THE ROYAL SOCIETY

Survey of factors affecting science communication by scientists and engineers

science communication

excellence in science

wellcome trust

foreword

Scientists need to engage more fully with the public. The Royal Society recognises this, and is keen to ensure that such engagement is helpful and effective.

The role of science in public policy is becoming ever more pervasive. Many scientists are willing to engage in dialogue and debate, but they need encouragement and guidance, and they need to feel that their efforts are valued.

The Society established this study, with the support of Research Councils UK and the Wellcome Trust, to provide evidence on current attitudes and practice among scientists. A representative sample of UK researchers, at different stages in their careers, completed an online questionnaire and took part in interviews to establish the level of current 'outreach' activity, and how such activities were perceived.

The study was overseen by a Consultative Group, chaired by Professor Sir David Wallace FRS, and comprising senior representatives from science organisations across the UK.

This report outlines the key findings of the study, and the conclusions and recommendations of the Consultative Group.

The Royal Society has resolved to take several initiatives in response to the Consultative Group's recommendations. We hope the findings will be helpful to other funding organisations, universities and research institutions in their efforts to promote and enhance the engagement of scientists with the public.

Professor Martin Rees
President of the Royal Society

contents

1

introduction

Survey of factors affecting science communication by scientists and engineers.

Introduction

1.1

The *Factors affecting science communication* study was commissioned by the Royal Society, with support from Research Councils UK and the Wellcome Trust, to examine the views and experience of UK scientists and engineers (hereafter scientists) with regard to science communication and public engagement.

1.2

The study emerged in direct response to the BA/Royal Society Science Communication Conference in 2004, which produced several strategic recommendations to promote public engagement with science. Findings from the conference highlighted that 'public engagement will not happen to any appreciable extent unless scientists receive full recognition of their efforts and a supportive infrastructure is created in which engagement can take place'.[1] The study also complemented a previous research project undertaken by the Wellcome Trust and MORI on attitudes to science communication within the research community.[2]

1.3

The overall goal of the study was to provide evidence for funding organisations, universities and other research institutions on which they can base a workable system to reward scientists for their efforts to engage with the public.

1.4

The study involved a web-survey of 1485 research scientists in higher-education institutes and 41 interviews with a cross section of respondents and other relevant parties. The fieldwork and data reporting were undertaken by People, Science and Policy Ltd (PSP).

1.5

The study had six objectives:

- to establish the relative importance of science communication to UK researchers;
- to examine the amount and type of science communication activities undertaken by UK researchers;
- to explore factors that may facilitate or inhibit science communication;
- to explore the extent to which researchers may wish to undertake further science communication;
- to explore the views of funders, senior academics, social scientists and other relevant groups on factors affecting research scientists engaging in science communication activities; and
- to provide evidence about how universities, other research institutions and funders can promote effective science communication.

[1] For further information see: www.royalsoc.ac.uk/sccrecommendations.

[2] Welcome Trust/MORI (2000) *The role of the scientists in public debate*. Wellcome Trust: London.

1.6

The study was overseen by a Consultative Group, chaired by Professor Sir David Wallace FRS, Treasurer and Vice President of the Royal Society, and comprising senior representatives of organisations including Research Councils UK, the Wellcome Trust, the Higher Education Funding Council for England, Universities UK, the British Association for the Advancement of Science, the Academy of Social Sciences and the British Academy (see Appendix 1).

1.7

This report summarises key findings from the survey and interviews, and develops conclusions and recommendations based on the views of the Consultative Group. These include the need for:

- greater clarity about the definition, goals, roles and objectives of public engagement among funders of research and higher-education institutions before funding priorities are developed;
- an understanding, through evaluation, of what works and what does not in public engagement;
- further research and analysis on the dataset to highlight implications in relation to policy development in this area, and the placing of the raw data in the public domain to facilitate this analysis;
- a review of public engagement training at undergraduate and postgraduate level;
- the establishment of role models and advocates for public engagement;
- a more effective support system for scientists wishing to undertake public engagement, the introduction of significant departmental rewards and better recognition of the benefits of public engagement;
- policies which enable a higher proportion of younger scientists to get involved in public engagement and the need to reward public engagement activity in the career progression of scientists;
- co-ordination between funding agencies, government, higher-education institutions and learned societies on public engagement to agree approaches and achieve the desired scale of impact.

1.8

This report also sets out a series of actions the Royal Society will undertake in response to the recommendations. These include the need to:

- define 'public engagement' and set out the Society's policy in this area with a set of clear objectives;
- raise the profile of and explore activities with the Fellowship that examine the scope of public engagement in relation to science policy; the need to engage young people through its education programme; and the importance of communicating science as part of our heritage, culture and future prosperity;
- expand the 'continuous professional development' training offered to the researchers the Society funds to include training courses on public engagement in addition to those already offered on media and communication skills;
- engage Fellows and research fellows in public engagement activities the Society has organised and sponsored;

- help design activities for scientists funded by the Royal Society who wish to organise their own public engagement initiatives;
- track the level of public engagement activities, and the views and attitudes of scientists funded by the Royal Society to assess the impact of initiatives developed;
- develop a 'standard operating practice' that will detail how public and stakeholder engagement will be integrated into the Society's science policy work;
- work with the Higher Education Funding Council for England, Research Councils UK and the Wellcome Trust and other organisations who are considering developing awards for public engagement to ensure any mechanism is fully cognizant of the survey findings;
- continue to work in partnership with organisations to gain clarity and influence the strategic thinking, direction and impact of public engagement activities in the UK and to work with others to deliver the Society's objectives in this area.

1.9

This report is not intended to provide a comprehensive analysis of the data. Appendix 2 provides the responses (as percentages) to the questions asked in the survey. The full survey results, the qualitative interview findings and technical report (indicating the samples sizes, sub-group analysis and associated margins of error) are published separately.[3] These reports and raw data, are available at www.royalsoc.ac.uk/survey.

