The Role of Scientists in Public Debate

Summary of Findings

Research Study Conducted by MORI for

The Wellcome Trust

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This report presents the findings of a survey of scientists conducted by MORI (Market & Opinion Research International), commissioned and funded by The Wellcome Trust. An additional funding contribution was made by The Office of Science and Technology. This research was commissioned through a competitive tendering process.

Executive summary

Introduction

Research into the field of 'public understanding of science' has tended to focus on identifying and understanding the views of the general public towards science. Little effort has been made to understand how scientists themselves perceive increasing calls for them to become more involved in communicating their research to the public, and to increase dialogue on the social and ethical implications of this research. For this reason, the Wellcome Trust commissioned MORI to undertake a large-scale nationwide survey of scientists who are funded by a range of academic, charity and industry sources .

The research aimed to investigate whether scientists consider themselves to be the people most responsible for and best equipped to communicate their scientific research and its implications to the public, what benefits and barriers they see to a greater public understanding of science and what needs to change for scientists to take a greater role in science communication.

This survey is based on face-to-face interviews with a randomly selected sample of scientists working in Great Britain.

Key Findings

1. There is a large gap between the way that scientists perceive themselves, and the way they think the public perceives scientists. Scientists have a far more favourable image of themselves, than they think the public has of them.

2. Most scientists can see benefits to the non-specialist public having a greater understanding of science, but most can see barriers too. A lack of public knowledge, education and/or interest in science is regarded as a barrier by three in four scientists, and a third also perceive the media in this light.

3. The main sources of information which scientists think the public use for information about scientific research and its implications are national newspapers and television. Scientists think that the public primarily trusts the media, and those working for charities and campaigning groups, to provide accurate information about these areas, while they themselves are most inclined to trust those working in scientific circles.

4. The vast majority of scientists believe it is their duty to communicate their research and its social and ethical implications to policy-makers, and to the non-specialist public. A clear majority also feels that scientists should report on any social and ethical implications of their work when publishing their research findings. Many

scientists feel constrained by the day-to-day requirements of their job, leaving them with too little time to communicate, or even to carry out their research.

5. Scientists mention a variety of groups as being the most important with which to communicate - indicating a broad perceived potential audience overall. Most scientists feel that scientists themselves should have the main responsibility for communicating the social and ethical implications of scientific research to the non-specialist public. However, fewer feel that scientists are the people best equipped to do this.

6. Just over half of scientists have participated in one or more of fifteen given forms of communications activity in the last year. Participation is related to scientists' skill and confidence: those who feel equipped to communicate the scientific facts and implications of their research, and scientists who have received training, are more likely to have participated. Similarly, scientists who teach, as well as conduct research, and who therefore have experience of communicating to non-specialists, are more likely to have communicated in the past year.

7. Three-quarters of scientists feel equipped to communicate the scientific facts of their research, although only one in five feels very well equipped. Confidence declines when scientists are asked how they feel about communicating the social and ethical implications of their research. Among those whose work has social and ethical implications, 62% feel equipped, and one in ten feel very well equipped.

8. The overwhelming majority of scientists have not been trained to liaise with the media, or to communicate with the non-specialist public. Most scientists are aware that their institution or department provides a range of communications services. In contrast, relatively few scientists are aware of any communications services provided by funders.

9. A wide variety of stimuli to improve communications are mentioned by scientists. Incentives from funding authorities to encourage time spent on science communication are mentioned most frequently, followed by training in dealing with the media, and encouragement by institutions of time spent on science communication.

Implications

These findings provide a baseline of the current role of scientists in public debate. They complement recent studies which have mapped science communication activities and research which examines the attitudes and demographics of different non-specialist audiences. Together they provide a sound basis for developing a national strategy which moves beyond the Public Understanding of Science towards genuine public dialogue.

Audiences

Scientists were asked, without being prompted, to name the group that they regard as being the most important with which to communicate their research, and its social and ethical implications. A variety of groups are mentioned. However, no single one is mentioned spontaneously by more than one in four. This demonstrates the breadth of audiences which scientists as a whole feel they should communicate with – and these groups are drawn from all sectors of society. Nearly a quarter mention their peers, followed by 17% who specify 'the public'.

