
Introduction

1. The Academy of Medical Sciences welcomes the opportunity to respond to the Department for Innovation, Universities and Skills' (DIUS) consultation on 'A Vision for Science and Society'. The Academy's core mission is to promote advances in medical science and to ensure these are translated as quickly as possible into benefits for society. This mission incorporates many of the issues considered in the DIUS consultation: the provision of scientific advice to policy makers; capacity building in the medical sciences; active engagement with the media; and effective dialogue with patients and the public. Our 900 Fellows represent the UK's best medical researchers, drawn from hospitals, universities, industry and the public sector. The Fellows are therefore key elements in the important connections that must be made between science, society and policy.
2. This response was prepared by a group of Academy Fellows and representatives from our FORUM with industry (see end). Given the Academy's constituency, our response focuses on issues of science and society pertaining to medical research. We do not address issues of science education in schools and universities. We would be pleased to expand on any of the points made in this submission.
3. Discussions around 'science and society' have been ongoing for some time, and valuable progress has been made in recent years. Overall, we emphasise that this is not a time for new initiatives and quick-fix schemes, but instead a time to consolidate progress and ensure we are maximising our impacts. From the discussion below, we highlight the need to:
 - Emphasise the benefits to society from scientific research.
 - Stimulate real cultural change so that science is embedded in our everyday lives.
 - Encourage younger scientists to engage with the public, supported by dedicated grants schemes.
 - Empower doctors, particularly GPs, to become 'bridges' or 'brokers' between biomedical science and the public.
 - Develop a dedicated UK online strategy for science.
 - Harness the resources offered by the national academies.
 - Increase transparency around Government policymaking.
 - Increase transparency around pharmaceutical company science activities.
 - Capture current and recent past 'science and society' initiatives to evaluate what works and avoid re-inventing the wheel.

Science as an integral part of our culture

4. We strongly endorse the ambition set out in the consultation document to establish UK science 'as an integral part of our culture'. The term 'science and society' can imply a side-by-side arrangement, when in fact science is embedded in our everyday lives and provides the frame of reference for how we think about the world. While we

acknowledge the value of publicity around cutting-edge or controversial science, this can contribute to a feeling that science is a 'thing apart' from normal life, carried out only by scientists in far-away laboratories. Instead, science should be seen as something in which we all participate through the technologies we use, the clothes we wear, the foods we consume, and the medicines we take; science is also the expertise that makes all of these things safe as well as effective. In short, science is an active presence in every moment of our lives.

5. Effecting this kind of cultural change is perhaps the biggest challenge to realising the Government's vision for science and society. This challenge is not amenable to piecemeal initiatives or schemes, but instead requires sustained and coordinated efforts from multiple players over a time span that lasts a generation or more.

The objectives of promoting science and society

6. The Academy firmly believes that science in general, and medical research in particular, brings significant social and economic benefits. Indeed, a forthcoming report commissioned by the Academy, Medical Research Council and Wellcome Trust explores ways in which these benefits can be quantified.¹ A thriving science base contributes to UK prosperity, promotes the health and well being of our citizens and prepares us for future national and international challenges. We therefore strongly endorse the need to:
 - Strengthen scientific input into public policy-making.
 - Increase the number of science students and researchers.
 - Promote access to scientific information for all citizens.

Establishing a UK economy that is built on knowledge and innovation is the only way to address growing global economic and industrial competition, particularly from India, China and South Korea.

7. We emphasise that the goal should not be to simply increase knowledge of science *facts* in the population, but to engender an awareness of science *methods*. This creates a positive feedback mechanism, whereby the public asks better questions of scientists and policymakers, which increases the supply of good quality scientific advice and promotes further analysis and debate. This will have wider beneficial effects on the quality of public debate on issues and decisions of all kinds – transport, environment, finance, culture etc. A key element within this ambition is that the public is provided with real opportunities to ask questions of scientists and policymakers.
8. A particularly important consideration for the Academy relates to equipping the public with an awareness of evidence-based medicine – of how scientific methods are used to understand disease, to develop potential treatments and to rigorously test new therapies for safety and efficacy. The rigour of evidence based medicine can contrast strikingly with complementary and alternative therapies; a knowledge of science methods will help the public to make informed choices about health and treatment.

¹ For more information see: <http://www.wellcome.ac.uk/News/Media-office/Press-releases/2007/WTX038680.htm>