1.10

Although the study has been conducted with scientists and engineers, there are broader implications concerning the ways in which all academics engage and communicate with the public.

1.11

For further information on the survey and this report, please contact Dr Darren Bhattachary, Senior Manager for Science Communication at the Royal Society, at: darren.bhattachary@royalsoc.ac.uk.

[3]PSP (2006a). *Factors affecting science communication: data report.* PSP: London.
PSP (2006b). *Factors affecting science communication: report on qualitative research.* PSP: London.
PSP (2006c). *Factors affecting science communication: technical report.* PSP: London.

2

key findings

Key findings

2.1

What does public engagement mean to scientists and why is it important?

2.1.1

When scientists were asked to define in their own terms what engaging with the non-specialist public meant to them, the dominant answer was to explain and promote public understanding of science (34%), followed by highlighting the implications, relevance and value of science (15%) giving a public lecture (13%) and listening to and understanding the public (13%).

2.1.2

In the closed-answer questions, which pre-defined the range of responses, the most important reason for the scientific community in general to engage the non-specialist public was to ensure the public was better informed about science and technology (35%). The least important reasons were to contribute to ethical discussions about science (5%) and to recruit students (4%).

2.1.3

When considering their own research, the most important issues (ranked 4 or 5 on a scale of 1-5) to engage the non-specialist public over were the relevance of science to everyday life (64%), the benefit of their research to individuals (60%) and the enjoyment/excitement of doing science (59%). Next in priority were the social and ethical issues raised by science (49%)[4], career options for those wishing to study science at university (47%), the scientific process (46%), scientific uncertainty (45%) the findings of the research itself (38%), areas for further research (36%) and policy and regulatory issues (32%).

2.1.4

The qualitative interviews highlighted the need to engage with the non-specialist public in terms of public accountability and the need to increase the profile of science, scientists and their institutions to the public.

2.2

Audiences and activity

2.2.1

The most important audiences identified by scientists to directly engage with about their research (ranked 4 or 5 on a scale of 1-5) were policy makers (60%), schools and school teachers (50%) and industry (47%). Least important audiences were non-government organisations (34%), people in the media such as writers and documentary makers (33%) and general journalists (31%).

[4] This figure rose to 62% for clinical researchers and 59% for those who think their work has implications for society.

2.2.2

Of those surveyed, 74% reported having taken part in at least one science communication or public engagement activity in the past 12 months[5] – an 18% increase in activity since 2000, when benchmarked against the MORI/Wellcome Trust survey 'Role of Scientists in Public Debate' (see p. 54).

2.2.3

In the past 12 months, 40% of scientists surveyed that said they had had taken part in a public lecture; 33% had engaged with policy makers; 30% had worked with schools; 25% had written for non-specialist publications; and 20% had taken part in a public dialogue or debate.

2.2.4

Three levels of public engagement activity for scientists emerge: those who undertake no activity (26%); low to medium level activities (defined as 1–10 activities per year) (63%); and high-level activity (more than 10 activities per year) (11%). There is a strong positive correlation between the number of activities undertaken and the perceived importance of public engagement. Colleagues taking part also had a positive influence on activity.

2.2.5

Within the 'no activity' sub-group, 53% stated that they would like to spend more time engaging with the non-specialist public about science.

[5] This figure does not include participating in institutional open days.

2.2.6

Six per cent of participants said that they 'just did not want to' get involved in public engagement activity. This rose to 10% for those who had undertaken no public engagement activity in the past 12 months.

2.2.7

Public engagement was more likely to be undertaken by:

- senior scientists than junior colleagues;
- researchers funded by government or charities than those funded by research councils;
- the clinical and non-bioscience scientists than those in non-clinical biosciences;
- those in departments rated 1–5 in the research assessment exercise than those rated 5-star;
- those who had teaching responsibility than those in research-only positions;
- those older than 40 years;
- those with previous communication training.

2.3

Barriers to science communication

2.3.1

Sixty-four per cent said the need to spend more time on research was stopping them getting more engaged (the top response); 29% said that time taken away from research was the main drawback for engaging with the public; 20% agreed that scientists who engage are less well regarded by other scientists; and 3% cited peer pressure as a barrier.

2.3.2

In the qualitative interviews, several researchers highlighted that public engagement activity was seen by peers as bad for their career. A further message that emerged was that public engagement was done by those who were 'not good enough' for an academic career; and that public engagement was seen as 'light' or 'fluffy', and risked reinforcing negative stereotypes for women involved in such activity.

2.3.3

The qualitative study highlighted the importance of publications and bringing in departmental funding to developing a successful scientific career. The research assessment exercise was cited as a key driver influencing the academic community in the UK and as having a negative influence on science communication and, more broadly, all non-research activities, such as teaching. Science communication was viewed as 'altruistic' and not a central part of academic life.

2.3.4

The qualitative research also identified that public engagement does not bring in significant funding and is not therefore a high priority activity for universities (though not unimportant).

2.4

Incentives for science communication

2.4.1

Bringing more money into the department was the top incentive (81% saying it would encourage them a great deal or to some extent to undertake more public engagement). Grants that covered staff time as well as other costs were also important (78%). Awards or prizes for departments (56%) were preferred to awards for individuals (39%).

2.4.2

It was emphasised that public engagement activity should not be a demand from funding agencies but rather a potential opportunity or reward. It was also stressed that public engagement activity should not be mandatory for scientists.

2.4.3

There was strong agreement (70% versus 8% disagree) that funders should support public engagement activity; 69% said they would be happy to take part in public engagement activity others had organised. This was reinforced in the qualitative interviews, which highlighted that greater coordination was needed between funders and higher-education institutions to guide and provide structures for public engagement work. For example, mentors, technical help and direct support from science communicators were suggested as part of a necessary support system.