There is very little overlap between those saying their peers are a key group with whom to communicate, and those saying the public - therefore, the two most frequently mentioned groups are generally being cited by different scientists. Scientists at Research Council-funded establishments[1] are considerably more likely than average to say that the general public is the most important group with whom to communicate[2]. In contrast, those who do not feel equipped to communicate scientific facts[3] are more likely to give their peers as the primary group[4].

Most of the scientists who say communicating with the public is a priority, also say the public is not knowledgeable about the science in their research area (85%)[5], or has little or no awareness of its social and ethical implications (59%).[6] This suggests that these scientists feel that communication with the public would be from a base of low public awareness of the scientific facts.

Perceived Benefits and Barriers

Almost all scientists think there are benefits to the non-specialist public having a greater understanding of science.

Scientists were asked to cite spontaneously the main perceived benefits to the non-specialist public of having a greater understanding of science. Public ability to understand and judge science issues, or to make more informed decisions about their lives; increased understanding of what scientists do, and the possibility of more funding for science are the main benefits which scientists perceive would result.

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[1] That is, scientists at institutes funded by one of the three participating Research Councils – BBSRC, MRC and NERC.

[2] 32% of them mention this, compared with 17% for other respondents. The sample size is too small to be able to draw reliable conclusions about the reasons. Based on small numbers, however, the most frequent answer from Research Council-funded establishments' scientists is: Because respondents' research/research implications are most relevant, useful or interesting to the general public (mentioned by 17% of this group, or 6 respondents).

[3] Who are more likely than average to be aged under 45.

[4] In this case the sample size is reliable; the most commonly mentioned reason, from those who do not feel equipped to communicate scientific facts, is again because respondents' research/research implications are most relevant, useful or interesting to scientists' peers (mentioned by 62% of this group c.f. 43% for those who do feel equipped to communicate scientific facts).

[5] This figure is higher than for any other group (where the sample sizes were large enough to be able to analyse responses). The next highest was students/graduates/schoolchildren at 75%.

[6] Again, this was higher than for any other group (where sample sizes permitted an analysis of responses). The next highest was again students/graduates/ schoolchildren, at 57%.

Scientists were then asked about the main personal benefits that could arise from communicating their research and its implications to the public. These they cited as attracting possible funding, personal satisfaction and providing help with their career (for example, through publicising their work or offering job security). Those being funded by industry are among the most likely to say that a personal benefit is the possibility of attracting funding.

Virtually all scientists name at least one barrier to greater understanding of science among the non-specialist public. A lack of public knowledge about, education and/or a lack of public interest in science is regarded as the main barrier (mentioned by 74%). A lack of communications skills among scientists themselves (20%), or a lack of awareness or interest among scientists of the public's understanding of science (11%) are also highlighted.

The media is also perceived by one in three scientists to be a barrier to a greater public understanding of science. The role of the media is discussed in more detail later on in this summary.

Many scientists (38%) do not see any personal disadvantages to communicating scientific research and its implications to the public – though six in ten cite at least one disadvantage. A quarter say it takes too much time or energy, and one in seven that it can lead to misunderstanding or misrepresentation of information. Biomedical scientists are considerably more likely than non-biomedical scientists to say there are personal disadvantages (68% c.f. 51%). These include the possible likelihood of misunderstandings around or misrepresentation of their research (mentioned by 18% of biomedical scientists c.f. 9% of non-biomedical scientists); that they feel they may face risks from animal rights or extremist groups (13% c.f. 1% of non-biomedical scientists); and that they may be forced to take a particular social or ethical stance in relation to their research (8% c.f. 2%).

Nearly three in ten (28%) of those in research teams holding a license to conduct research on animals mention the risk they may face from animal rights or extremist groups, highlighting this as a real concern.

Social and Ethical Implications of Research

Seven in ten scientists say there are social and ethical implications for the public in their field of research.

Most (56%) say their research has 'some' implications, rather than 'many' (34%) or 'hardly any' (9%). There is a strong division between biomedical and non-biomedical scientists: 79% of biomedical scientists say their research has social and ethical implications, compared with 60% of non-biomedical scientists. Biomedical scientists are also more likely than non-biomedical scientists to say there are many such implications.

The areas of research most commonly mentioned by scientists who believe their work has social and ethical implications are: research which is trying to cure, treat or

understand human illnesses; research looking at the impact of various factors on the environment; research involving biotechnology and research which uses animals.

