Public Dialogue Review

Lessons from public dialogues commissioned by the RCUK

27 July 2012

Centre for Science and Policy, University of Cambridge

Robert Doubleday

Rachel Teubner

Acknowledgements

The authors would like to acknowledge with thanks the considerable help they received from Ingrid Prikken and Simon Burall at Involve, Jack Stilgoe from the University of Exeter, and from Research Council staff who contributed their insight and experience during a workshop in February 2012 and during four additional background interviews.

Contents

Executive Summary

Research Councils UK (RCUK) public engagement with research strategy states that public engagement is an important element in maintaining public confidence in research, inspiring young people to pursue research careers, and ensuring that research decisions are informed by an awareness of relevant social and ethical issues. Within the broader public engagement strategy, public dialogue has a particularly important role to play in providing 'social intelligence' about the wider public, social and ethical dimensions of research strategy and governance. Successful public dialogue can play a key role in supporting more open research governance and decision making, which is recognised to be a condition of wider public confidence in the research system.

This report draws lessons from public dialogues, consultations, and other public engagement exercises commissioned by the Research Councils since 2003. The purpose is to reflect on what has worked, in what ways dialogues have contributed to the goals of RCUK's public engagement strategy, and what considerations should be given to designing the next phase of RCUK public dialogue support. The review was supported by the Sciencewise Expert Resource Centre.

This review finds that there is a consistent set of views and responses from public participants across the dialogue projects. The eight most common responses being:

1. **Conditional support** for the area of research being discussed;
2. Desire to see **equitable distribution** of both potential benefits and potential risks;
3. **Business** participation in research process is welcomed. However, society as a whole rather than business should set public research agendas;
4. Desire to see research focused on **clearly articulated societal needs**;
5. Preference for targeting **incremental solutions** to societal challenges;
6. Valuing '**naturalness**' – that is scepticism of the value of high-tech solutions to complex social and environmental problems;
7. Focus on **value for money** (both in terms of the research and the envisaged applications of research); and
8. **Anticipatory regulation** of emerging technologies should be considered simultaneously with research and innovation of these technologies.

There are two main reasons for the consistency with which these eight public responses emerge. The first is that the public dialogues all share a common set of overarching questions that explore public responses to challenge-led research. The second reason is that a major element of the discussion is about the conditions required for public support of particular research trajectories. What emerges are a set of public responses to the governance of research and innovation, and the public's sense of current weaknesses of these governance arrangements – for example the limited opportunities for articulating the social purposes of research, the lack of anticipatory regulation, and the failure to consider equitable distribution.

It is within the context of public attitudes to the governance of research and innovation that the theme of 'naturalness' emerges. It is important that this is not misinterpreted as a naive desire for a world without technology. Rather it can be understood as an expression of scepticism towards focusing on high-tech solutions for complex social and environmental problems, especially where these solutions depend on strong assumptions about our collective capacity to predict and control technological interventions.

The identification of this set of eight common themes has significant implications for Research Councils. When considering a possible new challenge-led research programme these eight themes should form the starting point for consideration of the potential value of engaging with the public as a stakeholder in the research. If these themes seem relevant, then the question becomes "is formal public dialogue the right route to address these public issues?" The eight themes can then inform the development of the dialogue including what questions should be asked, what range of experts will be required, what might the relevant 'pathways to impact' be. Of course, that these themes are relevant is a hypothesis that should be tested each time, but in cases where they do apply, forward planning on the basis of reflection on these themes should allow the dialogue to proceed further, faster, than if it had to 'reinvent the wheel'.

Reflection on the relevance of these eight themes might be relevant, even in cases where public dialogue is not pursued. For example, the social purpose to be addressed by the research could be articulated and tested through other forms of public engagement; anticipatory approaches to regulation could be explored through stakeholder workshops; and consideration of how benefits and risks might be distributed could be addressed through research.

This review also finds that the public dialogues have had a positive impact on Research Council strategy and decision making. These impacts range variously from council-level organisation, programme strategy, and call design, to research proposals and projects. The dialogues have used different combinations of methods and activities, and the evaluations have found that in all the dialogues most or all of the activities were carried out to a high standard. However, when it comes to explaining the positive impact of the dialogue on the work of the Research Councils it is not the detailed choice of the dialogue method that is significant. Well designed and executed dialogue methods are necessary but insufficient to ensure dialogues make the sort of contribution to Research Councils envisaged by the RCUK public engagement strategy.