Public engagement and dialogue

9. We support the broad definition of public engagement and dialogue set out in the consultation document. Methods of public dialogue have advanced considerably over the years and Sciencewise and others have done much to establish and disseminate good practice. Policy development in important areas such as GM technology or embryo research could not now be contemplated without including public dialogue as a core component.
10. We support the view expressed in the consultation that there is no 'them and us' when it comes to scientists and the public: scientists are themselves part of society. This was demonstrated during the Academy's recent study into 'Brain science, addiction and drugs', in which participants in the public meetings and workshops raised the same concerns, voiced the same hopes, and identified the same challenges and opportunities as the experts.² Nevertheless, the report emphasised that: *in a liberal democracy, an intelligent and appropriate approach to the regulation of recreational drug use presupposes a prior deliberative and inclusive community debate... Government should therefore continue to engage in a sustained conversation with the public to develop a position that commands real support*'. This point can be generalised to many other areas of public policy.
11. We challenge the assertion that scientists who engage with the public are somehow discredited in the eyes of their peers. This situation has improved dramatically in recent years, to the point where it is now expected that top scientists will take their work into public forums. The Fellows of the Academy typify this new breed of scientist: of the 215 Fellows who responded to our 2007 communications survey, 98% had engaged with the media about their work and 83% had given a public lecture.³ Reward and recognition of scientists who take on science communication as part of their work are important, and national academies such as the AMS have a role to play in acknowledging excellence in this sphere. Research funders and higher education institutions routinely include expectations around public engagement in grant application forms and job specifications. However, there is still scope for recognition of public engagement work in future versions of the Research Assessment Exercise.
12. It does appear that participation in public engagement work is more common amongst senior scientists, perhaps because they have reached a level where they have more control over their time. It is important to ensure that researchers at all stages of the career pathway are encouraged to participate in public engagement activities, particular younger researchers who might be better able to connect with children and teenagers. There is a case for a specific, dedicated grants scheme to enable early-career researchers to undertake public engagement work. It would be helpful to gather information about the experiences of younger scientists who combine flourishing research careers with significant profiles as science communicators, and to gain the views of science festival coordinators and media representatives about what makes a good communicator and how scientists with a talent for public dialogue can be identified and nurtured. We encourage more

² To access the 'Brain science, addiction and drugs' report, go to: <http://www.acmedsci.ac.uk/p99puid126.html>

³ To access the Fellows Communications Survey, go to: <http://www.acmedsci.ac.uk/p101puid124.html>

schemes such as the successful Wellcome Trust/New Scientist essay competition for post-graduate and post-doctoral researchers, which can help to identify researchers with an interest in and talent for communication⁴.

13. We stress that many medical scientists are also practicing clinicians who engage with many different publics on a daily basis. This interaction is often not included in discussions about public engagement, yet is one of the most common and most important aspects of the public's involvement with science. GPs in particular could play a significant role in engaging individuals, families and communities in medical science, and will almost certainly have to respond to an increasing number of scientific inquiries from their internet-using patients. This also applies to pharmacists who are an important bridge between science and the public. There are certainly opportunities here that merit further consideration.

Media relations

14. There is no doubt that the status and quality of science reporting in the UK media have improved considerably in recent years. Much credit should go to the Science Media Centre, whose work has helped to establish a cadre of science correspondents, particularly in the press, who are knowledgeable, responsible and closely engaged with scientists. Recent debates over the Human Fertilisation and Embryology Bill showcased the success of this relationship and provided a good case study for how scientific-media engagement can work well. However, more could be done to engage a broader range of journalists and broadcast media in the scientific agenda; there was a notable change in the content and tone of reporting when coverage of the Bill was passed from the science to the political/lobby correspondents.
15. The Academy's 2007 report, 'Identifying the environmental causes of disease: how should we decide what to believe and when to take action?', included a set of guidelines for science/medical writers and journalists, and for their editors, to assist them in reporting research findings.⁵ These guidelines included paying detailed attention to the methodology used in the research, identifying whether the researchers have any vested interests, giving balanced coverage to competing views and giving some idea of the weight behind different scientific positions. There is still work to do in taking these messages to schools of journalism and exploring the possibility of dedicated science and science reporting training, especially for journalists who do not intend to become science specialists, but who might be passed a science story when it grows into a major issue of public concern.
16. Many of our Fellows bemoan the loss in quality of science coverage on television. Since the demise of the BBC Science Council there are few, if any, forums for scientists to engage with TV producers, directors or programme commissioners. We recommend that this is an area for targeted activity.
17. Finally, we believe that, to date, science and society strategies have not taken sufficient account of the growth in online media and we make a strong call for the development of a dedicated UK 'online strategy for science'. This strategy should

⁴ See: <http://www.wellcome.ac.uk/Funding/Public-engagement/WTD003407.htm>

⁵ To access the report go to: <http://www.acmedsci.ac.uk/p99puid115.html>

include evaluation of current and previous online initiatives: what has worked and what has not? Whilst technical advances encourage the use of ever more dynamic and interactive approaches, which tools are actually effective in generating public engagement around science?

