information about medical research, followed by websites and newspapers.

One in five of the public has visited a science museum or science centre in the last 12 months. By contrast, one-third have visited a history museum, and three in ten have visited an art gallery.

The majority of the public say they are interested in hearing directly from scientists about the research they do, but would prefer to hear from them via passive means, such as television, radio, newspapers, and websites, rather than interacting with them directly. Hearing from scientists about the latest findings from scientific research, and about research of personal relevance, are of greatest interest.

Of the professions and institutions involved in the production and dissemination of scientific and medical research, doctors, nurses and other medical practitioners are most trusted by the public, followed by scientists working in universities, medical research charities, and scientists working in private industry. Journalists are by far the least trusted group. Reasons for trust and distrust are explored in the report.

Around three-quarters of the public are willing to share their anonymised medical records, or their anonymised genetic information, for the purposes of a medical research study. The primary concern among those who are unwilling relates to confidentiality and privacy.

The report explores how the public relate to issues of science and medicine in their everyday lives. Two-thirds think their understanding of science is useful in their everyday lives, but more, almost nine in ten, believe it is useful for others – people in general – to have an understanding of science in their everyday lives. The vast majority of the public feel confident making informed decisions about their health - for example whether to have a flu jab, or whether to make a doctor’s appointment when feeling unwell - and around half feel confident challenging the conclusions of a medical professional.

When presented with three options as to how a drug’s effectiveness can best be tested, seven in ten of the public choose the controlled experimentation option. Far fewer think that talking

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to patients to get their opinion, or that scientists using their own knowledge to determine a drug's effectiveness, are the best approaches.

The amount of time taken to develop a medical treatment varies greatly, but research suggests it takes between 15 and 25 years from the pre-discovery phase to availability to patients. Half of the public believe it takes between 10 and 20 years, on average, to develop a medical treatment. Around one in ten believes the process takes less than ten years, and almost one in five say they do not know how long it takes.

Around two-thirds of the public believe (correctly) that pharmaceutical companies spend the most on developing new medical drugs in the UK. One in five think the NHS and other public sector or government organisations spend the most.

Behaviour

To provide a context to the Wellcome Trust's Crunch campaign, which encourages the public to look at the relationship between food and drink, health, and the environment, the Monitor explored the various influences behind people's food and drink choices. The public prioritise considerations affecting their own health, namely sugar and salt content. The most important environmental factors relate to sustainability, packaging, and food being produced in the UK rather than in a foreign country. Our analysis segments the public according to the factors they consider important when deciding what to eat and drink.

The Monitor also explored the public's experiences with antibiotics, and their understanding of antibiotic resistance. Nine in ten of the public say they have heard of antibiotic resistance, however this is most commonly thought (mistakenly) to refer to one's body becoming resistant or immune to antibiotics. Although the great majority of the public believe that antibiotics treat bacterial infections, only two in five (correctly) believe that antibiotics treat bacterial infections alone.

Over one in five of the public say they have, at some point, asked a GP or medical professional to prescribe them antibiotics. The great majority of these requests were granted. Of those who have been prescribed antibiotics before, whether they have asked for them or not, over two in five feel they have, at some point, been prescribed antibiotics inappropriately.

Around two in five of the public say they have been prescribed antibiotics in the last year. The great majority report following their most recent prescription as instructed, taking all the antibiotics they were prescribed, at the right times. However, six per cent say they did not finish the course, typically because they were feeling better.

Use of a range of alternative and complementary medicines is unchanged since 2009, with the exception of acupuncture, for which use has risen. Just under one in five of the public has used homeopathy before. These adults are more than twice as likely to say that homeopathy was effective, rather than ineffective, in treating their condition the last time they used it. Among those who have never used homeopathy, almost two in five say they would never use it, while almost one-third would consider using it if they thought it would be appropriate for their health problem.

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1. About the study

This report sets out the results of the third Wellcome Trust Monitor, a survey of the UK public aged 18 or over conducted by Ipsos MORI on behalf of the Wellcome Trust. The Wellcome Trust Monitor is designed to measure the public's awareness, interests, knowledge and attitudes in relation to science, and in particular, biomedical science.

The Wellcome Trust Monitor is conducted every three years in order to measure long-term trends in public attitudes. The first (baseline) wave was conducted in 2009 by the National Centre for Social Research (NatCen), and the second in 2012 by Ipsos MORI.

1.1. Background and objectives

For over 75 years the Wellcome Trust has worked to promote advances in the fields of animal and human health. Over this time the Trust has become the UK's largest charitable funder of biomedical research, aiming to improve health and well-being through new discoveries. The Wellcome Trust also has a long history of promoting public engagement with science and biomedical research. The Wellcome Trust Monitor is an important study that not only explores interest in and attitudes towards biomedical science, but also helps organisations interested in public engagement with science to plan their activities.

The questionnaire retained key questions from the 2009 and 2012 questionnaires to allow changes over time to be tracked. Examples include questions assessing interest in medical research; what kinds of information about medical research people actively seek, or passively encounter; past participation in medical research; participation in scientific and cultural experiences; trust in professions to provide information about medical research; optimism about medical research; understanding of clinical trials, and of particular biomedical terms; use of alternative medicines; and scientific literacy, assessed via a knowledge quiz.

New questions were added in 2015 to gather evidence of attitudes, behaviours, and knowledge in other areas. These included questions about antibiotics and antibiotic resistance; interest in hearing directly from scientists; factors affecting what people choose to eat and drink; understanding of the drug development process; the perceived value of science in everyday life; and medical and scientific networks.

In 2009 and 2012, young people (aged 14 to 18) in the UK were interviewed as part of the Wellcome Trust Monitor. In accordance with the recommendations of an independent review of the Monitor in 2014, in 2015 the Monitor interviewed only adults (aged 18 or over) in the UK.[1] A total of 1,524 adults were interviewed in 2015, a larger sample size than in 2012 (1,396) and 2009 (1,179) in order to enable deeper exploration of the data.

1.2. Methodology

Further technical details are provided in Appendix A and in the Technical Report.[2] Here we summarise key aspects of the survey design to assist the reader in interpreting the results. As the Wellcome Trust Monitor was designed to track changes over time, great emphasis was

[1] The Wellcome Trust has commissioned a separate survey to measure the views of young people, to be carried out in 2016.
[2] Appendix A and the Technical Report are available at: www.wellcome.ac.uk/monitor

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placed on achieving comparability between waves. Thus, in most respects the methodology used is the same as that for the 2009 and 2012 waves of the Monitor.

Cognitive testing and pilot survey

New questions developed for the third wave were subjected to cognitive testing, a type of in-depth interviewing that pays explicit attention to the mental processes respondents go through when answering a question. Three rounds of ten cognitive interviews each were conducted, with findings discussed with the Wellcome Trust between each round, and the questionnaire developed and re-tested from round-to-round in light of these discussions.

A pilot survey of 50 interviews was then conducted to test the operation of the questionnaire and associated survey materials.

Sampling

A two-stage probability sampling methodology was used (as is common in high-quality surveys of the general public) to achieve interviews with a representative sample of adults aged 18 or over in the UK.

A total of 129 postcode sectors were selected from a stratified list of all postcode sectors, with probability of selection proportionate to size.[3] Twenty-five addresses were then randomly selected from each selected sector to obtain a sample of 3,225 addresses to issue to interviewers. At addresses with more than one dwelling unit and/or more than one resident adult, interviewers selected one dwelling unit/adult at random to approach.

Fieldwork and response

An advance letter was sent to all selected addresses. Interviews took place between 2 June and 1 November 2015, using face-to-face Computer-Assisted Personal Interviewing (CAPI). Interviews took 45 minutes to complete on average. Respondents were given a £20 (or £40 at the reissues stage) LoveToShop gift card as an incentive conditional on completion of an interview.

Interviews were achieved with 1,524 adults, equating to a response rate of 51.4 per cent.[4]

Weighting

Data in the report have been weighted to adjust for differing probabilities of selection, and to adjust the sample to match the UK population by age within gender, and by region.

[3] Each postcode sector containing fewer than 1,000 delivery points was combined with an adjacent sector, or sectors, so that each combined sector contained at least 1,000 delivery points.

[4] Response Rate 1, as defined by the American Association for Public Opinion Research Standard Definitions (2011). This is the number of interviews achieved expressed as a proportion of the number of addresses approached less those found to be ineligible during fieldwork (see www.aapor.org/Education-Resources/For-Researchers/Poll-Survey-FAQ/Response-Rates-An-Overview.aspx)

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1.3. Interpretation of sub-group and over-time differences

Statistical significance

Data are taken from a sample of UK adults, rather than the entire population, meaning results are subject to sampling variability. The Technical Report provides a guide to statistical reliability, and shows the 95 per cent confidence intervals around key survey estimates. For instance, the survey finds that 77 per cent of the public are interested in medical research with an associated confidence interval of $\pm$ 3.0 per cent, and that 75 per cent are willing to allow anonymised information from their genes to be used in a medical research project, with an associated confidence interval of $\pm$2.7 per cent. The mean design effect (across seven key survey variables) resulting from the complex sample design is 1.5.

Sub-group differences

Where results are analysed by sub-group, the differences have been tested for significance at the 95 per cent confidence level or above using the complex samples module in SPSS 19.0.[5] The significance testing examines the overall relationship between the question variable and the sub-group variable, and avoids testing all pairwise comparisons within a sub-group as this risks detecting spurious differences.

Sub-group differences by gender and age are considered for all questions, and additional sub-group differences are considered on a question-by-question basis based on expected relationships with the question variable.

The questionnaire included a nine-item knowledge quiz intended to measure respondents' scientific literacy. At points throughout this report, findings are broken down according to scores on this quiz, with respondents grouped by high scores (8-9 items correct), medium scores (5-7 items correct) and low scores (0-4 items correct). Chapter 7 provides details of the knowledge quiz.

Selected findings within the report are also broken down by whether the respondent had gained a science-related qualification from school, or from university or college. Respondents were left to self-define whether or not qualifications they had gained were "science-related".

Comparisons between the 2009, 2012, and 2015 Wellcome Trust Monitors

This report comments on the statistical significance of differences between the findings of the 2009, 2012, and 2015 waves of the Wellcome Trust Monitor where the same question has been repeated in different waves. This is not possible in all cases due to changes in the wording of questions or answer options. In these instances, the reasons for not making comparisons are noted.

In considering wave on wave changes, readers should note that cross-wave changes in sample composition could account for some or all of the observed changes. That is to say, it is possible that apparent changes in attitudes are actually a result of differences in the profile of

[5] The complex samples module accounts for sample stratification, clustering and weighting when conducting significance testing. This means that type 1 errors (i.e. 'false positive' results, where a difference is interpreted as real when it is not) are less likely than if standard formulae were used.

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respondents. However, because the demographic profiles of the samples are similar across the three surveys (see Appendix A), undue emphasis should not be placed on this possibility.

Reporting conventions

Footnotes are used throughout the report to indicate which questions and variables are being discussed. This is to allow the reader to cross-refer easily to the questionnaire documentation, data tables, and the SPSS dataset, which has been deposited at the UK Data Service.

Where percentages do not sum to 100 per cent, this may be due to rounding, or questions allowing multiple answers. An asterisk (*) denotes a value that is less than half a per cent but greater than zero. Figures in the report include the unweighted and weighted base sizes (the actual number of respondents asked the question, and the weighted number of respondents asked the question, respectively).

1.4. Acknowledgements

This report on the third Wellcome Trust Monitor has been compiled by Ipsos MORI, who are responsible for its contents.

Ipsos MORI would like to thank all members of the public who took part. We would also like to thank Dr. Hilary Leevers, Ethan Greenwood, and Dr. Chonnettia Jones from the Wellcome Trust, the Academic Advisor Professor Patrick Sturgis from the University of Southampton, and the members of the External Advisory Board, for their input throughout the study. Our thanks also go to staff on the Wellcome Trust Internal Advisory Group for their expert guidance during the questionnaire development stage. We would also like to thank the other reviewers who provided helpful feedback and comments on drafts of this report. Any errors or omissions are the responsibility of Ipsos MORI.

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2. How interested are people in science and medical research?

This chapter explores how interested people are in medical research, and how they find out about medical research, whether by actively seeking, or passively encountering information. This chapter also examines the trust people place in various professions and organisations to provide accurate and reliable information about medical research. The chapter concludes by considering how optimistic the public are about the future of medical research.

Key findings:

- The majority of the public (77 per cent) say they are very or fairly interested in medical research.
- Interest in medical research is more likely among women, older adults, those with higher educational qualifications, and those who know more about science (as measured by scores on the knowledge quiz), even when the influence of other factors are controlled for.
- Among those in managerial and professional occupations, 83 per cent say they are interested in medical research. This falls to 73 per cent among those in routine and manual occupations, and to 59 per cent among those who have never worked, or are long-term unemployed.
- Three broad areas of medical research are of most interest to the public: the development of new drugs, vaccines and treatments, mentioned by 61 per cent, how the body works (46 per cent) and how the brain works (45 per cent). There has been no significant change in the broad areas of medical research of interest to the public since 2012.
- There has been little change since 2012 in the specific fields of medical research of interest to the public. The proportion of the public interested in mental health has increased significantly from 48 per cent in 2012 to 55 per cent in 2015.
- Over two in five (42 per cent) of the public say they have actively tried to find out information about medical research in the past year, in line with the proportion recorded in 2009 (39 per cent). Those looking for information about medical research are most likely to be seeking medical advice (69 per cent) or information on other people's experiences of an illness or disease (48 per cent).
- As in 2012, the internet is the most common method for seeking information about medical research, used by 90 per cent of those seeing information.
- Of the professions and institutions involved in the production and dissemination of scientific and medical research, doctors, nurses and other medical practitioners are most trusted by the public (with 64 per cent having complete trust or a great deal of trust in them to provide accurate and reliable information about medical research). Journalists are the least trusted (three per cent).

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Key findings (continued):

- Men are more trusting than women of doctors, nurses and other medical practitioners (71 per cent expressing complete trust, or a great deal of trust, compared with 58 per cent), and of journalists (five per cent, compared with two per cent). Younger adults are more trusting than older adults towards medical research charities (45 per cent of those aged 18 to 34, falling to 28 per cent of those aged 65 or over), and towards scientists working in private industry (36 per cent of those aged 18 to 34, falling to 19 per cent among those aged 65 or over).
- Almost all of the public (94 per cent) believe that medical research will lead to an improvement in the quality of life for people in the UK in the next 20 years.

2.1. How interested are people in medical research?

The Wellcome Trust Monitor has measured public interest in medical research since 2009 (Figure 2.1[6]). Before being asked how interested they were in medical research, respondents were presented with a card showing a definition of medical research, in order to ensure that responses were based on a consistent interpretation of this term.[7]

Three-quarters (77 per cent) of the public say they are very or fairly interested in medical research. This proportion is not significantly different from the 75 per cent expressing interest in 2012, but is significantly lower than the 91 per cent expressing interest in 2009.[8] This high level of interest was also found in the recent Public Attitudes to Science study (BIS, 2014) for science in general; over four in five (84 per cent) of the public say that "science is such a big part of our lives that we should all take an interest".

Figure 2.1 Interest in medical research

Q. How interested, if at all, would you say you are in medical research?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w1 (2009) (%)	Monitor w2 (2012) (%)	Monitor w3 (2015) (%)
Very interested	34	20	22
Fairly interested	57	55	55
Not very interested	7	18	16
Not at all interested	2	7	7
Don't know	*	1	*
% Interested (very or fairly)	91	75	77
Unweighted base:	*1,179*	*1,396*	*1,524*
Weighted base:	*1,179*	*1,396*	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

[6] Figure 2.1 shows data from Interest (press CTRL and click on question name to access data table).
[7] For the purposes of this survey, medical research was defined as follows: "Medical research is about how the body works, the causes of illnesses and diseases, and developing and testing new treatments".
[8] It is difficult to assess whether this represents a genuine decrease in interest in medical research between 2009 and 2012, or whether it may, at least in part, be a result of changes in sample composition between the two surveys, or differences in the way the question was administered between NatCen and Ipsos MORI.

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Interest in medical research by sub-group

Interest in medical research varies by population sub-groups. Women are more likely than men to say they are very or fairly interested in medical research (80 per cent, compared with 74 per cent). Interest in medical research also varies with age; older adults are more likely to express an interest (83 per cent of those aged 50 and over, compared with 68 per cent of those aged 18 to 34).

Those with a serious long-term illness or medical condition, or who have a friend or family member with such an illness or condition, are more likely to say they are interested in medical research than those with no experience of serious illness or disability (81 per cent, compared with 73 per cent). In addition, those with a serious genetic condition in their family are also more likely to be interested in medical research (84 per cent, compared with 76 per cent among those without such a condition).

Interest in medical research also varies by social class, as measured by the National Statistics Socio-Economic Classification (NS-SEC). Among those in managerial and professional occupations, 83 per cent say they are interested in medical research, a proportion which falls to 73 per cent among those in routine and manual occupations, and to 59 per cent among those who have never worked, or are long-term unemployed.

Turning to education and employment, interest in medical research varies by the highest educational qualification adults have obtained. Those with a postgraduate degree are most likely to be interested (85 per cent), while those with no qualifications are least likely to be interested (63 per cent). With respect to qualifications in science specifically, among those with a science-related qualification gained from university or college, 86 per cent express an interest in medical research, compared with 73 per cent of those with no science-related qualifications. Among those who work, or have previously worked, in a scientific or medical field, 81 per cent say they are interested in medical research, compared with 73 per cent of those who have not worked in these fields.

Knowledge about science (as measured by a scale derived from the knowledge quiz)[9] is associated with interest in medical research; 85 per cent of those with high scores on the knowledge quiz express an interest, compared with 77 per cent of those with medium scores, and 64 per cent of those with low scores.

Interest in medical research also varies between those who have visited a science-related attraction in the past year, and those who have not.[10] Over four in five (84 per cent) of those who have visited a science-related attraction in the last year say they are interested in medical research, compared with 70 per cent among those who have not made such a visit.

Interest in medical research: multivariate analysis

Many of the factors considered above which are associated with interest in medical research will, of course, be correlated with one another. For instance, those who have a job in a scientific or medical field will be more likely to have science-related qualifications, and older

[9] See section 7.1 in Chapter 7 for an explanation of the knowledge quiz.

[10] Those visiting a science-related attraction were defined as those who had visited, or attended, one or more of the following in the last 12 months: a science museum or centre, a science-related art exhibition or installation, a zoo or aquarium, a planetarium, a working laboratory or similar scientific site, a local community science event, a science festival, or a science talk. Overall, half (51 per cent) of adults have made such a visit.

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adults will be more likely to have a long-term health condition or disability, and will be less likely to have a degree.

For this reason, multivariate analysis was carried out in order to isolate the unique contribution of each of the identified factors to interest in medical research.[11] The results of this analysis are presented in the Annex to this chapter (Figure 2.17).

This analysis demonstrates that interest in medical research is more likely among women, older adults, those with higher educational qualifications, and those who know more about science (as measured by scores on the knowledge quiz), even when the influence of other factors is controlled for.[12]

The following factors are related to interest in medical research when considered on their own but are no longer significant once other factors are controlled for: social class, science-related qualifications, having worked in a scientific or medical field, and experience of serious illness or disability.

[11] The multivariate analysis technique used was logistic regression.
[12] It should be noted that the knowledge quiz, while not a demographic variable like the others included in the model, was included as it provides a current measure of knowledge about science.

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2.2. Which areas of medical research interest people?

To understand the areas of medical research of most interest to the public, respondents were presented first with a list of *broad* areas of medical research, and then with a list of *specific* areas of medical research. For each, they were asked to choose which, if any, were of interest to them.

Broad areas of medical research of interest to people

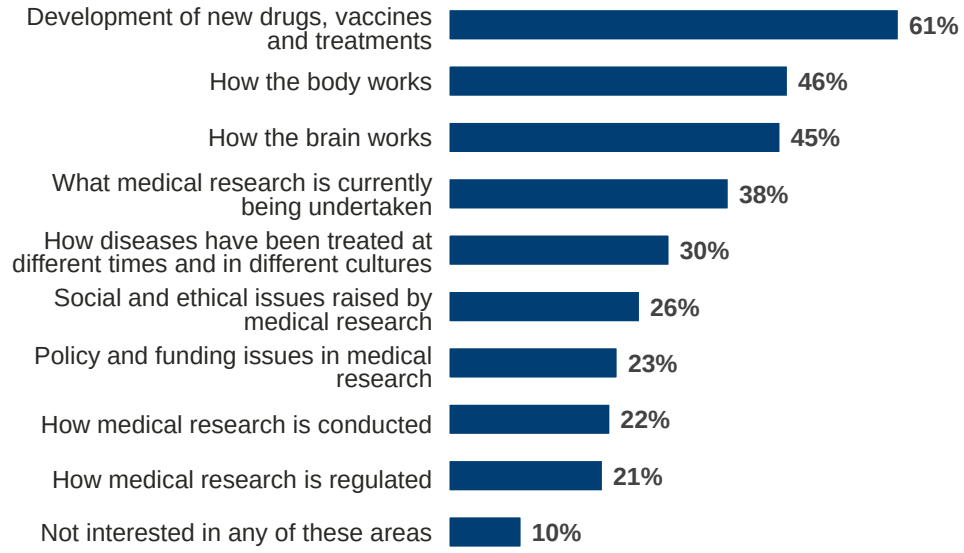
On average, respondents mentioned three areas of medical research of interest to them (mean number of areas mentioned = 3.1). Those with an interest in medical research mentioned closer to four areas (mean = 3.7), and those who said they are not interested in medical research specified one area, on average, in which they have an interest (mean = 1.4).

Three broad areas of medical research emerge as of particular interest: the development of new drugs, vaccines and treatments, which is the only area of interest to a majority of the public (61 per cent); how the body works (46 per cent); and how the brain works (45 per cent) (Figure 2.2[13]).

Ten per cent of the public say they are not interested in any of the broad areas of medical research presented to them.

Figure 2.2: The broad areas of medical research which interest people

Q. This card lists a number of broad areas of medical research. Which, if any, of these are you interested in?



Ipsos MORI Social Research Institute

Bases: 1,524 UK adults aged 18+
Fieldwork dates: 2 June to 1 November 2015

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Women are more likely than men to be interested in how diseases have been treated at different times and in different cultures (32 per cent, compared with 27 per cent); however, aside from this, the areas of interest show no differences by gender.

[13] Figure 2.2 shows data from K1/2MR (press CTRL and click on question name to access data table).

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Younger adults are more likely to express an interest in how the body works (53 per cent of those aged 18 to 34, falling to 35 per cent of those aged 65 or over), and in how the brain works (52 per cent of those aged 18 to 34, falling to 38 per cent of those aged 65 or over). Conversely, older adults are more likely to express an interest in policy and funding issues in medical research (27 per cent of those aged 65 or over, falling to 17 per cent of those aged 18 to 34), and in how medical research is regulated (25 per cent of those aged 65 or over, falling to 16 per cent of those aged 18 to 34).

Those adults with a serious genetic condition in their family are more likely to be interested in the development of new drugs, vaccines and treatments (70 per cent, compared with 60 per cent among those without such a condition in their family), and in what medical research is currently being undertaken (46 per cent, compared with 37 per cent). They are also more likely to be interested in how the brain works (55 per cent, compared with 43 per cent), in the social and ethical issues raised by medical research (34 per cent, compared with 25 per cent), and in policy and funding issues in medical research (31 per cent, compared with 22 per cent).

Areas of interest do not vary between those who have a serious long-term illness or medical condition, or who have a friend or family member with such an illness or condition, and those with no experience of serious illness or disability.

There have been no significant changes in the proportions choosing each area of interest since 2012 (Figure 2.3[14,15]).

Figure 2.3 The broad areas of medical research that interest people

Q. This card lists a number of broad areas of medical research. Which, if any, of these are you interested in?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w2 (2012) (%)	**Monitor w3 (2015)** (%)
Development of new drugs, vaccines and treatments	61	61
How the body works	47	46
How the brain works	45	45
What medical research is currently being undertaken	34	38
How diseases have been treated at different times and in different cultures	29	30
Social and ethical issues raised by medical research	25	26
Policy and funding issues in medical research	21	23
How medical research is conducted	24	22
How medical research is regulated	20	21
Not interested in any of these areas	10	10
Unweighted base:	*1,396*	*1,524*
Weighted base:	*1,396*	*1,524*

[14] Figure 2.3 shows data from K1/2MR (press CTRL and click on question name to access data table).
[15] Comparisons with Monitor wave 1 data (2009) are not made due to a change in the response codes between wave 1 and wave 2.

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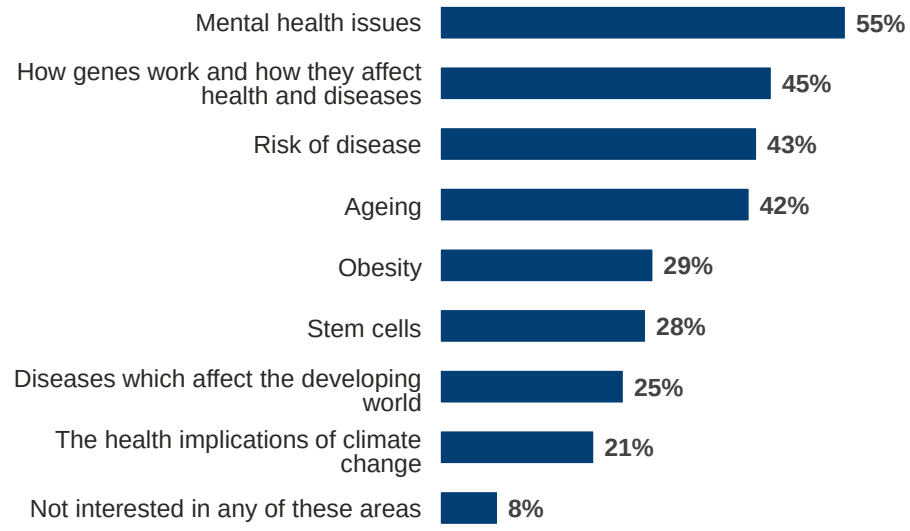
Specific areas of medical research of interest to people

Respondents were next presented with a list of specific areas of medical research, and asked which, if any, they were interested in (Figure 2.4[16]). On average, respondents mentioned three specific areas of medical research of interest to them (mean = 2.9). Those who said they were interested in medical research mentioned, on average, twice as many areas of interest as those who said they were not interested in medical research (mean = 3.3, compared with 1.6).

The specific areas of medical research of greatest interest to the public are mental health issues (chosen by 55 per cent), how genes work and how they affect health and diseases (45 per cent), risk of disease (43 per cent), and ageing (42 per cent). Eight per cent say they are not interested in any of the specific areas of medical research presented to them.

Figure 2.4: The specific areas of medical research which interest people

Q. This card lists a number of specific areas of medical research. Which, if any, of these are you interested in?



Ipsos MORI Social Research Institute

Bases: 1,524 UK adults aged 18+
Fieldwork dates: 2 June to 1 November 2015

wellcome trust

Women are more likely than men to express an interest in mental health issues (60 per cent, compared with 49 per cent), and obesity (33 per cent, compared with 25 per cent), while men are more likely than women to cite stem cells as an area of interest (32 per cent, compared with 25 per cent).

Ageing is, understandably, substantially more likely to be of interest to older adults; a majority (59 per cent) of those aged 65 or over express an interest in ageing, compared with a minority (32 per cent) among those aged 18 to 34. Risk of disease, however, is less likely to be chosen by older adults; 34 per cent of those aged 65 or over express an interest in this topic, rising to 46 per cent among those aged 35 to 64, and 45 per cent among those aged 18 to 34.

[16] Figure 2.4 shows data from K3/4SP (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Those with a serious genetic condition in their family are more likely to express interest in two specific areas, each concerned with genetics: how genes work and how they affect health and diseases (55 per cent, compared with 43 per cent among those without such a condition in their family), and stem cells (37 per cent, compared with 27 per cent).

Adults with a serious long-term illness or medical condition, or with a friend or family member with such a condition, are more likely to express an interest in mental health issues (59 per cent, compared with 50 per cent among those with no experience of serious illness or disability). These individuals are also more likely to cite the health implications of climate change as an area of interest (24 per cent, compared with 19 per cent).