There are five organisational factors that are critical to the dialogues' successful contribution to the work of Research Councils. Successful public dialogues:

1. Devote sufficient time to **upfront planning** of the dialogue, this includes clarifying the purpose, ensuring timing is appropriate for feeding into specific decisions;
2. Ensure the dialogue has visible and **active high-level support** from senior managers within the Research Councils and also relevant senior researchers;
3. **Value of being there** – it is widely acknowledged that the most powerful impact from dialogues is on those individuals who participate in (or at least observe) the dialogues;
4. **Appropriate oversight** – the role of advisers from within Research Councils and external stakeholders is critical to steering a successful dialogue, but also it is an important mechanism to link the dialogue into relevant Council processes and external agendas; and
5. Ensure there **is organisational capacity to learn from the dialogue** – this could mean staff with knowledge and experience of dialogue, and as in the case of the BBSRC and EPSRC, having societal issue advisory groups.

Recommendations

This review makes three broad recommendations. The first relates to the implications of the finding that eight common cross-cutting public themes emerge from public dialogues, the second relates to the five organisational factors needed to support effective impact, and the third highlights one of those factors, the value of having a senior group within the structure of the Research Council that has expertise on public dialogues and societal issues.

When setting up a new research programme a Research Council should reflect on how this programme relates to the eight cross-cutting public concerns. This reflection could lead to better planning of the public dialogue, or it could point the way to other actions to address public concerns, such as other forms of public engagement or research on societal dimensions as an integrated element of the research programme.

In order to ensure that a dialogue has impact within a Research Council ensure that the five key organisational factors identified by this review are given proper weight before a dialogue is commissioned. Dialogues will be more likely to contribute substantive value to research if they are tailored to specific research areas or programmes; if they are built into the early development of the programme; and if care is taken to ensure involvement of key stakeholders (including from the research community) in the design, delivery, and oversight of the dialogue.

This may mean that the model moves towards one in which greater attention is given upfront to increasing buy-in to dialogue from key stakeholders. Dialogue will necessarily look different in different areas. With greater investment in framing and proportionately reduced investment in delivery, therefore, we may see a further diversification of types of dialogue.

Research Councils should ensure that there are appropriate connections between the dialogue and organisational structures that can reflect on the outcome of the dialogues, and that are able to interpret the findings in ways that are meaningful to decision makers. Mechanisms for organisational learning are vital. For example the Synthetic Biology dialogue has been particularly successful in contributing to development of Research Council strategy and practice because of the role played by members of the EPSRC and BBSRC societal issues groups. These bodies have helped build capacity, develop public dialogue strategy, reflect on findings, and encourage action in response to the dialogues.

This review has found that Research Council public dialogues with research have been carried out to high standards and have led to important and productive impacts on Research Council work. RCUK's commitment to public dialogue and innovation in upstream engagement is internationally recognised. There is much good practice and organisational strength to build on.

Public dialogue has specific and important roles to play in contributing directly to research funders taking a systematic approach to their organisational capacity to learn, reflect and respond to public aspirations and concerns. And, if dialogue is to be effective and sustainable, organisational structures are needed to reflect on, and be responsive to, the issues raised by public dialogue.

1. Introduction

Since the 1994 National Consensus Conference on Plant Biotechnology, UK Research Councils have been at the forefront of innovation in public dialogue on research. RCUK's commitment to public dialogue was further strengthened following the House of Lords 2000 report on Science in Society, which called for public dialogue to become a routine part of science and research.[1]

From 2005, RCUK's active participation in the UK Government's Sciencewise public dialogue programme has led to major public dialogues on key emerging areas of research, from stem cell research to geoengineering.

Public dialogue fits squarely within the first aim of RCUK's broader public engagement strategy:[2]

AIM 1. Recognising and responding to public views

Identify public attitudes and values to be considered through the lifecycle of research, and foster debate that will enable public aspirations and concerns to contribute to Councils' policies and research strategies.

What is 'public dialogue'?

'Public dialogue' is a term that refers to a set of aims and approaches to involving the general public in discussion about complex issues and decisions that may have an impact on the wider public. There are four key elements of public dialogue:[3]

- **Deliberative**: emphasising mutual learning and dialogue;
- **Inclusive**: involving a wide range of citizens and groups whose views would not otherwise have a direct bearing on policy deliberation;
- **Substantive**: focusing on topics relevant to specific decision contexts, and also relating to areas of public knowledge and experience; and
- **Consequential**: commitment from decision makers to consider dialogue in ways that can lead to a material difference to a decision or strategy.