Responsibility for Communication

Respondents were asked to select which, if any, from a list of 14 groups should have the main responsibility for communicating the social and ethical implications of scientific research to the non-specialist public[7]. Seven in ten scientists feel that they themselves should have the primary responsibility. Scientists who feel equipped to communicate their research, and those aged 45+ are more likely to say that scientists should bear the main responsibility.

Scientists do see other groups as having similar responsibilities in this area, namely funders of scientific research (46%), specialist science communicators[8] (42%, as distinct from journalists, marginally behind at 39%) and the government (40%).

Scientists were subsequently asked to select which groups from the same list they felt were the best equipped to communicate the social and ethical implications of scientific research findings to the non-specialist public[9]. No single group is considered by a majority of scientists to be the best equipped for this task - specialist science communicators and then scientists being most commonly mentioned, by around four in ten.

Scientists were considered to be the best equipped because of their understanding of research and its implications, and their scientific knowledge and skills. However, few mentioned that scientists had the necessary communication skills. In contrast, specialist science communicators are mentioned because of their ability to communicate, and their knowledge and skills[10], though not surprisingly, a smaller proportion felt that they had the necessary understanding of research and its implications.

In summary, scientists believe that they should have the main responsibility for communicating their research and its implications as they feel they are the best equipped to understand these. However, they are disinclined to rate themselves as being the best equipped to communicate. This highlights the potential of training to assist scientists develop relevant communications skills. This is particularly important because, with the possible exception of specialist science communicators, no other group emerges as being particularly well suited and well equipped to undertake this important role.

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[7] They were asked to select a maximum of three groups.

[8] This phrase refers to people who are professional science communicators, but not necessarily journalists. This could include people such as: Lord Winston, Professor Susan Greenfield, David Attenborough, Dr Raj Persaud, Dr Hillary Jones, David Bellamy, and possibly HRH Prince Charles; as well as medical public relations and communications companies. This definition and examples were not provided on the questionnaire.

[9] Again, they were asked to select a maximum of three groups.

[10] 'Knowledge and skills' was mentioned more often for specialist science communicators (43%) than for scientists (34%).

Participation in Communications Activities

Fifty-six per cent of scientists have participated in the last year in at least one of the fifteen communications activities presented to them. Biomedical scientists who deal with patients are more likely to have participated in communicating their research than those who do not deal with patients. Senior scientists are also more likely to have participated. Scientists funded by the Wellcome Trust (33%) and by industry (45%) are less likely to have taken part in communicating their research.

Over the past year, just over three in ten have given a presentation to a non-scientific audience. This includes one or more of the following: talking at schools and colleges, presenting at public conferences (other than conferences for scientific professionals), speaking at non-scientific academic conferences, speaking at public meetings, and talking to the public. Twenty-nine per cent have spoken to the media (on TV or radio, with journalists from newspapers, with the popular science press, or/and with the computer press); nearly a quarter have participated in open days at their institutions; while 13% have published written work (for example, in newspapers, specialist magazines, the popular science press, or/and the computer press).

Of the specific activities listed, scientists are most likely in the last year to have given talks to schools or colleges (21%), or participated in open days for the general public at their institutions (24%). There is a greater overlap between these two activities than any other[11]; and scientists aged under 45 are more likely to have been involved in them than in other communication activities[12]. Many scientists who have been involved with the media, or presented at public or non-scientific academic conferences, have also talked at schools or participated in open days. However, fewer of those who have talked at schools, or participated in open days have been involved with the media, or presented at conferences. The data therefore suggests that some scientists may have 'cut their teeth' giving talks to schools or colleges, or at open days.

Training in Communications Activities

Nearly half of scientists think that speaking on TV and radio is the most effective method of communicating with the public. Speaking to the media as a whole – talking to journalists, as well as speaking on TV and radio, is rated by nearly three-quarters as the most effective method[13]. This is despite the fact that, as shall be seen later in the summary, few scientists select most types of journalists as sources they trust to provide accurate information about scientific research facts or their social and ethical implications[14]. Presumably then, scientists are acknowledging the wide reach that can be obtained from talking on TV or radio, or being quoted or writing in the press – even if it does carry the risk of criticism or misrepresentation of their research.

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[11] 49% of those who have talked at schools and colleges have also participated in open days; and 42% of those who have participated in open days have also talked at schools and colleges.