The only area to have seen a significant change in interest since 2012 is mental health, for which interest has increased seven percentage points over the past three years (from 48 per cent in 2012, to 55 per cent in 2015) (Figure 2.5[17,18]).

Figure 2.5 The specific areas of medical research that interest people

Q. This card lists a number of specific areas of medical research. Which, if any, of these are you interested in?

Base: All respondents *Wellcome Trust Monitor*

	Monitor w2 (2012) (%)	**Monitor w3 (2015)** (%)
Mental health issues	48	55
How genes work and how they affect health and diseases	41	45
Risk of disease	39	43
Ageing	39	42
Obesity	26	29
Stem cells	31	28
Diseases which affect the developing world	29	25
The health implications of climate change	18	21
Not interested in any of these areas	9	8
Unweighted base:	*1,396*	*1,524*
Weighted base:	*1,396*	*1,524*

[17] Figure 2.5 shows data from K3/4SP (press CTRL and click on question name to access data table).
[18] Comparisons with Monitor wave 1 data (2009) are not made due to a change in the response codes between wave 1 and wave 2.

http://dx.doi.org/10.6084/m9.figshare.3145744

2.3. How do people find out about medical research?

This section looks at the types of information about medical research that people encounter either when actively looking for information, or simply by coming across it.

Two in five (42 per cent) say they have actively tried to find out information about medical research in the past year (Figure 2.6[19]). This is significantly higher than the proportion in 2012 (35 per cent), but is in line with the proportion recorded in 2009 (39 per cent).

Figure 2.6 Proportion seeking information about medical research in past year

Q. In the past year, have you tried to find out any information about medical research? This might have been about how the body works, the causes of illnesses and diseases or the testing or development of new treatments?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w1 (2009)	**Monitor w2 (2012)**	**Monitor w3 (2015)**
	(%)	(%)	(%)
Yes	39	35	42
No	61	65	58
Unweighted base:	*1,179*	*1,396*	*1,524*
Weighted base:	*1,179*	*1,396*	*1,524*

Two-thirds (67 per cent) of the public recall passively encountering information about medical research in the past year; that is, they remember hearing, seeing, or reading something about medical research they just happened to come across, but had not been actively trying to find.

[19] Figure 2.6 shows data from MRInfo (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

The types of medical research topics the public have actively sought information about in the past year, or that they remember passively encountering, are shown in Figure 2.7[20]. Those seeking information about medical research are most likely to look for information about types of illnesses (for instance information about cancer, diabetes, Alzheimer's, epilepsy, Parkinson's, heart disease, or other illnesses) (58 per cent), followed by information about aspects of illnesses (for instance information about the causes of illnesses, the prevention of illnesses, about identifying and diagnosing illness, and about treatments and cures) (21 per cent).

This pattern is reflected in the types of information the public remember passively encountering. People are most likely to have come across information about types of illness (49 per cent of those who recall encountering information about medical research), followed by aspects of illness (16 per cent).

Figure 2.7 Information about medical research topics actively sought, or passively encountered

Q. (Active) What were you trying to find information about? (code all that apply)
Q. (Passive) Please think of the last time, before this interview, that you heard, saw or read something about medical research that you just happened to come across and had not been trying to find. This might have been about how the body works, the causes of illnesses and diseases or the testing or development of new treatments. Please tell me what you remember hearing, seeing or reading. (code all that apply)

Base: (Active) Respondents who have tried to find information about medical research;(Passive) Respondents who remember information they have heard, seen or read about medical research

Wellcome Trust Monitor

Mentioned by three per cent or more for either actively seeking, or passively encountering information	**Active** (%)	**Passive** (%)
Types of illnesses	58	49
Aspects of illnesses	21	16
Medicine, drugs, tablets	8	9
Mental health issues	7	3
Genetics	5	5
How the brain works	4	2
How the body works	3	1
Fertility, pregnancy or childbirth	3	2
Obesity	2	3
Diet, weight loss, nutrition	2	3
Stem cell research	1	4
New findings/scientific breakthroughs (unspecified)	0	8
Antibiotics/antibiotic resistance	0	3
Unweighted base:	*599*	*1,028*
Weighted base:	*638*	*1,027*

[20] Figure 2.7 shows data from FindWhat, PMRInfo2 (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Those who actively seek information about medical research are most likely to be looking for medical advice (69 per cent), followed by information on other people's experiences of an illness or disease (48 per cent), while those who passively encounter information about medical research are most likely to come across information on medical research projects, trials or experiments (45 per cent), followed by information about medical advice (37 per cent) (Figure 2.8[21]).

Figure 2.8 Types of information about medical research actively sought or passively encountered

Q. (Active) What type of information were you looking for? (code all that apply)
Q. (Passive) What type of information did you come across? (code all that apply)

Base: (Active) Respondents who have tried to find information about medical research; (Passive) Respondents who remember information they have heard, seen or read about medical research

Wellcome Trust Monitor

Showcard responses	**Active** (%)	**Passive** (%)
Medical advice e.g. on cures, symptoms, prevention	69	37
Information on other people's experiences of an illness or disease	48	32
Information on medical research projects, trials or experiments	43	45
Data or statistics	25	16
Unweighted base:	*599*	*1,028*
Weighted base:	*638*	*1,027*

[21] Figure 2.8 shows data from InfType and PInfType (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

2.4. Where do people find information about medical research?

Those seeking information about medical research look for it through a variety of channels (Figure 2.9[22]). By far the most common is the internet (90 per cent), followed by talking to another person (40 per cent), and visiting a hospital or doctor's surgery (31 per cent). There have been no significant changes since 2012 in the channels the public use to seek information about medical research.

Younger adults are more likely to use the internet to seek information, with almost all (96 per cent) of those aged 18 to 34 doing so, falling to 77 per cent among those aged 65 or over. This pattern reflects the findings in a recent survey by OfCom (2015), which shows that while 85 per cent of adults in the UK have internet access at home, this proportion stands at 92 per cent among those aged 16 to 24, falling to just 40 per cent among those aged 75 or over.

Figure 2.9 Source of information about medical research actively sought

Q. Which of the things on this card, if any, did you do to try to find this information?

Base: Respondents who looked for information about medical research *Wellcome Trust Monitor*

Mentioned by one per cent or more in 2012 or 2015	**Monitor w2 (2012)** (%)	**Monitor w3 (2015)** (%)
Used the internet	87	90
Talked to another person	44	40
Visited a hospital or doctor's surgery	30	31
Looked in a book	22	21
Attended a discussion with experts	17	20
Looked at a newsletter from a medical organisation	17	19
Attended a lecture or talk	14	10
Visited a library	9	6
Phoned a helpline or other information service	8	6
Watched a TV programme	0	1
Looked in a newspaper	*	1
Unweighted base:	*481*	*599*
Weighted base:	*492*	*638*

** indicates a percentage less than 0.5%, but greater than 0.*

[22] Figure 2.9 shows data from MRInfHow (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

Respondents who reported using the internet to find out information about medical research were asked how they did this (Figure 2.10[23]). Search engines are the most commonly used method to find out information about medical research on the internet (72 per cent), followed by specific websites run by the NHS (50 per cent), and specific websites run by a charity (29 per cent). Other specific websites are used by one-third (32 per cent) of those using the internet to find out information about medical research.

Figure 2.10 How internet used to find out information about medical research

Q. How did you use the internet to try to find out information about medical research? (code all that apply)

Base: Respondents who used the internet to find out information about medical research — *Wellcome Trust Monitor*

Mentioned by one per cent or more	**Monitor w3 (2015)** (%)
Search engine	72
Specific website, run by the NHS	50
Another specific website	32
Specific website, run by a charity	29
Online video	14
Blog	13
Chat room or discussion forum	10
Facebook	8
App on a smartphone or tablet	7
Podcast	4
Twitter	2
Other social media	1
Accessed publishers/journals/books/leaflets	1
Unweighted base:	*534*
Weighted base:	*576*

Women are more likely than men to use a chat room or discussion forum to find medical research on the internet (13 per cent, compared with six per cent). Younger adults are more likely to use a blog (19 per cent of those aged 18 to 34, compared with just four per cent of those aged 65 or over), or Facebook (17 per cent of those aged 18 to 34, compared with six per cent of those aged 35 to 49, and just one per cent of those aged 65 or over).

[23] Figure 2.10 shows data from MrIntHow2 (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Turning to the channels via which people passively encounter information about medical research, television is the most common medium (cited by 43 per cent of those who remember information they have heard, seen, or read about medical research), followed by websites (21 per cent) and newspapers (19 per cent) (Figure 2.11[24,25]).

Figure 2.11 Source of information about medical research passively encountered

Q. Where did you come across this information? (code all that apply)

Base: Respondents who remember information they have heard, seen, or read about medical research — *Wellcome Trust Monitor*

Showcard responses	**Monitor w3 (2015)** (%)
Television	43
On a website	21
In a newspaper	19
Radio	10
Another person told me about it	8
Social media, such as Facebook or Twitter	7
In a magazine	5
In a hospital or doctor's surgery	4
A book	3
Attending a lecture or talk	2
A newsletter from a medical organisation (print or online)	2
On an online chat room or discussion forum†	1
On a blog‡	1
On an online video sharing site (e.g. YouTube)	1
An email	1
An app (on a smartphone or tablet)	1
At school or college	1
A podcast	*
Unweighted base:	*1,024*
Weighted base:	*1,024*

** indicates a percentage less than 0.5%, but greater than 0.*

Of those passively coming across information about medical research on television, the majority (62 per cent) see this information on the television news, with 31 per cent coming across it on a documentary or factual programme.[26]

[24] Figure 2.11 shows data from PIWhere (press CTRL and click on question name to access data table).
[25] Data from 2009 and 2012 are not presented due to changes to the format of this question across survey waves. Data from the relevant question asked in 2009 and 2012 can be found in the wave 1 and wave 2 Wellcome Trust Monitor reports, respectively.
[26] Data are from PITV (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

2.5. Whom do people trust to provide accurate information about medical research?

This section examines the public's trust in the professions and institutions involved in the production and dissemination of scientific and medical research, including journalists, medical research charities, and scientists working in a variety of sectors. Respondents were asked "Please tell me how much trust you have in each of the following to provide accurate and reliable information about medical research", and then provided their answer about each profession and institution in turn.

Doctors, nurses, and other medical practitioners emerge as the most trusted of the professions, with 64 per cent of the public saying they have complete trust, or a great deal of trust in them (Figure 2.12[27]). Scientists working in universities come a close second, with three in five (59 per cent) of the public having complete trust, or a great deal of trust, in them to provide accurate and reliable information about medical research.

This pattern is in line with Ipsos MORI's Trust in Professions survey, which has found doctors to be the most trusted profession since the survey was first conducted in 1983. Scientists are also regularly among the most trusted of professions, with politicians and journalists tending to be trusted the least.

The Monitor finds that just under two in five (37 per cent) say they have complete trust, or a great deal of trust, in medical research charities to provide accurate and reliable information about medical research.

A random half of respondents were asked how much they trust "scientists working for pharmaceutical companies", with the remaining half asked how much they trust "scientists working in private industry". Both of these groups of scientists are trusted far less than are scientists working in universities. One-third (32 per cent) say they have complete trust, or a great deal of trust, in scientists working for pharmaceutical companies, which is not statistically different from the 29 per cent for scientists working in private industry.

Journalists are the least trusted of the professions asked about, with just three per cent of the public saying they have complete trust, or a great deal of trust, in them to provide accurate and reliable information about medical research. It is instructive to consider that journalists are the least trusted source of accurate and reliable information about medical research along with the finding that the information about medical research the public passively encounter is most likely to come from journalistic sources, including from news on television, and from newspapers (see Figure 2.11).

[27] Figure 2.12 shows data from TrDoc, TrMed, TrJourn, TrSciUn, TrPriIn (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 2.12 Levels of trust in different groups providing information about medical research

Q. Please tell me how much trust you have in each of the following to provide accurate and reliable information about medical research…

Base: All respondents (1,524) *Wellcome Trust Monitor*

		Complete trust	A great deal of trust	Some trust	Very little trust	No trust at all	Don't know	*% Complete/great deal of trust*
Doctors, nurses and other medical practitioners	(%)	20	44	29	4	2	1	*64*
Scientists working in universities	(%)	10	49	32	3	1	5	*59*
Medical research charities	(%)	7	30	43	7	4	9	*37*
Scientists working for pharmaceutical companies†	(%)	7	25	47	12	4	4	*32*
Scientists working in private industry †	(%)	4	25	47	12	4	8	*29*
Journalists	(%)	1	3	34	38	22	3	*3*

† A split sample approach was employed, whereby a random half of respondents were asked about "Scientists working in private industry", and the other half asked about "Scientists working for pharmaceutical companies".

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Has trust changed over time?

There have been changes across the three waves of the Wellcome Trust Monitor in the levels of trust the public place in the professions and institutions asked about (Figure 2.13[28]).

Figure 2.13 Levels of trust in different groups providing information about medical research (% complete or a great deal of trust)

Q. Please tell me how much trust you have in each of the following to provide accurate and reliable information about medical research…

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w1 (2009) (%)	Monitor w2 (2012) (%)	Monitor w3 (2015) (%)
Doctors, nurses and other medical practitioners	72	67	64
Scientists working in universities	61	66	59
Medical research charities	60	60	37
Scientists working for pharmaceutical companies†‡	26	-	32
Scientists working in private industry†	-	32	29
Journalists	4	8	3
Unweighted base:	*1,179*	*1,396*	*1,524*
Weighted base:	*1,179*	*1,396*	*1,524*

† In 2015 a random half of the sample was asked about "Scientists working in private industry" (unweighted base 766, weighted base 773), with the other half asked about "Scientists working for pharmaceutical companies" (unweighted base 758, weighted base 751).
‡ In 2009 respondents were asked about "Scientists working for drug or pharmaceutical companies".

With respect to doctors, nurses and other medical practitioners, almost three-quarters (72 per cent) of the public had complete trust, or a great deal of trust, in these individuals to provide accurate and reliable information about medical research in 2009. By 2012, this had fallen to 67 per cent, and in 2015 stands at 64 per cent, which while significantly below 2009 levels, does not represent a further significant decline since 2012.

Turning to scientists, the proportion of the public saying they have complete trust, or a great deal of trust, in scientists working for universities rose significantly between 2009 and 2012 (from 61 per cent to 66 per cent), but has now fallen back to the level recorded in 2009 (59 per cent). Trust in scientists working for private industry follows the same trend; the proportion of the public saying they have complete trust, or a great deal of trust, in scientists working for private industry rose significantly between 2009 and 2012 (from 26 per cent to 32 per cent), and has now fallen back to a level consistent with that recorded in 2009 (29 per cent).[29]

The proportion of the public saying they have complete trust, or a great deal of trust, in journalists also rose between 2009 and 2012 (from four per cent to eight per cent), and has now fallen back to 2009 levels (three per cent).

[28] Figure 2.13 shows data from TrDoc, TrMed, TrJourn, TrSciUn, TrPriIn (press CTRL and click on question name to access data table).
[29] Comparisons with 2009 should be made with caution due to a change in question wording. In 2009, respondents were asked about scientists working for "drug or pharmaceutical companies", whereas in 2015 respondents were asked about scientists working for "pharmaceutical companies".

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The greatest change in trust is for medical research charities, for which the proportion expressing complete trust, or a great deal of trust, has fallen from a majority of the public (60 per cent) in both 2009 and 2012, to a minority (37 per cent) in 2015. The proportion saying they have very little trust, or no trust at all, in medical research charities has increased from five percent in both 2009 and 2012, to 11 per cent in 2015.

In interpreting this finding, it should be noted that there has been a rise in the proportion who say they "don't know" how much trust they place in medical research charities to provide accurate and reliable information about medical research. This proportion has more than quadrupled, from two per cent in both 2009 and 2012, to nine per cent in 2015.

Also of note is a questionnaire change that may have contributed to this fall in trust. Specifically, in 2009 and 2012 respondents were asked how much trust they had in medical research charities *immediately after* being asked how much trust they had in government departments and ministers. In 2015 however, trust in government departments and ministers was not asked; instead, respondents were asked how much trust they had in medical research charities *immediately after* being asked how much trust they had in doctors, nurses and other medical practitioners. This change may have produced a "context effect" (e.g. see Tourangeau et al., 2000) which reduced the likelihood that respondents answered that they trusted medical research charities, or increased the likelihood that they answered "don't know".

It is also possible that negative publicity about the charity sector during the fieldwork period affected respondents' trust in medical research charities.[30]

Trust by sub-group

Men are more trusting than women of doctors, nurses and other medical practitioners (71 per cent expressing complete trust, or a great deal of trust, compared with 58 per cent), and of journalists (five per cent, compared with two per cent). Younger adults are more trusting than older adults of medical research charities (45 per cent of those aged 18 to 34, falling to 28 per cent of those aged 65 or over), and scientists working in private industry (36 per cent of those aged 18 to 34, falling to 19 per cent among those aged 65 or over).

With respect to education, those with higher educational qualifications are more trusting of scientists working in universities (69 per cent of those with a postgraduate degree expressing complete trust, or a great deal of trust, falling to 47 per cent among those with no qualifications), and towards medical research charities (49 per cent among those with a postgraduate degree, falling to 26 per cent among those with no qualifications). However, this trend is reversed with respect to trust in scientists working for pharmaceutical companies: 29 per cent of those with a postgraduate degree, and 19 per cent of those with a first degree express complete trust, or a great deal of trust in scientists working for pharmaceutical companies, compared with 49 per cent among those with level 1 qualifications, and 33 per cent of those with no qualifications.

Social class is related to trust in scientists working for universities (63 per cent of those in managerial or professional occupations say they have complete trust, or a great deal of trust in

[30] For instance, the suicide of the poppy seller Olive Cooke in Bristol on 6 May 2015 led to a substantial media focus in the months that followed on charities' fundraising activities, and in July 2015, the financial problems, and related controversies, surrounding the Kids Company charity were widely reported, with the charity ultimately ceasing operations on 5 August 2015.

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scientists working for universities, falling to 45 per cent among those who have never worked or are long-term unemployed).

Those who are more knowledgeable about science (as measured by the knowledge quiz) are more trusting of three of the professions asked about: doctors, nurses and other medical practitioners (73 per cent among those with high scores express complete trust, or a great deal of trust, falling to 57 per cent among those with low scores), scientists working in universities (66 per cent among those with high scores, falling to 48 per cent among those with low scores), and medical research charities (47 per cent among those with high scores, falling to 29 per cent among those with low scores).

Trust in medical research charities: multivariate analysis

Many of the factors considered above which are associated with public trust in medical research charities to provide accurate and reliable information about medical research will be interlinked. For instance, those who have higher educational qualifications are more likely to score highly on the knowledge quiz.

For this reason, multivariate analysis was carried out in order to isolate the unique contribution of each of the identified factors with trust in medical research charities.[31] This analysis was carried out separately for both the 2009 and the 2015 surveys. The results of this analysis are presented in the Annex to this chapter (Figure 2.18).

Before turning to the results of this analysis, it is first worth considering, for both 2009 and 2015, which demographic factors bear a relationship with trust in medical research charities, regardless of the influence of other factors.

Age had a significant relationship with trust in medical research charities in both 2009 and 2015, with younger adults more likely to be trusting than older adults.

In both 2009 and 2015, trust in medical research charities was higher among the more highly educated, among those with greater knowledge of science (as measured by scores on the knowledge quiz), and among those with experience of working in a scientific or medical field.

A number of factors had no significant relationship with trust in medical research charities in either 2009 or 2015: gender, social class, experience of serious illness or disability, or having a serious genetic condition in one's family.

The multivariate analysis demonstrates that, in both 2009 and 2015, trust in medical research charities is more likely among those who know more about science (as measured by scores on the knowledge quiz), even when the influence of other factors is controlled for.[32] In addition, in 2009 trust was higher among those who had worked in a scientific or medical field, even when the influence of other factors is controlled for, and in 2015 trust was higher among younger adults, even when the influence of other factors is controlled for.

Additional analysis considered the 2009 and 2015 results together, to assess whether the nature of the relationships between sub-groups of the population, and trust in medical research charities, has changed between 2009 and 2015. For instance, the fact that trust in medical

[31] The multivariate analysis technique used was logistic regression.

[32] It should be noted that the knowledge quiz, while not a demographic variable like the others included in the model, was included as it provides a current measure of knowledge about science.

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research charities bore a significant relationship (after controlling for other factors) with age in 2015, but not in 2009, does not necessarily mean the relationship between age and trust in medical research charities has changed significantly over time.

This analysis did not find any significant changes in the nature of the relationships between sub-groups of the population, and trust in medical research charities, between 2009 and 2015.

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

2.6. Why do people trust certain professions?

Respondents who said they had complete trust, or a great deal of trust, in three of the professions asked about (doctors, nurses and other medical practitioners; scientists working in universities; and medical research charities) were asked why they trusted these individuals or organisations to provide accurate and reliable information about medical research (Figure 2.14[33]).

The most commonly cited reason is that the respective professionals are knowledgeable, or are experts. Fewer adults mention evaluation of the respective professionals' work. One in eight adults (12 per cent) say they trust doctors, nurses and medical practitioners because they have "no choice but to trust them", around twice the proportion that give this as a reason for trusting scientists working in universities (five per cent), or medical research charities (six per cent).

Figure 2.14 Reasons for trust in the provision of accurate and reliable information about medical research

Q. You said that you have complete trust/a great deal of trust in…to provide accurate and reliable information about medical research. Why do you say that? (open ended, interviewer code response to code frame)

Base: All respondents with "complete trust" or "a great deal of trust" in individual/organisation — *Wellcome Trust Monitor*

Mentioned by five per cent or more for one or more individual/organisation	**Doctors, nurses and other medical practitioners** (%)	**Scientists working in universities** (%)	**Medical research charities** (%)
They are knowledgeable/are experts	58	56	39
Just trust them/have always trusted them/no reason to doubt them	29	13	23
They are honest people	15	10	20
Their careers/reputations depend on them being correct/unbiased	12	15	15
Their work is evaluated by others	7	17	13
There is evidence/proof their work is effective†	-	12	11
Their work is regulated	9	10	10
No choice but to trust them	12	5	6
I am a trusting person/trust people in general	5	3	3
I/family member/friend is a medical practitioner/works for medical charity/is a scientist	6	5	2
Their work is evaluated by someone (unspecified) ‡	-	7	-
Don't know	1	1	2
Unweighted base:	*949*	*868*	*554*
Weighted base:	*979*	*902*	*569*

† *Not included in codeframe for Doctors, nurses and other medical practitioners*
‡ *Not included in codeframe for Scientists working in universities, or Medical research charities.*

[33] Figure 2.14 shows data from YesTrDoc, YesTrSciUn, YesTrMed (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

2.7. Why do people distrust certain professions?

Respondents who said they had very little trust, or no trust at all, in three of the professions asked about (journalists, scientists working in private industry, and scientists working for pharmaceutical companies) were asked why they don't trust these professions (Figure 2.15[34]).

Figure 2.15 Reasons for distrust in the provision of accurate and reliable information about medical research

Q. Why do you not have much trust in…to provide accurate and reliable information about medical research? (code all that apply)

Base: All respondents with "very little trust" or "no trust at all" in individual — *Wellcome Trust Monitor*

Mentioned by three per cent or more for one or more individual	**Journalists** (%)	**Scientists working in private industry** (%)	**Scientists working for pharmaceutical companies** (%)
They would try to present themselves in the most positive light	19	34	35
They would exaggerate information relating to medical research	49	39	32
They are generally corrupt, so I couldn't trust them to provide accurate information	30	18	26
They would not be honest about the findings of medical research	20	30	25
They are only interested in profits /making money†	-	6	12
They would not have access to all available information about medical research	18	6	4
They have too much vested interest /not independent /biased†	-	2	4
They don't have training or knowledge about medical research	26	3	3
Other reason	10	8	4
Don't know	2	10	6
Unweighted base:	*923*	*122*	*127*
Weighted base:	*906*	*124*	*121*

† Due to an error in the CAPI script, where respondents cited a reason for distrusting journalists that was not present on the showcard, their verbatim response was not recorded by the interviewer. As a result of this, it was not possible to allocate verbatim responses to this question into codes that were raised at the coding stage, and these codes remained in the "other reason" category.

The most common reason for distrusting journalists to provide accurate and reliable information about medical research is a belief that they would exaggerate information relating to medical research (cited by 49 per cent). This is followed by a belief that journalists are

[34] Figure 2.15 shows data from NoTrJourn, NoTrPrin (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

generally corrupt (30 per cent), and concerns that they do not have the relevant training or knowledge about medical research (26 per cent).

Among those distrusting scientists working in private industry, the primary reasons for this distrust are a belief they would exaggerate information relating to medical research (39 per cent), would try to present themselves in the most positive light (34 per cent), and would not be honest about the findings of medical research (30 per cent).

These reasons are also among the main ones for distrust in scientists working for pharmaceutical companies; 35 per cent feel that these scientists would try to present themselves in the most positive light, 32 per cent that they would exaggerate information relating to medical research, 26 per cent that they are generally corrupt, and 25 per cent that they would not be honest about the findings of medical research.

2.8. Optimism about medical research improving quality of life in the future

The great majority (94 per cent) of the public believe that medical research will definitely, or will probably, lead to an improvement in the quality of life for people in the UK in the next 20 years, consistent with public sentiment in 2009 and 2012 (92 per cent on each occasion) (Figure 2.16[35]). The proportion that believe medical research will definitely lead to an improvement in quality of life, however, has increased across the three waves of the Monitor, from a minority of 41 per cent in 2009, to a majority of 58 per cent in 2015.

Optimism about the future of medical research is equivalent between men and women, across age groups, across levels of educational qualifications, and across social classes. Those who are more knowledgeable about science (as measured by the knowledge quiz) are more likely to be optimistic, with 97 per cent of those scoring highly expecting an improvement, compared with 91 per cent of those with low scores.

Figure 2.16 Optimism about medical research

Q. Please say whether you think medical research will or will not lead to an improvement in the quality of life for people in the United Kingdom in the next 20 years? Is that definitely or probably?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w1 (2009) (%)	**Monitor w2 (2012)** (%)	**Monitor w3 (2015)** (%)
Definitely will lead to an improvement	41	51	58
Probably will lead to an improvement	51	41	36
Probably will not lead to an improvement	6	4	3
Definitely will not lead to an improvement	1	1	1
Don't know	1	4	2
% Will lead to an improvement (definitely or probably)	*92*	*92*	*94*
Unweighted base:	*1,179*	*1,396*	*1,524*
Weighted base:	*1,179*	*1,396*	*1,524*

[35] Figure 2.16 shows data from MrImprov (press CTRL and click on question name to access data table).