2.4.4

Public engagement grants need to be simplified to encourage activity: 75% said making it easier to get funds and 72% making it easier to organise a public engagement event would be an incentive, for instance professional science communicators organising activities and inviting scientists to take part.

2.4.5

Seventy-three per cent of junior staff said that support from their head of department would encourage them to undertake public engagement 'a great deal' or 'to some extent'; similarly 83% said they would participate if public engagement helped with their career.

2.4.6

The qualitative research identified leadership within individual universities and to a lesser extent other science institutions as important incentives to behaviour.

2.4.7

Sixty-one per cent said changes to the research assessment exercise to encompass public engagement activity would act as an incentive: more for senior (71%) than junior (58%) staff. The need to better recognise non-research activities was also highlighted in the interviews.

2.5
Training and demand

2.5.1

Seventy-three per cent of scientists surveyed have had no media, communications or public engagement training.

2.5.2

Irrespective of the amount of previous engagement activity, around half of scientists wished to spend more time undertaking public engagement activity. The main reason for this for all groups was that scientists and engineers should spend more time engaging (66%); this view was particularly strong for those groups that undertook no engagement activity. Only very few scientists (3%) wished to undertake less public engagement activity.

3

Conclusions and recommendations

Conclusions and recommendations

The following conclusions and recommendations are based on a review of the survey and interview evidence by the Consultative Group. They represent initial thoughts on a complex and multifaceted issue. It is hoped that they will promote relevant action by universities and funding institutions and a broader discussion among the science community.

In this spirit, the Royal Society has also listed a series of actions it will undertake in relation to the recommendations of the Consultative Group.

Conclusions of the Consultative Group

1.

The finding that three quarters of scientists surveyed reported undertaking at least one public engagement activity in the past 12 months is encouraging. The 18% increase in science communication and public engagement activity since 2000 is welcome, as is the recognition of the increased importance placed on public engagement by funders of scientific research. The Group supported the view expressed in the qualitative research that it was undesirable to require all scientists to engage with the public.

2.

There was concern that many scientists see the main reason for engaging with the public as the need to 'educate' them rather than to debate, listen and learn as part of a genuine dialogue. This suggests that much of the current focus on promoting these activities in the UK by Government, learned societies and funders of science is having only a marginal influence on scientists' attitudes and behaviours. The Government's 10 year investment framework for science and innovation, for example, and many other organisations including the sponsors of this report and the Council for Science and Technology, have prominently encouraged the greater engagement of the science community with the public.

Recommendations and actions by the Royal Society

1.

The term 'public engagement' needs to be clarified

The definition of 'public engagement' is ambiguous, with the term used by scientists and institutions in many and varied ways. **The Consultative Group recommends that funders of research, and higher-education institutions, should clarify the definitions and objectives of public engagement before any future funding priorities are developed. It is also important to develop an understanding, through evaluation, of what works and what does not in public engagement.**

In response:

The Royal Society will clearly define 'public engagement' and set out the Society's policy in this area with a set of objectives.

It will specifically develop a 'standard operating practice' that will detail how public and stakeholder engagement will be used to inform its science policy work.

It will also benchmark the public engagement activities, views and attitudes of scientists funded by the Royal Society to assess and evaluate the impact of future initiatives developed.

2.

Further analysis of the relationship between research culture and involvement with public engagement activities is needed

The issue of academic and broader research culture was noted as a complex issue that may be impacting on public engagement in many ways. Generally, younger researchers, those in RAE 5-star departments and in research-only appointments undertook less public engagement activity compared with senior researchers, those in departments rated RAE 1–5 and those research and teaching appointments. The pressures on academics to publish and bring substantial research funds into the department to progress their career were also highlighted in the qualitative research. However, caution should be exercised before inferring a causal relation between research pressures (such as the research assessment exercise) and a negative impact on public engagement activities. Some members of the Consultative Group argued for the need to open up a discussion about the aims and priorities of research culture in the UK. Several members of the Group **recommended that further research and analysis be undertaken on the dataset to highlight implications in relation to policy development in this area**. As such, the anonymised quantitative data set will be placed in the public domain for further analysis.

In response:

The Royal Society will work with other institutions to oversee a study on how research culture impacts on public engagement in universities, the challenges of mainstreaming public engagement within universities, and good practice in universities to progress science communication.

3.
More young scientists should be encouraged to get involved with public engagement activities

The Consultative Group recommends that policies are developed which enable a higher proportion of younger scientists to get involved with public engagement. Involvement with public engagement activities should also make a positive contribution to the career progression of scientists. The training of scientists on public engagement at undergraduate and postgraduate levels is also supported by the Consultative Group. In addition, the development of communication training courses to help scientists engage communities they view as important (such as policy makers, young people and industry) should be explored. There is a need to establish role models and advocates for public engagement, particularly among eminent scientists in the field, including Fellows of the Royal Society.

In response:

The Royal Society will raise the profile of and explore activities with its Fellowship on the scope of public engagement in relation to science policy; the need to engage young people through its education programme; and the importance of communicating science as part of our heritage, culture and future prosperity. It will provide support for Fellows to play an ambassadorial role on this issue through writing, talks and statements on science in society. (PRIORITY)

The Royal Society will expand the 'continuous professional development' support offered to the researchers it funds (University Research Fellows) to include training courses on 'science in society' in addition to those already offered on media and communication skills. Potential research funding for interdisciplinary study in science in society will also be explored, as will other mechanisms to promote engagement between the science and social science communities, such as secondments. (PRIORITY)

4.
A more effective support system for public engagement

The Consultative Group endorses the findings from the study that institutions and funding bodies need to provide better support for scientists undertaking public engagement. This could range from the setting up of public engagement activities by other agencies in which scientists were asked to participate, to providing direct technical and mentoring support to those departments undertaking their own activities.