[12] Though those aged 45+ are still more likely than the under 45s to have given talks to schools or colleges (28% and 16% respectively), or at open days (27% and 22% respectively).

[13] Respondents were presented with a list of 15 methods of communicating and asked which, if any, they rated as being the most effective for communicating their research and its social and ethical implications to the non-specialist public. They were allowed to select up to three categories.

[14] The exception is the popular scientific press (for example, *New Scientist*) - which half rated as a source they generally trust for scientific research facts. Fewer trust them to communicate the social and ethical implications of scientific research (39%).

Presentations to non-scientific audiences as a whole (schools, public meetings, open days and conferences) are thought by just over half to be most effective, while just under half consider that writing about or publishing their work is the most effective method.

While many agree that oral communication and writing for the national press are the most effective methods, the vast majority of scientists have not been trained to undertake these sorts of activities. More than eight in ten have received no training in communicating their research and its implications to the non-specialist public, and nine in ten have never had any training in dealing with the media.

Scientists at Research Council-funded establishments are more likely to have received training in communicating their research and its implications, and in dealing with the media. Biomedical scientists who deal with patients, and Professors or Heads of Departments, are also more likely to have had training in dealing with the media.

Scientists who have participated in communications activities in the past year are more likely to have received training both in communicating their research and its implications to the public, and in dealing with the media. They also tend to be older (45+).

Although few scientists have been trained to deal with the public or the media, three-quarters do feel equipped to communicate the scientific facts of their research, although only one in five feels very well equipped. A quarter do not feel at all equipped to do so.

Fewer (53%)[15] feel equipped to communicate the social and ethical implications of their research, and only one in ten feels very well equipped. Almost four in ten do not feel equipped to do so. Scientists who feel equipped to communicate are more likely to have received training[16], and to have participated in communications activities with the public.

The results therefore indicate that training plays a part in increased participation in communications activities. They also highlight that training and communication experience are key factors in how confident scientists feel about communicating the scientific facts[17] of their research with the public. However, there are indications that other factors, such as age, seniority, and teaching experience, also contribute to a confidence to communicate.

Attitudes towards Communicating

A series of statements on a variety of related subjects were read out to scientists and they were asked to state their level of agreement or disagreement with each, using a five-point scale.

Nearly all scientists (93%) agree that the non-specialist public needs to know about the social and ethical implications of scientific research, and just over half (53%) agree

[15] The 53% is based on 'All excluding: the 6% who said they would not personally present at this question (Q17), the 29% who say there are no social and ethical implications to their research, and scientists in Research Council-funded establishments'.
[16] In communicating with the public, or in dealing with the media.
[17] Sub-group sizes are too small to be able to draw conclusions about communicating the social and ethical implications.

strongly with this statement. The vast majority of scientists also agree that it is their responsibility to communicate the social and ethical implications of their research to policy-makers (91%), and their duty to communicate their research and its implications to the non-specialist public (84%). Biomedical scientists are more likely than non-biomedical scientists to agree that scientists have a duty to communicate their research and its implications to the non-specialist public (88% c.f. 79%). This presumably reflects the fact that they are more likely to believe there are social and ethical implications in their personal field of research.

Many scientists say they feel constrained by the day-to-day requirements of their job, leaving them with too little time to carry out their research (56%) or to communicate its results (60%).

Nevertheless, almost six in ten say they would like to spend more time communicating the implications of their research to non-specialist audiences. Those who have communicated with the public in the last year are more likely to say they want to spend more time doing so (61%), but half of those who have not would also like to participate more.

The profile of those who have not participated in communications activities but who want to do so,[18] differs from those who have not participated and do not want to do so. The former are more likely to say that there are social and ethical implications for the public in their field of research – suggesting that those who see a relevance to communicating are more inclined to want to do so. This group is also more likely to: feel equipped to communicate the scientific facts, as well as the social and ethical implications of their research; be aged under 35; and receive research funds from industry. In contrast, those who do not want to spend more time communicating with the public (and have not) are more likely to be aged 45+, and on a permanent contract.

The research also shows that those who feel equipped to communicate the scientific facts, and the implications of their research, are more inclined to want to spend more time communicating research implications to non-specialist audiences.