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2.9. Annex: Multivariate analysis tables

Figure 2.17 Interest in medical research, logistic regression

Base: All respondents *Wellcome Trust Monitor*

	Logit	Std. error	Odds ratio
Gender (Male) **			
Female	0.52	0.16	1.63
Age (18-34) **			
35-59	0.53	0.21	1.71
50-64	1.27	0.26	3.57
65+	1.20	0.27	3.32
Age missing/refused	-0.21	0.82	0.81
NS-SEC (Managerial and professional occupations)			
Intermediate occupations	-0.06	0.22	0.95
Routine and manual occupations	-0.04	0.21	0.96
Never worked and long-term unemployed	-0.82	0.35	0.44
NS-SEC missing/refused	0.09	0.39	1.09
Highest educational qualification (Postgraduate degree) **			
First degree	-0.04	0.33	0.96
Higher education below degree	0.23	0.38	1.26
A levels	-0.09	0.35	0.92
GCSEs/O levels	-0.28	0.31	0.76
Level 1 qualifications	0.45	0.46	1.58
No qualifications	-0.85	0.34	0.43
Highest educational qualification missing/refused	0.50	0.98	1.65
Science-related qualifications (University/college)			
School	-0.24	0.24	0.79
No science-related qualifications	-0.46	0.24	0.63
Science-related qualifications missing/refused	-0.78	0.75	0.46
Score on knowledge quiz (High) **			
Medium	-0.51	0.20	0.60
Low	-0.85	0.25	0.43
Worked in a scientific or medical field (Yes)			
No	-0.53	0.32	0.59
Employment in science missing/refused	-1.08	1.02	0.34
Area deprivation (first quartile, least deprived)[36]			
Second quartile	0.10	0.25	1.11
Third quartile	-0.24	0.27	0.79
Fourth quartile (most deprived)	-0.14	0.27	0.87

Table continued overleaf

[36] Respondents were assigned, based on their postcode, into deprivation quartiles using the most recently available Index of Multiple Deprivation statistics (IMD England 2015, IMD Wales 2014, IMD Scotland 2012, IMD NI 2010). The Index of Multiple Deprivation is the official measure of relative deprivation for areas across the country, and combines data from seven separate domains, including income deprivation, employment deprivation, and, education, skills and training deprivation. For more information, see www.gov.uk/government/statistics/english-indices-of-deprivation-2015

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Figure 2.17 (continued) Interest in medical research, logistic regression

Base: All respondents *Wellcome Trust Monitor*

	Logit	Std. error	Odds ratio
Disability (No one)			
Yes, respondent or close friend or family member	0.28	0.14	1.33
Disability missing/refused	0.78	0.87	2.19
Serious genetic condition in family (No)			
Yes	0.35	0.23	1.42
Serious genetic condition in family missing/refused	-1.26	0.47	0.29

Notes:
1. Dependent variable is Interest. Very or fairly interested in medical research=1, else 0. Reference category=0.
*2. For each independent variable, * indicates a significant relationship at the 95% level, and ** at the 99% level. Specifically, the asterisks relate to the two-tailed p-values associated with the Wald Chi square values (with corresponding degrees of freedom) testing the null hypothesis that the coefficient is equal to zero; i.e., that there is zero variation in interest across the different categories of the independent variable. For example, for age the p-value is <0.01, which implies that interest in medical research varies by age when other variables in the model are held constant. The odds ratios can then be used to assess the direction of the relationship.*
3. Odds ratio>1 indicates higher odds of being interested in medical research, and odds ratio<1 indicates lower odds, compared to the reference category (in bold and brackets).

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Figure 2.18 Trust in medical research charities, logistic regression

Base: All respondents *Wellcome Trust Monitor*

	Monitor w1 (2009)			Monitor w3 (2015)		
	Logit	**Std. error**	**Odds ratio**	**Logit**	**Std. error**	**Odds ratio**
Gender (Male)						
Female	0.16	0.16	1.18	-0.09	0.13	0.09
Age (18-34) w3 *						
35-59	-0.05	0.20	0.95	-0.27	0.16	0.76
50-64	-0.06	0.19	0.94	-0.44	0.17	0.65
65+	-0.52	0.22	0.59	-0.63	0.20	0.53
Age missing/refused	n/a	n/a	n/a	-1.11	0.74	0.33
NS-SEC (Managerial and professional occupations)						
Intermediate occupations	0.03	0.18	1.03	0.43	0.19	1.54
Routine and manual occupations	0.01	0.17	0.99	0.21	0.18	1.24
Never worked/long-term unemployed/missing	0.29	0.29	1.33	0.16	0.24	1.17
Highest educational qualification (Postgrad. degree)						
First degree	-0.66	0.41	0.52	-0.29	0.19	0.75
Higher education below degree	-0.68	0.40	0.51	-0.33	0.23	0.72
A levels	-0.62	0.37	0.54	-0.35	0.20	0.70
GCSEs/O levels	-0.22	0.39	0.81	-0.57	0.24	0.57
w1: CSE or equivalent /w3: Level 1 qualifications	-0.41	0.40	0.67	-0.56	0.33	0.57
No qualifications	-0.56	0.37	0.57	-0.68	0.25	0.51
Highest educational qualification missing/refused	-0.94	0.80	0.39	-1.17	0.89	0.31
Score on knowledge quiz (High) w1 & w3 **						
Medium	-0.41	0.17	0.66	-0.47	0.14	0.69
Low	-0.81	0.22	0.44	-0.37	0.19	0.62
Worked in a scientific or medical field (Yes) w1 **						
No	-0.48	0.22	0.62	-0.32	0.17	0.73
Employment in science missing/refused†	n/a	n/a	n/a	-20.50	0.95	<0.01
Disability (No one)						
Yes, respondent or close friend or family member	0.05	0.13	1.05	-0.02	0.14	0.98
Disability missing/refused	-0.19	1.14	0.09	0.22	1.00	1.25
Serious genetic condition in family (No)						
Yes	0.07	0.19	1.07	0.06	0.20	1.06
Serious genetic condition in family missing/refused†	-21.32	1.02	<0.01	-0.96	0.71	0.38

Notes:
1. Dependent variable is Interest. Very or fairly interested in medical research=1, else 0. Reference category=0.
*2. For each independent variable, * indicates a significant relationship at the 95% level, and ** at the 99% level. Specifically, the asterisks relate to the two-tailed p-values associated with the Wald Chi square values (with corresponding degrees of freedom) testing the null hypothesis that the coefficient is equal to zero; i.e., that there is zero variation in interest across the different categories of the independent variable. For example, for age the p-value is <0.01, which implies that interest in medical research varies by age when other variables in the model are held constant. The odds ratios can then be used to assess the direction of the relationship.*
3. Odds ratio>1 indicates higher odds of being interested in medical research, and odds ratio<1 indicates lower odds, compared to the reference category (in bold and brackets).
† The significance of these relationship is not commented upon as they rest on very low base sizes.

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3. The value of science in everyday life

This chapter considers the value the public place on science in everyday life. The chapter starts by exploring how useful people think an understanding of science is in their own everyday lives, and in the lives of people in general. We then turn to how well people feel they understand stories relating to science that they see or hear in the news, and their confidence in discussing these stories with others. We then consider the confidence people have in making informed decisions about their health. The chapter concludes by examining how many people are employed in scientific or medical fields, and why those working in these fields chose to do so.

Key findings:

- Most of the public (66 per cent) think their understanding of science is useful in their everyday lives, but a higher proportion (87 per cent) believe it is useful for others – people in general – to have an understanding of science in their everyday lives.
- Around two in five (39 per cent) of the public say they usually understand stories about science in the news, and a further half (50 per cent) say they sometimes understand them. Only 13 per cent of those who say they usually, or sometimes, understand these stories say they feel very confident discussing them with others.
- Nine in ten (90 per cent) of the public feel confident in making informed decisions about their health, and almost half (48 per cent) feel confident challenging the conclusions of a medical professional.
- Over one in five (22 per cent) of the public live in a household where they, or another household member, has worked in a scientific or medical field.
- Around three in five (61 per cent) of those who have worked in a scientific or medical field said they did so because they were interested in the field, or enjoyed the role.
- Most of the public (62 per cent) say that when they were growing up, their parents were not interested in science. Those whose parents were interested in science are twice as likely to have worked in science or medicine themselves, and are more than twice as likely to have gained a science-related qualification from university or college, as those whose parents were not interested in science.
- Twelve per cent of the public say that one or both of their parents have worked in a scientific or medical field. Those with a parent who has worked in a scientific or medical field are twice as likely to have themselves worked in a scientific or medical field as those whose parents have not worked in these areas.

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3.1. How useful is an understanding of science in everyday life?

While the majority of the public (66 per cent) say that their understanding of science is useful in their everyday lives, a greater proportion (87 per cent) say that it is useful for others - *people in general* - to have an understanding of science in their everyday lives (Figure 3.1[37]).

There is evidence that the importance the public place on knowing about science has increased in recent years. The Public Attitudes to Science study (BIS, 2014) measured public agreement with the statement "it is important to know about science in my daily life". Almost three-quarters (72 per cent) agreed with this statement in 2014, compared with 62 per cent in 2008, and 50 per cent in 1996.

Figure 3.1 How useful is an understanding science in everyday life

Q. How useful, if at all, would you say…
…your understanding of science is in your everyday life?
…it is for people in general to have an understanding of science in their everyday life?

Base: All respondents — *Wellcome Trust Monitor*

	Your everyday life (%)	**People's lives in general** (%)
Very useful	19	33
Fairly useful	47	55
Not very useful	24	10
Not at all useful	4	2
I don't know enough about science for it to be useful	5	-
Don't know	1	1
% Useful (very or fairly)	*66*	*87*
Unweighted base:	*1,524*	*1,524*
Weighted base:	*1,524*	*1,524*

Men are more likely than women to believe their understanding of science is useful in their everyday life (71 per cent, compared with 61 per cent). There is no significant difference by age.

Turning to how useful the public think it is for *people in general* to have an understanding of science in their everyday life, while there is no significant variation by gender, those aged 35 to 49 are most likely to think this is useful (91 per cent), and those aged 65 or over least likely (83 per cent).

[37] Figure 3.1 shows data from SciDaily and SciDaily2 (press CTRL and click on question name to access data table).

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3.2. How well do people understand stories about science in the news?

Two in five (39 per cent) of the public say they usually understanding what is being talked about when they see or hear stories about science in the news, with a further 50 per cent saying they sometimes understand what is being talked about (Figure 3.2[38]). One in ten (10 per cent) say they usually do not understand what is being talked about.

Figure 3.2 Understanding of stories about science in the news

Q. Thinking of the stories about science you see or hear in the news, which of the statements on this card would you say best describes you?

Base: All respondents	*Wellcome Trust Monitor*
	Monitor w3 (2015)
	(%)
I usually understand what they are talking about	39
I sometimes understand what they are talking about	50
I usually do not understand what they are talking about	10
(Spontaneous) I don't see or hear science news stories	1
Don't know	*
% Understand (usually or sometimes)	*89*
Unweighted base:	*1,524*
Weighted base:	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

Men are more likely than women to claim that they usually understand what is being talked about (45 per cent, compared with 32 per cent). Those in the middle of the age range (aged 35 to 64) are most likely to claim they usually understand what is being talked about (44 per cent, compared with 35 per cent of those aged 18 to 34, and 33 per cent of those aged 65 or over).

[38] Figure 3.2 shows data from SciUnd (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Respondents who said they usually, or sometimes, understand stories about science they see or hear in the news were asked how confident they feel in discussing these news stories with other people. Seven in ten (70 per cent) say they feel confident discussing such stories with other people; however, just 13 per cent say they feel very confident, with the majority (56 per cent) saying they feel fairly confident (Figure 3.3[39]).

Figure 3.3 Confidence in discussing stories about science with other people

Q. And in general, how confident would you say you feel discussing these news stories about science with other people?

Base: Respondents who say they usually or sometimes understand science stories in the news — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Very confident	13
Fairly confident	56
Not very confident	27
Not at all confident	3
Don't know	*
% Confident (very or fairly)	*70*
Unweighted base:	*1,337*
Weighted base:	*1,354*

** indicates a percentage less than 0.5%, but greater than 0.*

Men are more likely than women to express confidence in discussing stories about science with other people (75 per cent, compared with 65 per cent). There is no significant variation in confidence by age group.

[39] Figure 3.3 shows data from SciConf (press CTRL and click on question name to access data table).

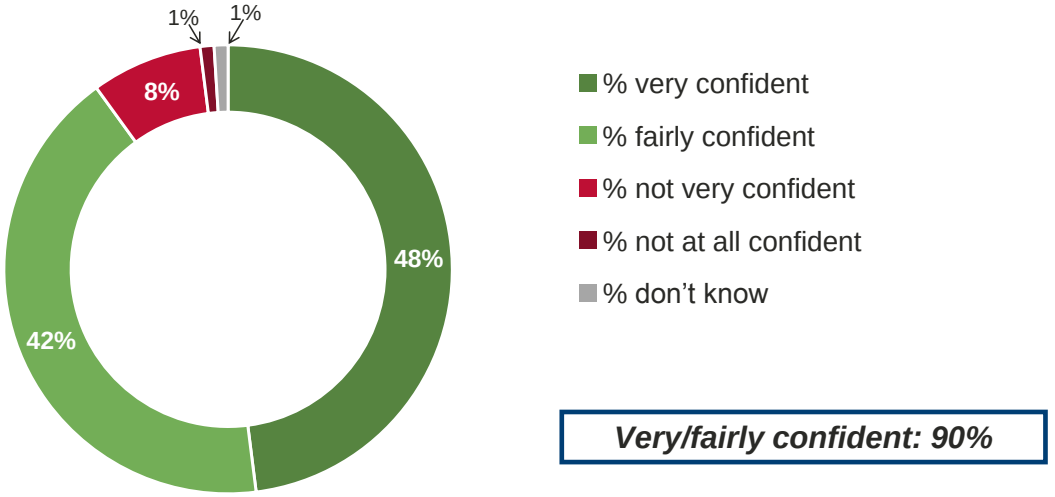
http://dx.doi.org/10.6084/m9.figshare.3145744

3.3. How confident are people when making decisions about their health?

The great majority of the public (90 per cent) feel confident in making informed decisions about their health (such as deciding whether to have a flu jab, or whether to make a doctor's appointment when they are feeling unwell), with half (48 per cent) saying they feel very confident (Figure 3.4[40]).

Figure 3.4: Confidence in making informed decisions about health

Q. How confident, if at all, would you say you are making informed decisions about your health, for example whether to have a flu jab, or whether to make a doctor's appointment when you are feeling unwell?



Ipsos MORI
Social Research Institute

Base: 1,524 UK adults aged 18+
Fieldwork dates: 2 June – 1 November 2015

wellcome trust

While confidence in making informed health-related decisions is high across the population, there are some differences by sub-group. Women are significantly more likely than men to feel confident in making informed decisions about their health, however this difference is small (93 per cent, compared with 88 per cent). There are no significant differences in confidence levels by age.

By social class, those in managerial and professional occupations are most likely to feel confident (93 per cent, falling to 79 per cent among those who have never worked or are long-term unemployed).

With respect to qualifications in science, 96 per cent of those with a science-related qualification from university or college express confidence, falling to 87 per cent among those with no science-related qualifications. Reflecting this pattern, among those who score highly on the knowledge quiz, 93 per cent say they feel confident. This falls to 84 per cent among those with low scores.

To examine the extent to which confidence in making health-related decisions may be linked to the medical and scientific expertise within one's personal and professional networks,

[40] Figure 3.4 shows data from ConfHlth (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

respondents were asked if they knew anyone with a job in a medical field whom they feel able to talk to, or ask for advice about scientific or medical issues. They were also asked whether they know anyone with a job in another scientific field whom they feel able to talk to, or ask for advice about scientific or medical issues.

Among those who know someone with a job in a medical field, 93 per cent express confidence in making informed decisions relating to their health, higher than the 88 per cent among those who say they do not know such a person. And among those who know someone with a job in another scientific field, 96 per cent express confidence, higher than the 87 per cent among those who do not know such a person.

Confidence in challenging the conclusions of medical professionals

The Wellcome Trust is interested in the extent to which the public tend to defer to medical professionals without question, or alternatively, are confident challenging and questioning medical professionals if they do not feel the advice they are receiving is correct.

Respondents were read the following scenario, and were asked to say how much the person described in the vignette was like them:

When he[41] sees a medical professional, he likes to ask questions to make sure the medical professional hasn't made a mistake or missed something, and feels confident querying or challenging the medical professional's conclusions.

Half of the public (48 per cent) say the person described is like them, including just over one-quarter (28 per cent) who say the person described is very much like them (Figure 3.5[42]). Only 15 per cent say the person described is not at all like them.

Figure 3.5 Confidence in challenging a medical professional's conclusions

Q. I am now going to read you a brief description of somebody, and I would like you to tell me how much this person is, or is not, like you… How much is this person like you?

Base: All respondents — *Wellcome Trust Monitor*

Similarity to the person described	**Monitor w3 (2015)** (%)
Very much like me	28
Like me	20
Somewhat like me	23
A little like me	13
Not at all like me	15
(spontaneous) Can't say/it depends	1
Don't know	*
% Very much like me/like me	*48*
Unweighted base:	*1,524*
Weighted base:	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

[41] For female respondents, "she" was substituted in place of "he".
[42] Figure 3.5 shows data from GPChallenge (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Men and women are equally likely to say the person described is like them, or very much like them, and there are no significant differences by age group.

Those who say they know someone working in a medical field are more likely to feel that the person described is like them, or very much like them (54 per cent, compared with 42 per cent among those who do not know such a person). Similarly, those who say they know someone working in another scientific field are more likely to say the person described is like them, or very much like them (57 per cent, compared with 43 per cent among those who do not know such a person).

Confidence in challenging a medical professional's conclusions is higher among those with higher educational qualifications, and among those who are more knowledgeable about science. Among those with a postgraduate degree, the majority (63 per cent) feel the person described is like them, or very much like them, falling to half (49 per cent) among those with GCSEs or O levels, and to a minority (36 per cent) among those with no qualifications. With respect to qualifications in science specifically, those with a science-related qualification from university or college are more likely to feel the person described is like them, or very much like them (58 per cent) than those with science-related qualifications from school (45 per cent), or with no science-related qualifications at all (also 45 per cent). And with respect to scientific knowledge, as defined by answers to the knowledge quiz, over half (56 per cent) of those with high scores feel the description is like them, or very much like them, falling to two in five (40 per cent) among those with low scores.

By social class, those working in managerial or professional occupations are most confident in challenging the conclusions of medical professionals, with 54 per cent feeling the description is like them, or very much like them, compared with 42 per cent among those who have never worked or are long-term unemployed.

http://dx.doi.org/10.6084/m9.figshare.3145744

3.4. How many people work in a scientific or medical field?

One in five (22 per cent) of the public live in a household in which they, or someone else, works or has previously worked in a scientific or medical field (Figure 3.6[43]). Fourteen per cent of adults say that they themselves work or have worked in a scientific or medical field.[44]

Figure 3.6 Households with experience of jobs in a scientific or medical field

Q. Have you or any of the other adults in your household ever had a job in a scientific or medical field?

Base: All respondents	*Wellcome Trust Monitor*
	Monitor w3 (2015) (%)
Yes, respondent only	12
Yes, respondent and someone else in household	2
Yes, someone else in household only	7
Nobody in the household	78
Don't know	*
% Someone in the household	*22*
Unweighted base:	*1,524*
Weighted base:	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

Reflecting the fact that many jobs in scientific and medical fields are professional in nature, those in managerial or professional occupations are most likely to say they or someone else in their household has had a job in such a field (32 per cent), falling to 13 per cent among those in routine or manual occupations, and a similar proportion among those who have never worked or are long-term unemployed (12 per cent).

[43] Figure 3.6 shows data from SciJB (press CTRL and click on question name to access data table).
[44] It should be noted that the definition of a "job in a scientific or medical field" was left to respondents, and as such may have been liberally interpreted.

http://dx.doi.org/10.6084/m9.figshare.3145744

When asked why they pursued a job in a scientific or medical field, most (61 per cent) say they enjoy the role or are interested in the area (Figure 3.7[45]). One in five (21 per cent) cite good career prospects, and a similar proportion (18 per cent) refer to the chance to make a difference. Reasons such as pay, parental encouragement, or the influence of other family members are mentioned less frequently.

Figure 3.7 Why respondent pursued job in a scientific or medical field

Q. Why did you pursue a job in a scientific or medical field? (code all that apply)

Base: Respondents who have worked in a scientific or medical field — *Wellcome Trust Monitor*

Mentioned by three per cent or more	**Monitor w3 (2015)** (%)
Enjoy the role/interest in the area	61
Good career prospects	21
Chance to make a difference	18
Was good at science at school	14
By chance/fell into it	12
Well paid	9
Parents' encouragement	6
Had a good teacher	6
Other family member in science or medical role	6
Parents in science or medical role	3
Encouraged by famous people in science	3
Encouraged by science programmes on TV	3
Unweighted base:	*222*
Weighted base:	*218*

There are no significant differences in the proportion giving the three most frequently provided responses (enjoyment of the role and interest in the area, good career prospects, and the chance to make a difference) by either gender or age. However, men are far more likely than women to cite being good at science at school as a reason (26 per cent compared with five per cent). Mentions of this reason do not vary by age group.

3.5. Social and family networks

Parental employment in scientific or medical fields

Twelve per cent of the public say that one or both of their parents have had a job in a scientific or medical field (10 per cent say just one of their parents has, and a further two per cent say both of their parents have)[46].

Older adults are less likely than younger adults to say their parents have worked in a scientific or medical field (seven per cent of those aged 65 or over, compared with 17 per cent of those aged 18 to 34). This is likely to reflect the changing nature of the economy over the past fifty

[45] Figure 3.7 shows data from YesSciJB (press CTRL and click on question name to access data table).
[46] Data are from PScJB (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

years or so. For instance, Census data published by the Office for National Statistics (2013) shows that the proportion of the workforce in England and Wales employed in the service industry (which includes health, scientific, and technical activities) has increased from just under half in 1961, to around four in five in 2011, while over this period the proportion working in manufacturing has fallen from around two in five, to just under one in ten.

Twenty-three per cent of those who have had a scientific or medical job themselves are children of parents who have had such a job, over twice the proportion among those who have never had a scientific or medical job (10 per cent). Considering this pattern from the parents' perspective, among those with a parent who has worked in science or medicine, 28 per cent have worked in science or medicine themselves, while among adults whose parents have never worked in science or medicine, only 13 per cent have worked in science or medicine themselves.

A similar relationship is evident with respect to qualifications in science. Among those with a science-related qualification from university or college, 23 per cent have a parent who has worked in science or medicine, while among those with no science-related qualifications, this falls to just five per cent. And from the perspective of parents, among adults with a parent who has worked in science or medicine, almost half (48 per cent) have gained a science-related qualification from university or college, over twice the proportion among those whose parents have never worked in science or medicine (21 per cent).

Parental interest in science

Most of the public (62 per cent) say that when they were growing up, their parents were not interested in science, almost double the proportion (32 per cent) who say their parents were interested in science (Figure 3.8[47]).

Figure 3.8 Parental interest in science

Q. How interested in science were your parents when you were growing up?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Very interested	9
Fairly interested	23
Not very interested	30
Not at all interested	32
(Spontaneous) It varies/varied by science subject	*
Don't know	5
% Interested (very or fairly)	*32*
Unweighted base:	*1,524*
Weighted base:	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

Those whose parents were interested in science while they were growing up are twice as likely to have worked in science or medicine themselves as those whose parents were not

[47] Figure 3.8 shows data from SciIntP (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

interested in science (22 per cent, compared with 11 per cent). In addition, those whose parents were interested in science while they were growing up are more than twice as likely to have gained a science-related qualification from university or college as those whose parents were not interested in science (41 per cent, compared with 17 per cent).

These data illustrate a strong relationship between adults' employment in science and the science-related experiences of their parents, and are consistent with separate research by Archer et al. (2013) which found that among children aged 10 to 14, parental attitudes to science is one of the factors most strongly related to a child's likelihood of aspiring to be a scientist.

However, these data from the Monitor do not establish a causal relationship, and it should be noted that other socio-demographic factors are likely to influence the likelihood that an individual gains employment in a scientific or medical field. Only six per cent of those who have worked in a scientific or medical field explicitly mention parental encouragement as a motivating factor, and only three per cent explicitly mention having a parent who worked in science or medicine as a motivating factor (see Figure 3.7). Furthermore, it is possible that some respondents' reports of how interested their parents were when they were growing up are inaccurate, whether by problems with recall, or due to their own interest in science biasing their responses.

http://dx.doi.org/10.6084/m9.figshare.3145744

4. Cultural and informal science experiences

This chapter focuses on people's visits to science museums, and other science-related and cultural experiences and attractions. The chapter also examines how visiting such attractions varies according to individual characteristics and group memberships.

Key findings:

- One in five (20 per cent) of the public has visited a science museum or science centre in the last 12 months, and seven in ten (71 per cent) say that they have visited a science museum or science centre at some point in their life.
- Younger adults are more likely than older adults to have visited a science museum or science centre in the past 12 months (27 per cent of those aged 18 to 34 and 28 per cent of those aged 35 to 49, falling to just seven per cent of those aged 65 or over).
- By socio-economic group, those in managerial and professional occupations are most likely to have visited a science museum or science centre in the past 12 months (29 per cent, compared with 10 per cent among those in routine and manual occupations, and 10 per cent also among those who have never worked or are long-term unemployed).
- By contrast, one-third (33 per cent) of the public have visited a history museum in the last 12 months, and 30 per cent have visited an art gallery.
- Almost all (96 per cent) those visiting a science museum or science centre in the last 12 months found the experience interesting.
- The majority of the public (57 per cent) have watched a film or television programme involving science or medical research in the last 12 months, and around one in five (19 per cent) have listened to a radio programme involving science or medical research.
- Overall, 51 per cent of the public have made a visit to a science-related attraction or event in the past twelve months.

4.1. How often do people visit science museums or centres?

One in five of the public (20 per cent) has made at least one visit to a science museum or science centre in the past 12 months (Figure 4.1[48]). Half (52 per cent) say they have not made such a visit in the past 12 months, and 29 per cent say they have never visited a science museum or centre.

[48] Figure 4.1 shows data from SciCent (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 4.1 Frequency of visits to a science museum or science centre in past 12 months

Q. In the last 12 months, how often, if at all, have you visited a science museum or science centre?

Base: All respondents *Wellcome Trust Monitor*

	Monitor w1 (2009) (%)	Monitor w2 (2012) (%)	Monitor w3 (2015) (%)
Once a month or more	1	2	2
Several times in the past 12 months	10	5	6
Once in the past 12 months	20	19	12
Not in the past 12 months†	68	74	52
Never visited science museum or science centre†	-	-	29
Can't remember	0	*	*
% Once or more in past 12 months	*32*	*26*	*20*
Unweighted base:	*1,179*	*1,396*	*1,524*
Weighted base:	*1,179*	*1,396*	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

† in 2009 and 2012 the response codes were 'Once a month or more', 'Several times in the past 12 months', 'Once in the past 12 months', and 'Never'. In 2015, the response code 'Never' was replaced with 'Not in the past 12 months' and 'I have never visited science museum or science centre'.

Since 2009, there has been a fall in the proportion of the public making at least one annual visit to a science museum or centre. This proportion has fallen from 32 per cent in 2009, to 26 per cent in 2012, and to 20 per cent in 2015. However, comparisons between 2015 and earlier years should be made with caution due to a change to the response codes. The 2009 and 2012 questionnaires included the code "Never [in the past 12 months]", which in 2015 was separated into two codes: "Not in the past 12 months" and "I have never visited a science museum or science centre". It is possible (although the data cannot address this directly) that the inclusion in 2015 of an explicit code for never having visited a science museum or centre led respondents to feel more comfortable saying they had not made such a visit in the past 12 months, reducing a tendency to over-report visits that may have been evident in previous waves.

Younger adults are more likely to have visited a science museum or centre in the past 12 months (27 per cent of those aged 18 to 49, compared with 11 per cent of those aged 50 or over). Those living in households with children (aged 18 or below) are also more likely to have visited (28 per cent, compared with 16 per cent among those living in households with no children). Frequency of visits does not vary by gender.

Visiting science museums or centres is strongly related to educational qualifications. Two in five (42 per cent) of those with a postgraduate degree, and one-third (34 per cent) of those with a first degree have visited a science museum or centre in the past 12 months. This falls to just five per cent among those with no qualifications. Among those who have a science-related qualification from university or college one-third (34 per cent) have visited a science museum or centre in the past 12 months. This falls to 19 per cent among those with a science-related qualification from school, and to 11 per cent among those with no science-related qualifications.

By social class, those in managerial and professional occupations are most likely to have made at least one visit to a science museum or centre in the past 12 months (29 per cent, compared with 10 per cent for those in routine and manual occupations, and 10 per cent

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

among those who have never worked or are long-term unemployed). Similarly, those with higher annual household incomes are more likely to have visited a science museum or centre in the past 12 months (30 per cent of those with a (pre-tax) household income of £50,000 or more and 26 per cent of those with an income between £29,000 and £49,999, falling to 15 per cent among those with an income between £10,000 and £19,999, and 13 per cent among those with an income below £10,000). Separate qualitative research by Dawson (2014) finds that those from low-income, minority ethnic backgrounds can experience science museums and centres as unwelcoming places, and that infrequent visits among these groups are not merely attributable to issues of affordability.