The RCUK definition of public dialogue is '*deliberative (i.e. over time) participatory engagement where the outcomes are used to inform decision making (such as research council policies).*'[4]

This definition has three important elements to it. First, that dialogue is **deliberative**, in other words the process allows time for all participants to hear and respond to each others' views. Managing a process that facilitates the exchange of views and learning among public participants, scientists and stakeholders on an equal footing requires specialist expertise and careful planning. Second, that the dialogue is **participatory**, in other words open to active participation of the wider public, with some degree of ownership and control of the terms of the dialogue. Third, **inform decision making**, on the face of it this third element is the most straightforward. It is clear that a well-run dialogue takes place with a specific decision

[1] House of Lords Select Committee on Science and Technology (2000) Third Report: Science and Society, House of Lords Papers 1999-00, 38 HL, London: The Stationery Office.
[2] www.rcuk.ac.uk/Publications/policy/Pages/perStrategy.aspx
[3] For example OECD (2012) Planning Guide for Public Engagement and Outreach in Nanotechnology.
[4] Taken from the Invitation to Tender [ITT], Annex II footnote 3, Reference P2100080, RCUK 7 November 2011.

context in mind, and occurs far enough in advance of the decision making that its outputs can inform the process.

For a more detailed practical discussion of the definition of public dialogue see the accompanying Resource.

What value do public dialogues provide to Research Councils?

Public dialogue is one of the central elements of RCUK's commitment to public engagement with research. RCUK is now recognised internationally for its contribution to developing a distinctive model of intensive upstream public dialogue on emerging areas of research.[5]

This review of RCUK public dialogues has identified six main areas where public dialogues have provided value and made tangible positive impacts to the work of Research Councils:

- Better understanding of public attitudes relating to an emerging area of research;
- Better understanding of publics as potential end-users or consumers of research;
- Researchers stimulated to reflect on the social implications of their research;
- Directly inform Research Council thinking, strategy and decision making;
- Promote stronger stakeholder engagement with NGOs and civil society; and
- Contribute to wider public debate about emerging research and technologies.

Purpose and structure of this review

The purpose of this review is to:

- Characterise fully the range of common and differing views and responses of the public to developing research in different contexts, and explore the possible reasons for such commonalities and differences; and
- Consider the effectiveness of different dialogue and consultation methods and processes, and how outcomes and impacts might have been influenced by the engagement process.

This report is based on a review of 14 RCUK public dialogues and consultation (see Annex 1) and was supported by the Sciencewise Expert Resource Centre[6]. The analysis presented here focuses in particular on the six Research Council public dialogues. The reasons for this focus are first that formal evaluations were carried out on these six dialogue processes. The desk research on which this report is based relied heavily on these six evaluation reports. Secondly, these six dialogues were commissioned by Research Councils with the explicit aim of engaging in deliberative and participatory dialogue with members of the general public to inform Research Council strategy and decision making.

The following section of the report explores the findings of public dialogues. It sets out the difference between those public attitudes that are specific to a particular area of research, and those that are common across the dialogues. In section 3, the report discusses the different dialogue methods used and the various elements of the engagement process, from inception and commissioning, to oversight and delivery. The final section of the report summarises specific lessons learned from the review and reflects on implications for future RCUK public dialogues with research.

[5] See for example special issue of *Science and Engineering Ethics* Vol. 17 (4) 2011.

[6] The Sciencewise Expert Resource Centre (Sciencewise-ERC) is funded by the Department for Business, Innovation and Skills (BIS). Sciencewise-ERC aims to improve policy making involving science and technology across Government by increasing the effectiveness with which public dialogue is used, and encouraging its wider use where appropriate. www.sciencewise-erc.org.uk

2. Comparing dialogue findings

This section compares the findings of the RCUK public dialogues. Despite the variation in purposes and topics of the dialogues, it is possible to classify public attitudes into two groups:

- **Specific Issues**: public attitudes towards the particular topic posed by the dialogue; and
- **Cross-cutting Issues**: underlying public attitudes to new areas of research and technology, criteria or conditions for support, and views on the governance of research and innovation.

Specific Issues

Each of the public dialogues found a range of public views and responses that were specific to the particular technology or area of research being discussed. There is value in reflecting on these specific attitudes because the dialogue can provide an opportunity to explore reactions of the **public as the potential end-user or consumer of research**. Dialogue can be used as a tool to assist in the 'co-production' of research or innovation, where user perspectives are tested and built into the design process.