In response:

The Royal Society will specifically work to engage the scientists it supports, particularly Fellows and research fellows, in science communication and policy related public dialogue activities the Society has organised and sponsored. It will also help design activities for scientists funded by the Royal Society who wish to organise their own public engagement initiatives and provide web-based resources in this area. (PRIORITY)

5.
Greater rewards and recognition for public engagement work

While noting the issues outlined above about the need for clearer objectives before specific schemes are undertaken, **the Consultative Group recommends that significant departmental rewards and better recognition of the benefits of public engagement should be introduced.**

In response:

The Royal Society will work with organisations like the Higher Education Funding Council for England, Research Councils UK and the Wellcome Trust, who are considering developing new and significant funding awards for public engagement to ensure any mechanism is fully cognizant of the survey findings. It will stress the importance of gaining the buy-in of universities on reward structures for science communication and public engagement. The Society will also highlight funding and support mechanisms to Royal Society scientists undertaking public engagement activity in the UK. (PRIORITY)

6.
Better coordination between organisations working on public engagement

The Consultative Group recommends the need for better coordination between funding agencies, government, higher-education institutions and learned societies on public engagement, in exploring differences and synergies in goals for public engagement activities.

In response:

The Royal Society will continue to work with a range of science based institutions to influence the strategic thinking, direction and impact of public engagement activity in the UK, and to work in partnership with others to deliver its own objectives for this area.

Appendix 1

Survey of factors affecting science communication by scientists and engineers

Appendix 1

Members of the Consultative Group

Professor Sir David Wallace FRS
Treasurer and Vice-President
The Royal Society (Chair)

Professor Glynis Breakwell
Vice-Chancellor
University of Bath

Professor Sir Ivor Crewe
former Chairman
Universities UK

Professor Ian Diamond
Chairman, Executive Group
Research Councils UK

Professor Robert Dingwall
Council Member
Academy of Social Sciences

Professor Duncan Gallie FBA
Vice President
The British Academy

Sue Hordijenko
Director of Programmes
The British Association for the Advancement of Science

Professor Alan Irwin
Dean of Social and Environmental Studies
University of Liverpool

Clare Matterson
Director Medicine, Society and History
The Wellcome Trust

Professor Martyn Poliakoff FRS,
Research Professor in Chemistry
University of Nottingham

David Young
Chairman
Higher Education Funding Council for England

Appendix 2

Overall responses

Factors affecting science communication: a survey of scientists and engineers

There are increasing calls for scientists and engineers to engage with the public and to discuss their research with those outside their field. The Royal Society, the Wellcome Trust and the Research Councils want to know what you think about this. Is this a good use of your time? If so, how can you be supported? If not, it is still important that your views are heard because they will impact on policy decisions.

Towards the end of the questionnaire you will be asked some questions about yourself so that we can compare the results for different groups.

You have been selected using robust sampling procedures and it is important that you personally reply. Your replies will be treated in the strictest confidence. Nothing any individual says will be attributed in the final report or passed on to the funders or anyone else. People Science & Policy Ltd has been appointed to undertake this survey by the funders.

Q1

Scientists are being asked to engage more with the non-specialist public. What, if anything, does this mean to you? (Unweighted Base 1377, Weighted Base 1358)

34%	Informing, explaining, promoting understanding (public)
15%	Implications, relevance, utility of research, value of science
13%	Listening, understanding public, involving people in science, science-based debates, science-based decisions
13%	Communicating with or speaking to the public, speaking in public, lectures, shows
10%	Media work
10%	Explaining the process of science, what is done, why, limitations
9%	Talking to schools, inspiring young people
7%	Good, worthwhile, important
7%	Accountability, duty of publicly funded researchers
6%	Disseminating research / research findings
6%	Informing, stimulating, promoting understanding (other researchers, policy-makers, users)
5%	PR positive, raise profile, attract students, attract funding
4%	Additional call on time, waste of time
4%	Writing general books, articles
4%	Counteracting poor media coverage, stereotypes
3%	Nothing, not much, very little
2%	Talking to specific target audiences (NGOs, interest groups, community groups)
1%	Comment on the question
1%	Definition of "the non-specialist public"
1%	Don't know
*	Important / valuable part of my job
*	Required by funders
*	PR negative, Govt. spin, "selling" science

* indicates less than 1% but greater than 0.

Q2

How important do you feel it is that you personally, in your current post, directly engage with each of the following groups about your research?

Please rate importance on a scale of 1 to 5, where 1 is not important and 5 is very important

		Not important 1	2	3	4	Very important 5
Q2a	General journalists (i.e. in press, TV and radio) (Unweighted Base 1481, Weighted Base 1481)	25%	22%	22%	21%	10%
Q2b	Popular science journalists (e.g. on New Scientist) (Unweighted Base 1482, Weighted Base 1482)	11%	18%	25%	27%	18%
Q2c	Others in the media such as writers, documentary and other programme makers (Unweighted Base 1478, Weighted Base 1479)	20%	21%	26%	23%	10%
Q2d	Schools and school teachers (Unweighted Base 1481, Weighted Base 1481)	14%	15%	21%	30%	20%
Q2e	Young people outside school (Unweighted Base 1476, Weighted Base 1477)	17%	19%	26%	24%	14%
Q2f	Policy-makers (Unweighted Base 1477, Weighted Base 1478)	9%	11%	20%	25%	35%
Q2g	Industry / business community (other than where directly concerned with funding your research) (Unweighted Base 1478, Weighted Base 1479)	12%	17%	24%	25%	22%
Q2h	The non-specialist public (Unweighted Base 1475, Weighted Base 1474)	11%	19%	31%	27%	12%
Q2i	Non-Governmental organisations (NGOs) (Unweighted Base 1472, Weighted Base 1477)	15%	19%	31%	23%	11%

Q3

Which of these groups do you find it easiest to talk with about your research findings? (Unweighted Base 1468, Weighted Base 1470)