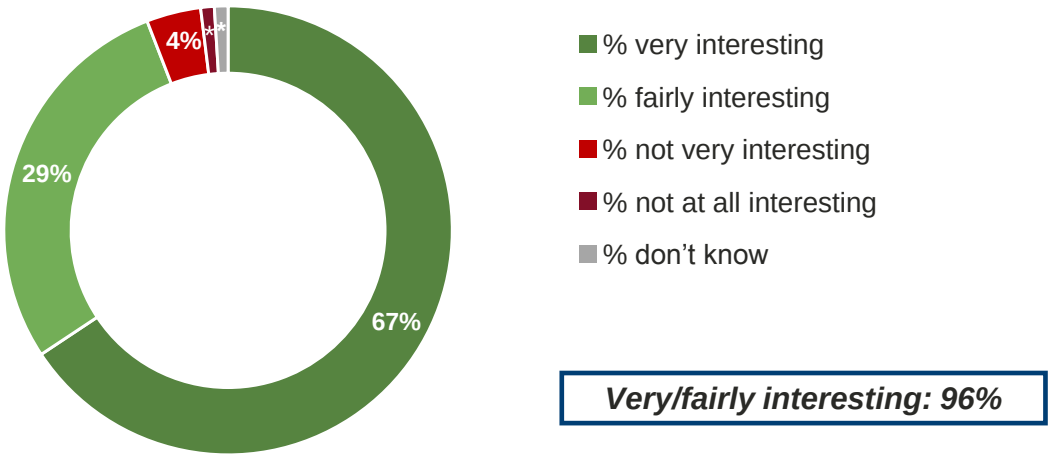
Those who themselves have a serious long-term illness or medical condition (regardless of whether their friends or family have such a condition) are less likely to have visited a science museum or centre in the past 12 months than those without a serious long-term illness or medical condition (12 per cent, compared with 22 per cent).

4.2. How interesting do people find science museums or centres?

Almost all those who have visited a science museum or centre in the past 12 months say they found their most recent visit interesting (96 per cent). Two-thirds (67 per cent) found the visit very interesting, and three in ten (29 per cent) found it fairly interesting (Figure 4.2[49]).

Figure 4.2: Interest in science museums or centres

Q. And thinking of the last time you visited a science museum or science centre, how interesting did you find it?



** indicates a percentage less than 0.5%, but greater than 0.*

Ipsos MORI Social Research Institute

Base: All who visited a science museum or centre in the last 12 months (277)
Fieldwork dates: 2 June – 1 November 2015

wellcome trust

Men and women are equally likely to have found their most recent visit interesting, and interest levels are also similar across age groups.

[49] Figure 4.2 shows data from SciCentInt (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

4.3. Science-related attractions and experiences

Respondents were asked whether they had visited a range of science-related attractions in the last 12 months, or whether they had listened to or watched a science-related programme across a range of media (Figure 4.3[50]).

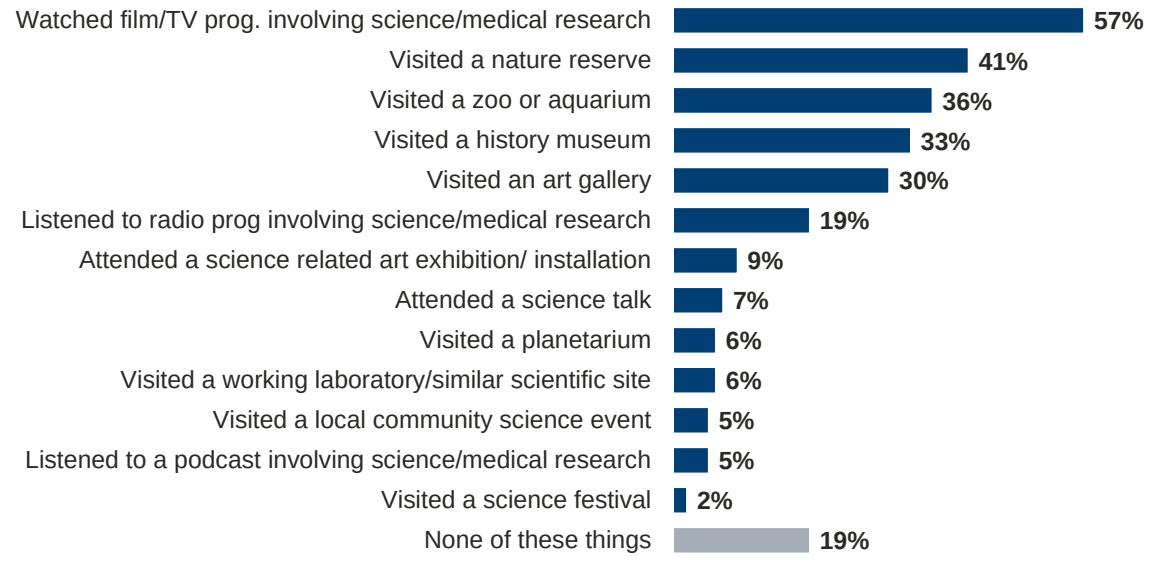
Of the attractions and programmes asked about, the public are most likely to have watched a film or television programme involving science or medical research (57 per cent), followed by visiting a nature reserve (41 per cent), and visiting a zoo or aquarium (36 per cent).

Respondents were also asked for their experiences of two cultural attractions – whether they had visited a history museum, or an art gallery, in the last 12 months. One-third (33 per cent) of the public have visited a history museum, and 30 per cent have visited an art gallery in the last 12 months; both these proportions are higher than the proportion of the public that have visited a science museum or centre in the last 12 months (20 per cent).

One in five (19 per cent) said they had not done any of the things listed in the last 12 months.

Figure 4.3: Science-related attractions and experiences

Q. In the last 12 months, which, if any of the following things have you done?



Ipsos MORI Social Research Institute

Base: 1,524 UK adults aged 18+
Fieldwork dates: 2 June – 1 November 2015

wellcome trust

We defined those making a "science-related visit" as those who had visited one or more of the following in the last 12 months: a science museum or science centre, a science-related art exhibition or installation, a zoo or aquarium, a planetarium, a working laboratory or similar scientific site, a local community science event, a science festival, or a science talk.

By this yardstick, half (51 per cent) have made a science-related visit in the past 12 months. Younger adults are more likely to have made a science-related visit, with two-thirds (65 per

[50] Figure 4.3 shows data from SciVisit (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

cent) of those aged 18 to 49 having made such a visit, falling to a minority of 36 per cent among those aged 50 and over. There is no difference by gender.

Making a science-related visit is strongly related to qualification levels. Seven in ten (72 per cent) of those with a postgraduate degree, and 69 per cent of those with a first degree have made a science-related visit in the past 12 months. This falls to less than half (47 per cent) of those with GCSEs or O levels, and to one-quarter (25 per cent) among those with no qualifications. With respect to science-related qualifications, 69 per cent of those with a science-related qualification gained from university or college have made a science-related visit, compared with 37 per cent among those with no science-related qualifications.

Three in five (60 per cent) of those in managerial and professional occupations have made a science-related visit in the last 12 months. This falls to 42 per cent among those in routine and manual occupations, and to 37 per cent among those who have never worked or are long-term unemployed.

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5. Public interest in hearing from scientists

The Wellcome Trust is committed to encouraging people of all ages, and from all walks of life, to be informed about, inspired by, and involved in science. In this chapter, we consider the extent to which the public are interested in hearing directly from scientists about the work they are conducting. We also examine the nature of that interest: what do people want to know about, and how should this be communicated?

Key findings:

- The majority (63 per cent) of the public say they are interested in hearing directly from scientists about the research they are conducting.
- Almost three-quarters (73 per cent) of those interested in hearing directly from scientists want to hear about the current or latest findings from scientific research, and almost three in five (57 per cent) want to hear about scientific research that is relevant to their lives.
- Those interested in hearing directly from scientists would prefer to do so via the television, the radio or from a podcast (73 per cent), or from a newspaper, magazine, book, blog or website (65 per cent). These preferences coincide with the channels via which the public tend to come across information about medical research (as reported in Chapter 2), the most common of which are television, websites, and newspapers.
- Other preferred channels for hearing directly from scientists include listening to a lecture, talk or debate (31 per cent), and from a museum or exhibition (23 per cent).
- Younger adults are more likely than older adults to express a preference for online channels of communications, as well as those channels which involve making a visit outside the home, or actually interacting with a scientist.

5.1 Interest in hearing directly from scientists about their research

Respondents were asked to what extent, if at all, they were interested in hearing directly from scientists about the research they are conducting. It was explained that this could include anything from talking with scientists, to reading a newspaper article written by a scientist.

The majority of the public (63 per cent) say they are interested in hearing directly from scientists about the research they are conducting, with one in five (18 per cent) saying they are very interested (Figure 5.1[51]). Around one-third (36 per cent) of the public say they are not very interested, or are not at all interested in hearing directly from scientists.

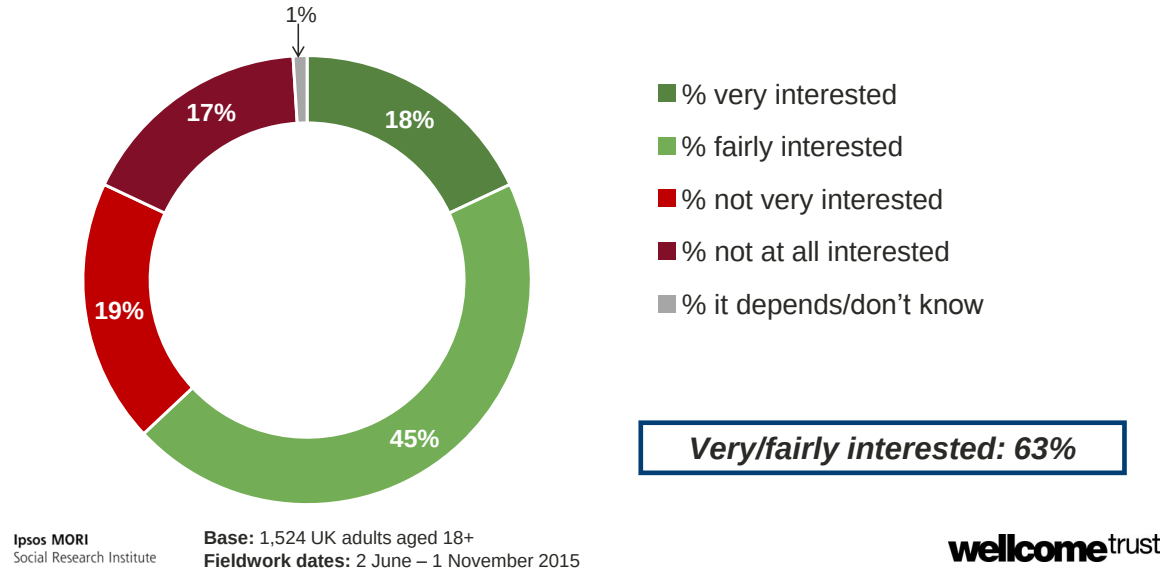
A small proportion (one per cent) are unable to say whether they would be interested in hearing directly from scientists or not, because this would depend on the context, such as the topic or whether the research was relevant to them.

[51] Figure 5.1 shows data from ScEng (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 5.1: Interest in hearing directly from scientists

Q. To what extent, if at all, are you interested in hearing directly from scientists about the research they are conducting? This includes anything from talking with them, to reading a newspaper article written by a scientist. If you are not interested, please just say so.



Ipsos MORI
Social Research Institute

Base: 1,524 UK adults aged 18+
Fieldwork dates: 2 June – 1 November 2015

wellcome trust

Men are more likely than women to say they are interested in hearing directly from scientists about the work they are conducting (66 per cent, compared with 60 per cent). Interest shows no significant variation, however, by age group.

Interest in hearing directly from scientists is strongly related to educational achievement. Three-quarters (76 per cent) of those with a postgraduate degree express an interest in hearing directly from scientists, falling to two in five (41 per cent) among those with no qualifications. And 79 per cent of those with a science-related qualification from university or college express an interest, compared with 51 per cent among those with no science-related qualifications.

Interest in hearing directly from scientists is also associated with other attitudes and behaviours relevant to science and medical research. For instance, among the 77 per cent who say they are interested in medical research, three-quarters (73 per cent) say they are interested in hearing directly from scientists, compared with just 28 per cent among those who say they are not interested in medical research. And of those who have made a science-related visit in the past 12 months[52], three-quarters (74 per cent) say they are interested in hearing directly from scientists. This falls to half (52 per cent) among those who have not made such a visit.

Those who are more optimistic about medical research are more likely to be interested in hearing directly from scientists. Among those who believe that medical research will lead to an improvement in the quality of life for people in the UK over the next 20 years, two-thirds (64 per cent) express an interest in hearing directly from scientists. Among those who do not believe medical research will lead to such improvements, this proportion falls to 40 per cent.

[52] See chapter 4 for details about the definition of a "science-related visit".

http://dx.doi.org/10.6084/m9.figshare.3145744

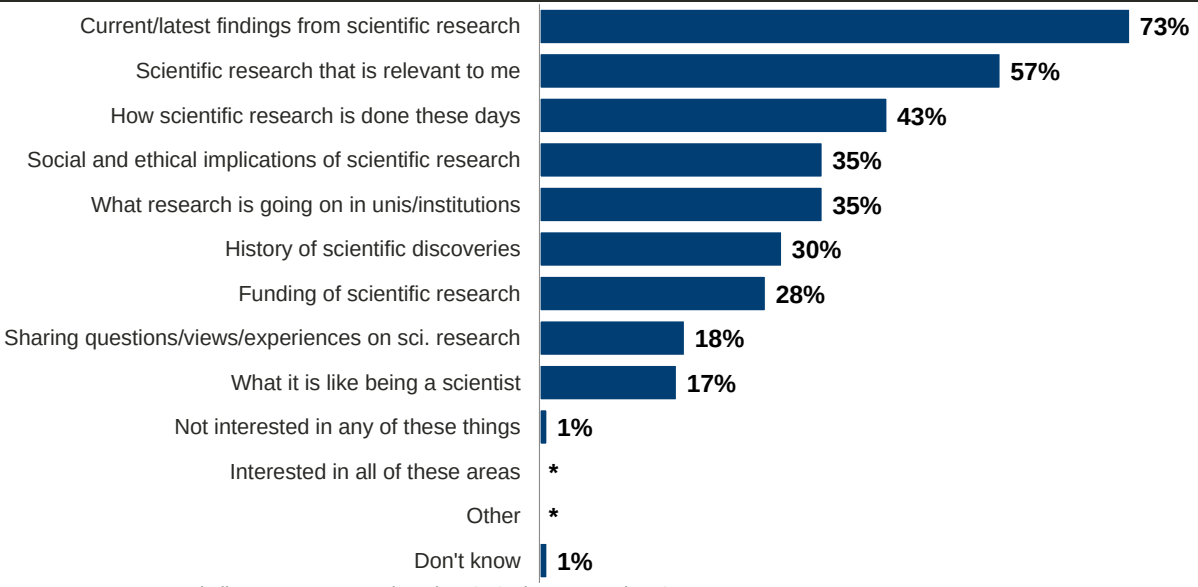
5.2 What would people like to hear from scientists about?

Respondents who expressed an interest in hearing directly from scientists about their research were asked to choose from a list which research-related activity or activities they would be interested in hearing about (Figure 5.2[53]).

The most popular choice is hearing about the latest findings from scientific research (chosen by 73 per cent). Almost three in five (57 per cent) are interested in hearing about research that is relevant to them personally, and two in five (43 per cent) would welcome the opportunity to hear directly from scientists about how scientific research is done these days.

Figure 5.2: Interest in hearing from scientists

Q. And which of the things on this card, if any, are you interested in hearing directly from scientists about?



** indicates a percentage less than 0.5%, but greater than 0.*

Ipsos MORI Social Research Institute

Base: All interested in hearing directly from scientists about the research they conduct (940)
Fieldwork dates: 2 June – 1 November 2015

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Taking the top three most frequently mentioned areas of interest, men (47 per cent) are significantly more likely than women (39 per cent) to express an interest in how scientific research is done these days. Men and women do not differ, however, in their interest in hearing about the latest findings from scientific research, or hearing about scientific research of personal relevance.

Younger adults are more likely to express an interest in hearing about the latest findings from scientific research (76 per cent of those aged 18 to 34, compared with 66 per cent of those aged 65 or over), and in hearing about scientific research of personal relevance (63 per cent, compared with 48 per cent). Interest in hearing about how scientific research is done these days does not differ by age group.

[53] Figure 5.2 shows data from ScEngArea (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

5.3 How would people like to hear from scientists?

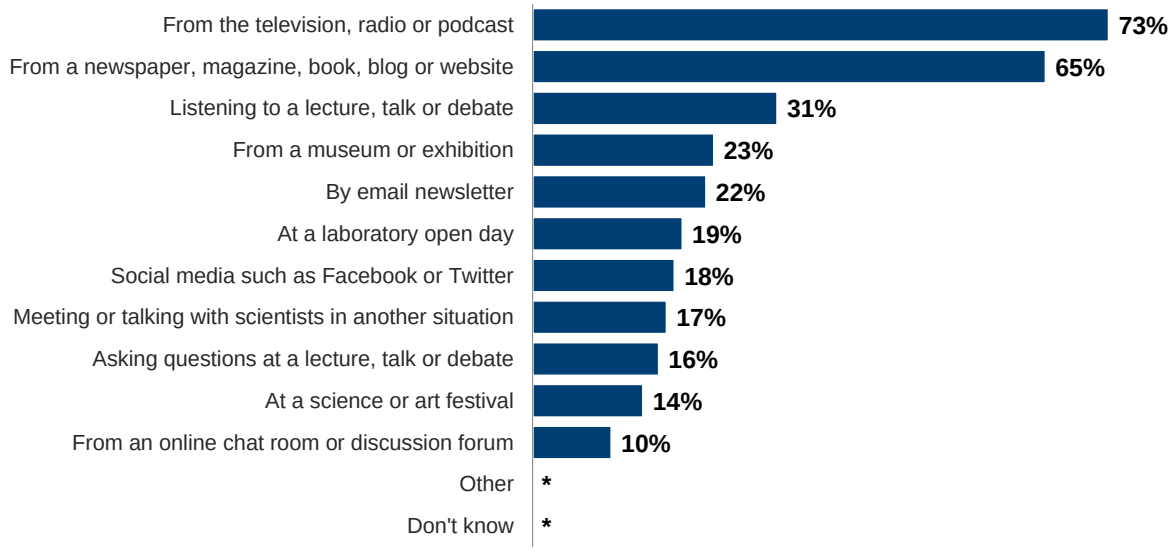
Those expressing an interest in hearing directly from scientists about their research were asked *how* they would prefer to hear from them (Figure 5.3[54]).

The most popular communication channels are television, radio or a podcast (73 per cent), followed by reading about the research in a newspaper, magazine, book, blog or on a website (65 per cent). Tree in ten (31 per cent) say they would like to listen to a lecture, talk or debate, and one-quarter (23 per cent) say they would like to hear via a museum or exhibition.

The most popular communication channels are passive in nature; they do not require interaction with a scientist. Of those channels which do involve direct interaction with a scientist, the most frequently mentioned was attending a laboratory open day (19 per cent).

Figure 5.3: Ways to hear directly from scientists

Q. And in which of the ways on this card, if any, would you prefer to hear directly from scientists about the research they are conducting?



** indicates a percentage less than 0.5%, but greater than 0.*

Ipsos MORI Social Research Institute

Base: All interested in hearing directly from scientists about the research they conduct (940)
Fieldwork dates: 2 June – 1 November 2015

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These preferred communications channels follow a similar pattern to the manner in which people say they *actually* hear or read about new scientific research, as measured by the Public Attitudes to Science study (BIS, 2014). This research found that television news was the most common medium, followed by other programmes on television, and print newspapers. It is also instructive to compare these preferred communication channels with the channels via which the public tend to come across information about medical research, the most common of which are on television, on a website, and in a newspaper (see Figure 2.11 in Chapter 2).

The preferred channels for hearing directly from scientists differ by age. These differences are likely to reflect general communication preferences, rather than being specific to scientific research.

[54] Figure 5.3 shows data from ScEngHow (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Older adults are more likely to want to hear directly from scientists on television, radio or from a podcast (78 per cent of those aged 65 or over, compared with 65 per cent of those aged 18 to 34).

Younger adults, on the other hand, are more likely to prefer online channels of communication, as well as channels which involve making a visit outside the home, or actually interacting with a scientist. For instance, among those aged 18 to 34, one-third (33 per cent) want to hear directly from scientists through social media (compared with just five per cent among those aged 65 or over), and one-quarter (27 per cent) want to hear directly from scientists from an email newsletter (compared with 15 per cent among those aged 65 or over). Those aged 18 to 34 are more than twice as likely to wish to hear directly from scientists at a museum or exhibition than those aged 65 or over (32 per cent, compared with 13 per cent), from asking questions at a lecture, talk or debate (24 per cent, compared with 11 per cent), from meeting or talking with scientists in another situation (22 per cent, compared with nine per cent), or at a science or art festival (16 per cent, compared with six per cent).

Men and women do not differ in how they would prefer to hear directly from scientists.

We conducted further analysis to assess the extent to which different groups prefer to hear directly from scientists via active versus passive channels of communication. For this analysis, we allocated respondents into one of three groups:

- Active (those mentioning one or more of "at a laboratory open day", "asking questions at a lecture, talk or debate", "to meet with/talk with scientists in some other situation", and "at a science or art festival");

- Passive (those mentioning one or more of "from the television, radio or podcast", "from a newspaper, magazine, book, blog or website", "listening to a lecture, talk or debate" and "by email newsletter", and no active channels); and

- Ambiguous whether passive or active (those mentioning one or more of "from social media", "from an online chat room or discussion forum", and "from a museum or exhibition", and no other channels).

Overall, the majority (61 per cent) of those wishing to hear directly from scientists want to hear from them via passive channels only. Around two in five (37 per cent) express a preference for active forms of communication. The remaining two per cent wish to hear only via channels whose nature is ambiguous.

Younger adults are more likely to express a preference for active channels (45 per cent of those aged 18 to 34, falling to 26 per cent among those aged 65 or over). Reflecting this, older adults are more likely express a preference passive channels only (74 per cent of those aged 65 or over, compared with 54 per cent of those aged 18 to 34). Men and women do not differ in their preferences for active or passive communication channels.

We also examined whether these communication preferences are associated with the likelihood of having visited a science-related attraction. Those wishing to hear from scientists

http://dx.doi.org/10.6084/m9.figshare.3145744

via active channels are more likely to have made a science-related visit in the last 12 months than those who do not mention an active channel (70 per cent, compared with 54 per cent).[55]

These findings can be considered alongside work that has been carried out to understand how scientists themselves view public engagement activities. A consortium of 15 funders of UK public research (including the Wellcome Trust) commissioned TNS-BMRB and PSI (2015) to conduct research to inform strategies for supporting UK researchers to engage with the public. This found that three-quarters of STEM researchers believe researchers have a moral duty to engage with the public, and that 57 per cent believe the public are enthusiastic to learn more about research, complementing the Monitor finding that 63 per cent of the public are interested in hearing directly from scientists about their work. The research further found that, since 2006, public engagement has become more valued, and better understood, by researchers. However, the proportion of STEM (Science, Technology, Engineering and Mathematics) researchers undertaking public engagement activities has only risen by a small proportion over this period. The research concludes that more work is required if public engagement is to become a fully embedded aspect of the UK research culture.

[55] As described in Chapter 4, we defined those making a "science-related visit" as those who had visited one or more of the following in the last 12 months: a science museum or science centre, a science-related art exhibition or installation, a zoo or aquarium, a planetarium, a working laboratory or similar scientific site, a local community science event, a science festival, or a science talk

http://dx.doi.org/10.6084/m9.figshare.3145744

6. Participation in medical research

This chapter examines public participation in medical research. It also examines the public's willingness to allow their medical records, and genetic information, to be used in medical research studies, and what concerns they may have about this.

Key findings:

- One in eight (12 per cent) of the public say they have, at some point, taken part in a medical research project. This level of participation has remained stable over the last six years.
- Of those living in a household where someone has taken part in medical research, 41 per cent say participation involved testing a new drug, 39 per cent say a blood or tissue sample was provided, 37 per cent say a survey was completed, 26 per cent say participation involved health or behaviour monitoring, and 24 per cent say participation involved allowing access to medical records.
- Most of the public (77 per cent) say they are willing to share their anonymised medical records for the purposes of medical research. A similar proportion (75 per cent) say they are willing to share information from their genes for medical research purposes, again on an anonymous basis.
- The key concern among those unwilling to share their anonymised medical records, or anonymised genetic information, for the purposes of medical research relates to confidentiality and privacy. Other concerns include a lack of trust, concerns with the research and what it is, not being interested or wanting to take part, and (especially for sharing genetic information) not knowing enough about this type of research.

6.1. Public participation in medical research

A quarter of the public (24 per cent) report that either they, or a family member, have taken part in a medical research project (Figure 6.1[56]). This proportion includes one in eight adults (12 per cent) who report that they themselves have taken part in a medical research project.

These findings are in line with the 2009 and 2012 surveys, where 23 and 22 per cent of the public, respectively, reported that either they, or a family member, had participated in a medical research project.

[56] Figure 6.1 shows data from PartProj (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 6.1 Participation in medical research

Q. Have you or a member of your family ever taken part in a medical research project? This might have involved testing a new drug as part of a clinical trial, providing samples of blood or tissue for a project tracking the development of a particular illness, or completing a survey about your experiences of a particular illness or drug?

Base: All respondents *Wellcome Trust Monitor*

	Monitor w1 (2009) (%)	**Monitor w2 (2012)** (%)	**Monitor w3 (2015)** (%)
Yes, respondent but no family member	11	10	10
Yes, respondent and family member	2	2	2
Yes, family member, but not respondent	10	10	12
Neither respondent nor family member	77	78	75
Don't know	*	1	1
% respondent has taken part	*13*	*12*	*12*
% respondent and/or family member has taken part	*23*	*22*	*24*
Unweighted base:	*1,179*	*1,396*	*1,524*
Weighted base:	*1,179*	*1,396*	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

Older adults are more likely to have taken part in a medical research project: one in five (21 per cent) of those aged 65 or over have done so, three times the proportion among those aged 18 to 34 (seven per cent). It should be noted that this does not imply that an older adult is more likely to participate in a medical research project in a given year; rather, it is likely to reflect the fact that older adults have simply had more time to participate in medical research over their lives. The likelihood of having taken part in a medical research project does not differ by gender.

Knowledge about science (as measured by the knowledge quiz) is associated with the likelihood of having participated in a medical research project. Among those with high scores, 16 per cent have taken part in a medical research project, compared with eight per cent of those with low scores.

Adults with a serious long-term illness or medical condition, or with a friend or family member with such a condition, are more likely to have taken part in a medical research project than those with no experience of serious illness or disability (14 per cent, compared with 10 per cent).

Those in managerial and professional occupations are most likely to have participated in a medical research project (17 per cent, compared with 10 per cent among those in all lower social classes).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

Types of medical research participated in

The public report having participated in a wide variety of medical research projects (Figure 6.2[57]). Among those who report that they or a family member have done this, the most recent project was most likely to involved testing a new drug or treatment (41 per cent), provision of blood or tissue samples (39 per cent), or the completion of a survey or questionnaire (37 per cent).

There has been little change since 2009 in the types of medical research projects that adults, or their family members, have participated in. The only significant change over this period is a fall of nine percentage points in the proportion that say they, or a family member, have participated in a study requiring the provision of samples of blood or tissue (48 per cent in 2009, compared with 39 per cent in 2015).

Figure 6.2 Type of participation in medical research

Q. Thinking about the most recent time you/your family member participated in a medical research project, which of the following activities did this medical research project involve?