The great majority agree that scientists should receive help[19] from funders of scientific research (84%), to convey research findings and their implications to the non-specialist public. Nearly three-quarters also agree that scientists should obtain assistance from professional communicators.

Trust in Information Sources

If there is to be greater dialogue between scientists and the public – either directly or through the media - it is worth examining which sources of information scientists trust, and which they think the public trusts. Respondents were presented with a list of eleven sources and asked which, if any, they generally trusted to provide accurate information

[18] That is, they agreed that they wanted to spend more time than they do, communicating the implications of their research to non-specialist audiences.

[19] This was not followed up directly with a question about the type of help, although we know from a subsequent question that 60% of scientists believe that incentives from funding authorities to encourage time spent on communication could improve communications with the general public.

about scientific research facts, and about the social and ethical implications of scientific research. They were then asked which sources of information they believe the general public would generally trust.

Scientists are most inclined to trust other scientists to provide accurate information, and are least inclined to trust most of the media (journalists working for national newspapers, TV news and current affairs, and documentaries). However, they are relatively more likely to trust journalists working for the popular scientific press (e.g. *New Scientist*), particularly for scientific fact (50%), but also for providing accurate information about the social and ethical implications of scientific research (39%).

In stark contrast, scientists think the public is most inclined to trust the media (TV news and current affairs programmes, and TV documentaries), for accurate reporting of scientific fact, and the social and ethical implications.

Scientists were also asked what characteristics they thought the non-specialist public associated with scientists, and how they themselves viewed scientists. 'Detached', 'poor at public relations', 'secretive' and 'uncommunicative' are among the descriptions which scientists are most likely to feel the public attributes to them. In contrast, few scientists assign three of these four descriptions to themselves[20] - they are most likely to view themselves as being enquiring, intelligent, poorly paid and methodical.[21] Scientists clearly feel that the public has an erroneous view of their profession, and that they and their work are misunderstood. A further distance between them might be evident in that scientists feel the public trusts a source which they themselves have little faith in – the media.

Attitudes to the Media

As mentioned earlier, the media is cited by one in three scientists as being a barrier to greater public understanding of science. Biomedical scientists are significantly more likely to consider the media as a barrier to greater understanding than are non-biomedical scientists (40% c.f. 30%). This may reflect the mainstream media's greater focus on biomedical stories (reflecting public interest in the rapid advances being made in this area), the debates[22] which surround much biomedical science, and the resulting possibility of miscommunication.

Following a period of intense media coverage and controversy about science and its implications, we asked scientists whether they were more or less likely to communicate their research to the non-specialist public, or whether it had made no difference. Around two-thirds of scientists say that recent media coverage of scientific issues has made no difference to communication of their research to the non-specialist public. This attitude holds whether scientists have been communicating in the past year or not.

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[20] The exception is 'Poor at public relations', which 39% of scientists say about themselves (and 48% of scientists say they think the non-specialist public would think this of scientists).
[21] 'Enquiring' came joint first, with 'intelligent' and 'poorly paid'.
[22] For example on genetically modified (GM) food, as discussed in The MORI/OST 'Public Consultation on Developments in the Biosciences' report, 1998–1999.

Consistent with their low level of trust in the media to report scientific issues accurately, scientists tend to say[23] that the recent media coverage of BSE, GM foods or HGM/animal cloning[24] has made the public more wary about science, or confused them. Certainly, relatively few scientists feel that the recent media coverage has clarified the issues on these topics.

The Role of Institutions and Funders

It has been shown that the majority of scientists have not been trained to communicate with the public or the media, and that many do not feel very well equipped to communicate with the public[25]. More than half believe that training in dealing with the media could improve communications between the general public and scientists, as could incentives from their funders and assistance from their institutions to encourage time spent on communication.

In this section we explore whether scientists are aware of existing facilities for communication that may be provided by their funders and institutions, and investigate ways in which the latter may be able to promote greater dialogue between scientists and the public.

Over four-fifths of scientists are aware that their institution or department provides at least one mechanism for communication. The relevant services that scientists are most likely to be aware of are: access to staff with expertise in dealing with the media (46%); participation in science-schools collaboration (45%); and training for conference speaking (43%). Almost one in five, however, does not know whether such facilities are available, which may indicate a need for improved communications within HEIs.

Biomedical scientists are less likely to be aware that they have access through their institution or department to communications services or assistance (74%, c.f. 84% of non-biomedical scientists).