For example, a researcher who participated in the Nanotechnologies for Healthcare Dialogue commented that they found it valuable to hear and reflect on:

> *"The vision of the patients, which I hadn't really included in my thinking – I now think it's very important. When you're deciding what to include* [in your research]*, you need to include all those aspects. So, I think the community needs to do that. I'm going to try to include that in my research and convince colleagues to do the same." Physical scientist*
> (Nanotechnologies for Healthcare Dialogue Evaluation Report, page 13)

It is not only in relation to the development of emerging technologies that public dialogue can contribute the perspective of the public as end-user. For example, in the case of the LWEC Citizens Advisory Forum, behaviour change policies were discussed. Public participants were clear that behaviour change polices that targeted individual consumer transport choices were more likely to be acceptable if they were developed as part of an explicitly joined-up set of proposals that also targeted business and public investment in transport infrastructure. The reasoning behind this view was that although behaviour change policies might be able to shape individual consumer choices, people wanted to see that the overall approach was 'fair' and burdens were equitably shared between different users, business and government.

Another way that specific public attitudes can be useful to Research Councils and researchers is that they can be thought of as applying cross-cutting public concerns to a particular case. Although it is possible to predict the general outline of public attitudes to an emerging area of research, the particular judgements will always depend on a host of contextual factors, and therefore there is value in testing specific cases.

In the case of the Geoengineering Dialogue, for example, one of the most significant findings in terms of NERC policy was that public participants were conditionally supportive of geoengineering research, and did not see this as replacing or reducing the importance of climate change mitigation policy. In fact, the more participants engaged in discussion about geoengineering options, the more important they considered climate change mitigation.

Another example of the value of testing the application of general public criteria to specific technologies can be found in the Synthetic Biology Dialogue. During this dialogue various potential applications of synthetic biology were discussed, including medical, energy, environmental, and food and crop applications. A general concern about managing the risks and unintended consequences of novel technologies led to a specific concern about their environmental release. Therefore energy applications that allowed for the 'contained use' of the technology were viewed much more favourably than the environmental applications discussed, which entailed deliberate release of the technology.

A third example of the way the dialogues have explored specific public issues is to ask participants to rank various research options. For example this was done in the case of Geoengineering, LWEC, Nanotechnologies for Healthcare, and Energy. However, there are limits to the value of this kind of exercise as participants are not experts in the kind of trade-offs that need to be made when allocating limited resources across a wide range of different potential research areas. For example, in the case of the LWEC Citizens Advisory Forum: "Within the second session, some Forum members fed back that they found the exercise of ranking types of research into adaptation too challenging to undertake." (OPM, 19).

Ranking exercises can be useful, however, when used as a means within the dialogue of bringing out underlying conditions and criteria of public support. For example, in the Nanotechnologies for Healthcare dialogue public participants were asked to rank various specific options for the focus of a forthcoming call. These results represented a substantive finding: research aimed at improving disease diagnosis was ranked most highly. From interviews with Research Council staff carried out for the evaluation of this dialogue, it is clear that while substantive findings were useful, more valuable as an input to decision making was the rich understanding of the underlying public reasoning that underpinned the specific ranking of options.

Cross-cutting issues

As highlighted above, the most significant findings, both in terms of volume and value, relate to cross-cutting public issues. Perhaps the most complex, but also the most informative, of the dialogue outcomes relate to the underlying reasoning that public participants discussed and applied during the dialogue process to evaluate particular research or technological options. In some cases these criteria emerged and were reported without being a specific aim of the dialogue (Geoengineering, Synthetic Biology), in other cases the elicitation of underlying criteria was a specific aim (Energy Research). In some of the dialogue reports, the criteria became a key part of the final analysis and presentation of findings. In the case of the Synthetic Biology and Stem Cells Dialogues, the criteria were discussed in terms of the conditions under which public participants would be likely to support particular research and innovation trajectories.

This review has systematically identified the major cross-cutting public attitudes documented by the public dialogue reports. Similar public responses were grouped together under one heading, which resulted in 19 different themes. These are listed in Table 1. Each instance where the theme is reported by a particular dialogue report it is recorded in the table.