Base: Respondents who have participated in a medical research project, or who have a family member that has participated in a medical research project — *Wellcome Trust Monitor*

	Monitor w1 (2009) (%)	**Monitor w2 (2012)** (%)	**Monitor w3 (2015)** (%)
Testing a new drug or treatment	40	37	41
Providing samples of blood or tissue	48	45	39
Completing a survey or questionnaire	36	34	37
Monitoring health or behaviour	25	21	26
Allowing access to medical records	25	22	24
Other	5	1	2
Don't know	*	1	2
Unweighted base:	*269*	*306*	*370*
Weighted base:	*269*	*304*	*368*

** indicates a percentage less than 0.5%, but greater than 0.*

Younger adults are more likely to say that the most recent study they (or a family member) participated in involved monitoring health or behaviour (39 per cent among those aged 18 to 34, falling to 18 per cent among those aged 65 or over). No other significant differences emerge across the types of research project by age group, nor is there any significant difference by gender, or by experience of serious illness or disability.

6.2. Willingness to participate in, and concerns about, medical research projects that involve access to anonymised personal data

The increasingly important role of anonymised patient data in biomedical research studies has focused attention on how willing the public are to share their personal medical and health-related data with researchers. We asked respondents how willing they would be to allow their medical records to be used in a medical research study, if the information given to researchers excluded their name, date of birth, address, and contact details. We also asked how willing they would be to allow information from their genes to be used in a medical research study,

[57] Figure 6.2 shows data from TypeProj (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

on the same anonymised basis. We specified that by "information from your genes" we were referring to "information about you contained in your DNA".

Almost four in five of the public (77 per cent) say they would be willing to allow their anonymised medical records to be used in a medical research study, and over two in five (43 per cent) say they would be very willing to do so (Figure 6.3[58]).

The public are equally likely to be willing for their anonymised genetic information to be used in a medical research study. Three-quarters (75 per cent) of the public say they would be willing to share their genetic information in this way, and two in five (40 per cent) say they would be very willing to do so.

Figure 6.3 Willingness to allow anonymised medical records, and genetic information, to be used in medical research studies

Q. How willing or unwilling would you be to allow…
…your medical records to be used in a medical research study? The information given to researchers would not include your name, date of birth, address or any contact details.
…information from your genes to be used in a medical research study? By this I mean information about you contained in your DNA. The information given to researchers would not include your name, date of birth, address or any contact details.

Base: All respondents — *Wellcome Trust Monitor*

	Medical records (%)	**Genetic information** (%)
Very willing	43	40
Fairly willing	34	35
Fairly unwilling	10	11
Very unwilling	11	11
Don't know	3	4
% Willing (very or fairly)	*77*	*75*
Unweighted base:	*1,524*	*1,524*
Weighted base:	*1,524*	*1,524*

Other research in recent years has demonstrated that the public are largely in favour of sharing their personal data for the benefit of medical research.

In the second Wellcome Trust Monitor (2012), respondents were asked "How willing or unwilling would you be to take part [again] in a medical research project which involved allowing access to your personal health information, that is, your medical records, on an anonymous basis?". Three in five (60 per cent) said they would be very willing, or fairly willing, to take part. While a majority, this is a lower proportion than the 77 per cent who express a willingness to share their medical records in the present research. This difference may, in part, be because the question wording in 2012 ("how willing or unwilling would you be to take part…") implied a greater chance of active participation on behalf of the respondent than did the wording in 2015 ("how willing or unwilling would you be to allow information from your genes to be used in a medical research study").

[58] Figure 6.3 shows data from WillAccMed and WillAccGen (press CTRL and click on question name to access data table).

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It should also be noted that the questions asked in both 2012 and 2015 specified explicitly that the information provided to researchers would be anonymised. Recent research by the Royal Statistical Society (2014) highlights the impact of anonymisation on the public's willingness to share their personal data. This study found that the public's acceptance of their data being shared between government departments depended strongly on assurances of anonymity. While a minority (33 per cent) felt that "we should share all the data we can [between government departments] because it benefits the services and me", this rose to a majority (55 per cent) when it was made clear that the shared data would be anonymised, and that no individual could be identified.

Recent research carried out by Ipsos MORI (2016), and commissioned by the Wellcome Trust, explored this theme further to look at public views on commercial access to health data. Qualitative research indicates that people tend to apply four key tests when judging the acceptability of data uses: why (the purpose needs to have public benefit), who (different types of commercial organisation are viewed as acting in the public interest to a greater or lesser extent), what data (use of identifiable information is less acceptable than aggregate data) and how (safeguards and regulation are necessary). Subsequent quantitative research indicated that a slight majority support commercial access for research purposes. The findings also revealed that the public know little about how health data is used (or could be used) within a commercial context beyond their direct care, nor about the safeguards that are already in place, nor about what counts as anonymised information.

Willingness to share medical records, and genetic information, by sub-group

The public's willingness to share their medical records, or genetic information, for use in a medical research study does not differ by age group, gender, or whether one is employed in a scientific or medical field.

Participation in past medical research is, though, strongly associated with willingness to share medical records, or genetic information, for use in a medical research study. Among those who have previously participated in a medical research project, 90 per cent are willing to share their medical records, and 86 per cent are willing to share their genetic information (compared with 76 per cent and 73 per cent, respectively, among those who have not previously participated in a medical research project).

Those with higher educational qualifications are more likely to be willing to share their medical records, or their genetic information. Among those with a postgraduate degree, 78 per cent are willing to share their medical records, and 73 per cent are willing to share their genetic information, and among those with A levels, 83 per cent are willing to share their medical records, and 83 are willing to share their genetic information. Among those with no educational qualifications, however, the proportion willing to share their medical records falls to 66 per cent, and the proportion willing to share their genetic information to 64 per cent.

Those who are more knowledgeable about science are more likely to be willing to share their medical records, and their genetic information. Among those with high scores on the knowledge quiz, 82 per cent are willing to share their medical records, and 80 per cent are willing to share their genetic information (compared with 66 per cent and 65 per cent respectively among those with low scores). Whether one has gained a science-related qualification, and the level of this qualification, however, does not bear a significant relationship with willingness to share either one's medical records, or one's genetic information.

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http://dx.doi.org/10.6084/m9.figshare.3145744

People with a serious long-term illness or medical condition, or with a friend or family member with a serious long-term illness or medical condition, are more likely to be willing to share their data. Among those with experience of serious illness or disability, 82 per cent are willing to share their medical records, and 79 per cent are willing to share their genetic information (compared with 72 per cent and 70 per cent respectively among those with no experience of serious illness or disability). In addition, among those with a serious genetic condition in their family, 84 per cent say they would be willing to share their medical records, compared with 76 per cent among those with no such genetic condition. While this is in the same direction as sharing genetic information (81 per cent of those with a genetic condition are willing to share their genetic information, compared with 74 per cent among those without a genetic condition), this difference is not statistically significant.

There is a significant association between social class and willingness to share medical records. Among those in managerial and professional occupations four in five (81 per cent) say they are willing to share their medical records, compared with 57 per cent among those who have never worked or are long-term unemployed. Willingness to share genetic information, however, does not exhibit a significant relationship with social class.

Willingness to share genetic information: multivariate analysis

CHAID analysis was carried out to identify the groups that are the most, and the least, willing to allow anonymised information from their genes to be used in a medical research study.[59]

The results of this analysis are presented in Figure 6.4. At the first level (the "trunk") are all respondents, amongst whom, as we have seen, 75 per cent are willing to allow anonymised information from their genes to be used in a medical research study.

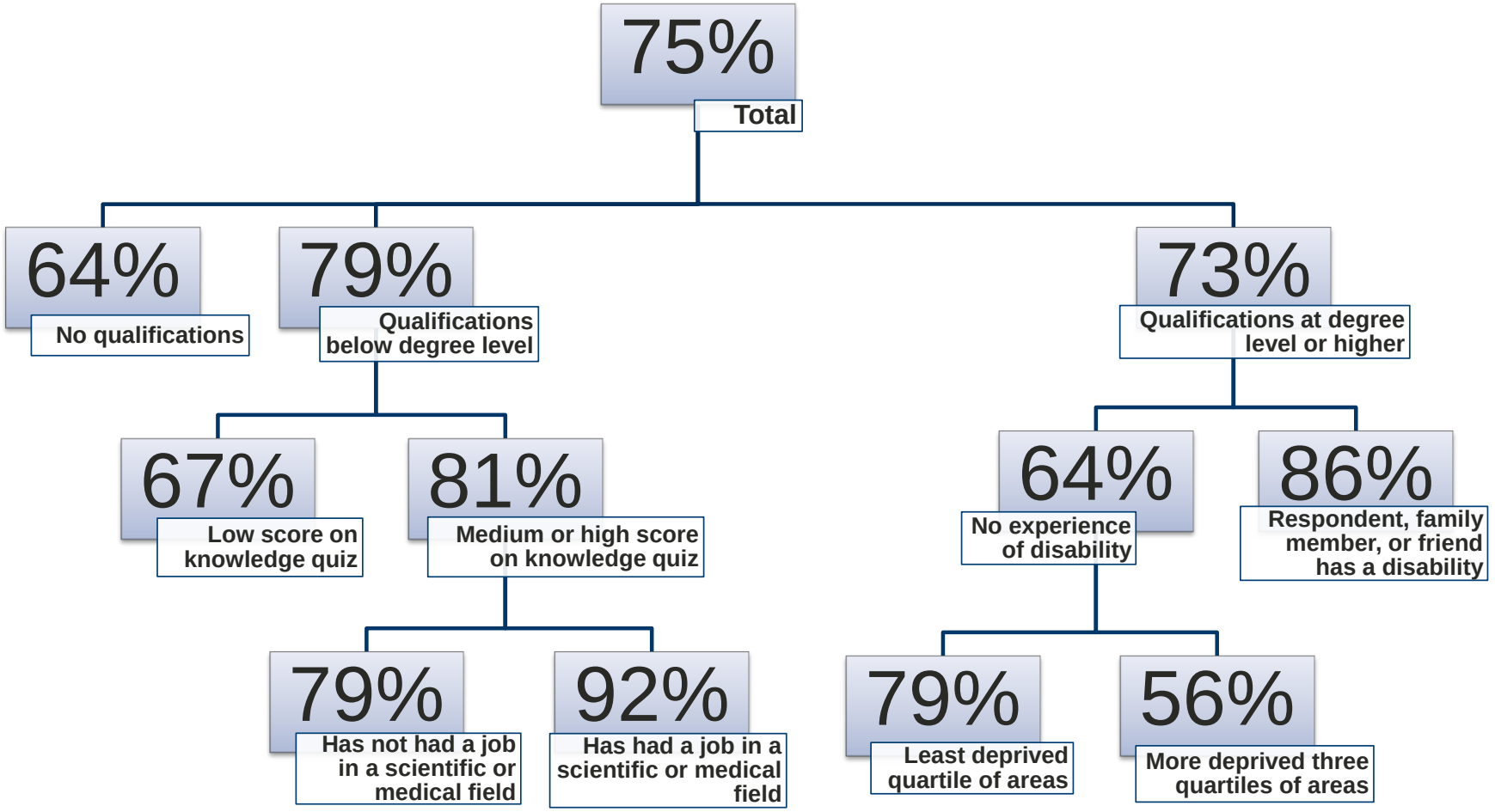
As we progress down the tree to the first "branch", we see that the variable that most strongly discriminates the public's willingness to share their genetic information is highest educational qualification, and our total sample is broken down into groups based on this variable. Those with no educational qualifications are least likely to be willing to share their genetic information (64 per cent), while those with qualifications below degree level are most likely (79 per cent), and those with qualifications at degree level or higher lie towards the middle of this range (73 per cent).

Within these first groups defined by educational qualifications, the variables that most discriminate willingness to share genetic information are shown in the next "branch" of the tree diagram. The final level shows that the most willing group are people with: qualifications below degree level, with medium or high scores on the knowledge scale, who have worked in a scientific or medical field. Among this sub-group 92 per cent say they are willing to share their genetic information. In comparison, the proportion is just 56 per cent among people with qualifications at degree level or higher, with no experience of disability, and living in more deprived areas.

[59] CHAID is a statistical technique that identifies the characteristic that is most highly discriminating on the outcome variable. The characteristic which discriminates the most on the outcome variable within this first identified characteristic is then identified, producing a "tree" structure which identifies the population sub-groups which have the highest and the lowest proportions in the categories of the outcome variable. In the specified model, the response variable was willingness to share genetic information, and the demographic variables were gender, age, social class, highest educational qualification, the level of area deprivation, experience of disability, presence of a genetic condition in the family, score on the knowledge quiz, and whether or not the respondent identified as belonging to a particular religion.

http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 6.4: Willingness to share genetic information: CHAID analysis (% very or fairly willing)



Ipsos MORI
Social Research Institute

Base: 1,524 UK adults aged 18+
Fieldwork dates: 2 June – 1 November 2015

wellcome trust

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
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Concerns around use of medical and genetic information in medical research studies

Respondents who said they were unwilling to allow their anonymised medical records, or their anonymised genetic information, to be used in a medical research study were asked what concerns they had about sharing this data.

As shown in Figure 6.5[60], public concerns about sharing medical records are similar in nature to concerns about sharing genetic information. Confidentiality and privacy issues are by far the most common concerns, cited by 64 per cent of those concerned about sharing their medical records, and - significantly fewer, but still more than half - 54 per cent of those concerned about sharing their genetic information.

Adults are less likely to mention other concerns as reasons behind their unwillingness to share their medical records or genetic information. Fewer than one in five cite factors such as a lack of trust, concerns with the research itself, a lack of interest, or not knowing enough about these types of research.

It is possible that the public's lack of familiarity with "genetic information", relative to "medical records", contributes to their unwillingness to share their genetic information. One in five (18 per cent) of those unwilling to allow their genetic information to be used in a medical research study say this is because they "don't know enough about it". This is significantly higher than the proportion of those unwilling to share their medical records who give this reason (11 per cent).

Figure 6.5 Concerns with medical and genetic information being used in a medical research study

Q. What concerns, if any, would you have about…
…your medical records being used in this way?
…information from your genes being used in this way?

Base: Respondents who were unwilling to allow their medical records/genetic information to be used in a medical research study — *Wellcome Trust Monitor*

Mentioned by three per cent or more with respect to medical records or genetic information	**Medical records** (%)	**Genetic information** (%)
Concerns regarding confidentiality/privacy	64	54
Lack of trust	17	19
Concerns with the research/what it is	15	17
Not interested/do not want to take part/do not want to be involved	13	14
Don't know enough about it	11	18
Who/which organisation is conducting the research	7	9
Concerns with the drugs/medication	4	6
Age/too old	4	6
Own illness/finding out you could be ill	4	4
Lack of time/time commitments	4	3
Other	5	7
Don't know	2	3
Unweighted base:	*300*	*318*
Weighted base:	*310*	*326*

[60] Figure 6.5 shows data from AccessCoMed and AccessCoGen (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Concerns about confidentiality and privacy, and a lack of trust, were also identified as the top concerns in the research about data sharing by the Royal Statistical Society (2014). This research asked the public how much trust they had in academic researchers and universities to "use your data appropriately". Among those who said they had a low level of trust, the main reasons underlying this were a concern their data would be used for other purposes, about which they would not be informed (mentioned by 49 per cent), a concern their data might be lost to hackers (also 49 per cent), and a concern their data might be lost by accident (42 per cent).

http://dx.doi.org/10.6084/m9.figshare.3145744

7. What does the public know about science and medical research?

This chapter begins by looking at how knowledgeable the public are about science, as measured by a knowledge quiz which has been used in all three waves of the Wellcome Trust Monitor. The chapter then examines public understanding of how medical research is conducted, public understanding of genetic modification, and public awareness of genetic tests that can predict the likelihood of developing genetically influenced conditions. The chapter also considers public understanding of the drug development process.

Key findings:

- The public's knowledge about science, as measured by the knowledge quiz, has been broadly stable over the last six years. Women are less likely to score highly than men, and those aged 65 and over are less likely to score highly than younger adults.
- When presented with three options as to how a drug's effectiveness can best be tested, seven in ten (70 per cent) choose the controlled experimentation option, with far fewer choosing the other two options: talking to patients to get their opinion (14 per cent), and scientists using their own knowledge to decide (10 per cent). Adults aged between 50 and 64 are most likely to choose the controlled experimentation option (78 per cent), while those aged 18 to 34 are least likely to (65 per cent).
- When those choosing the controlled experimentation option are asked why they chose it, the most common responses relate to comparing groups of patients, providing a true picture or conclusive results, and to the placebo effect.
- Nine in ten (90 per cent) of the public have heard of the term "GM, or genetically modified". Of these, only around one-third (36 per cent) say they have a very good or good understanding of what the term means.
- Almost nine in ten (86 per cent) of the public say they are aware of genetic tests that predict the likelihood of developing genetically influenced diseases, although over a quarter (27 per cent) say they have not hear much about them.
- Over half (53 per cent) of the public believe that life evolved as a result of natural selection, without the involvement of God. This proportion rises to 63 per cent among those with a science-related qualification from university or college, and falls to 44 per cent among those with no science-related qualifications. Around one in five (22 per cent) believe life evolved in a process guided by God, and a similar proportion (19 per cent) believe all life was created by God, and has always existed in its current form.
- The amount of time taken to develop a medical treatment varies greatly, but research suggests it takes between 15 and 25 years from the pre-discovery phase to availability to patients. Half (50 per cent) of the public believe it takes between 10 and 20 years, on average, to develop a medical treatment. Around one in ten (11 per cent) believes the process takes less than ten years, and 16 per cent say they do not know how long it takes.

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Key findings (continued)

- Around two-thirds of the public (65 per cent) correctly believe that pharmaceutical companies spend the most on developing new medical drugs in the UK.

7.1. Results of the knowledge quiz

The questionnaire included a knowledge quiz to measure respondents' scientific literacy. This comprised nine "true or false"[61] questions that were asked in both 2009 and 2012, as follows:[62]

Q. For each of the following statements, please say whether you think it is definitely true, probably true, probably false or definitely false. If you don't know, just say so and we'll go on to the next one:

- All plants and animals have DNA *(True)*
- The oxygen we breathe comes from plants *(True)*
- The cloning of living things produces genetically identical copies *(True)*
- By eating a genetically modified fruit, a person's genes could also become modified *(False)*
- All radioactivity is man-made *(False)*
- It is the mother's genes that determine the sex of the child *(False)*
- Lasers work by focusing sound waves *(False)*
- More than half of human genes are identical to those of mice *(True)*
- Electrons are smaller than atoms *(True)*

When reporting the results of the knowledge quiz, respondents have been classified into three groups. Those who answered between 0 and 4 questions correctly were classified as "low" scoring, those who answered between 5 and 7 questions correctly were classified as "medium" scoring and those answering between 8 and 9 questions correctly were classified as "high" scoring (Figure 7.1). This follows the classification method employed in both 2009 and 2012.

[61] For each question, respondents could answer "definitely true", "probably true", "probably false", "definitely false", or "don't know". Those answering "definitely true" or "probably true" in the case of true statements (or "definitely false" or "probably false" in the case of false statements) were scored as having answered correctly.
[62] The questionnaire also included one additional question asked in 2015 for the first time: "1 kilogram of lead has the same mass on Earth as it does on the Moon" *(True)*. This was included to provide additional discriminatory power to analysts wishing to explore the data by scientific knowledge. For reasons of consistency with waves 1 and 2, this item has been excluded for the purposes of allocating respondents into the "high", "medium" and "low" quiz grouping.

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

At points throughout this report, findings are broken down according to scores on the knowledge quiz, with respondents grouped by high, medium and low scores.

Figure 7.1 Knowledge quiz scores

Base: All respondents *Wellcome Trust Monitor*

	Monitor w1 (2009)	Monitor w2 (2012)	Monitor w3 (2015)
Proportion providing correct answers	%	%	%
High (8-9)	25	23	29
Medium (5-7)	58	53	52
Low (0-4)	16	24	19
Unweighted base:	*1,176*	*1,396*	*1,524*
Weighted base:	*1,176*	*1,396*	*1,524*

Men are more likely to score highly than women (36 per cent, compared with 21 per cent). Research in this area (e.g. see Sturgis at al., 2008) suggests that this gender difference is partly to do with the greater propensity of men to guess answers when they are uncertain and for women to say they do not know when they might guess the answer correctly at a rate higher than 50 per cent. The difference may also reflect cultural differences in what is seen to constitute knowledge about science and, relatedly, the selection of items in the knowledge quiz.

Older adults are less likely to score highly (22 per cent among those aged 65 or over, compared with 31 per cent among those aged 50 to 64, and 30 per cent among those aged 49 and under).

Those with a postgraduate degree are most likely to score highly (54 per cent), over four times the proportion among those with no educational qualifications (12 per cent). With respect to scientific qualifications specifically, almost half (49 per cent) of those who have gained a science-related qualification from university or college score highly, compared with 28 per cent of those with science-related qualification from school, and 16 per cent of those with no science-related qualifications.

Those in managerial or professional occupations are most likely to score highly on the knowledge quiz (41 per cent), while those in routine and manual occupations (18 per cent) are least likely.

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

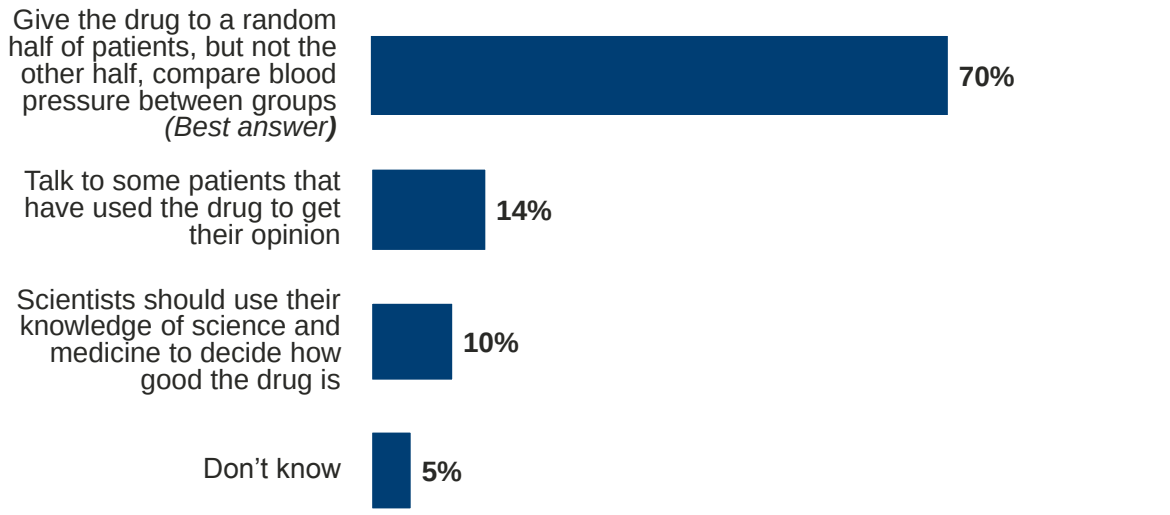
7.2. Do people understand the principles behind clinical trials?

How do people think clinical trials work?

The majority of the public believe that controlled experimentation is the best way for scientists to find out if a treatment works. As illustrated in Figure 7.2[63], 70 per cent of the public think the effectiveness of a drug developed to treat high blood pressure can best be tested by giving the drug to a random half of patients, but not to the other half, and then comparing blood pressure between the two groups of patients. Fourteen per cent of the public think that talking to patients to get their opinion would be the best way, while 10 per cent think that scientists should use their knowledge of science and medicine to determine the effectiveness of the drug.

Figure 7.2: How people think clinical trials work

Q. Suppose a drug has been developed to treat high blood pressure. Here are 3 different ways scientists might use to determine whether the drug is effective. Which one do you think would be the best way for scientists to find out if the drug works?



Ipsos MORI Social Research Institute

Bases: 1,524 UK adults aged 18+
Fieldwork dates: 2 June to 1 November 2015

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Awareness of how clinical trials work varies by age. Those aged 50 to 64 are most likely to choose the controlled experimentation option (78 per cent), while those aged 65 or over (66 per cent) and those aged 18 to 34 (65 per cent) are least likely. Men and women do not differ in their likelihood of choosing the controlled experimentation option.

Awareness of the mechanism by which clinical trials work is related to knowledge of science, as measured by scores on the knowledge quiz. Among those obtaining high scores, 87 per cent choose the controlled experimentation option, compared with just 38 per cent of those obtaining low scores. Those who have had a job in a scientific or medical field are more likely to choose the controlled experimentation option than those who have not (86 per cent, compared with 67 per cent), and related to this, 82 per cent of those who have a science-related qualification from university or college choose the controlled experimentation option,

[63] Figure 7.2 shows data from DrugEff2 (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

compared with 72 per cent of those with a science-related qualification from school, and 60 per cent of those with no science-related qualifications.

Around four in five (83 per cent) adults working in managerial or professional occupations choose the controlled experimentation option. This falls to 58 per cent of those in routine or manual occupations, and to a minority (38 per cent) of those who have never worked or are long-term unemployed. Among this latter group, one in five (22 per cent) say they do not know what the best method would be (compared with five per cent across all adults).

Those who have previously taken part in a medical research project are more likely to choose the controlled experimentation option than those who have not (83 per cent, compared with 68 per cent).

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Why do people think this is how clinical trials work?

Respondents identifying a particular approach as being the best for testing a drug's effectiveness were asked *why* they chose this approach (Figure 7.3[64]). Their verbatim responses to this question were recorded by interviewers, and subsequently coded to a code frame.

Among those believing controlled experimentation to be the best option, around one-quarter (28 per cent) made reference to outcomes being compared between the two groups, 15 per cent mentioned that this method would show a true picture, or conclusive results or proof, nine per cent mentioned the placebo effect, and nine per cent mentioned tests of the drug.

Figure 7.3 Justification for identification of particular approaches for testing a drug

Q. Why do you think that this would be the best way for scientists to find out if the drug works? (open ended)

Base: All respondents who identified particular method of testing drugs *Wellcome Trust Monitor*

Mentioned by three per cent or more for one or more approach	**Give drug to random half of patients** (%)	**Talk to patients** (%)	**Use own knowledge** (%)
Comparing one group of patients with another to see if outcome of one group improves	28	1	1
It shows a true picture/conclusive result/proof	15	4	3
Placebo effect	9	0	2
Tests/testing the drug	9	3	12
Most scientific method	8	0	4
Control group	7	0	1
It is independent/unbiased/objective/impartial	7	0	1
To learn more/find out if drug works/doesn't work	6	7	2
Every patient is different/drugs react differently on different people	5	6	5
Most accurate method	5	2	1
Personal opinion would affect results	5	2	1
Negative comments relating to other methods	4	3	9
Users of the drug best placed to know if it worked	2	22	1
Expertise of doctors/scientists	1	2	16
Docs and scientists best positioned for informed decision	1	2	6
Those taking drug would know most about effects	1	26	2
They would know/have more knowledge about the drug	1	6	4
Personal experience	*	5	0
Don't know	3	9	16
Unweighted base:	*1,053*	*221*	*159*
Weighted base:	*1,061*	*219*	*160*

** indicates a percentage less than 0.5%, but greater than 0.*

[64] Figure 7.3 shows data from DEWhy2 (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Those who believe that talking to patients would be the best way to test a drug's effectiveness are most likely to justify this approach by saying that users of the drug would know the most about its effects, or would be best placed to know whether it works. Those who think that scientists should use their own knowledge to determine a drug's effectiveness are least likely to provide any justification: 16 per cent of this group say they do not know why this would be the best method, and a further 16 per cent simply refer to the expertise of doctors and scientists.

7.3. Understanding of genetic modification

The great majority (90 per cent) of the public have heard of the term "GM, or genetically modified" (Figure 7.4[65]). Less than two in five (36 per cent), however, feel they have a very good or good understanding of what the terms means, a proportion that has not changed significantly since 2012 (34 per cent). Men are more likely than women to say they have a very good or good understanding of genetic modification (42 per cent, compared with 30 per cent). Of course, this does not necessarily mean that men have a more accurate understanding of the term, it may simply mean that they are more confident that their understanding is correct. Reported understanding of genetic modification does not have a significant relationship with age.