16%	Policy-makers
22%	Young people in schools
29%	Industry / business community
14%	Young people outside school
29%	Popular science journalists (e.g. on New Scientist)
21%	The non-specialist public
12%	General journalists
10%	NGOs (non-Governmental organisations)
9%	Others in the media such as documentary and other programme makers
20%	Patients / patient groups
17%	Press officers in your institution
19%	None / Don't know
23%	Schools and school teachers

Q4

Why do you say that? (Unweighted Base 1248, Weighted Base 1224)

24%	They want to know / are most interested / put in effort
21%	We speak the same language / they are most like me / they understand me
17%	My work is most relevant to them / to what they do
5%	My own experience
4%	The networks / contacts / opportunities are already in place
3%	Not Valid
3%	They're the most fun / it's most rewarding
3%	There is no one difficult group / easy group / I like talking to anyone / no-one
2%	They don't have pre-conceived ideas / misconceptions
2%	They don't twist things / have different agenda
2%	They are easily accessible
2%	Because it's already part of my job
1%	I don't have to try / they contact me
1%	I've had special training / I have the skills
1%	Other
*	None
*	Don't know

Q5

Which of these groups do you find it hardest to talk with about your research findings? (Unweighted Base 1401, Weighted Base 1413)

19%	Policy-makers
7%	Young people in schools
12%	Industry / business community
11%	Young people outside school
6%	Popular science journalists (e.g. on New Scientist)
15%	The non-specialist public
21%	General journalists (i.e. in press, TV and radio)
5%	Non-Governmental organisations (NGOs)
10%	Others in the media such as writers, documentary and other programme makers
4%	Patients / patient groups
5%	Press officers in universities
47%	None / don't know
6%	School teachers

Q6

Why do you say that? (Unweighted Base 1058, Weighted Base 983)

27%	I have no / less experience dealing with them / any groups
18%	We have different agendas / They twist things
17%	We don't speak the same language / they are least like me / they don't understand me
14%	They do not want to know / are least interested / don't put in any effort
8%	There is no one difficult group / easy group / I like talking to anyone / no-one
6%	The networks / contacts / opportunities are not already in place
5%	They are not easily accessible
5%	They have pre-conceived ideas / misconceptions
3%	My work is not relevant to them
3%	They want definite answers / simple statements
2%	Other
1%	Don't know
1%	It's too much effort to try and contact them
1%	Because it's has little to do with my job
1%	I have not had any training / I don't have the skills
1%	Not Valid
1%	My own experience

Q7

Thinking about public engagement with, and communication about, science, roughly how many times in the past 12 months have you done each of the following?

		None	Once	2-3 times	4-5 times	More than 5 times
Q7a	Worked with teachers / schools (including writing educational materials) (Unweighted Base 1464, Weighted Base 1468)	70%	15%	10%	2%	3%
Q7b	Participated in an institutional open day (Unweighted Base 1466, Weighted Base 1471)	44%	36%	14%	5%	2%
Q7c	Given a public lecture, including being part of a panel (Unweighted Base 1460, Weighted Base 1462)	60%	21%	14%	3%	3%
Q7d	Taken part in a public dialogue event / debate (Unweighted Base 1442, Weighted Base 1452)	80%	13%	6%	1%	*
Q7e	Been interviewed on radio (Unweighted Base 1444, Weighted Base 1452)	88%	7%	4%	1%	1%
Q7f	Been interviewed by a newspaper journalist (Unweighted Base 1454, Weighted Base 1458)	77%	13%	8%	2%	1%
Q7g	Written for the non-specialist public (including for the media, articles and books) (Unweighted Base 1448, Weighted Base 1453)	75%	15%	8%	1%	1%
Q7h	Engaged with policy-makers (Unweighted Base 1447, Weighted Base 1455)	67%	16%	11%	2%	4%
Q7i	Engaged with non-Governmental organisations (NGOs) (Unweighted Base 1440, Weighted Base 1451)	77%	9%	8%	2%	4%
Q7j	Worked with science centres / museums (Unweighted Base 1445, Weighted Base 1454)	87%	6%	5%	1%	1%
Q7k	Judged competitions (Unweighted Base 1445, Weighted Base 1453)	89%	8%	2%	1%	*

For the remainder of the questionnaire, we will be talking about communication and engagement with the non-specialist public only. By this we mean adults with no specialist knowledge of, or training in, science.

Q8

How important do you think it is that you personally, in your current post, engage directly with the non-specialist adult public on each of the following?

Please rate importance on a scale of 1 to 5, where 1 is not important and 5 is very important

		Not important 1	2	3	4	Very important 5
Q8a	The scientific findings of your research (Unweighted Base 1475, Weighted Base 1476)	14%	19%	28%	22%	16%
Q8b	Areas for further research (Unweighted Base 1472, Weighted Base 1474)	14%	21%	29%	22%	14%
Q8c	Policy and regulatory issues (Unweighted Base 1469, Weighted Base 1472)	20%	22%	26%	20%	12%
Q8d	The wider social and ethical implications of your research findings for society (Unweighted Base 1468, Weighted Base 1470)	15%	15%	20%	27%	22%
Q8e	The potential benefits of your work to individuals (Unweighted Base1471, Weighted Base 1473)	11%	10%	20%	32%	28%
Q8f	The scientific process / the nature of science (Unweighted Base 1471, Weighted Base 1471)	12%	14%	28%	25%	21%
Q8g	Scientific uncertainty (Unweighted Base 1472, Weighted Base 1473)	13%	16%	25%	25%	20%
Q8h	The enjoyment and excitement of doing science (Unweighted Base 1474, Weighted Base 1475)	10%	11%	20%	27%	32%
Q8i	The relevance of science to everyday life (Unweighted Base 1472, Weighted Base 1474)	8%	10%	18%	30%	34%
Q8j	To raise awareness of career options in science (Unweighted Base 1473, Weighted Base 1474)	13%	14%	26%	26%	21%

