

Summary

- The Academy recognises open communication and ongoing dialogue as prerequisites for support and trust in research and researchers. Increasing public awareness of scientific methodology so that they can evaluate the outcomes of medical research should be a particular priority.
- Science communication should target the broadest possible audience, requiring innovative strategies to engage hard-to-reach groups. Encouraging health literacy throughout society in this way will enable shared decision making in patient healthcare.
- High-quality reporting of science within the media must be the combined responsibility of journalists, scientists and press officers, facilitated by organisations such as the Science Media Centre. Particular care must be taken when reporting preliminary or controversial data; here press officers and other communications professionals can play a particularly important role.
- Public dialogue remains essential for well-informed policy making and encouraging trustworthiness. The Academy's 'Animals containing human material' project demonstrated how such dialogue can help direct regulations towards addressing areas of public concern.
- Continued efforts must be made to increase transparency in research – recent controversy surrounding reproducibility in science threatens public confidence in the field and must be addressed both through tackling problems within research itself and promoting better public discussion of the complex underlying issues.
- Increasing the level of public engagement undertaken by researchers may require a reappraisal of related incentives within the academic career structures, and should include the expansion of schemes to train researchers and connect them to local communities.

Introduction

The Academy of Medical Sciences promotes advances in medical science, and campaigns to ensure that these are translated into healthcare benefits for society. Our elected Fellowship includes experts drawn from a broad and diverse range of research areas. We welcome the opportunity to respond to the House of Commons Science and Technology Committee inquiry into science communication. Our written evidence has been informed by engagement with our Fellows, from across the disciplines and sectors we represent. We would be pleased to provide further evidence, and our previous relevant outputs, if required.

The UK's position as a global centre for research and innovation brings extensive health, social and economic gains. Retaining this position in the face of international competition and maximising the capacity of individuals to benefit from scientific progress requires research to occur in the context of an informed, engaged and involved society. Public funding is a major contributor to the UK's research base, and scientists have a duty to

promote greater public communication of their work where possible. As such, the Academy strongly supports efforts to foster a culture of communication and engagement between scientists and society that enables an open dialogue between researchers and their broader community.

Current trends

As evidenced by the Department of Business, Innovation and Skills (BIS) Public Attitudes to Science 2014 survey, public support for science remains high, with 81% of respondents agreeing that science will make people's lives easier.¹ Recent data from the Wellcome Trust Monitor, a long-term survey examining trends in public attitudes to science, shows that trust in academic scientists and healthcare professionals also remains high, as does interest in medical research.² The ongoing collection of these data helps identify trends and gaps where better communication efforts are needed and we support their continuation.

Recent findings, including a survey commissioned by the Academy, suggest a low level of awareness among the public of scientific methodology.³ Many members of the public are unable to describe the principle of a clinical trial, and the primary factor used to decide the trustworthiness of a trial is the reputation of the organisation which conducted it.^{4,5} Fundamental scientific process, such as peer review, are not broadly understood, with 29% of individuals believing research is rarely or never checked by other scientists before publication.⁶ This appears to translate into a lack of confidence, with only a minority of respondents saying they would trust data from a clinical trial, suggesting that whilst public trust in academic scientists is high, trust in *science* in the broader sense lags behind.⁷ Better and more open communication is the only way to address this challenge.

Low awareness of scientific process can create misconceptions regarding the costs and timescales of research. While some groups of individuals (e.g. patient groups) may be well-informed, a clearer comprehension among the wider public may avoid unrealistic expectations on aspects such as the rate at which drugs become available to patients. We therefore recommend that communications training for researchers supports them to talk about how they work as well as what they work on.

Reaching out to the broader public

While public interest in medical science remains consistently high, a majority of the public do not feel informed, and believe that scientists do too little to reach out beyond their community.⁸ Survey respondents express an interest in hearing directly from scientists about their research, but the methods used often only engage an interested

¹ Ipsos MORI (2014). *Public attitudes to science 2014, main report*.

² Ipsos MORI (2016). *Wellcome Trust monitor: wave 3*.

³ The Academy of Medical Sciences and ComRes (2016). *Academy of Medical Sciences: medical information survey*. To be published shortly.

⁴ *Ibid.*

⁵ Ipsos MORI (2013). *Wellcome Trust monitor: wave 2*.

⁶ Ipsos MORI (2014). *Public attitudes to science 2014, main report*.

⁷ The Academy of Medical Sciences and ComRes (2016). *Academy of Medical Sciences: medical information survey*. To be published shortly.