Figure 7.4 Self-reported understanding of genetic modification

Q. When you hear the term GM or genetically modified, how would you rate your understanding of what the term means?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w2 (2012) (%)	**Monitor w3 (2015)** (%)
Very good	10	10
Good	23	26
Some understanding	34	39
Heard the term but little understanding of what it means	22	16
Have not heard the term	8	9
Don't know	2	1
% Very good/good	*34*	*36*
Unweighted base:	*1,396*	*1,524*
Weighted base:	*1,396*	*1,524*

[65] Figure 7.4 shows data from KnowGM (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

Those respondents who had heard of genetic modification were asked what they understood by the term (Figure 7.5[66]). Their verbatim responses to this question were recorded by interviewers, and were subsequently coded to a code frame. The most common responses relate to genes being changed, altered, or modified (mentioned by 18 per cent), human intervention (11 per cent), and to "something" (non-specified) being changed, altered, or modified (11 per cent).

More detailed responses are less common; for instance, just eight per cent refer to DNA specifically being changed, altered, or modified, and just four per cent make explicit reference to genetic information being taken from one organism and added to another. Fifteen per cent of those who have heard of the term say they do not know what it means.

Figure 7.5 What is understood by the term "GM, or genetically modified"

Q. What do you understand by the term GM, or genetically modified? (open ended)

Base: Respondents who have heard of the term "GM, or genetically modified" — *Wellcome Trust Monitor*

Mentioned by three per cent or more	**Monitor w3 (2015)** (%)
Genes that are changed/altered/modified	18
Human intervention/man-made	11
Something that has been changed/altered/modified	11
Makes things bigger/better/improved	10
Crops/plants that have been changed/altered/modified	8
DNA altered/modified/changed	8
Scientific intervention/changed by scientists	7
Not natural	6
To make something a certain way/how you want it	6
Makes crops/plants disease resistant/immune to pests	5
Makes crops/plants/grow bigger/stronger/better/improved	5
Genes/cells/DNA taken from one organism added to another	4
Relating to crops/plants	3
Something that has been produced/modified in a laboratory	3
Chemicals added	3
Artificial/false	3
Genes modified to enhance products	3
Makes things resistant/disease resistant	3
Relating to crops/plants	3
Food that has been changed/altered/modified	3
Don't know	15
Unweighted base:	*1,372*
Weighted base:	*1,379*

[66] Figure 7.5 shows data from GMMean (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

7.4. Awareness of genetic tests

A clear majority of the public (86 per cent) say they are aware of genetic tests that predict the likelihood of developing genetically influenced diseases, such as heart disease and cancer, although one-quarter (27 per cent) say they have not heard much about them (Figure 7.6[67,68]). Fourteen per cent, however, have heard nothing at all about such tests.

Figure 7.6 Awareness of genetic tests that predict the likelihood of developing certain genetically influenced diseases or conditions

Q. How much have you read or heard about genetic tests that predict the likelihood that a person will develop certain genetically influenced diseases or conditions, such as heart disease and cancer?†

Base: All respondents — *Wellcome Trust Monitor*

How much has the respondent read or heard	Monitor w1 (2009) (%)	Monitor w2 (2012) (%)	Monitor w3 (2015) (%)
Quite a lot	22	14	20
Some	44	39	39
Not much	25	30	27
Nothing at all	9	14	14
Don't know	*	3	1
% Quite a lot/some	*66*	*53*	*59*
% Quite a lot/some/not much	*91*	*83*	*86*
Unweighted base:	*1,179*	*1,396*	*1,524*
Weighted base:	*1,179*	*1,396*	*1,524*

† In 2009 and 2012 the question wording included Alzheimer's as an example (i.e. "How much have you read or heard about genetic tests that predict the likelihood that a person will develop certain genetically influenced diseases or conditions, such as heart disease, cancer and Alzheimer's?"). This example was removed in 2015.
** indicates a percentage less than 0.5%, but greater than 0.*

Adults in the middle of the age range are most likely to be aware of such tests; 90 per cent of those aged 35 to 49, and 89 per cent of those aged 50 to 64 say they are aware of genetic tests, compared with 84 per cent of those aged 18 to 34, and 79 per cent of those aged 65 or over. Awareness does not vary significantly by gender.

Those with a serious genetic condition in their family are more likely to be aware of genetic tests than those without such a condition (94 per cent, compared with 85 per cent), and those with a serious long-term illness or medical condition, or with a friend or family member with such a condition, are more likely to be aware than those with no experience of disability (88 per cent compared with 83 per cent).

Awareness of genetic tests has a significant relationship with social class: 92 per cent of those in managerial or professional occupations say they are aware of genetic tests, compared with 79 per cent among those in routine or manual occupations, and 72 per cent among those who have never worked or are long-term unemployed.

[67] Figure 7.6 shows data from GenTest2 (press CTRL and click on question name to access data table).
[68] In 2009 and 2012 the question wording included Alzheimer's as an example (i.e. "How much have you read or heard about genetic tests that predict the likelihood that a person will develop certain genetically influenced diseases or conditions, such as heart disease, cancer and Alzheimer's?"). This example was removed in 2015, and as a result of this change, wave on wave significance testing has not been conducted.

http://dx.doi.org/10.6084/m9.figshare.3145744

Those who are interested in medical research are far more likely than those who are not interested to be aware of genetic tests (91 per cent, compared with 67 per cent).

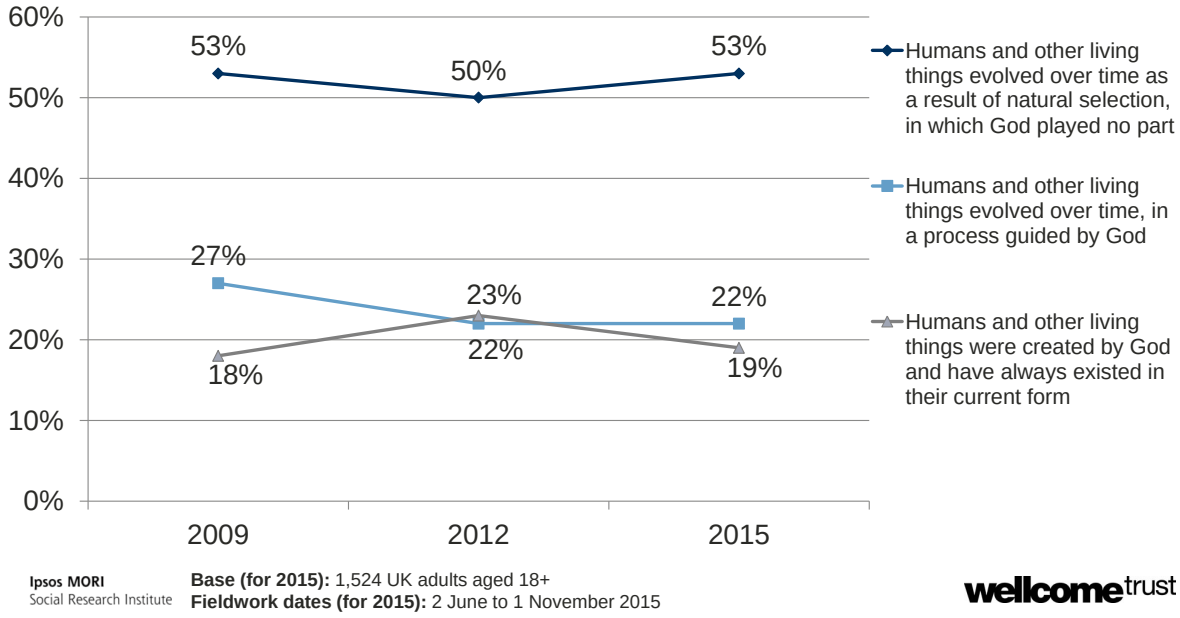
7.5. The origins of life

As illustrated in Figure 7.7[69], just over half of the public (53 per cent) believe that life evolved as a result of natural selection, with God playing no part in the process. One in five (22 per cent) believe that life evolved over time, but that this process was guided by God, and a similar proportion (19 per cent) hold the "creationist" view that all life was created by God, and has always existed in its current form.

Beliefs about the origins of life have remained broadly stable since 2009, although there has been a fall in the proportion believing that life evolved in a process guided by God (from 27 per cent in 2009, to 22 per cent currently).

Figure 7.7: Perceived origins of life

Q. Which of the following comes closest to your view about the origin and development of life on earth?



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Base (for 2015): 1,524 UK adults aged 18+
Fieldwork dates (for 2015): 2 June to 1 November 2015

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Men are more likely than women to believe that life evolved by natural selection, with God playing no part (58 per cent, compared with 48 per cent), and this belief is also more prevalent among younger adults (58 per cent of those aged 18 to 34, falling to 43 per cent of those aged 65 or over).

Turning to religious belief and practice, among those who do not regard themselves as belonging to any particular religion, 76 per cent believe that life evolved by natural selection, with God playing no part. Among those who regard themselves as belonging to a religion, but who attend services or meetings connected with their religion no more than twice a year, 43 per cent believe that life evolved by natural selection, with God playing no part. Among those

[69] Figure 7.7 shows data from LifeEart (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

who regard themselves as belonging to a religion, and who attend services or meetings connected with their religion at least once a month, the proportion believing that life evolved by natural selection, with God playing no part, falls to just nine per cent. Among this group, the majority (53 per cent) believe that humans and other living things were created by God, and have always existed in their current form.

Beliefs about the origin of life on earth are also related to the science-related qualifications people have gained, and to their knowledge about science. Among those with a science-related qualification gained from university or college, 63 per cent believe life evolved by natural selection with God playing no part, over four times the proportion (14 per cent) that hold the creationist view that humans and other living things were created by God and have always existed in their current form. Among those with a science-related qualification gained from school, 55 per cent believe life evolved by natural selection with God playing no part, almost three times the proportion that hold the creationist view (19 per cent). And among those with no science-related qualifications, 44 per cent believe life evolved by natural selection with God playing no part, twice the proportion that hold the creationist view (22 per cent).

Related to this, those who are more knowledgeable about science (as measured by the knowledge quiz) are more likely to believe that life evolved by natural selection, with God playing no part (66 per cent among those with high scores, compared with 32 per cent among those with low scores), and are less likely to hold the creationist view (10 per cent among those with high scores, compared with 34 per cent among those with low scores).

http://dx.doi.org/10.6084/m9.figshare.3145744

7.6. What do people know about the drug development process?

How long does it take to develop the average medical treatment?

The length of time it takes to develop a medical treatment, from investing in early research, to the treatment being available to patients, varies considerably across types of medical treatment. Research suggests that it takes between 15 to 25 years for a medicine to be developed, from the pre-discovery phase during which scientists work to understand the disease, to eventual availability to patients (e.g. Glover et al., 2014; Paul et al., 2010; Health Economics Research Group, Office of Health Economics, and RAND Europe, 2008).

In order to gauge the public's appreciation of this time-span, respondents were asked to indicate (by choosing their answer from a list) how long it takes to develop the average medical treatment, from investment in early research to the treatment being available to patients (Figure 7.8[70]).

Half of the public (50 per cent) think it takes over ten years, and up to 20 years, for the average medical treatment to be developed. One in ten (11 per cent) believe the process is faster than this, while 21 per cent believe it takes longer. A significant minority (16 per cent) say they do not know how long it takes to develop the average medical treatment.

Figure 7.8 Length of time taken to develop the average medical treatment

Q. From this card, please indicate how long you think it takes to develop the average medical treatment, from investment in early research to the treatment being available to patients? If you don't know at all, please just say so rather than guessing.

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Less than 10 years	11
Over 10 years, up to 20 years	50
Over 20 years, up to 30 years	15
Over 30 years, up to 40 years	4
Over 40 years, up to 50 years	2
More than 50 years	1
(Spontaneous) Depends on the treatment	3
Don't know	16
Unweighted base:	*1,524*
Weighted base:	*1,524*

[70] Figure 7.8 shows data from PhaTime (press CTRL and click on question name to access data table).

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Who spends the most of the development of medical drugs in the UK?

Respondents were asked to choose which organisation (from a list) spends the most on the development of new medical drugs in the UK (Figure 7.9[71]). The majority of the public (65 per cent) correctly identify pharmaceutical companies as the highest spenders, while 20 per cent believe that the NHS and other public sector or government organisations spend the most.

Figure 7.9 Organisation spending the most on developing new medical drugs in the UK

Q. This card shows a number of organisations. Which one of these do you think spends the most on the development of new medical drugs in the UK?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Pharmaceutical companies	65
The NHS, and other public sector or government organisations	20
Medical charities	7
Private healthcare insurers	4
(Spontaneous) Depends on the medicine	1
Don't know	4
Unweighted base:	*1,524*
Weighted base:	*1,524*

Older adults are more likely to believe that pharmaceutical companies spend the most on drug development in the UK (73 per cent of those aged 65 or over, falling to 54 per cent of those aged 18 to 34). By contrast, younger adults are more likely than older adults to believe that the NHS and other public sector or government organisations spend the most (27 per cent among those aged 18 to 34, compared with 17 per cent among those aged 65 or over). Beliefs do not differ by gender.

Identification of pharmaceutical companies as the largest funders of drug development in the UK has a significant relationship with people's science-related qualifications, and with their knowledge about science as measured by the knowledge quiz. Among those with a science-related qualification gained from university or college, 75 per cent believe pharmaceutical companies spend the most, while just 14 per cent believe that the NHS and other public sector or government organisations spend the most. Among those with no science-related qualifications, the proportion citing pharmaceutical companies falls to 59 per cent, while the proportion citing the NHS and other public sector or government organisations rises to 23 per cent. Reflecting this pattern, 79 per cent of those scoring highly on the knowledge quiz cite pharmaceutical companies (compared with 12 per cent who cite the NHS and other public sector or government organisations), while just 40 per cent of those of those with low scores on the knowledge quiz cite pharmaceutical companies, in line with the 36 per cent who cite the NHS and other public sector or government organisations.

[71] Figure 7.9 shows data from PhaFunds (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Those in managerial and professional occupations are most likely to cite pharmaceutical companies (77 per cent, compared with 54 per cent among those who have never worked or are long-term unemployed).

http://dx.doi.org/10.6084/m9.figshare.3145744

8. What is important to the public when deciding what to eat and drink?

The Wellcome Trust's nationwide initiative, The Crunch, aims to engage people of all ages with the future of food and drink. The Crunch is a year of activities, experiences, and discussions about food, health and the planet. It provides free resources for schools, activities for families and adults, and an opportunity for everyone to join in and have their say. The Monitor includes a range of questions about food choices, and one question about drink choices, to help us understand what the nation thinks about food and its relationship to our health and to our planet.

Key findings:

- When the public hear the term "healthy food" they typically think of vegetables, salads and greens (mentioned by 60 per cent), and fruit (47 per cent).
- When asked about the importance of various factors when deciding what to eat and drink, the public prioritise considerations affecting their own health, namely sugar and salt content. The most important environmental factors are food coming from sustainable sources, food not coming in a lot of packaging, and food being produced in the UK rather than in a foreign country.
- Older adults are more likely than younger adults to consider it important that their food is produced in the UK, is produced in their part of the country, and does not come in a lot of packaging.

8.1. What do people understand by the term "healthy food"?

Respondents were asked what comes to mind when they hear the term "healthy food" (Figure 8.1[72]). Their verbatim responses to this question were recorded by interviewers, and were subsequently coded to a code frame.

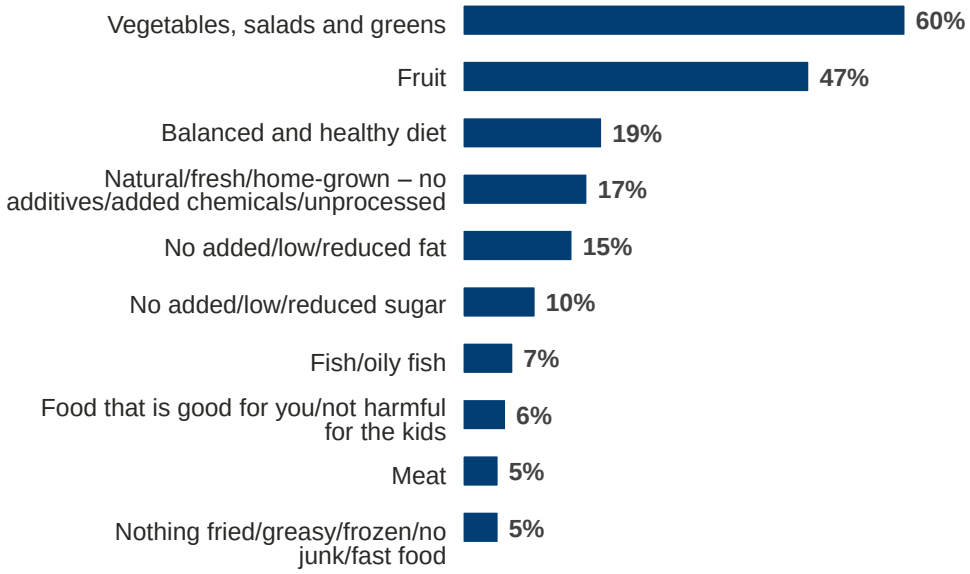
The term "healthy food" elicits a wide variety of responses among the public, with the most common being "vegetables, salads and greens" (cited by 60 per cent), followed by fruit (47 per cent). Around two in five of the public (43 per cent) mention vegetables, salads and greens, as well as fruit. One in five (19 per cent) think of a balanced and healthy diet, 17 per cent mention food that is natural, fresh or home-grown and free from additives, while 15 per cent refer to food that is low in fat, or fat-free.

[72] Figure 8.1 shows data from HFoodMean (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 8.1: What people understand by the term healthy food

Q. Please just tell me, in a sentence, what comes to mind when I say the term "healthy food"?



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Bases: 1,524 UK adults aged 18+
Fieldwork dates: 2 June to 1 November 2015

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The following verbatim responses give a sense of the diversity among the public in the way in which they think about healthy food:

I suppose it would need to be fresh food without any additives. Preferably if it is from an animal, the animal would have to have been well husbanded.
Male, aged 55, Scotland

Fruit and veg - anything not fried.
Female, aged 28, North West

Eat what you like in moderation.
Female, aged 48, London

Growing naturally and not sprayed with anything - the uglier the apple the better. Not too much sugar or salt.
Female, aged 38, South East

Food that provides our body with the building blocks to remain healthy.
Female, aged 48, Wales

Food that is good for your body, easily digested, without too much fat in it, and with the right vitamins.
Male, aged 51, North West

What they say about healthy food is confusing and often boring.
Female, aged 63, North West

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Five a day, plenty of water, and moderate portions of fat and protein.
Female, aged 23, Northern Ireland

Food that's not salty.
Male, aged 92, West Midlands

Women are significantly more likely than men to think of vegetables, salads and greens, and fruit. Two-thirds of women (66 per cent) say they think of vegetables, salads or greens, compared with 54 per cent of men, and over half of women (54 per cent) think of fruit, compared with 40 per cent of men.

8.2. What do people consider important when choosing what to eat?

Four per cent of the public describe their diet as vegetarian, one per cent as vegan, and less than one per cent as pescatarian.[73] Women are almost three times more likely than men to describe their diet as vegetarian, vegan, or pescatarian (eight per cent, compared with three per cent); however, there is no significant variation by age.

Respondents were asked how important nine different factors are when deciding what to eat and drink (Figure 8.2[74]). The results show that the public prioritise considerations affecting their own health, with around four in five considering it important that what they eat and drink does not have a high sugar content, and that their food does not have high salt content.

The majority of the public (73 per cent) consider it important that their food comes from sustainable sources, that their food does not come in a lot of packaging (66 per cent), and that their food is produced in the UK (57 per cent). Among the 90 per cent of the public who are aware of genetic modification, just over half (52 per cent) consider it important that their food is free from genetic modifications.

The two least important considerations, of those asked about, are that food is produced locally (with 35 per cent considering this to be important), or is organic (31 per cent).

The majority of the public (70 per cent) consider five or more of the nine factors asked about to be important.

[73] These data are from Vegetarian.
[74] These data are from FDUK, FDLocal, FDGM, FDPack, FDOrganic, FDSust, FDSalt, FDSugar and FDDrSugar (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 8.2 Importance of certain factors in decisions about food and drink consumption

Q. And in general, how important is it to you that the food you eat…

Base: All respondents (1,524) *Wellcome Trust Monitor*

		Very important	Fairly important	Not very important	Not at all important	(spontaneous): I don't know what you mean	Don't know	*% Important (very or fairly)*
…does not have high sugar content	(%)	41	39	13	6	*	*	*80*
…does not have high salt content	(%)	40	37	15	6	*	1	*77*
…comes from sustainable sources	(%)	26	46	15	7	4	2	*73*
…does not come in a lot of packaging	(%)	26	40	23	10	*	1	*66*
…is produced in the UK rather than in a foreign country	(%)	21	36	28	14	*	*	*57*
…is not genetically modified†	(%)	23	30	29	14	2	3	*52*
…is produced in this part of the country	(%)	10	25	39	25	*	*	*35*
…is organic	(%)	7	24	41	26	1	1	*31*
Q. And now thinking about what you drink, how important is it to you that it does not have…								
…high sugar content	(%)	46	35	13	6	0	1	*81*

** indicates a percentage less than 0.5%, but greater than 0.*
† Base is respondents who have heard of the term "GM, or genetically modified" (unweighted base: 1,372).

The biggest differences in how people weigh these factors are related to age. Older adults are more likely to place importance on where their food is produced. Whereas 71 per cent of those aged 65 or over consider it important that their food is produced in the UK, only around two in five (41 per cent) of those aged 18 to 34 consider this important. Similarly, half of those aged 65 or over think it important that their food is produced in their part of the country (47 per cent), twice the proportion among those aged 18 to 34 (23 per cent). Another stark difference by age relates to packaging, with three-quarters (76 per cent) of those aged 65 or over (and a similar proportion of those aged 35 to 64) considering it important that their food does not come in a lot of packaging, compared with less than half (46 per cent) of those aged 18 to 34.

Older adults are also more likely to place importance on factors relating to their own health, reflecting the fact that older people are more likely to be in poor health. Four in five (82 per cent) of those aged 65 or over consider it important that their food does not have a high salt content, compared with 71 per cent of those aged 18 to 34. Similarly, 85 per cent of those

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aged 65 or over consider it important that their food does not have a high sugar content (compared with 73 among those aged 18 to 34), and 87 per cent of those aged 65 or over consider it important that what they drink does not have a high sugar content (compared with 70 per cent of those aged 18 to 34).

The importance placed on food being free from genetic modification, being organic, or coming from sustainable sources does not vary by age group.

Women are significantly more likely than men to place importance on each of the factors asked about, with the exceptions of food being produced locally, or coming from sustainable sources (for which there are no significant gender differences). In general, the differences in opinion between men and women are relatively small. The greatest difference relates to genetically modified food. Around three in five (63 per cent) women consider it important that their food is not genetically modified, compared with 42 per cent of men. The next largest difference relates to food being imported. Around three in five (63 per cent) women consider it important that their food is produced in the UK, compared with half (50 per cent) of men.

There is evidence that those who know more about genetic modification are more willing to eat genetically modified foods. Those who say they have a very good or good understanding of the term "GM, or genetically modified" are less likely to consider it important that their food is free from genetic modification than those who do not have a good understanding of this term (48 per cent, compared with 56 per cent).

Factors considered when choosing what to eat and drink: multivariate analysis

This section explores the factors the public consider when choosing what to eat and drink, grouping them into five groups ("clusters"), identified using a segmentation methodology.

Segmentation, or cluster analysis, is a technique used to classify individuals into groups that are as similar as possible within each group, but as different as possible to the other groups, based on responses to a set of questions.

We segmented the public using eight of the nine questions which asked about the importance of various factors when deciding what to eat and drink.[75] Following preliminary analysis exploring several different segmentation solutions, a five cluster solution was selected.[76]

We now present the groups. In interpreting the groups, reference can also be made to the demographic profile of the groups, which is presented in Figure 8.3 in the Annex to this chapter.

- **Health-conscious.** This is the largest group, accounting for one-quarter (24 per cent) of the public. These individuals place more importance on considerations affecting their own health (the sugar and salt content of their food, and the sugar content of their drink) than do the public as a whole, but are similar to the public as a whole with regard to other considerations, such as where food is produced, sustainably sourced food, packaging, and whether food is organic. Individuals in this group are more likely

[75] The question asking how important it is that the food is not genetically modified (FDGM) was excluded from the analysis because it was only asked of a sub-set of respondents (those who had heard of the term "GM, or genetically modified").

[76] 124 respondents who answered "don't know", or who refused to provide an answer for one or more of the questions, were not assigned to a cluster.

http://dx.doi.org/10.6084/m9.figshare.3145744

than the public as a whole to be in managerial and professional occupations, and to have a higher level of education.

- **Concerned about all factors**. This group accounts for one in five (21 per cent) of the public. Adults in this group place high importance on each of the eight factors asked about, relative to the public as a whole. Consistent with the pattern among the public overall, they place the greatest importance on considerations affecting their own health, and the least importance on local food production, or whether or not the food they eat is organic. Individuals in this group are more likely than the public as a whole to be women, to be aged 50 or over, and to live in less deprived areas of the country.

- **Focused on local produce.** This group accounts for one in five (22 per cent) of the public. Adults in this group are more likely, relative to the public as a whole, to place importance on food being produced in the UK, and in their area of the country, but are less likely to place importance on considerations affecting their own health. Individuals in this group are more likely than the public as a whole to live in less deprived areas of the country, and to have higher household incomes,

- **Little concern for any factor but health.** This group accounts for 16 per cent of the public. Individuals in this group are similar to the public as a whole in terms of the importance they place on factors affecting their own health, but they place less importance than do the public as a whole on other considerations, such as where food is produced, sustainably sourced food, packaging, and whether or not food is organic. Individuals in this group are more likely than the public as a whole to be aged 18 to 34.

- **Little concern for any factor.** This is the smallest group, accounting for 10 per cent of the public. Individuals in this group place little importance on each the eight factors asked about, compared to the public as a whole. Individuals in this group are more likely than the public as a whole to be male, to be aged 18 to 34, to be in routine and manual occupations, to have no educational qualifications, and to live in the more deprived areas of the country.

http://dx.doi.org/10.6084/m9.figshare.3145744

8.3. Annex: Multivariate analysis tables

Figure 8.3 Selected demographics by cluster

Base: All respondents assigned to a cluster (1,400) *Wellcome Trust Monitor*

	Health-conscious	Concerned about all factors	Focused on local produce	Little concern for any factor but health	Little concern for any factor	Total
	(%)	(%)	(%)	(%)	(%)	(%)
Gender						
Male	50	37	51	51	61	49
Female	50	63	49	49	39	51
Age						
18-34	23	17	25	42	47	29
35-49	31	22	29	24	19	26
50-64	22	28	26	19	22	24
65+	24	33	20	15	12	22
NS-SEC						
Managerial and professional occupations	46	37	41	33	26	38
Intermediate occupations	20	24	21	26	25	23
Routine and manual occupations	29	34	36	36	45	35
Never worked and long-term unemployed	5	4	2	5	4	4
Household income (grouped)						
Less than £9,999	5	8	7	9	10	7
£10,000 - 14,999	9	10	7	9	6	8
£20,000 - £25,999	4	6	5	5	8	5
£26,000 - £31,999	12	8	9	5	9	9
£32,000 - £43,999	8	5	7	6	10	7
£44,000 - £55,999	9	9	11	17	7	10
£56,000 or more	11	9	11	9	7	10
Refused	16	12	19	12	12	15
Don’t know	14	18	14	13	17	15
Highest educational qualification						
Postgraduate degree	16	12	11	9	4	11
First degree	22	14	14	21	17	18
Higher education below degree	16	15	16	16	9	15
A levels	12	18	24	17	10	17
GCSEs/O levels	15	20	15	18	23	17
Level 1 qualifications	7	4	7	4	9	6
No qualifications	12	17	13	16	27	15

Table continued overleaf

http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 8.3 (continued) Selected demographics by cluster

Base: All respondents assigned to a cluster (1,400) *Wellcome Trust Monitor*

	Health-conscious	Concerned about all factors	Focused on local produce	Little concern for any factor but health	Little concern for any factor	Total
	(%)	(%)	(%)	(%)	(%)	(%)
Area deprivation						
First quartile (least deprived)	28	31	32	23	14	27
Second quartile	21	29	25	25	17	24
Third quartile	26	21	26	25	31	26
Fourth quartile (most deprived)	25	19	17	27	37	24
Qualifications in science						
University/college	30	24	23	29	16	25
School	37	34	38	35	39	37
No qualifications	32	42	39	36	45	38
Respondent score on science quiz						
Low	15	17	15	18	27	17
Medium	54	54	53	50	49	52
High	31	29	32	32	24	30
Respondent works in science						
Respondent has not had a scientific job	83	84	84	85	94	85
Respondent has had a scientific job	17	16	16	15	6	15
Parents had a scientific job						
Yes, one parent	9	11	11	11	7	10
Yes, both parents	3	0	3	1	1	2
No, neither parent	87	89	85	88	92	88
Disability						
No one	53	48	46	53	55	51
Respondent, friend, or family member	47	52	54	47	45	49
Serious genetic condition in family						
Yes	12	14	17	15	10	14
No	88	86	83	85	90	86
Religion						
No religion	44	43	54	55	49	49
Christian - no denomination	16	16	12	13	15	14
Roman Catholic	8	8	5	11	11	8
Church of England/Anglican	18	21	15	9	9	15
Other Christian	7	7	9	3	8	7
Non-Christian	7	4	4	9	9	6

http://dx.doi.org/10.6084/m9.figshare.3145744

9. Antibiotic resistance and the use of antibiotics

Antibiotics, which are used to treat or prevent bacterial infections, have been estimated by the World Health Organisation (2012) to have (along with vaccines) lengthened our life-spans by an average of twenty years since the discovery of the first antibiotic, penicillin, by Alexander Fleming in 1928. However, the misuse of antibiotics has contributed to the emergence of antibiotic resistance, whereby bacteria are no longer affected by antibiotics, resulting in drug resistant infections becoming widespread.