Table 1 Public views and responses organised by theme

	Geo-engineering	LWEC Forum	Synthetic Biology	Nano for healthcare	Stem Cells	Energy
Conditional support	□		□	□	□	
Purpose						
Research should focus on social need		□	□	□	□	
Role of business		□		□	□	□
Increase user autonomy				□	□	
Clarify purposes of research			□			
Equity						
Equitable distribution	□			□	□	□
Consider future generations						□
Pragmatism						
Incremental solutions		□		□		□
Value for money		□		□		□
Effectiveness	□					
Support basic research					□	
Naturalness						
Work with nature, not against it	□		□		□	
Focus on causes and prevention	□			□		
Unintended consequences						
Anticipatory regulation			□	□	□	
Consider wider implications			□		□	
Environmental impact			□			□
Technologies should be reversible / recoverable	□			□		
Technologies should be manageable / controllable	□					
Pace of development too rapid			□			

Conditional support

A common finding across all the public dialogues is that participants generally welcome the idea that public money is being invested in research to tackle problems and create new opportunities. 'Conditional public support' is singled out as one of the main findings in the Geoengineering, Synthetic Biology, Nanotechnology for Healthcare and Stem Cell dialogues. Even when 'conditional support' is not referred to explicitly, it is clear that this term aptly characterises public views and responses to the dialogue as a whole.

> *"Findings from the dialogue showed there was conditional support for synthetic biology - while there was great enthusiasm for the possibilities of the science; there were also fears about control; who benefits; health or environmental impacts; misuse; and how to govern the science under uncertainty."*
> (Synthetic Biology Dialogue Report, page 7)

Research should focus on social need

The dialogues all framed deliberation around the potential impacts of funding specific areas of research. Both positive and negative impacts are discussed, as well as intended and unintended, and foreseen and unforeseen impacts. Within this context, public participants routinely return to question of who is setting the research agenda and who is likely to benefit. A common theme is that public funds should be directed towards research that addresses societal needs, and that these agendas should be set though an open and accountable process.

> *"I just feel [Government] is investing in science that is of value to the UK industry, 'well what about the patient', I ask myself?" (Male, London)*
> (Nanotechnologies for Healthcare Dialogue Report, page 19)

Role of business

Related to the question of who sets the goals for research, public participants were often sceptical about the role of the business in driving research agendas. It is important to note that public views were clearly understanding and supportive of the role of business as partners in research, especially their role in bringing the benefits of research to the public. However, they were clear that business should not be setting the agenda.

> *"The involvement of the private sector raised new questions about both the means and ends of research. Participants expressed concern about the social purposes to which stem cell technologies were directed, particularly if governed by private rather than public interests. The values of openness, transparency and disclosure must not be lost in commercialisation."*
> (Stem Cell Dialogue Report, page vii)

Increase user autonomy

In areas of research that focused on emerging technologies designed to be consumed by the publics, for example in healthcare applications, a theme which emerged strongly was the extent to which the anticipated technology enhanced the capacity of the patient to take control of their own healthcare – rather than being presented with a 'black box'.

> *"Devices that promote patient control and agency were fundamental to the types of technology that participants wanted to see developed."*
> (Nanotechnologies for Healthcare Dialogue Report, page 42)

Clarify purposes of research

A major theme that emerged from the Synthetic Biology dialogue was a desire for researchers to state clearly the aims and motivations of their research. This point is clearly closely linked to the more widely shared public desire to see research directed towards societal goals.

> *"Enabling scientists to reflect on motivations was deemed very important. What is the purpose? Why are you doing it? What are you going to gain? What else will it do? How you know you are right? These are five central questions at the heart of public concerns in this area. It should be incumbent on scientists to consider them."*
> (Synthetic Biology Dialogue Report, page 12)

Equitable distribution

Equitable distribution of both the benefits and risks of the consequences of research is a commonly recurring theme. Public participants welcome investment in research towards addressing societal challenges, however they believe that positive and negative impacts of new solutions are unlikely to be distributed equally unless specific attention is paid to questions of equity of access to benefits, and liability for harms.

> *"Fairness and ethical concerns centred on whether the energy source being researched can potentially offer benefits cutting across the whole of society."*
> (Energy Dialogue Report, page 68)

Consider future generations

Ethical questions about how the risks and benefits of research and innovation are distributed were present in the background of many of the dialogues. In the Energy Dialogue the particular issue of inter-generational equity was raised.

> *"Projects should have an obligation to consider future generations' needs in terms of social awareness of the planet, and the individual's well-being."*
> (Energy Dialogue Report, page 70)

Incremental solutions

A common thread linking several themes was a public preference for pragmatic approaches to addressing societal challenges. In three of the dialogues (LWEC, Nanotechnologies for Healthcare, and Energy), public participants favoured adopting incremental, application oriented research approaches.