⁸ Ipsos MORI (2014). *Public attitudes to science 2014, main report*.

minority.⁹ For example, while much public engagement activity by scientists centres around science festivals, the BIS Public Attitudes to Science survey found that only three per cent of respondents had attended such an event in the past year.¹⁰ It is therefore important that science communication broadens the audience which it engages, and the places in and means by which it does so.

Widening participation requires innovative strategies which target groups not normally accessed. The Academy's recent public dialogue as part of its ongoing 'Health of the Public in 2040' project combined cinema-screenings with a series of workshops; each workshop targeted members of a specific group, including the LGBT community, mothers of young children from low socioeconomic groups, older people with strong religious faith, and young digital entrepreneurs.¹¹ Individuals participated enthusiastically and felt their opinions were valued.¹² Some of these demographic groups are often the target of particular public health campaigns, and their engagement is essential in both informing the design of strategies, and delivering the desired health outcomes. More innovative exploitation of digital communications must be recognised as key to unlocking access to some of these groups.

Broad public engagement in the scientific process is an essential part of realising the NHS commitment to Shared Decision Making.¹³ A majority of the public would wish to inform themselves independently prior to making a medical decision.¹⁴ With increased access to medical information via digital communications, it is important that public healthcare systems embrace the role and value of individuals in managing their personal healthcare. This trend further reinforces the need for broader awareness of the medical research process, and support to increase levels of health literacy in order to inform personal decision making. The Academy's ongoing project, 'How can we all best use evidence to judge the potential benefits and harms of medicines', seeks to identify and address many of issues surrounding this topic, and we welcome continued support from public bodies, including the National Institute for Health Research (NIHR), for research concerning the relationship between communication and healthcare decision-making.¹⁵ As the major interface between the public and the healthcare sector, the NHS is well positioned to take a leading role in encouraging health literacy. Concepts of medical risk and uncertainty are pertinent to the healthcare of every individual; therefore science communication must aim to inform every individual.

Supporting high quality reporting of science in the media

Despite the increasing importance of the digital communications, traditional forms of media (television, radio, newspapers) remain the most popular sources of information on scientific research.¹⁶ Fortunately, the UK has a long history and enviable reputation of science broadcast and journalism with regular coverage of novel discoveries, and most

⁹ Ipsos MORI (2016). *Wellcome Trust monitor: wave 3*.

¹⁰ Ipsos MORI (2014). *Public attitudes to science 2014, main report*.

¹¹ Ben Gammon Consulting (2016). *Health, lies & video-tape: an evaluation of the public engagement element of 'Health of the public in 2040'*.

¹² *Ibid.*

¹³ www.england.nhs.uk/ourwork/pe/sdm/commitment

¹⁴ The Academy of Medical Sciences and ComRes (2016). *Academy of Medical Sciences: medical information survey*. To be published shortly.

¹⁵ www.acmedsci.ac.uk/policy/policy-projects/how-can-we-all-best-use-evidence

¹⁶ Ipsos MORI (2016). *Wellcome Trust monitor: wave 3*.

scientists report positive interactions with the media.¹⁷ Nevertheless, we note some concerns, particularly in the reporting of preliminary data. It is important that distinctions are made between initial studies, for example evidence of drug efficacy in animal models, and clinical trials which clear the way for a new therapy to be made available to patients. Raising expectations when treatments are years from the clinic is not in the interest of patient groups, and serves to undermine trust in medical research.

Accurately communicating the nature of scientific evidence, and the proximity of such research to delivering patient impact, is not only the responsibility of journalists, but also of scientists and press officers. We welcome the Government's continued support for the Science Media Centre (SMC), which facilitates communication between these parties. The medical sciences, as a particularly competitive area of research, are especially at risk of inflation of the importance of stories by researchers and press officers. BIS support for Stempra, an organisation which supports training and career advancement for science communications professionals, is therefore important in ensuring accurate communication of research to journalists.¹⁸ We would urge researchers interested in engaging journalists to make use of resources such as institutional press officers and the Science Media Centre to ensure responsible communication of their work.

Promoting science communication through the media requires more than just a focus on the accuracy of individual stories. Journalists and editors should ensure a balance between the reporting of promising discoveries which are years from implementation, and clinical trials clearing the final hurdles for a therapy to reach patients. Where possible, researchers should encourage the inclusion of aspects of study methodology in reporting. Scientists must also be supported to engage proactively and reactively with the media, even where stories have already been published. A recent SMC workshop highlighted the growing issue of online news sources, which may exert less regulation of their output.¹⁹ Science journalists play an important role in filtering out stories with poor scientific content, and the editors of news outlets must support them to ensure that this continues. However, where controversial or even dubious scientific content is reported, scientists must be prepared to engage with journalists to ensure their views are represented in the debate as it progresses.