Q9

Looking at the list below, what do you think is the main reason for scientists and engineers generally to engage with the non-specialist public? (Unweighted Base 1473, Weighted Base 1478)

10%	To be accountable for the use of public funds
11%	To contribute to public debates about science and scientific issues
5%	To contribute to discussions about the social and ethical issues science can raise
8%	To generate / stimulate additional funds for universities and colleges
4%	To recruit students to your subject
35%	To ensure the public is better informed about science and technology
11%	To raise awareness about your subject
12%	To raise awareness of science generally
*	There are no reasons to engage with this group
2%	Other, PLEASE SPECIFY
*	(Other) Combat negative images
*	(Other) Combat bad job done by others

Q10

Looking at the list below, what do you think is the second most important reason for scientists and engineers generally to engage with the non-specialist public? (Unweighted Base 1413, Weighted Base 1428)

15%	To be accountable for the use of public funds
15%	To contribute to public debates about science and scientific issues
9%	To contribute to discussions about the social and ethical issues science can raise
9%	To generate / stimulate additional funds for universities and colleges
6%	To recruit students to your subject
17%	To ensure the public is better informed about science and technology
13%	To raise awareness about your subject
14%	To raise awareness of science generally
*	There are no reasons to engage with this group
1%	Other, PLEASE SPECIFY
1%	(Other) Combat negative images
0%	(Other) Combat bad job done by others

Q11

Looking at the list below, what do you think is the main drawback to scientists and engineers generally engaging with the non-specialist public?

(Unweighted Base 1447, Weighted Base 1456)

1%	It makes them look bad in front of their peers
10%	It makes them a target
19%	It can send out the wrong messages
1%	It diverts money from research projects
*	It diverts money from other, non-research, activities
29%	It takes up time that is better used on research
3%	It takes up time that is better used on other, non-research, activities
27%	There are no drawbacks to engaging with any of these groups
3%	Other, PLEASE SPECIFY
*	(Other) Does not benefit me / no motivation
3%	(Other) Most scientists are bad at it / misrepresentation
1%	(Other) Most science is not newsworthy / public are not interested
*	(Other) Trivialisation of science
2%	(Other) It takes time (general)
0%	(Other) All of the above

Q12

Looking at the list below, what do you think is the second main drawback to scientists and engineers generally engaging with the non-specialist public? (Unweighted Base 893, Weighted Base 938)

3%	It makes them look bad in front of their peers
14%	It makes them a target
16%	It can send out the wrong messages
7%	It diverts money from research projects
1%	It diverts money from other, non-research, activities
16%	It takes up time that is better used on research
14%	It takes up time that is better used on other, non-research, activities
24%	There are no drawbacks to engaging with any of these groups
4%	Other, PLEASE SPECIFY
1%	(Other) Does not benefit me / no motivation
*	(Other) Most scientists are bad at it / misrepresentation
1%	(Other) Most science is not newsworthy / public are not interested
*	(Other) Trivialisation of science
*	(Other) It takes time (general)
0%	(Other) All of the above

Q13

In relation to the other things you have to do in your working life, how important is it to you that you find time to engage with the non-specialist public? (Unweighted Base 1479, Weighted Base 1481)

10%	Not at all important
42%	Not very important
21%	Equally important
19%	Fairly important
9%	Very important

Q14

Would you like to spend more time, less time or about the same amount of time as you do now engaging with the non-specialist public about science? (Unweighted Base 1481, Weighted Base 1482)

45%	I would like to spend more time
41%	I am content with the amount of time I spend on this now
3%	I would like to spend less time
11%	Don't know

Q15

Why do you say that? (Unweighted Base 690, Weighted Base 666)

66%	Scientists and engineers should engage more with the community
28%	I work in a topical area of science
14%	There is a need to recruit more students
13%	Scientists and engineers need to be more accountable
10%	I work in a controversial area of science
6%	Other, PLEASE SPECIFY
1%	(Other) The general public should know more about science
1%	(Other) The general public should understand the importance / benefits of science
1%	(Other) To raise the profile of science to increase participation (e.g. donor transplants)
1%	(Other) I don't have enough time at the moment
*	(Other) To enthuse the public
*	(Other) To increase funding

Q16

Below are some things people have said about engaging with the non-specialist public about science and engineering.

Please indicate whether you agree or disagree for each statement.

		Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Don't know
Q16a	Scientists who communicate a lot are not well regarded by other scientists (Unweighted Base 1480, Weighted Base 1479)	3%	17%	22%	36%	18%	3%
Q16b	Engaging with the non-specialist public might help researchers make new contacts for their research (Unweighted Base 1477, Weighted Base 1470)	7%	46%	22%	17%	4%	3%
Q16c	Funders of scientific research should help scientists to communicate with the non-specialist public (Unweighted Base 1479, Weighted Base 1477)	16%	54%	17%	7%	1%	3%
Q16d	Scientists have a moral duty to engage with the non-specialist public about the social and ethical implications of their research (Unweighted Base 1480, Weighted Base 1479)	20%	49%	14%	12%	2%	2%
Q16e	I don't think my research is interesting to the non-specialist public (Unweighted Base 1480, Weighted Base 1477)	6%	11%	13%	39%	29%	2%
Q16f	The main reason to engage with the non-specialist public is to get their support for science and engineering (Unweighted Base 1479, Weighted Base 1478)	6%	33%	24%	28%	7%	2%
Q16g	I simply don't have time to engage with the non-specialist public (Unweighted Base 1473, Weighted Base 1468)	8%	28%	25%	28%	9%	1%
Q16h	I would not want to be forced to take a public stance on the issues raised by my research (Unweighted Base 1477, Weighted Base 1476)	7%	24%	20%	33%	14%	3%

