



THE ROYAL SOCIETY

Response to the House of Commons Science and Technology Select Committee inquiry into scientific advice and evidence in emergencies

The Royal Society welcomes the opportunity to contribute to the Select Committee's inquiry into scientific advice and evidence in emergencies. It is one of the Royal Society's stated objectives to 'Influence policymaking with the best scientific advice'. We are well-placed to identify and connect with relevant scientific expertise. As the UK's national academy of science, we have contributed expertise and evidence, through our policy reports and our Fellows, to a number of recent policy issues. In addition to advising strategically on emerging issues such as food security, population and neuroscience, the Society has conducted a number of formal reviews of unpredictable policy challenges, including pandemic flu and Foot and Mouth Disease.

This submission summarises the Society's views on how government can make best use of scientific advice, the importance of which is magnified in emergencies.

The principles of scientific advice

Public policy is increasingly dependent on complex science. It is impossible to put a figure on the value of good scientific advice. But the costs of past failures are clear. The BSE crisis had, by 2000, cost the Government £3.7 billion.¹ The costs to long-term public trust were far higher. BSE was a new disease that emerged rapidly and without warning. Policymakers had to take decisions rapidly, with limited information. Nevertheless, there were shortcomings in the way that expert advice was sought and used in tackling this crisis, as described in depth by the Phillips Inquiry report.²

Since BSE, there has been considerable progress in the principles and practice of scientific advice in policy-making. The Government's 'Guidelines on Scientific Advice' now advocate taking advice from a wide range of experts – scientists, social scientists, engineers, clinicians and others – and openly acknowledge scientific uncertainty in policymaking.³ The most recent version of the guidelines, published in June this year, acknowledge the need to improve horizon-scanning, engage with representative bodies such as the Royal Society, seek advice internationally and make better use of engineering expertise.⁴ The application of these guidelines should enable government to horizon-scan for likely challenges, increase its capacity to respond and become more resilient in the face of surprises. In emergencies, rapid access to expertise and confidence that the expertise is as complete and relevant as possible become more important.

¹ Lord Phillips of Worth Maltravers, Bridgeman J, Ferguson-Smith M. (2000) *The BSE Inquiry*. London: The Stationery Office, *Volume 10 - Economic Impact and International Trade*.

² Lord Phillips of Worth Maltravers, Bridgeman J, Ferguson-Smith M. (2000) *The BSE Inquiry*. London: The Stationery Office

³ HM Government (2005). *Guidelines on Scientific Analysis in Policy Making*. Cabinet Office: London, UK

⁴ <http://www.bis.gov.uk/assets/biscore/goscience/docs/g/10-669-qcsa-guidelines-scientific-engineering-advice-policy-making.pdf>

The practice of scientific advice

The appointment of Chief Scientific Advisers (CSAs) to most Government departments and the creation of independent departmental scientific advisory committees have strengthened Government's links with the scientific community and led to an improvement in the use of science across Whitehall.⁵ But the roles and policy influence of CSAs vary from department to department. Maximising the value of these senior scientists at the heart of government necessitates equipping them with the resources to make a difference. We have recently recommended that departmental CSAs are given greater resources to inform and provide constructive challenge to policy makers.⁶

The guidelines on scientific advice recognise the importance of public dialogue on issues involving science and technology. Public and stakeholder dialogue is vital in broadening understanding of emerging science and technology issues and in developing appropriate policy responses to new evidence. In the past, The Royal Society has highlighted the importance of broad dialogue to identify possible issues of concern that may need to be addressed by scientists, particularly with new and emerging technologies such as nanotechnologies.⁷ Improvements in the practice of scientific advice should build on recent work by the 'Science and trust' and 'Science for all' expert groups and the ongoing work of the Sciencewise Expert Resource Centre.

The UK's capacity to understand and respond to emergencies depends on Government commissioning and using high-quality research. It is a matter of some concern that, as science in UK universities has flourished, there had been a relative decline in Government's spending on science outside the ring-fenced science budget, particularly defence R&D (see Figure 1). Departments' research budgets are at risk of being raided as policy makers are confronted with conflicting short-term priorities. This undermines Government's strategic objectives and reduces the ability of departments to commission, access and make use of independent research, evidence and expertise.⁸ Government should appreciate the long-term value of both its departmental research budgets and of the various public bodies that exist to provide challenging, independent (and occasionally inconvenient) advice.⁹

Figure 1 – Public Expenditure on Research and Development as a percentage of GDP by sector, 1985 to 2007¹⁰

⁵ House of Commons Innovation, Universities, Science and Skills Committee (2009). *Putting Science and Engineering at the Heart of Government Policy. Eighth Report of Session 2008-09. Volume I*. The Stationery Office: London, UK.