This chapter considers the public's awareness and understanding of antibiotic resistance, as well as their knowledge about the types of conditions that antibiotics can treat. The chapter then examines public behaviours around antibiotics, including how recently people have taken antibiotics, whether they adhere to their prescribed course, and the expectations they have of medical professionals to prescribe them antibiotics.

Key findings:

- Awareness of the term "antibiotic resistance" is high, with 91 per cent of the public saying they have heard of the term.
- Antibiotic resistance is most commonly thought (mistakenly) to refer to one's body becoming resistant or immune to antibiotics. Other common conceptions of antibiotic resistance are that antibiotics do not work, or have less effect, and that antibiotics are overused.
- Although most of the public (84 per cent) believe (correctly) that antibiotics treat bacterial infections, only two in five (41 per cent) have a fully accurate understanding, believing that antibiotics treat bacterial infections alone.
- Almost all of the public (91 per cent) have been prescribed antibiotics at some point in their lives, and around two in five (41 per cent) have been prescribed antibiotics in the last year. Over one in five (22 per cent) of those who have been prescribed antibiotics believe there has been an occasion when they have been prescribed antibiotics inappropriately.
- The great majority (86 per cent) of those who have been prescribed antibiotics report following their most recent prescription as instructed, taking all the antibiotics they were prescribed, at the right times. However, six per cent (equating to 2.6 million adults across the UK) say they did not finish the course, and this was typically because they were feeling better.

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

Key findings (continued):

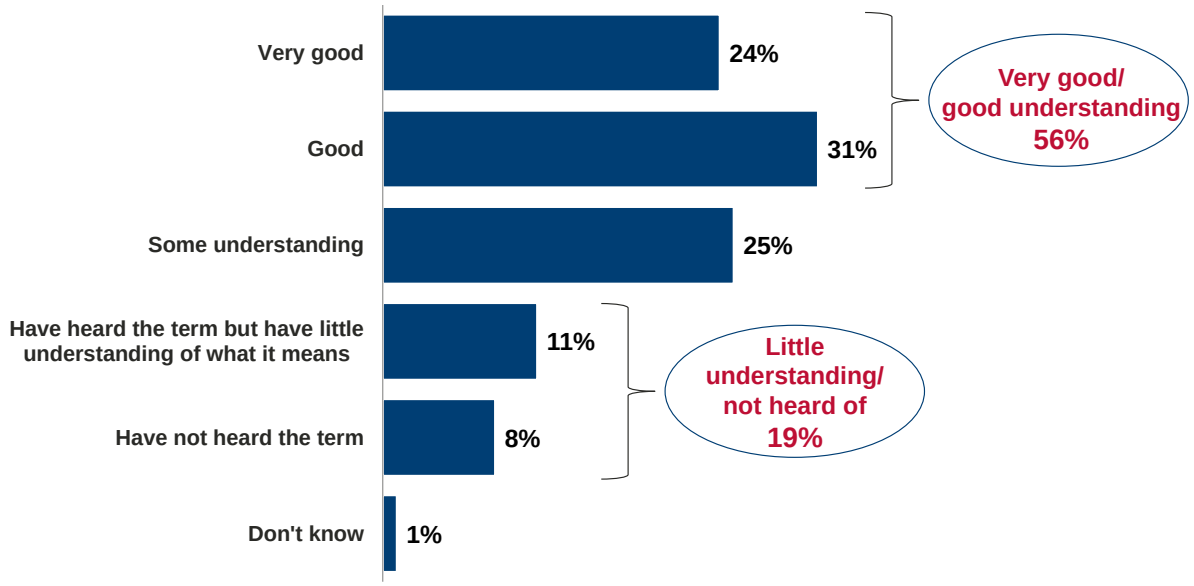
- Just over one in five (21 per cent) of the public say they have, at some point, asked a GP or other medical professional to prescribe them antibiotics. Of those who have asked for antibiotics, most (85 per cent) say their request was accepted the last time they asked, with younger adults more likely to have had their request accepted (94 per cent of those aged 18 to 34, falling to 77 per cent of those aged 65 or over).
- Of those whose request for antibiotics was refused on asking, one-third (34 per cent) believe they should have been prescribed antibiotics.

9.1. Awareness and understanding of antibiotic resistance

The great majority of the public (91 per cent) say they have heard of the term "antibiotic resistance", and most (56 per cent) say they have a very good or good understanding of the term (Figure 9.1[77]). One in ten (11 per cent) say they have heard of the term but have little understanding of its meaning.

Figure 9.1: Self-reported understanding of antibiotic resistance

Q. When you hear the term antibiotic resistance, how would you rate your understanding of what the term means?



Those aged between 18 and 34 are least likely to say they have a good or very good understanding of the term "antibiotic resistance" (49 per cent). This proportion rises to 63 per cent among those aged 50 to 64, and falls back to 55 per cent among those aged 65 or over. Professed understanding of antibiotic resistance does not vary by gender.

[77] Figure 9.1 shows data from KnowABR (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Respondents who had heard of antibiotic resistance were asked to say what they understood the term to mean (Figure 9.2[78]). Their verbatim responses were recorded by interviewers, and were coded to a code frame.

The most common responses relate (mistakenly) to one's body, or oneself, becoming resistant or immune to antibiotics (31 per cent). This is consistent with recent qualitative research carried out by Good Business (2015) on behalf of the Wellcome Trust, which found that the public commonly talk about "antimicrobial resistance" in terms of changes to their own bodies, to their own tolerance levels, or to their own levels of immunity.

Over one-quarter (28 per cent) understand antibiotic resistance to mean that antibiotics do not work, have less effect, or have no effect. One in five (20 per cent) refer to antibiotics being overused. One in ten (nine per cent) say they do not know what the term means.

Figure 9.2 What is understood by the term "antibiotic resistance"?

Q. What do you understand by the term Antibiotic resistance? (open ended)

Base: Respondents who have heard of the term antibiotic resistance — *Wellcome Trust Monitor*

Mentioned by two per cent or more	**Monitor w3 (2015)** (%)
You/your body becomes resistant/immune to antibiotics	31
Antibiotics don't work/have less/no effect	28
Antibiotics overused/too many antibiotics	20
References to something becoming resistant/immune, including:	*29*
references to bacteria	9
references to bacteria mutating/changing	3
references to bacteria multiplying/reproducing	*
references to diseases	5
references to viruses	3
references to infections	3
references to germs	2
references to bugs	2
generic/unspecified references to resistance/immunity	3
Taking antibiotics unnecessarily	2
Vague/irrelevant answer	3
Don't know	10
Unweighted base:	*1,385*
Weighted base:	*1,389*

Research by Eurobarometer (2013) found that the great majority of the UK public (89 per cent) knew that the unnecessary use of antibiotics would eventually result in antibiotics becoming ineffective. However, this research did not explore the public's understanding of the mechanism by which this occurs.

[78] Figure 9.2 shows data from ABRMean (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

9.2. What conditions do people think can be treated by antibiotics?

Respondents were asked to choose which conditions they thought could be treated effectively by antibiotics.

The great majority of the public (84 per cent) correctly identify bacterial infections as being treatable by antibiotics (Figure 9.3[79]). However, two in five (38 per cent) incorrectly believe that antibiotics are an effective treatment for viral infections, and 21 per cent incorrectly believe that antibiotics are an effective treatment for fungal infections.

A minority of two in five (41 per cent) have an accurate understanding of what antibiotics can treat; that is, they believe that antibiotics are an effective treatment for bacterial infections alone.

Figure 9.3 Perceptions of conditions that can be effectively treated by antibiotics

Q. Which of the conditions on this card, if any, do you think can be treated effectively by antibiotics?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Bacterial infections (such as throat infection, skin infections, pneumonia, urinary tract infections)	84
Viral infections (such as viral stomach bug, shingles, viral bronchitis, viral ear infections)	38
Fungal infections (such as athlete's foot, thrush or ringworm)	21
Flu	15
Allergic reactions (such as bee stings)	9
Colds	8
Spontaneous (All of these)	1
Spontaneous (None of these)	1
Don't know	2
% Bacterial infections alone	*41*
Unweighted base:	*1,524*
Weighted base:	*1,524*

Other research has explored public misconceptions about the conditions that antibiotics can treat, and the effects they can have. For instance, YouGov (2014) found that while 88 per cent of adults in Great Britain correctly believe that antibiotics can cure bacterial infections, 41 per cent incorrectly believe they can cure viral infections.

Women are more likely than men to have an accurate understanding of what antibiotics can treat; 45 per cent of women believe that antibiotics are an effective treatment for bacterial infections alone, compared with 36 per cent of men.

[79] Figure 9.3 shows data from ABTreat (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Younger adults are less likely than older adults to have an accurate understanding of what antibiotics can treat (31 per cent of those aged 18 to 34, rising to 43 per cent of those aged 35 to 49, 47 per cent of those aged 50 to 64, and 44 per cent of those aged 65 or over).

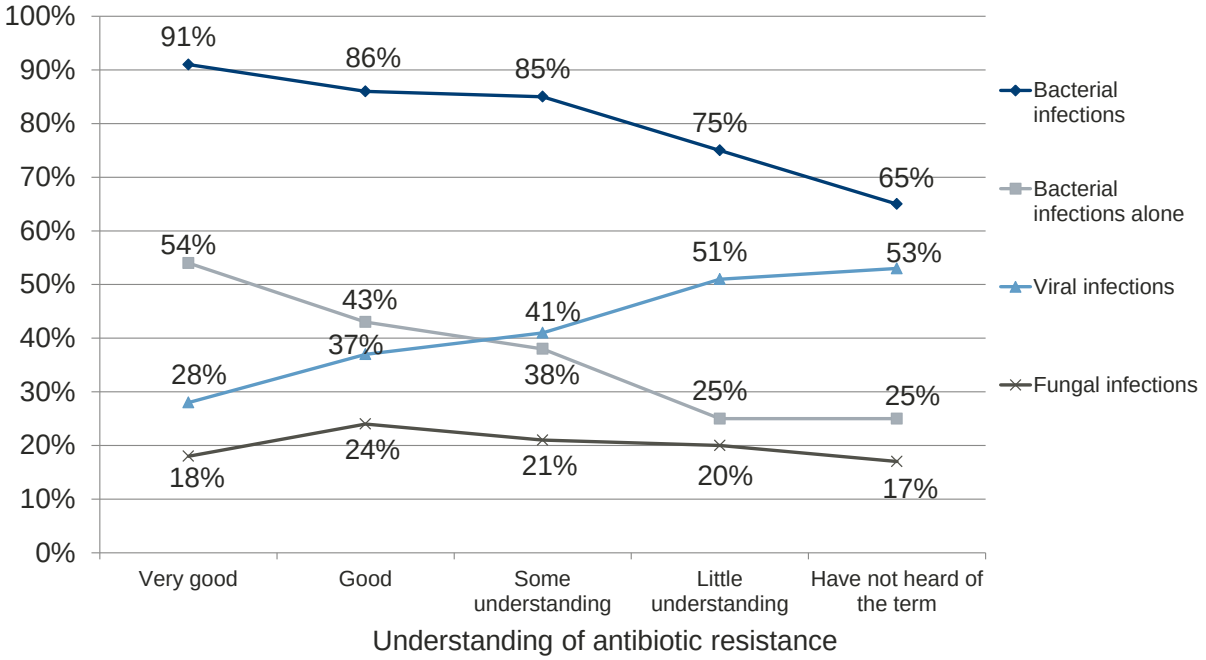
Around half of those with a postgraduate degree (53 per cent) or with a first degree (47 per cent) have an accurate understanding of what antibiotics can treat, falling to under one-third (31 per cent) of those with no educational qualifications.

Those who have taken antibiotics before are more likely than those who say they have never taken antibiotics to have an accurate understanding of what antibiotics can treat (42 per cent, compared with 25 per cent).

Figure 9.4[80] shows how the conditions the public believe antibiotics can treat varies by their professed understanding of antibiotic resistance. For instance, among those who rate their understanding of antibiotic resistance as very good, 91 per cent believe antibiotics treat bacterial infections, over three times the proportion that believe antibiotics treat viral infections (28 per cent). Among those who have not heard of the term antibiotic resistance, however, the proportion that believe antibiotics treat bacterial infections falls to 65 per cent, and the proportion that believe they treat viral infections rises to a majority of 53 per cent.

Of those rating their understanding of antibiotic resistance as very good, a slim majority (54 per cent) have an accurate understanding of the conditions antibiotics can treat (that is, they believe antibiotics are an effective treatment for bacterial infections alone). This is over twice the proportion (25 per cent) among those who have not heard the term antibiotic resistance.

Figure 9.4: Perceptions of conditions that can be effectively treated by antibiotics, by understanding of antibiotic resistance



Ipsos MORI Social Research Institute

Base: 1,524 UK adults aged 18+
Fieldwork dates (for 2015): 2 June to 1 November 2015

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[80] Figure 9.4 shows data from ABTreat and KnowABR (press CTRL and click on question name to access data table).

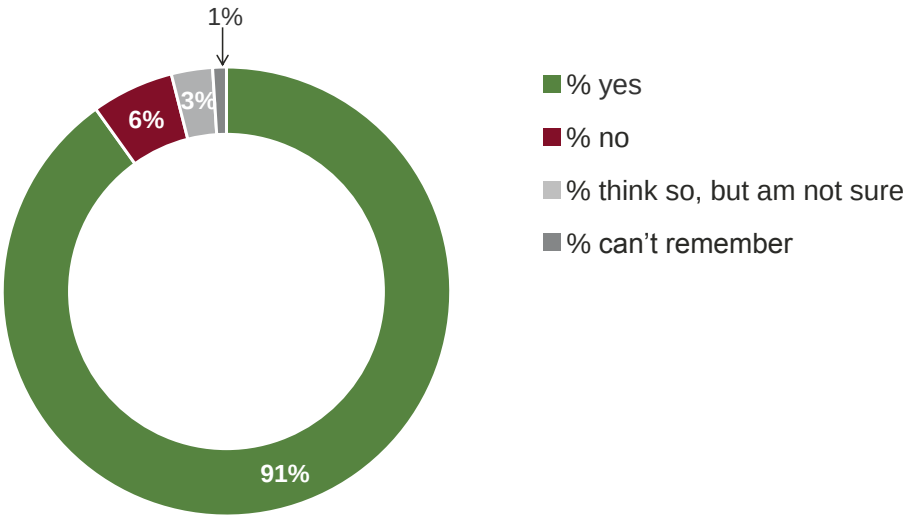
This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

9.3. What are people's most recent experiences of, and attitudes towards, taking antibiotics

The great majority of the public (91 per cent) say they have been prescribed antibiotics at some point in their life. Women are more likely to say they have been prescribed antibiotics than men (94 per cent, compared with 88 per cent). Nearly all adults aged between 50 and 64 say they have been prescribed antibiotics (96 per cent), while among those aged 18 to 34, this proportion falls to 86 per cent (Figure 9.5[81]).

Figure 9.5: Experience of antibiotics

Q. I would now like to ask you about your experience of antibiotics. As far as you know, have you ever been prescribed antibiotics?



Ipsos MORI Social Research Institute

Base: 1,524 UK adults aged 18+
Fieldwork dates: 2 June – 1 November 2015

wellcome trust

[81] Figure 9.5 shows data from ABEvPresc (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Respondents who said they have been prescribed antibiotics were asked whether there had ever been an occasion when they had been prescribed antibiotics, but had thought that this prescription was inappropriate. One in five (22 per cent) feel they have, at some point, been prescribed antibiotics inappropriately (Figure 9.6[82]). This proportion does not vary by gender or age group, nor by whether people have an accurate understanding of what antibiotics can treat.

Figure 9.6 Perceived inappropriate prescribing of antibiotics

Q. And has there ever been an occasion when you been prescribed antibiotics, but have thought that this was not the appropriate treatment for you?

Base: All who have been prescribed antibiotics — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Yes	22
No	77
Don't know	1
Unweighted base:	*1,396*
Weighted base:	*1,385*

[82] Figure 9.6 shows data from ABWrong (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

Among adults who have been prescribed antibiotics at some point in the past, just under half (45 per cent) most recently took antibiotics within the last year (Figure 9.7[83]). This equates to 41 per cent of all adults who have taken antibiotics in the last year. The Eurobarometer survey (2013) also found that 41 per cent of adults in the UK had taken antibiotics in the past 12 months.

Half of women say they last took antibiotics within the last year (48 per cent), higher than the proportion among men (41 per cent). Those aged 18 to 34 are most likely to have taken antibiotics within the past year (52 per cent). This proportion falls amongst older respondents; 38 per cent among those aged 50 to 64, and 45 per cent among those aged 65 or over.

Figure 9.7 Most recent experience of taking antibiotics

Q. Now I would like you to think about the last time that you took antibiotics. When was this? Was it…

Base: All who have been prescribed antibiotics — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Within the last month	11
Within the last three months	11
Within the last year	23
Within the last two years	16
More than two years ago	37
(Spontaneous) I have never taken antibiotics	*
Can't remember	2
% Some point within the last year	*45*
Unweighted base:	*1,396*
Weighted base:	*1,385*

** indicates a percentage less than 0.5%, but greater than 0.*

Those respondents who had been prescribed antibiotics at some point in the past, and who could remember when they last took them, were asked if the antibiotics they took most recently had been prescribed to them. Almost all adults (99 per cent) said that the antibiotics they had most recently taken had been prescribed to them.[84,85]

[83] Figure 9.7 shows data from ABWhen (press CTRL and click on question name to access data table).
[84] Data are from ABLstPre (press CTRL and click on question name to access data table).
[85] Only five respondents said they had not been prescribed the antibiotics they most recently took, of which two said they had antibiotics left over from another time, two said they obtained the antibiotics from abroad, and one said they obtained them from a family member. Data are from ABNPreWhere (press CTRL and click on question name to access data table).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

What are people's approaches to taking antibiotics?

Respondents were asked to choose, from a list, the scenario that best described what they did on receiving the prescription for the antibiotics they took most recently. The great majority (86 per cent) report following their prescription as instructed, taking all the antibiotics they had been prescribed at the right times (Figure 9.8[86]).

Seven per cent report that, although they took all the antibiotics they had been prescribed, they failed to do so at the right times, and a further six per cent (equating to 2.6 million adults across the UK) say they failed to take all of the antibiotics they had been prescribed.

This is consistent with research commissioned by Royal Society of Chemistry (2014) that found a similar pattern of adherence.

Figure 9.8 Adherence to the prescribed course of antibiotics

Q. And, when you were given the prescription, which of the following did you do?

Base: All who were prescribed the antibiotics they took most recently — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
I took all the antibiotics I was prescribed, at the right time	86
I took all the antibiotics I was prescribed, but not at the right times	7
I did not take all the antibiotics I was prescribed	6
(Spontaneous) I am currently taking antibiotics	1
(Spontaneous) Other	*
Can't remember	1
Unweighted base:	*1,368*
Weighted base:	*1,355*

Failure to follow the prescribed course of antibiotics is associated with age. Among those aged 18 to 34, one in five (20 per cent) reports either failing to take all the antibiotics they were prescribed, or taking them at the wrong times. This is almost twice the proportion among those aged 35 to 49 (11 per cent), and more than twice the proportion among those aged 65 or over (eight per cent). Failure to follow the prescribed course does not vary by gender, by social class, by qualifications in science, or by knowledge about science. Nor does failure to follow the prescribed course vary between those who have an accurate, versus inaccurate, understanding of the conditions antibiotics treat.

Those respondents who reported not taking all of the antibiotics they were prescribed were asked why they did this. The most common reason reported was that they were feeling better before the course was completed (mentioned by 60 per cent). One-quarter (25 per cent) said it was because they experienced side-effects, and 12 per cent that they simply forgot to take them.[87]

[86] Figure 9.8 shows data from ABCourse (press CTRL and click on question name to access data table).
[87] Data are from ABNComp (press CTRL and click on question name to access data tables).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

9.4. Asking GPs or medical professionals to prescribe antibiotics

In recognition of the serious dangers of over-prescribing antibiotics, The National Institute for Health and Care Excellence has recently drawn up fresh guidelines (NICE, 2015) on antibiotic prescribing for the NHS in England.

Research by Public Health England (2014) found that prescriptions of antibiotics by GPs and hospital doctors rose by six per cent between 2010 and 2013, with up to half of this increase potentially being "inappropriate". And a survey of GPs in the UK by the Longitude Prize (2014), carried out by MedeConnect, found that the great majority of GPs (90 per cent) feel pressure from patients to prescribe antibiotics, and over one-quarter (28 per cent) prescribe antibiotics "several times a week", even when they are not sure this is medically necessary. Furthermore, almost half of GPs (45 per cent) say they have prescribed antibiotics for a viral infection, when they know this will not treat the condition.

The present research included questions to gather up-to-date information about the extent to which adults in the UK are requesting antibiotics from their GPs, and to what extent these requests are being accepted.

One in five (21 per cent) of the public say they have, at some point, asked a GP or other medical professional to prescribe them antibiotics (Figure 9.9[88]). Women are more likely than men to have made such a request (25 per cent, compared with 17 per cent), and this may help to explain why, as seen earlier in this chapter, women are more likely than men to say they have, at some point, been prescribed antibiotics (94 per cent, compared with 88 per cent). The likelihood of requesting antibiotics does not differ by age group, by knowledge about science as measured by the knowledge quiz, or between those who have an accurate, versus inaccurate, understanding of the conditions antibiotics can treat.

[88] Figure 9.9 shows data from ABAsked, ABAskedPre, and ABPersuadeY (press CTRL and click on question name to access data tables).

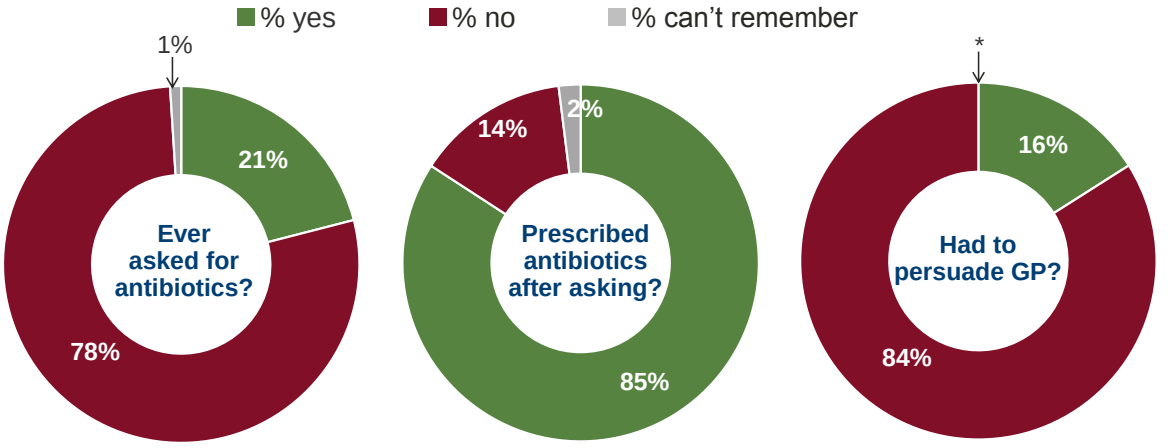
http://dx.doi.org/10.6084/m9.figshare.3145744

Figure 9.9: Asking for antibiotics

Q. Have you ever asked a GP or other medical professional to prescribe you antibiotics?

Q. And thinking of the last time you asked a GP or other medical professional to prescribe you antibiotics, did they give you a prescription for antibiotics?

Q. And did you have to persuade them to give you a prescription for antibiotics, before they did so?



Base: 1,524 UK adults aged 18+

Base: All who have asked for a prescription for antibiotics (308)

Base: All who, after asking for a prescription for antibiotics, were prescribed antibiotics (257)

Ipsos MORI Social Research Institute

Fieldwork dates: 2 June – 1 November 2015

** Indicates a percentage less than 0.5%, but greater than 0.*

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Among those who have asked their GP or another medical professional for antibiotics, the great majority (85 per cent) say that the last time they made such a request, they were provided with a prescription for antibiotics (Figure 9.9 again). Younger adults are more likely to have had their most recent request for antibiotics accepted (94 per cent among those aged 18 to 34, falling to 77 per cent among those aged 65 or over). This does not necessarily mean that GPs and other medical professionals are more easily persuaded by younger adults; for instance, it is possible that younger adults are more likely to request antibiotics when, in the opinion of their GP, they actually need them. Men and women are equally likely to have had their most recent request for antibiotics accepted.

Respondents who were given a prescription for antibiotics on requesting one were asked whether they had to persuade their GP or other medical professional for a prescription. The great majority (84 per cent) say they were given the prescription on asking for it, with the remainder having to persuade their GP before being given the prescription (Figure 9.9 again). There are no significant differences either by gender, or age group, in the proportions having to persuade their GP before being given a prescription for antibiotics.

Turning to those adults whose most recent request for antibiotics was refused, one-third (34 per cent) think that they *should* have been prescribed antibiotics, and one-quarter (25 per cent) say that they attempted to persuade their GP or other medical professional to give them a prescription for antibiotics, after being told they were not going to be given one.[89]

Those respondents who thought they should have been prescribed antibiotics were asked why

[89] These data are from ABPersuadeN and ABShdPre (press CTRL and click on question name to access data tables). They are based on the responses from 47 respondents, and as such, should be interpreted with caution.

http://dx.doi.org/10.6084/m9.figshare.3145744

they thought this. Due to the low base size (15 respondents), a selection of verbatim answers are presented below.

Because I didn't feel well and he was refusing to do anything.
Female, aged 52, West Midlands

I had a bad chest infection and thought I needed antibiotics to clear it up. The doctor gave me a nasal spray instead.
Male, aged 33, Scotland

I had a kidney infection and they thought it might be related to my bad back, but it wasn't, it was my kidneys. It took a few visits to get the antibiotics.
Male, aged 37, North East

I was unwell and needed something.
Male, aged 84, Wales

I had a bad cough and thought I needed antibiotics to clear it.
Male, aged 45, Scotland

These answers suggest that some adults may feel entitled to antibiotics based on their prior experiences with antibiotics, others may believe they have been incorrectly diagnosed, while others may even believe that antibiotics should be prescribed as a "default" treatment upon feeling unwell. Qualitative research conducted by Good Business (2015), on behalf of the Wellcome Trust, is consistent with these indicative findings. This research found that many people think they know when they need antibiotics, and do not need a doctor to tell them. Furthermore, most of the participants considered antibiotics to be a suitable treatment when they feel "really ill", irrespective of the cause of their illness.