Those scientists who have not been trained in communicating with the public, or have not participated in communications activities in the past year, are also less likely to be aware of the facilities available.

Funders of research are thought to be far less likely to provide mechanisms for communicating than institutions. More than a third (36%) do not know what communications assistance their principal funder provides; and a further three in ten believe that their principal funder does not provide any assistance for communicating with the non-specialist public. This suggests a possible under-use of funders' resources, and a need for both funders and institutions to increase awareness and promote usage of the facilities available.

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[23] When asked at a subsequent question.

[24] Bovine Spongiform Encephalopathy/Genetically Modified Foods/Human Genetic Modifications or Animal Cloning.

[25] This question, on how well equipped scientists feel to communicate, was not asked about communicating with the media.

Nearly nine in ten scientists are aware that their institution has a public relations department or press office. This falls to 79% among scientists from Research Council-funded establishments. However, only one in three (32%) say that their institution has produced any press releases or briefings in connection with their own research.

The results indicate that many scientists do not get involved with the communication of their work through press releases or press briefings. Of those scientists whose institutions have produced press releases or briefings about their research, four in ten (39%) did not personally contribute to them. Likelihood of personally contributing increases with age and academic seniority.

Improving Communications

Scientists were shown a list of items and asked which, if any, they believed could improve communications between the general public and scientists[26]. The main suggestions were encouragement from institutions and funding authorities to spend time on communication, training in dealing with the media, financial support from institutions and an increased role for specialist science communicators. This suggests that the main barriers to communication are a lack of support and a supportive environment, time, skills and money.

Scientists who have experience of dealing with the media are more likely to think that communications could be improved by relevant training, and incentives from funding authorities to encourage communication. In contrast, those who have not communicated their research to the public and those who feel ill-equipped to do so are more in favour of the appointment of specialist science communicators.

One in four would like to see changes to the way the Research Assessment Exercise is carried out, possibly to enable effort in communicating to be recognised in the assessment.

Implications

Around half of scientists in Great Britain have participated in at least one communications activity in the past year. However, despite scientists' views that they have a duty to communicate their research, not all feel equipped to do so and even fewer feel capable of explaining the social and ethical implications of their research. This could well be related to the fact that four in five scientists have never received any relevant training.

A combination of response categories reveals that 78% of scientists[27] believe encouragement and incentives from funders and institutions to spend time on science communication could improve communications between the public and scientists. Training, assistance from skilled professionals and financial support could also help, as

[26] They could choose as many or as few as they liked.

[27] This includes 60% who said 'Having incentives from funding authorities to encourage time spent on science communication'. These people may also have given other 'time' responses, as this was a multiple response question.

could changes to the way the Research Assessment Exercise is carried out, and a stipulation in research grants to communicate with the non-specialist public.

Some scientists, particularly younger ones and those who are not eager to communicate themselves, favour the use of specialist science communicators to convey research findings and implications to the public. These people are seen to have both the scientific background and the ability to communicate. Yet there are also many scientists who personally would like to spend more time conveying the results of their research and its implications to the general public.

Scientists feel the most effective way to communicate their research and its implications is through the media. However, few have had any training in dealing with the media, and most journalists are not well regarded by scientists to provide accurate information about scientific facts or their implications. Furthermore, many scientists feel that the public trusts journalists, while at the same time holding a generally low opinion of scientists. These factors may be creating further disincentives for scientists to communicate with the public.

Institutions need to publicise and promote the communications facilities they have available, which may include access for staff to press offices, training courses and specialist communicators. Many scientists are unaware of any facilities which may exist. Funders also need to look at the definition and scope of their role, and consider whether it is appropriate for them to provide similar services, and/or to encourage scientists to communicate to the public as part of their funding. If communication is to become an integral part of a researcher's job, and if funders are to consider whether they should provide mechanisms for communicating routinely, this also raises the question of whether promotion should take place at local HEI, or at funder, level.

Scientists currently have many competing responsibilities - the need to find funding, conduct their research, and fulfil their teaching and administrative responsibilities. However, if a combination of factors can be realised - training, time to communicate, a supportive, encouraging environment, funding, and breaking down of the barriers between scientists, the public and the media which have been identified in this survey - one might expect to see greater communication among scientists, the media and the public.

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