> *"Specifically participants were more likely to be supportive of applications that have a short-to medium term pay off – rather than long term/high risk return on an investment."*
> (Nanotechnologies for Healthcare Dialogue Report, page 45)

> *"Across the three sessions, they emphasised the need for action orientated research, which has a clearly defined purpose and is designed with its application in mind."*
> (LWEC Citizens Advisory Forum Report, page 37)

Value for money

In addition to favouring research towards incremental solutions, public participants also favoured considering 'value for money' – both in terms of the 'return' on the research investment, but also in targeting research towards technologies that will offer affordable solutions to the problem under consideration.

> *"[Citizens Advisory Forum] members emphasised the need for research within the current financial and political climate to be 'value for money'. To be considered value for money, research should aim to produce new information and solutions, which cannot be obtained elsewhere, and have a strong potential for application and use by principle stakeholders. A primary concern within this context was that research produces cost effective solutions, which are more likely to be implemented at this time of budgetary constraint."*
> (LWEC Citizens Advisory Forum Report, page 37)

Effectiveness

In one of the dialogues (Geoengineering) the pragmatic streak of public attitudes is expressed in terms of a desire to see more explicit consideration of the likely effectiveness of the assumed solution in addressing the challenge.

> *"How effective is it? To judge the efficacy of geoengineering, participants asked that scientists weigh up core benefits against costs. They considered two benefits to be most important: the amount of CO2 removed from atmosphere and the overall global temperature drop."*
> (Geoengineering Dialogue Report, page 31)

Support basic research

The focus on pragmatism evident in the preceding three themes ('incremental solutions', 'value for money', and 'effectiveness') can be understood in part as a response to the framing of dialogues in terms of the value of research in addressing societal challenges. However, alternative views were also raised in some of the dialogues. Public participants in one dialogue specifically recognised the value of basic research.

> *"[T]he role of basic research was increasingly valued by public participants over the course of the workshops. Whilst the ultimate ends of research certainly needed to be kept in mind, understanding cell differentiation and control were thought to be a high priority."*
> (Stem Cell Dialogue Report, page 66)

Work with nature, not against it

A common thread of themes emerged in relation to the value public participants placed on 'naturalness'. It is important that this is not misinterpreted as a naive desire for a world without technology. Rather it can be understood as an expression of scepticism of high-tech solutions to complex social and environmental problems, especially where assumptions are made about the predictability and control of technological interventions.

Claims about our collective capacity to quantify and control technological risks do not accord with public participants' experience of past technological promises. Public participants see value in more 'natural' approaches that work within natural processes, which publics assume will lead to fewer problematic unintended consequences.

"Naturalness was an important theme underpinning many of the principles. Most participants believed that natural systems are balanced and self-contained and that geoengineering should be considered in terms of how well it preserves natural systems."
(Geoengineering Dialogue Report, page 31)

"Participants saw nature as a set of balanced systems, which operate together without wastage. They believed the Earth has a natural ability to calibrate these systems. They strongly preferred technologies that enhanced or mimicked processes they saw as natural, such as Afforestation, Biochar and to some extent, Cloud Whitening. These were perceived to work in harmony with the planet, using the self-contained systems which already exist on the Earth, and would not have many side effects. It was felt that "natural" technologies would be easier to 'sell' to the wider public because of their natural features. Conversely, ideas which reduced the Earth's temperature by using "unnatural" processes (such as Mirrors in Space) were liked less."
(Geoengineering Dialogue Report, page 31)

Focus on causes and prevention

A theme that came up strongly in two of the dialogues (Geoengineering and Nanotechnology for Healthcare) was a desire to look beyond a 'techno-fix' to the problem identified, and to focus attention on tackling the root causes of a problem.

"If you stop something before it gets bad and out of control you can save a lot more people… a lot of money should be put into prevention, definitely. That might cut down on costs in the future as well, saving a lot of people's lives"
Male, Sheffield
(Nanotechnologies for Healthcare Dialogue Report, page 12)

"SRM [solar radiation management] was less supported overall, as it was seen not to tackle the root cause of climate change (i.e. increasing atmospheric CO2)."
(Geoengineering Dialogue Report, page 23)

Anticipatory regulation

In three dialogues (Synthetic Biology, Nanotechnology, and Stem Cells) the need for better systems of regulation was highlighted a major issue. In particular, public participants called for regulatory frameworks to cope better with rapid technological developments and potential unforeseen consequences. These issues also came up in the other dialogues, and participants discussed the need for systems for managing technological risks and liabilities. Public participants tend to assume that there will be some unintended and unforeseen consequences from research.