question 16 continued on next page

question 16 continued

Q16i	Engagement with the non-specialist public is best done by trained professionals and journalists (Unweighted Base 1477, Weighted Base 1476)	6%	28%	19%	35%	9%	2%
Q16j	Engaging the non-specialist public in science is personally rewarding (Unweighted Base 1479, Weighted Base 1478)	11%	52%	21%	6%	1%	9%
Q16k	My research is too specialised to make much sense to the non-specialist public (Unweighted Base 1477, Weighted Base 1477)	4%	17%	15%	44%	19%	*
Q16l	I would need help to develop a science engagement project (Unweighted Base 1477, Weighted Base 1477)	10%	49%	18%	13%	3%	8%
Q16m	I would be happy to take part in a science engagement activity that was organised by someone else (Unweighted Base 1475, Weighted Base 1473)	8%	61%	18%	7%	2%	4%
Q16n	Public engagement could help with my career (Unweighted Base 1476, Weighted Base 1474)	4%	34%	30%	17%	7%	8%
Q16o	Engaging with the non-specialist public is best done by senior researchers (Unweighted Base 1473, Weighted Base 1472)	4%	19%	20%	42%	12%	3%
Q16p	There are no personal benefits for me in engaging with the non-specialist public (Unweighted Base 1476, Weighted Base 1474)	6%	15%	19%	43%	14%	4%

Q17

How easy or difficult do you think it is to get involved in science engagement activities for those who want to do so?

(Unweighted Base 1480, Weighted Base 1481)

4%	Very easy
6%	Very difficult
24%	Don't know / can't say
31%	Fairly easy
35%	Fairly difficult

Q18

How well equipped do you personally feel you are to engage with the non-specialist public about your research?

(Unweighted Base 1480, Weighted Base 1481)

8%	Very well equipped
43%	Fairly well equipped
38%	Not very well equipped
8%	Not at all equipped
4%	Don't know

Q19

What training, if any, have you had in communicating science to the non-specialist public? Do not include any teaching training you may have had. (Multi-code allowed) (Unweighted Base 1471, Weighted Base 1474)

73%	None
14%	Media training on being interviewed by journalists
10%	Training in writing for the non-specialist public
11%	Training in speaking to the non-specialist public
3%	Training in understanding the UK school education system
4%	Training in speaking to school children (of any age)
3%	[Other] Informal means / experience

Q20

What would encourage you personally to get involved in activities that engage the non-specialist public in science?

(Unweighted Base 1315, Weighted Base 1280)

22%	If someone else initiated it / it was offered to me
10%	If I had some (more) training
10%	Time (General)
7%	If it helped with my own career
6%	If I could see the benefit / positive feed-back
6%	If people were more interested in my work
5%	If it was part of my job
5%	More support from my head of department
4%	Don't know
4%	Recognition
4%	Financial Reward (Non-specified)
4%	Better links to relevant groups / contacts / framework
3%	If there was an area I felt I could contribute in
3%	Support (Other than from head of department)
3%	If it was part of the RAE exercise
3%	If I was relieved of other work
3%	Invalid Response
2%	If there were personal financial rewards
2%	If it was easier to get funds for engagement activities
2%	More backroom support / infrastructure
2%	Nothing (Positive)
2%	If it wasn't viewed as inferior to other work
2%	If other people got involved too
2%	Having a more permanent position / job security
2%	A better educated public
1%	If engagement grants covered staff time as well as costs

question 20 continued on next page

question 20 continued

1%	If it brought money into the department
1%	If time could be funded under grants
1%	Longer term funding- more free time / better funding
1%	Make it a condition of grants
1%	A less sensationalist media
1%	Recruiting more students
1%	Strategy / Plan
1%	Skills not good or good at things
1%	If other people weren't against it / if it wasn't detrimental to my career
1%	Other
*	Protection against animal rights protestors
*	Keeping control of published material
*	If there were awards or prizes
*	If it was part of getting professional status
*	If it was easier to organise such activities
*	Remove RAE
*	Personal benefit / feeling good

Q21

To what extent would you personally be encouraged to get more involved in activities to engage the non-specialist public in science and engineering by each of the following?

	A great deal	To some extent	Not very much	Not at all	Don't know
Q21a If my head of department / line manager were to give me more support and encouragement (Unweighted Base 1470, Weighted Base 1445)	18%	48%	19%	12%	3%
Q21b If there were awards and prizes for me as an individual (Unweighted Base 1468, Weighted Base 1444)	7%	32%	31%	28%	2%
Q21c If it was part of getting professional status, such as chartered engineer or membership of my professional body (Unweighted Base 1464, Weighted Base 1438)	18%	41%	20%	18%	3%
Q21d If it helped with my own career (Unweighted Base 1460, Weighted Base 1441)	27%	49%	13%	9%	1%
Q21e If I was relieved of other work (Unweighted Base 1465, Weighted Base 1444)	21%	40%	25%	12%	2%
Q21f If the RAE exercise was changed to encompass communication with the non-specialist public (Unweighted Base 1465, Weighted Base 1441)	29%	32%	17%	13%	9%
Q21g If my department or institution was recognised by an award or prize (Unweighted Base 1467, Weighted Base 1443)	16%	40%	26%	16%	2%
Q21h If it brought money into my department (Unweighted Base 1468, Weighted Base 1444)	33%	48%	12%	6%	1%
Q21i If it was easier for me to get funds for engagement activities (Unweighted Base 1468, Weighted Base 1444)	32%	43%	15%	7%	3%
Q21j If grants for engagement covered staff time as well as other costs (Unweighted Base 1468, Weighted Base 1442)	36%	42%	12%	6%	4%
Q21k If it was easier to organise such activities (Unweighted Base 1466, Weighted Base 1443)	25%	47%	18%	6%	4%
Q21l If I had some (more) training (Unweighted Base 1467, Weighted Base 1444)	22%	46%	19%	11%	2%

Q22

What is stopping you from getting (more) involved in activities that engage the non-specialist public in science? Please mark all that apply

(Unweighted Base 1470, Weighted Base 1459)