We emphasise the importance of diversity in the voices communicating science through the media. Despite progress in recent years, female experts continue to be outnumbered by their male colleagues in news and current affairs. The Academy is addressing this through the facilitation of dedicated media training for our women Fellows and Grant Awardees; however, more support from research funders is needed in increasing the number of authoritative female voices in media coverage of science.²⁰

Engaging the public in dialogue

Experimental approaches and emerging technologies in medical science can lead to ethical controversies which play out in the media and other communications platforms. Ensuring that the public are involved in the early stages of policy-making can help to

¹⁷ Science and the Media Expert Group (2010). *Science and the media: securing the future*.

¹⁸ <http://stempra.org.uk/about-stempra>

¹⁹ Science Media Centre media roundtable, 8 April 2016, report forthcoming.

²⁰ www.acmedsci.ac.uk/careers/mentoring-and-careers/sustain/media_women

inform decisions and identify areas of controversy before they arise. An example of this is the Academy's 'Animals containing human material' project, which engaged the public in dialogue on an emerging area of research through workshops and interviews, as well as holding discussions with special interest groups including patients and those interested in animal welfare.²¹ While the public were broadly supportive of such research for health and medical benefits, specific ethical issues were raised concerning the introduction of human genetic or cellular material into animal brains, as well as substantial modification of the reproductive organs.²² In turn, this directly informed the boundaries set out in new Home Office guidance for such research published this year, and resulted in press coverage making reference to the role of public consultation in this process.²³

Our 'Drugsfutures' dialogue, which engaged the public on issues surrounding drug use for recreational and therapeutic purposes, is another such example.²⁴ Both projects, as well as others such as a consultation on mitochondrial replacement therapy commissioned by the Human Fertilisation and Embryology Authority, were supported by the Sciencewise ERC with funding from BIS.²⁵ The current contract for management of the Sciencewise programme ended in March 2016, and we look forward to details of how BIS will continue to support this essential activity. While deliberative public dialogue can be expensive, the difficulties of legislating on controversial or emerging research areas mean that such projects can deliver long-term value and should be a standard part of policy making in relevant situations.

Supporting trustworthiness of science

Public trust in scientists is high at present, and continual engagement with the public is crucial to maintaining this position.²⁶ This is evident in the context of animal research: in an Ipsos MORI survey commissioned by BIS, 64% of the public were supportive of animal research for medical research purposes in 2014, a substantial reduction from 76% in 2010.²⁷ Whilst this still represents a clear majority, it demonstrates that support cannot be taken for granted. The scientific community must continue to earn the public's trust through open and sustained communication.

Transparency is an important contributor to retaining trust, and progress has already been made regarding animal research. In 2014, the Concordat on Openness in Animal Research was released, and has now (as of April 2016) been signed by 99 UK organisations, including universities, Research Councils, charities and private companies.²⁸ This commits signatory organisations to declare when and why they use animals in research, and to actively engage with the media and the public regarding these issues.²⁹ So far this project has been successful, with many organisations making progress beyond expectations, demonstrating the willingness amongst the UK research

²¹ The Academy of Medical Sciences (2011). *Animals containing human material*.

²² *Ibid.*

²³ Sciencewise (2016). *Tracing the impacts of public dialogue sponsored by Sciencewise: animals containing human material*.

²⁴ Office for Public Management (2007). *Drugsfutures: public engagement on the future of brain science, addiction and drugs*.

²⁵ Sciencewise (2014). *Case study: mitochondria replacement*.

²⁶ Ipsos MORI (2016). *Wellcome Trust monitor: wave 3*.

²⁷ Ipsos MORI (2014). *Attitudes to animal research: a long term survey of public views 1999-2014*.

²⁸ www.understandinganimalresearch.org.uk/policy/concordat-openness-animal-research.

²⁹ Williams AJ (2015). *Concordat on openness on animal research in the UK: annual report 2015*.

community to better engage the public on these issues.³⁰ Not only does greater transparency itself promote trust, it also helps to address misconceptions, including the widespread belief that animals are used for cosmetics testing, despite this being banned across the European Union.³¹

Recent coverage of a 'reproducibility crisis' in biomedical science threatens to erode trust in research.³² In an environment where public awareness of how research is undertaken is limited, failure to replicate a study may be viewed as evidence of fraudulent intentions, rather than an unintended oversight in reporting, the complexity and variability of biological systems or problems with experimental design. There are two problems which must be tackled: systematic issues with scientific methodology and reporting themselves, and the public perception of where such problems originate. The Academy has sought to address the difficulties in the science itself through its recent symposium titled 'Reproducibility and reliability of biomedical research: improving research practice'.³³ However, some degree of contradiction is inherent to cutting edge scientific research. These approaches must therefore be coupled with greater communications efforts to raise awareness of the complexity of the scientific method, noting that conflict is a natural part of the process. Scientists should not underestimate the general public's scientific understanding, but openly communicate the complexity of the issues to engage them in the debate.