"The need for effective regulation and control was one of the most important issues flagged up by participants."
(Stem Cell Dialogue Report, page 42)

"In terms of the UK, on the whole and given their experiences of other technologies, participants were reasonably trusting that the safeguards in place were likely to be effective at controlling current research. However, one of the biggest issues was for regulations to be able to keep apace with scientific developments. One concern was that, given that any synthetic pathway or micro-organism is by definition novel; whether current regulatory systems were adequate."
(Stem Cell Dialogue Report, page 43)

Consider wider implications

The Synthetic Biology and Stem Cell dialogues found that public participants wanted to see greater reflection on the wider social implications of the proposed research. This theme links both to the wish to see the purposes of research articulated more directly, and also a sense that insufficient attention is given to managing the inevitable unintended consequences of innovation. In both dialogues, participants were particularly keen to see researchers themselves address questions of the wider implications of their work.

"One of the key issues to emerge was the need for scientists to consider the wider implications of their work more effectively. There was a disconnect between individuals' own research which was seen as incremental or routine; and the field overall that was viewed as transformative."
(Synthetic Biology Dialogue Report, page 8)

Environmental impact

Two of the dialogues (Synthetic Biology and Energy) placed particular emphasis on consideration of the environmental impact of the potential application towards which the research is directed. In terms of the public attitudes that led this theme it can be understood as a sub-set of the more general call for more joined-up and anticipatory regulatory frameworks. For example, in the Energy Dialogue, participants evaluated research options according to criteria, including:

"Minimising the impact of global emissions, the effects on nature, in both the short and long-term {of the energy technology} and protecting the planet"
(Energy Dialogue Report, age 69)

Technologies should be reversible / recoverable

In the Geoengineering and Nanotechnology for Healthcare dialogues public participants called for consideration to be given to reversibility and recoverability of the emerging technology. This theme can be understood in light of the wider concern about management of risks, in particular unintended consequences. As participants assumed that unforeseen harms might occur in the future once an innovation is adopted, they wanted thought to be given at the earliest stages to how possible it would be to reverse implementation of a particular technology.

"How reversible is it? The public would support research which progresses in small stages, both to minimise uncertainty, and to ensure scientists retain the ability to 'switch off' a project."
(Geoengineering Dialogue Report, page 31)

Technologies should be manageable / controllable

A theme closely related to the reversibility theme (above) is the theme that the manageability of the technology should also be an important design criterion. This theme was singled out in the Geoengineering dialogue.

> *"How controllable is it? Participants stressed that nature contains complex, amorphous systems (sea, sky, space) in which scientists do not have the right to interfere deliberately without knowing the full consequences."*
> (Geoengineering Dialogue Report, page 31)

Pace of development too rapid

In the Synthetic Biology dialogue public participants were concerned that the research and innovation might be progressing too quickly for regulatory frameworks and wider public debate to have the chance to consider properly the impacts and trade-offs associated with particular research trajectories.

> *"Concerns included the pace of development in the field and the idea that the science may be progressing too quickly when the long term impacts are unknown."*
> (Synthetic Biology Dialogue Report, page 8)

Commonly occurring cross-cutting themes

Eight cross-cutting themes arose in half or more of the dialogues analysed and have been highlighted in Table 1. These commonly occurring 'cross-cutting issues' constitute a coherent and consistent set of responses from public participants:

1. **Conditional support** for the area of research being discussed;
2. Desire to see **equitable distribution** of both potential benefits and potential risks;
3. **Business** participation in research is welcomed, however, society as a whole rather business should set public research agendas;
4. Desire to see research focused on **clearly articulated societal needs**;
5. Preference for targeting **incremental solutions** to societal challenges;
6. Valuing '**naturalness**' – that is scepticism of the value of high-tech solutions to complex social and environmental problems;
7. Focus on **value for money** of both the research and the envisaged applications of research; and
8. **Anticipatory regulation** of emerging technologies should be considered simultaneously with the research and innovation of these technologies.