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

10. Complementary and alternative medicine

The Wellcome Trust is dedicated to improving health, and is therefore interested in understanding public use and perceptions of complementary and alternative medicine (CAM). Evidence on these matters is sparse, even though large numbers of people may be using treatments for which there is little or no evidence of their efficacy. This usage may adversely affect public health; for example, CAMs that are not effective (or for which there is no evidence of efficacy) may be used as a replacement for conventional medicines which are effective. Furthering our knowledge in this area may also help us to understand other issues, such as the uptake of vaccinations, or the value of public health initiatives around antibiotic resistance.

This chapter considers the use of CAM among the public, with a specific focus on homeopathy.

Key findings:

- Herbal medicine is the most popular of a number of alternative or complementary medicines asked about, having been used by 30 per cent of the public. This is followed by acupuncture (22 per cent), and homeopathy (16 per cent).
- The use of alternative or complementary medicines has not changed since 2009, with the exception of acupuncture, use of which has risen from 16 per cent to 22 per cent.
- Around half of those with a science-related qualification gained from university or college (52 per cent), or gained from school (50 per cent), have used at least one of the types of alternative or complementary medicine asked about, higher than the 43 per cent among those with no science-related qualifications.
- Sixteen per cent of the public say they have used homeopathy, with almost two in five of this group (37 per cent) having used it in the past year.
- Users of homeopathy are more likely to believe it was effective in treating their condition (42 per cent) than ineffective (17 per cent) the last time they used it.
- Among adults who have never used homeopathy, almost two in five (37 per cent) say they would never use it, while almost one-third (32 per cent) would consider using it if they thought it would be appropriate for their health problem. A further 22 per cent say they have never heard of homeopathy, or do not know what it is.
- The majority (54 per cent) of those who have heard of homeopathy but have not used it believe that, to a greater or lesser extent, homeopathy *can* be an effective treatment for medical conditions. However, this group is far more likely to think that homeopathy is less effective than conventional treatments (46 per cent) than is more effective (4 per cent) or just as effective (20 per cent).

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

10.1. What forms of alternative medicine have people used?

Respondents were asked which of a number of CAMs, if any, they had ever used. The most commonly used CAM of those asked about is herbal medicine, with 30 per cent of the public saying they have used this (Figure 10.1[90]). This is followed by acupuncture (22 per cent) and homeopathy (16 per cent). Almost half of the public report having used at least one of the types of alternative or complementary medicine asked about.

Figure 10.1 Use of alternative or complementary medicine

Q. Now for some questions about alternative and complementary medicine. Have you ever used any of the things listed on this card?

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w1 (2009) (%)	**Monitor w3 (2015)** (%)
Herbal medicine	28	30
Acupuncture	16	22
Homeopathy	18	16
Reiki	6	7
Hypnotherapy	6	7
Crystal healing	3	3
Don't know	*	1
(Spontaneous) None of these things	54	52
% At least one type of alternative/complementary medicine	*45*	*47*
Unweighted base:	*1,179*	*1,524*
Weighted base:	*1,179*	*1,524*

** indicates a percentage less than 0.5%, but greater than 0.*

Acupuncture is the only CAM to have undergone a change in its use since 2009, rising from 16 per cent in 2009, to 22 per cent currently.

Women are more likely than men to have used at least one CAM (54 per cent, compared with 40 per cent). Those aged 35 to 49 are most likely to have used one of the CAMs asked about (58 per cent, compared with 39 per cent of those aged 18 to 34, and 42 per cent of those aged 65 or over).

Use of CAM is higher among those with higher educational qualifications. Among those with a postgraduate degree, 57 per cent have used one or more of the CAMs asked about, and among those with a first degree, the proportion is similar, at 54 per cent. This falls to one-third (33 per cent) among those with level 1 qualifications, and to 29 per cent among those with no qualifications.

Half (52 per cent) of those with a science-related qualification gained from university or college, or from school (50 per cent), have used at least one of the types of alternative or complementary medicine asked about, compared with 43 per cent of those with no science-related qualifications. While this may appear counter-intuitive, this difference could be attributable to factors other than science education, such as the affordability CAM treatments.

[90] Figure 10.1 shows data from AlterM (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

10.2. Experiences of homeopathy

One form of alternative medicine was explored in further detail: homeopathy. Those who had used a homeopathic treatment were asked when they last used homeopathy, and how effective they felt it was on this occasion. Focusing only on those who report having used homeopathy risks under-estimating the potential of those who have not used it to be open to using it in the future. So, those who had never used homeopathy were asked about their likelihood of doing so in the future, and about their views on its likely efficacy as a treatment for medical conditions.

How recently have people used homeopathy?

Among adults who have used homeopathy, 12 per cent report having used homeopathy within the last month, and a further nine per cent report having used it within the last three months (Figure 10.2[91]). Half (51 per cent) say that the last time they used homeopathy was more than two years ago.

Figure 10.2 Most recent use of homeopathy

Q. Now I would like you to think about the last time that you used homeopathy. When was this? Was it…

Base: All respondents — *Wellcome Trust Monitor*

	Monitor w3 (2015) (%)
Within the last month	12
Within the last three months	9
Within the last year	16
Within the last two years	12
More than two years ago	51
Can't remember	1
% Some point in the last year	*37*
% Some point in the last two years	*49*
Unweighted base:	*230*
Weighted base:	*231*

[91] Figure 10.2 shows data from HomWhen (press CTRL and click on question name to access data table).

http://dx.doi.org/10.6084/m9.figshare.3145744

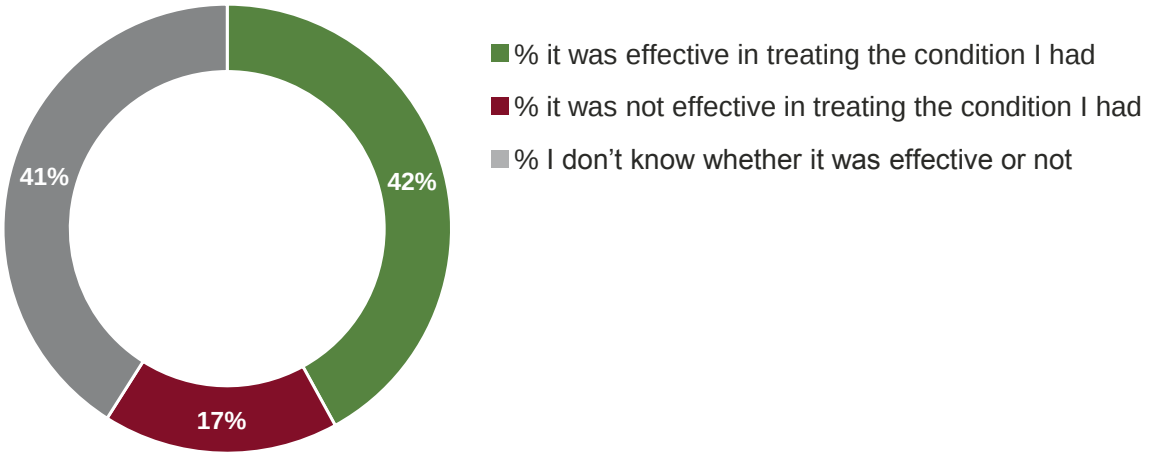
How effective do users of homeopathy think it is?

Respondents who had used homeopathy were asked to think back to the last time they used it, and consider how effective it was in treating the condition they had at the time.

Users of homeopathy are more likely to feel it was effective than ineffective as a way of treating their condition (42 per cent, compared with 17 per cent) (Figure 10.3[92]). However, as many say they "don't know" whether it was effective or not (41 per cent), as feel it was effective.

Figure 10.3: Effectiveness of last use of homeopathy

Q. And thinking back to the last time you used homeopathy, which of the options on this card best describes how effective you think it was?



Ipsos MORI Social Research Institute

Base: Respondents who have used homeopathy and can remember the last time they used it (229)
Fieldwork dates: 2 June – 1 November 2015

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[92] Figure 10.3 shows data from HomLastEff (press CTRL and click on question name to access data table).

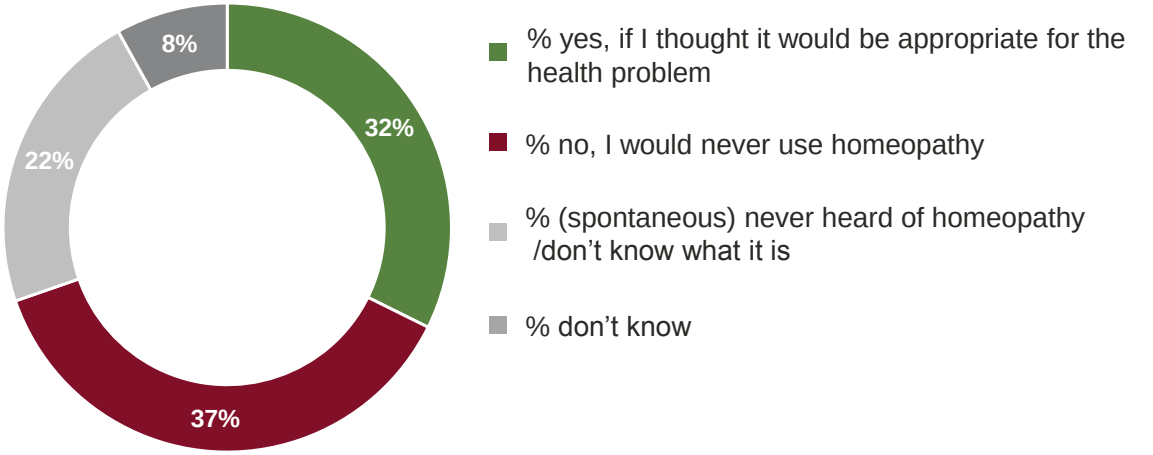
http://dx.doi.org/10.6084/m9.figshare.3145744

Is there a latent demand for homeopathy among non-users?

Respondents who had never used homeopathy were asked whether they would ever use it to treat a health problem they might have in the future. One-third (32 per cent) say they would use homeopathy if they thought it would be appropriate for their health problem, while 37 per cent say they would never use homeopathy (Figure 10.4[93]). Almost one-quarter (22 per cent) say they have never heard of homeopathy, or have heard of it but do not know what it is.

Figure 10.4: Use of homeopathy in the future

Q. Would you ever use homeopathy to treat a health problem that you might have in the future?



Ipsos MORI Social Research Institute

Base: Respondents who have never used homeopathy (1,294)
Fieldwork dates: 2 June – 1 November 2015

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The likelihood of using homeopathy in the future amongst those who have never used it does not vary between men and women, or across age groups.

How effective do people think homeopathy is at treating medical conditions?

Respondents who had heard of, but not used, homeopathy were asked how effective they thought homeopathy is at treating health problems.

Very few believe homeopathy is an effective treatment for *all* medical conditions (two per cent), and one in ten (nine per cent) believe it is an effective treatment for *many* medical conditions (Figure 10.5[94]). Instead, those who have heard of homeopathy, but have not used it, are most likely to say that homeopathy is an effective treatment, but only for *a few* medical conditions (43 per cent).

[93] Figure 10.4 shows data from HomNWould (press CTRL and click on question name to access data table).
[94] Figure 10.5 shows data from HomEff2 (press CTRL and click on question name to access data table).

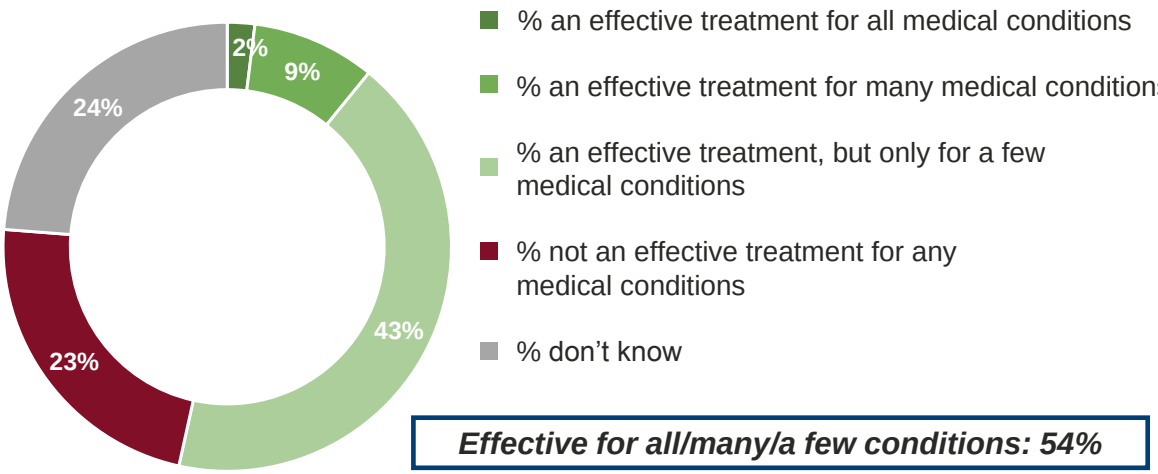
http://dx.doi.org/10.6084/m9.figshare.3145744

Nonetheless, the majority (54 per cent) of those who have heard of homeopathy but not used it believe that, to a greater or lesser extent, homeopathy *can* be an effective treatment for some medical conditions.

This means while only 16 per cent of the public have used homeopathy, most of the public do believe it can be an effective treatment. Research by Stoneman et al. (2012), using data from the first wave of the Wellcome Trust Monitor (2009), has investigated this distinction between reported use of homeopathy, and beliefs about its efficacy, in detail. The authors conclude that "there are good grounds…to assume that a high proportion of non-users of homeopathy would be willing to use this controversial treatment, if they were advised to do so and could afford to pay for it".

Figure 10.5: Effectiveness of homeopathy in treating medical conditions

Q. Do you think that homeopathy is . . . ?



Ipsos MORI Social Research Institute

Base: Respondents who have heard of, but have not used homeopathy (1,008)
Fieldwork dates: 2 June – 1 November 2015

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Women are more likely than men to believe that homeopathy is an effective treatment for many or all medical conditions (14 per cent, compared with eight per cent). There is no variation by age group.

http://dx.doi.org/10.6084/m9.figshare.3145744

We asked respondents who believed homeopathy to be an effective treatment for at least some medical conditions how they would rate it compared with conventional treatments available from qualified medical professionals. Just four per cent feel that homeopathic treatments are *more effective* than conventional treatments, and one in five (20 per cent) believes homeopathy is *just as effective* as conventional treatments they might get from their GP (Figure 10.6[95]). These adults are most likely, however, to say that homeopathy is less effective than conventional treatments (46 per cent).

There are no differences by age or gender in the proportions believing that homeopathy is more effective, or just as effective, as conventional medical treatments.

Figure 10.6 Effectiveness of homeopathy compared with conventional treatments

Q. And [for the sorts of medical conditions that homeopathy is effective at treating] how would you rate homeopathy compared to conventional treatments available from your GP or from other qualified medical professionals? Would you say it is...

Base: Respondents who had heard of, but not used homeopathy, who believed homeopathy to be an effective treatment for at least some medical conditions

Wellcome Trust Monitor

	Monitor w3 (2015) (%)
More effective	4
Just as effective	20
Less effective	46
(spontaneous) Depends on the illness	20
Don't know	11
% More effective/just as effective	*24*
Unweighted base:	*525*
Weighted base:	*526*

[95] Figure 10.6 shows data from HomComp (press CTRL and click on question name to access data table).

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11. Reflections

The findings from the third wave of the Wellcome Trust Monitor provide rich insight into a range of science and biomedical research themes. This report has described these findings in detail, and has explored differences between groups within the population; however, the themes have been, to a large extent, considered separately within their own chapters. In this final chapter, we bring the themes together. We reflect on what the findings tell us, on the questions they raise, and on the attitudes, knowledge, and behaviours that characterise key groups within the country.

Interest and engagement

A key objective of the Monitor is to assess the public's interest in, and engagement with, science and medical research. While we find a high level of interest in medical research, an appreciation for the value of science in everyday life, a desire among the public to hear directly from scientists, and many among the public seeking information about medical research, these findings should be considered in the context of the detail that the Monitor provides.

For instance, those who have actively sought information about medical research tend to do so to find medical advice, rather than to learn about new scientific developments *per se*. And those who are interested in hearing from scientists directly would prefer to do so via passive means, such as from television or radio, rather than via personal interaction. Furthermore, while the great majority of the public think it is useful for people to have an understanding of science in their everyday lives, when they consider their own lives specifically, comparatively fewer see the value of science.

Nevertheless, around half of the public have made a science-related visit in the past year, for instance visiting a zoo or aquarium, a science museum or centre, or a science-related art exhibition or installation. The one in five of the public that has visited a science museum or centre compares to around a third that have visited a history museum, and three in ten that have visited an art gallery.

Efforts to increase public engagement with scientific research could build on the high esteem in which doctors and other medical practitioners, and university scientists, are held in contrast to journalists. The findings suggest the public may be receptive to a greater presence from these professionals in the media.

Knowledge of science, and education

We now turn to consider the public's knowledge of science (as measured by the knowledge quiz) and levels of education, factors which are strong differentiators for many of the themes considered in this wave of the Monitor. These factors are, of course, highly inter-related; for instance, those with a postgraduate degree are over four times as likely to obtain a high score on the knowledge quiz as those with no educational qualifications, and those with a science-related qualification from university or college are around three times as likely to score highly as those with no science-related qualifications.

While over two-thirds of the public as a whole realise that controlled experimentation is the best method to assess the efficacy of a treatment, among those with no educational qualifications this falls to a minority of two in five, with a similar proportion professing that they do not know what the best method is.

This work was carried out in accordance with the requirements of the international quality standard for market research, ISO 20252:2006.
http://dx.doi.org/10.6084/m9.figshare.3145744

These differences extend to more specific fields of knowledge too. For instance, while most of those with a first or a higher degree feel they have a good understanding of genetic modification, and of antibiotic resistance, professed understanding is far lower among those with low or no qualifications. In addition, an accurate understanding of how antibiotics work (treating bacterial infections alone) is held by around half of those with first or higher degrees, compared to around one-third of those with low qualifications or no qualifications. A similar pattern pertains to science-related qualifications.

In spite of these differences, the public's knowledge about science, and their education levels, are not found to be associated with specific health-related behaviours such as the likelihood of adhering to a prescribed course of antibiotics, or the likelihood of asking a GP for antibiotics. Those with a higher level of education, or who know more about science, however, are more likely to say they feel confident querying or challenging the conclusions of a medical professional.

Engagement with science is considerably higher among the more highly educated, and among those who know more about science. For instance, these groups are far more likely to be interested in hearing directly from scientists, to be willing to share their medical records or genetic information for use in a medical research study, or to have visited a science museum or science centre in the last year.

Those with higher educational qualifications are also more trusting of scientists working in universities, and towards medical research charities; however, they are less trusting of scientists working for pharmaceutical companies.

Differences in engagement with science and medical research among the population

Focussing on age, gender and class, the Monitor finds that the public's relationship with science and medical research varies. In terms of age, these differences are not simple linear relationships where the public becomes more or less interested, engaged, or knowledgeable as they get older; rather, we also find similarities between younger and older adults, with those in the middle of the age range standing apart.

Older adults are more likely to express an interest in medical research, and we find this to be the case even when other factors are controlled for. The topics of interest also vary, with younger adults more likely to express an interest in medical research topics such as how the body and brain work, and older adults relatively more likely to be interested in issues of governance, such as policy and funding matters, and how medical research is regulated.

Adults of all ages express an interest in hearing directly from scientists about the research they are conducting, but younger adults have a greater appetite than older adults for hearing from scientists in person. It is also of note that younger adults are more likely than older adults to have visited a science museum or centre, or made a science-related visit more generally in the past year.

Perhaps related to these differences in engagement, younger adults are more trusting than older adults of medical research charities, and of scientists working in private industry.

Adults in the middle of the age range (aged 35 to 64) are most likely to be knowledgeable on a number of topics. They are most likely to be aware of genetic tests that predict diseases, to understand the importance of controlled experimentation in assessing the efficacy of a treatment, and to feel they have a good understanding of antibiotic resistance. This age group

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is also most likely to claim they usually understand stories about science in the news, and are most likely to think it is useful for people in general to have an understanding of science in their everyday lives. It is older adults (aged 50 and over) however, that are most likely to know that it is pharmaceutical companies that spend the most on drug development in the UK.

With respect to past experience of antibiotics, younger adults are the most likely to have failed to follow their most recent course of antibiotics, and are the least likely to have an accurate understanding of the conditions that antibiotics treat, or to profess a good understanding of antibiotic resistance. However, they are just as likely to have asked a GP for antibiotics as other adults, and indeed are most likely to have had their most recent request for antibiotics accepted.

Decisions around food and drink also exhibit differences by age. Older adults are more likely to place importance on sugar and salt content, whether food is produced in the UK, or produced locally, and the amount of packaging food has. Some of these differences may be attributable to a greater level of political and social engagement among older adults in general, rather than being specific to these aspects of food and drink.

It is also instructive to consider areas where age makes little or no difference. Confidence in making informed health-related decisions, and in querying or challenging the conclusions of a medical professional, is one such area, and willingness to share medical records, or genetic information, is another.

While we find that men and women are similar in many respects – for instance, they are equally happy to share their medical records, and genetic information, for the purposes of medical research, and are equally optimistic that medical research will improve the quality of life for people in the UK in the next 20 years - the Monitor uncovers a number of interesting differences between men and women. Women are more likely than men to express an interest in medical research, and while the topics of interest are broadly similar between the genders, women are more likely than men to be interested in mental health issues and obesity, while men are more likely to be interested in how scientific research is done. While men and women use very similar methods to seek information about medical research, women are more likely to use a chat room or discussion forum.

In spite of the greater interest in medical research among women, men are more likely than women to express an interest in hearing directly from scientists about the research they are conducting.

In terms of knowledge about science and medicine, men are more likely than women to score highly on the science quiz, to say they understand stories about science on the news and to have confidence discussing these stories, and to profess a good understanding of genetic modification. Men are also more likely than women to feel that their understanding of science is useful in their everyday life. However, men and women are equally likely to understand the need for controlled experimentation in assessing the , to be aware of genetic tests that predict the likelihood of developing genetically influenced diseases, and to believe that pharmaceutical companies spend the most on drug development in the UK.

With respect to antibiotics, while men and women are equally likely to profess a good understanding of antibiotic resistance, women are more likely to have an accurate understanding of the conditions that antibiotics can treat. Women are more likely to have taken antibiotics in the past year, and to some extent this may be explained by the greater

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likelihood among women to ask for antibiotics, requests which are accepted in the great majority of instances.

In terms of personal health, women are more likely than men to have confidence making informed decisions about their health, such as when to make a doctor's appointment, although there is no difference between the genders in terms of confidence in challenging the conclusions of a GP.

The findings from the Monitor suggest significant social class disparities in knowledge about, and engagement with, science and medical research. For instance, we find that those from the lowest social class groups are less likely to be interested in medical research, to visit science attractions, or to wish to hear from scientists directly about their research. They are less willing to share their genetic information, or medical records, for research purposes; have less confidence in making informed decisions about their health, or challenging the conclusions of a medical professional; and are less likely to score highly on the knowledge quiz, to understand the need for controlled experimentation in clinical trials, or be aware of genetic tests.

Differences in engagement may to a large extent be explicable by differences in educational attainment, or financial resources, but the consistency of these disparities throughout all areas of science knowledge and experience suggest that engagement with the general public is failing to reach all parts of society. Events that are focussed on broad themes relevant to all backgrounds and ages may help to engage these groups more.

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Bibliography

Archer L, Osborne J, DeWitt J, Dillon J, Wong B, Willis, B. ASPIRES: Young people's science and career aspirations, age 10–14. London: King's College; 2013.

BIS. Public Attitudes to Science 2014: Main Report. BIS; 2014.

Glover M, Buxton M, Guthrie S, Hanney S, Pollitt A, Grant J. Estimating the returns to UK publicly funded cancer-related research in terms of the net value of improved health outcomes. BCM Medicine 2014; 12:99.
www.biomedcentral.com/1741-7015/12/99

Dawson, E. "Not Designed for Us": How Science Museums and Science Centers Socially Exclude Low-Income, Minority Ethnic Groups. Science Education 2014; 98(6):981-1008.
http://onlinelibrary.wiley.com/doi/10.1002/sce.21133/epdf

European Commission Directorate-General for Health and Consumers. Special Eurobarometer 407: Antimicrobial Resistance; 2013.

Good Business. Exploring the consumer perspective on antibiotic resistance. Wellcome Trust; 2015.

Health Economics Research Group, Office of Health Economics, and RAND Europe. Medical Research: What's it worth? Estimating the economic benefits from medical research in the UK. London: UK Evaluation Forum; 2008.

Ipsos MORI. The One-Way Mirror: Public attitudes to commercial access to health data. Wellcome Trust; 2016.
www.wellcome.ac.uk/About-us/Policy/Spotlight-issues/Personal-information/Public-engagement/index.htm

Ipsos MORI. Trust in Professions; 1983-2014.
www.ipsos-mori.com/researchpublications/researcharchive/15/Trust-in-Professions.aspx

Longitude Prize. 'Benefit of the doubt' is the basis for prescribing antibiotics, finds Longitude survey; 2014.
www.nesta.org.uk/news/benefit-doubt-basis-prescribing-antibiotics-finds-longitude-survey

NICE. Antimicrobial stewardship: systems and processes for effective antimicrobial medicine use. NICE guidelines; 2015.
www.nice.org.uk/guidance/ng15

OfCom. The Communications Market Report; 2015.
http://stakeholders.ofcom.org.uk/binaries/research/cmr/cmr15/CMR_UK_2015.pdf

Office for National Statistics. 170 Years of Industrial Change across England and Wales; 2013.
www.ons.gov.uk/ons/rel/census/2011-census-analysis/170-years-of-industry/170-years-of-industrial-changeponent.html

Paul S, Mytelka D, Dunwiddie C, Persinger C, Munos, B, Lindborg S, Schacht, A. How to improve R&D productivity: the pharmaceutical industry's grand challenge. Nature Reviews Drug Discovery 2010; 9:203-214

Public Health England. English surveillance programme for antimicrobial utilisation and resistance (ESPAUR): Report; 2014.

Royal Society of Chemistry. "Antibiotics: A Cure for the Common Cold?"; 2014. www.ipsos-mori.com/researchpublications/researcharchive/3298/Antibiotics-a-cure-for-the-common-cold.aspx

Royal Statistical Society. Public attitudes to the use and sharing of their data: Research for the Royal Statistical Society by Ipsos MORI; 2014. www.slideshare.net/IpsosMORI/public-attitudes-to-the-use-and-sharing-of-their-data

Stoneman P, Sturgis P, Allum N. Understanding support for Complementary and Alternative Medicine in general populations: Use and perceived efficacy. National Centre for Research Methods Working Paper; 2012. http://eprints.ncrm.ac.uk/2925/1/CAM_use_and_efficacy_working_paper0612.pdf

Sturgis P, Allum N, Smith, P. The Measurement of Political Knowledge in Surveys. Public Opinion Quarterly 2008; 72,90-102.

TNS-BMRB & PSI. Factors Affecting Public Engagement by Researchers: A study on behalf of a Consortium of UK public research funders. Wellcome Trust; 2015. http://www.wellcome.ac.uk/About-us/Publications/Reports/Public-engagement/WTP060031.htm

Tourangeau R, Rips L, Rasinski, K. The psychology of survey response. Cambridge University Press; 2000.

World Health Organisation. "Self-prescription of antibiotics boosts superbugs epidemic in the European Region."; 2012. www.euro.who.int/en/media-centre/sections/press-releases/2012/11/self-prescription-of-antibiotics-boosts-superbugs-epidemic-in-the-european-region

YouGov. Antibiotics survey; 2014. http://cdn.yougov.com/cumulus_uploads/document/m81w0jtl6y/Internal_Results_140704_Antibiotics_W.pdf

http://dx.doi.org/10.6084/m9.figshare.3145744

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