Supporting researchers to engage with the public

Scientists must play a central role in direct engagement with the public. The Academy was one of a consortium of partners who commissioned a survey of researchers which revealed that the most influential factor in preventing engagement with the public was lack of time, followed by a perceived lack of opportunities and funding.³⁴ The lack of time reported reflects the significant pressures imposed by the competitive environment in which researchers must seek to advance their careers. The Academy's recent report on 'Team Science' highlighted a culture in which an academic's publication record largely determines career progression.³⁵ This means that there is little incentive to prioritise public engagement over core research duties. Many of the report's recommendations centre around instilling a culture in which a diversity of roles are accredited, placing more emphasis on the duties of researcher 'citizenship'.³⁶ Implementing these recommendations will help to redress the balance and incentivise researchers to give higher priority to public engagement priorities, while still improving their career prospects.

Researchers who are motivated to participate in communication and dialogue with the public must also be provided with the means to do so. This requires awareness of opportunities for engagement, and training in how to make the most of these opportunities. Organisations such as INVOLVE, which is funded by the NIHR, provide

³⁰ *Ibid.*

³¹ Ipsos MORI (2014). *Attitudes to animal research in 2014*.

³² For example, see <http://www.economist.com/news/briefing/21588057-scientists-think-science-self-correcting-alarming-degree-it-not-trouble>

³³ The Academy of Medical Sciences, BBSRC, MRC & Wellcome Trust (2015). *Reproducibility and reliability of biomedical research: improving research practice*.

³⁴ TNS BMRB & Policy Studies Institute (2015). *Factors affecting public engagement by researchers*.

³⁵ The Academy of Medical Sciences (2016). *Improving recognition of team science contributions in biomedical research careers*.

³⁶ *Ibid.*

biomedical researchers with information and support for public engagement, as do many Research Councils and other funders of biomedical research.³⁷ In particular, INVOLVE's 'People in research' database is an important example of linking researchers with interested members of the public. We would welcome further Government support for such schemes, to increase ties between researchers and interested parties such as community organisations or patient groups.³⁸ Facilitating interaction and project design in this way may help to reduce the associated time commitment, providing an additional incentive for engagement.

Training researchers to recognise and seize communications opportunities is essential. Many scientists are still not offered training opportunities by their institutions and this must change.³⁹ Training programmes should support researchers to design their own projects and take advantage of digital media, as well as promote a two-way dialogue in which research itself can be influenced by the public. Such training should be valued in the evaluation of individuals for employment or funding purposes. Greater funding for public engagement activities is required, and in turn, such activities should be subject to rigorous evaluation of efficacy. Funding bodies should publish regular analyses in order to allow continual improvement of the strategies used.

Conclusions

For the UK to continue to lead the world in scientific research, we must deliver communications that demonstrate science is at the heart of British culture. This requires a concerted effort on the part of scientists, the media, Government and society as a whole to promote conversations about the scientific method, its benefits and shortcomings. We support a culture in which an engaged public have a stake in influencing research priorities and regulation, but retain trust in researchers and the scientific enterprise to deliver improvements to their lives; where individuals can contribute to taking responsibility for their own healthcare, while still trusting healthcare professionals to provide expert and honest advice. We strongly emphasise the importance of Government support and direction in nurturing such a culture.

This response was prepared by Andrew Pountain (Policy Intern) and informed by members of the Academy's Fellowship, as well as individuals involved in our ongoing project, 'How can we all best use evidence to judge the potential benefits and harms of medicines'. For further information, please contact Nick Hillier, Director of communications & corporate events (nick.hillier@acmedsci.ac.uk; +44(0)20 3176 2154).

Academy of Medical Sciences

41 Portland Place

London, W1B 1QH

+44(0)20 3176 2150

info@acmedsci.ac.uk

Registered Charity No. 1070618 Registered Company No. 35202

³⁷ www.invo.org.uk

³⁸ www.peopleinresearch.org

³⁹ TNS BMRB & Policy Studies Institute (2015). *Factors affecting public engagement by researchers*.