Science and policy

18. The Academy has long been active in promoting the need for public policy-making to make use of the best available scientific evidence. Indeed, we see this as a key role for all national academies and learned societies. The Fellows of the Academy are an expert national resource, representing the breadth of basic and clinical medical research, on which policymakers in Government and allied agencies can draw. The Academy responds to specific requests for input from Government and others and we make submissions to relevant public consultations, but we also have a strong proactive mission to raise important and timely policy issues, horizon-scan future topics, promote debate, challenge existing policies and identify future opportunities for UK health and medical science. Through our reports, such as 'Pandemic influenza'⁶, 'Systems biology'⁷ and 'Inter-species embryos'⁸, we provide expert, evidence-based analysis and recommendations for action.
19. Government policymakers and Parliamentarians have stressed the value of the medical science community speaking with 'one voice' on important issues, and over the years we have formed effective collaborations with our peer organisations (Association of Medical Research Charities, Medical Research Council, Wellcome Trust, Royal Society, Cancer Research UK etc) on debates around the Human Tissue Bill, the Mental Capacity Bill, the Human Fertilisation and Embryology Bill, the EU Clinical Trials Directive and other legislation. In this way, we hope policymakers can assess the *weight* of scientific opinion behind particular policy options and can go to a single source for information.
20. Accessing policymakers within Government can, however, be extremely difficult. There is certainly scope for increased transparency around the departmental teams who are responsible for particular policies; e-mail addresses and telephone numbers are difficult to come by and it is often impossible to identify the right individual to contact, even to make the initial inquiry. There is a general feeling amongst Fellows that Government departments are still too insular and compartmentalised, and could do much more to engage with the wider scientific community to access new research findings and consult with experts. Government policymakers would benefit from a more visible presence at relevant scientific and science policy symposia, and to participate in the whole meeting, rather than simply delivering a presentation without hearing about wider developments and debate.
21. From our particular perspective, we believe more use could be made of the Academy and other national academies, which can provide authoritative, independent advice and – on a smaller scale - can match-make policymakers with the best experts. The Academy would be pleased to explore the benefits of hosting 'science surgeries',

⁶ To access the report go to: <http://www.acmedsci.ac.uk/p99puid89.html>

⁷ To access the report go to: <http://www.acmedsci.ac.uk/p99puid97.html>

⁸ To access the report go to: <http://www.acmedsci.ac.uk/p99puid105.html>

'horizon-scanning' sessions and/or networking opportunities for senior Government officials, policymakers and biomedical scientists to discuss issues of mutual interest and concern. We also believe there is scope to expand the role of the Parliamentary Office of Science and Technology (POST) and the Parliamentary Library in providing scientific advice to Parliamentarians and engaging with the wider scientific community.

22. In addition to scientists who work in Government as departmental Chief Scientific Officers, or who serve as external experts on Government advisory panels, there are a few initiatives designed to increase links between scientists and policymakers, such as the Royal Society MP-Scientist pairing scheme. There are also examples from abroad that could be considered for translation to the UK. A notable scheme is the Robert Wood Johnson Health Policy Fellowships Program sponsored by the United States Institute of Medicine.⁹ Under this scheme, senior academics from US universities and hospitals spend up to a year in a congressional or executive office, establishing a two-way relationship in which policymakers can access scientific expertise and senior scientists can learn more about the policy-making process, develop leadership skills and build influential networks.

Perceptions of the pharmaceutical industry

23. Views of the pharmaceutical industry amongst the UK public appear to vary enormously. These views can be complex, for instance when patients who rely on pharmaceutical companies to develop drugs are also hostile to their 'profit-driven' motives. There appears to be only a limited understanding that public and charitable funders are not themselves able to develop new medicines; they can do the fundamental research, but cannot undertake the rigorous process of trials and testing that is required before a treatment comes to market. Neither does there seem to be an appreciation that the profits of the UK pharmaceutical industry benefit all our investments and pension funds.
24. In terms of direct public engagement, many UK pharma companies participate in open days, public lectures, local activities and initiatives in schools such as Project ENTHUSE for science teaching.¹⁰ Some of the most successful projects involve individual scientists telling their personal stories of science discovery. Nevertheless, pharma companies acknowledge that more can be done to increase the transparency of their operations and so build up levels of public trust. Other groups, such as academics or Government representatives, can also be effective as 'honest brokers' in communicating appropriate messages about the UK pharma industry.
25. There are interesting and exciting stories to tell about the process of drug discovery around the challenges, triumphs and failures involved. It is important that patients and the wider public have an awareness of the amount of time and financial investment needed to develop a successful drug and the rigorous processes in place to ensure patients receive a medicine that is safe and effective. Again, these investments and processes can contrast very strikingly with types of complementary

⁹ For more information see: <http://www.healthpolicyfellows.org/aboutus.php>

¹⁰ <http://www.wellcome.ac.uk/News/Media-office/Press-releases/2008/WTD039207.htm>

and alternative therapies and it is important that the public is aware of this difference.

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The Academy of Medical Sciences

The Academy of Medical Sciences promotes advances in medical science and campaigns to ensure these are converted into healthcare benefits for society. Our Fellows are the UK's leading medical scientists from hospitals and general practice, academia, industry and the public service.

The Academy seeks to play a pivotal role in determining the future of medical science in the UK, and the benefits that society will enjoy in years to come. We champion the UK's strengths in medical science, promote careers and capacity building, encourage the implementation of new ideas and solutions – often through novel partnerships – and help to remove barriers to progress.

The Academy's Officers are:

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