9%	I am already involved enough
6%	I just don't want to
22%	I am too junior
4%	(Other) Lack of opportunity / I don't know how
8%	I am only in the UK for a limited period
1%	(Other) The public don't want to know / my work isn't interesting
13%	English is not my first language
0%	(Other) The public do not understand
3%	I feel that I am encroaching on Press Office work
*	(Other) I do not have the training
16%	There is no senior level support
*	(Other) I do not have the contacts / links
3%	Peer pressure
*	(Other) Nature of my research
18%	There is not enough funding
2%	(Other) Time (General)
64%	I need to spend more time on my research
*	(Other) Fear of negative reaction / self-promotion issues
23%	I need to spend more time teaching
1%	(Other) No benefit / recognition
24%	I need to spend more time on administration
1%	(Other) I need someone else to organise it
43%	I need to spend more time getting funding for my research
1%	(Other) I do not have the confidence / I would be bad at it
34%	I would have to do it in my own time
4%	Other

Q23

Do other members of your department take part in activities that engage the non-specialist public in science?

(Unweighted Base 1474, Weighted Base 1463)

3%	Yes, most of them
33%	Yes, some of them
35%	Yes, one or two of them
8%	None of them
20%	Don't know

Q24

Are the researchers in your department generally supportive towards those who take part in activities that engage the non-specialist public in science? (Unweighted Base 1470, Weighted Base 1458)

12%	Yes, very supportive
38%	Yes, fairly supportive
18%	Not particularly supportive
2%	Not at all supportive
30%	Don't know

Q25

Is your institution generally supportive towards researchers who take part in activities to engage the non-specialist public in science?

(Unweighted Base 1473, Weighted Base 1462)

13%	Yes, very supportive
36%	Yes, fairly supportive
17%	Not particularly supportive
2%	Not at all supportive
5%	It varies between departments
28%	Don't know

In order for us to understand the views of different types of respondent, please tell us something about yourself. All replies will be treated in the strictest confidence.

Q26

Which of these best describes your current position?

(Unweighted Base 1485, Weighted Base 1485)

12%	Professor or above
18%	Reader / senior lecturer / researcher / fellow
45%	Lecturer / researcher / fellow
23%	Junior / assistant researcher / fellow
*	Technician / other support staff
1%	No reply

Q27

Working status (Unweighted Base 1485, Weighted Base 1485)

93%	Working full-time (>35 hours per week)
6%	Working part-time (<35 hours per week)
1%	No reply

Q28

Which best describes your main role at your institution?

(Unweighted Base 1485, Weighted Base 1485)

50%	Research (including clinical research)
46%	Research and teaching
1%	Teaching only
1%	Clinical work only
2%	Management / administration
1%	No reply

Q29

From the list below, which discipline most closely describes your current area of research interest?

(Unweighted Base 1485, Weighted Base 1485)

26%	Clinical medicine (including dentistry)
28%	Non-clinical bioscience (including medical, psychology, veterinary, agricultural)
21%	Engineering / engineering sciences (including IT)
5%	Chemical / chemical engineering
8%	Physics (including materials sciences) and astronomy
4%	Mathematics
8%	Environmental sciences (including earth and marine sciences)
*	No reply

Q30

Do you think your work has implications for society and/or policy-makers and regulators?

(Unweighted Base 1485, Weighted Base 1485)

71%	Yes
14%	No
14%	Don't know / not sure
1%	No reply

Q31

What was the latest RAE score for your department/unit of assessment?

(Unweighted Base 1485, Weighted Base 1485)

*	1
*	2
4%	3
16%	4
30%	5
30%	5*
20%	Don't know
1%	No reply

Q32

What is the principal source of funding for your research?

(Unweighted Base 1485, Weighted Base 1485)

38%	Wholly or principally funded by a Research Council
7%	Wholly or principally funded by a Government Department
6%	Wholly or principally funded by a Higher Education Funding Council
7%	Wholly or principally funded by an EU research grant
8%	Wholly or principally funded by The Wellcome Trust
1%	Wholly or principally funded by the Royal Society
15%	Wholly or principally funded by another charity
11%	Wholly or principally funded by industry
4%	Other
1%	(Other) No funding
2%	(Other) Mixed funding
*	(Other) On / off funding
1%	No reply

Q33

Which council is funding your research?

(Unweighted Base 642, Weighted Base 560 – all those funded by Research Council at Q32)

14%	BBSRC
11%	MRC
10%	NERC
49%	EPSRC
6%	PPARC
4%	ESRC
*	AHRB / AHRC
4%	No reply

Q34

To the nearest year, how long have you been working in scientific research, whether in academia or elsewhere? If less than six months enter 0, if more than six months but less than a year enter 1.
(Unweighted Base 1485, Weighted Base 1485)

66%	Under 15 years
32%	15 years and over
2%	No reply

Q35

What was your age last birthday?
(Unweighted Base 1485, Weighted Base 1485)

54%	Under 40
44%	40 and Over
2%	No reply

Q36

Are you:
(Unweighted Base 1485, Weighted Base 1485)

65%	Male
34%	Female
1%	No reply

Q37

What is your ethnic origin? (Unweighted Base 1485, Weighted Base 1485)

53%	White - UK
14%	White - Europe
1%	White - US
5%	White - Other
*	Black - African
*	Black - Caribbean
*	Black - UK
0%	Black - US
*	Black - Other
10%	Chinese
3%	Indian
2%	Pakistani
6%	Other Asian
2%	Mixed race
3%	No reply
Other,	PLEASE SPECIFY

Q38

Is English your first language?

(Unweighted Base 1485, Weighted Base 1485)

69%	Yes
30%	No
1%	No reply

Q39

Do you intend to work in the UK in the long term?

(Unweighted Base 1485, Weighted Base 1485)

80%	Yes
4%	No
15%	Don't know
1%	No reply

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