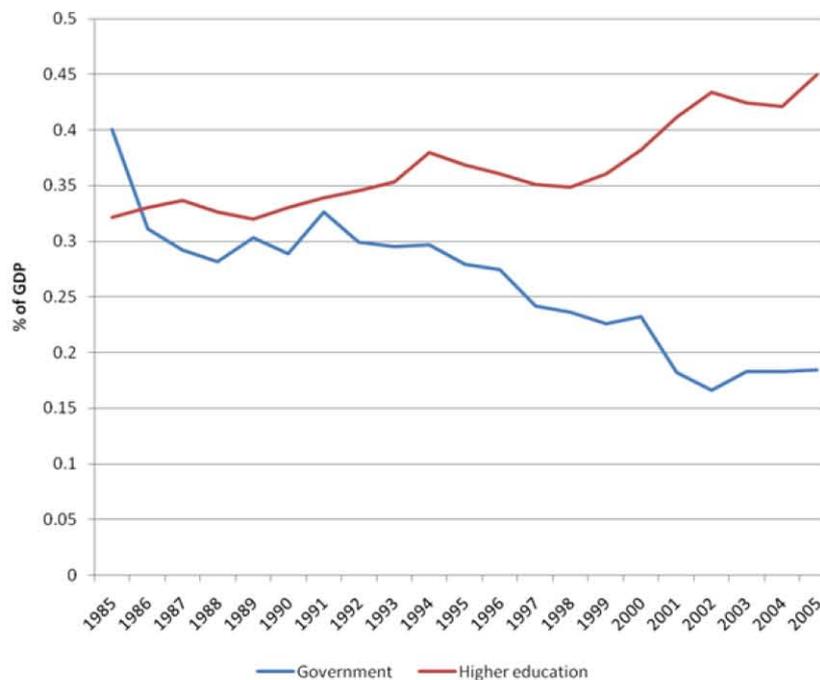
⁶ Royal Society (2010) *The Scientific Century*, <http://royalsociety.org/the-scientific-century>, London, Royal Society

⁷ Royal Society & Royal Academy of Engineering (2004) *Nanoscience and Nanotechnologies: opportunities and uncertainties*, http://royalsociety.org/Report_WF.aspx?pageid=9692&terms=nanotechnologies, London, Royal Society

⁸ House of Commons Science and Technology Select Committee (2000). *Government Expenditure on Research and Development: The Forward Look*. Fifth Report, Session 1999/2000. The Stationery Office: London, UK.

⁹ Royal Society (2010) *The Scientific Century*, <http://royalsociety.org/the-scientific-century>, London, Royal Society

¹⁰ Department for Business, Innovation and Skills (2009). *SET Statistics. Science, Engineering and Technology Indicators*



Scientific advice in emergencies

Scientific advice can help prepare for and respond to emergency situations. But policymakers must also recognise the limits of scientific evidence in answering urgent questions. In emergencies, relevant and reliable evidence may be limited; scientists may have to make judgements and offer immediate recommendations that affect public safety.

Through recent policy analysis of chemical and biological agents, pandemic flu and diseases in livestock, the Society has identified a number of issues that affect the provision of scientific advice in emergencies. In such situations, available scientific data for responding to a crisis will inevitably be incomplete, insufficient and uncertain. This uncertainty is unavoidable and is unlikely to be rapidly soluble, so it must be adequately incorporated into decisions and procedures. When the evidence is uncertain, expert judgement will play a more important role. This should be balanced with an appropriately wide range of expert opinions. Experts must not be put under political pressure to erase or obscure their uncertainties.

In keeping with the government's own guidelines on scientific advice, the use of evidence and expert judgement should be as open and transparent as possible in order to ensure both technical robustness and public credibility. Policymakers should publish minutes of meetings and evidence on which decisions are made as soon as possible. In certain situations, this will need to be balanced against the need to protect experts from public accountability and legal ramifications.¹¹

Emergency issues may cross departmental boundaries, which is why overarching bodies such as the Civil Contingencies Secretariat play such an important role. Expert advice should be sought in a joined-up fashion so that evidence and judgement can be brought to bear on the complete problem, in a coherent way. A number of cross-departmental bodies and advisory committees, able to offer such perspectives, already exist.

¹¹ Royal Society (2004) Making the UK safer: detecting and decontaminating chemical and biological agents <http://royalsociety.org/Making-the-UK-safer-detecting-and-decontaminating-chemical-and-biological-agents>; Royal Society/Academy of Medical Sciences (2006) Pandemic influenza: science to policy http://royalsociety.org/Report_WF.aspx?pageid=8224&terms=pandemic+influenza&fragment=&SearchType=&terms=pandemic, London, Royal Society

In some cases, Government will need to rapidly identify and access relevant experts outside its own advisory committees. The Royal Society can play an important role in this regard by (amongst other things) recommending appropriate and authoritative experts.

Scientific advice and evidence are a vital part of Government's capacity to deal with emergencies. For example, the Society's report of a workshop on new approaches to biological risk assessment identified that there is a spectrum of risks encompassing naturally occurring, unintended and deliberate risks.¹² Given the varying levels of uncertainty associated with all of these areas, a common approach should incorporate a range of specific risk assessments coupled with an overarching model that builds on the similarities across the spectrum.

The Royal Society and scientific advice

The provision of independent advice to Government has always been an important function of the Royal Society. The Society currently provides independent expert advice from its own funds and external non-Governmental sources as well as the time generously given for free by our Fellows and other experts. To support the formulation of policy in Government, the Royal Society offers:

- authoritative independent advice on topical issues (e.g. foot and mouth, pandemic influenza) as well as an early warning of emerging issues/evidence that will challenge policymakers (e.g. geo-engineering/food security). It does this both in response to specific requests from the Government and proactively, often with the involvement of other UK academies;
- a forum for discussion for policymakers, academics and other stakeholders (including the public) on topical issues including, for example, the synthetic biology co-ordination group to track and stimulate policy activities to encourage the responsible and responsive development of this field;
- connection to international networks of knowledge and expertise (including organisations such as the Inter-Academy Panel);
- links to scientific experts in the UK and overseas to act as formal and informal advisors;

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¹² Royal Society (2009) New approaches to biological risk assessment, <http://royalsociety.org/New-approaches-to-biological-risk-assessment>, London, Royal Society