It is worth noting that these eight public themes are not only closely related to each other, but they are also drawn from across the public dialogues. The consistency with which these eight public responses emerge can be understood in terms of how the dialogues are framed. The topics of the dialogues, and the way these topics are explored through the dialogue process, focus on public responses to challenge-led research. Public participants are informed about the current state of research, the nature of the problem that the research might address, and are then invited to deliberate over the pros and cons of various options. This approach to dialogue is, as the various evaluations attest, a tried and proved approach. It is important to note that however carefully facilitated, the dominant framing of the dialogue is a consideration of research intensive, and often technologically sophisticated, approaches to societal problems. Therefore what the dialogue elicits is public reactions to these visions of the value of research for wider society.

A related factor that helps explain the consistency of these public themes is that public participants are responding not only to the specific details of the research topic, but also to the wider governance arrangements for research and innovation. As the dialogues focus on research and the earliest stages of technological innovation, the governance context is largely shared across the dialogues, and is notably different from that of technologies already in use. What these eight themes illustrate is a public sense of the current weaknesses of these governance arrangements (such as articulation of social purpose of research, anticipatory regulation; equitable distribution of the benefits of novel technologies). As the focus of this line of responses is not on the detail of the specific research or technology but on the wider governance system, it follows that the public responses are common across the dialogues.

The identification of this set of eight common themes has significant implications for Research Councils. When considering a possible new challenge-led research programme or area of research these eight themes should form the starting point for consideration of the potential value of engaging with the wider public as a stakeholder in the research. If these themes seem relevant, then the question becomes "is formal public dialogue the right route to address these public issues?" The eight themes can then inform the development of the dialogue including what questions should be asked, what range of experts will be required, what might the relevant 'pathways to impact' be. Of course, that these themes are relevant is a hypothesis that should be tested each time, but in cases where they do apply, forward planning on the basis of reflection on these themes should allow the dialogue to proceed further, faster, than if it had to 'reinvent the wheel'.

Reflection on the relevance of these eight themes might be relevant, even in cases where public dialogue is not pursued. For example, the social purpose to be addressed by the research could be articulated and tested through other forms of public engagement; anticipatory approaches to regulation could be explored through stakeholder workshops; and consideration of how benefits and risks might be distributed might be addressed through research.

3. Comparing the dialogues

The RCUK public dialogues have been analysed according to six key characteristics:

- What issues were explored through the dialogue;
- What was the main aim of the dialogue;
- What oversight and governance structures were in place;
- What methods and activities were used;
- What were the main findings; and
- What were the outcomes and impacts?

Table 1 highlights the main cross-cutting findings and Table 2 sets out at a glance the different dialogue methods and activities used. It also provides a headline summary of the nature of the impact the dialogue had on Research Council work and what oversight and governance processes were used.

The overall conclusion from comparing the dialogues is that, despite considerable variation in the nature of the discussion, findings and impact, they have used a relatively consistent core set of dialogue methods. This core set of methods includes holding multiple deliberative workshops (which tend to be formed of about 20 members of the public recruited so that the group as a whole is broadly representative of area).[7] These workshops are often held in different parts of the UK to increase diversity of participants. During these deliberative workshops, researchers working on the topics under deliberation and other experts play a role in providing information and answering questions.

In some dialogues such processes were augmented by a quantitative public opinion survey (Geoengineering and Stem Cells), or in-depth interviews with stakeholders or specific groups of the public (Synthetic Biology and Stem Cells). In three cases, public participants in the deliberative workshops were invited to an additional event to explore implications of the dialogue's initial findings with researchers and other relevant stakeholders. This so-called 'reconvened' format was used in the Geoengineering, Synthetic Biology and Energy dialogues. Only the LWEC Citizens Advisory Forum did not use a deliberative workshop as its core dialogue approach.

This relative lack of variation in the dialogue methods used to date may be due to the high standards of dialogue promoted by Sciencewise-ERC and the complexity of the issues addressed by Research Council commissioned public dialogues. Such dialogue requires carefully facilitated deliberation among experts and lay publics, which requires considerable experience and planning. However, this intensive 'narrow but deep' approach to dialogue is brought into tension in policy contexts because policy makers are often sceptical of the value of findings from processes with only small numbers of participants. Therefore, despite the rationale for in-depth qualitative approaches, there is often pressure to augment the dialogue with some quantitative public opinion data. Due the high constraints placed upon these public dialogues there are only a limited number of providers who are experienced and equipped to carry out the dialogues.

[7] For example in the Geoengineering dialogue participants were recruited to form a representative group in terms of "age, gender, social grade, ethnicity, work status, and whether participants were parents or not. It was also an aim to have participants from a range of life stages." (Ipsos MORI 2010 *Experiment Earth*, page 71).

Of the six RCUK public dialogues analysed in detail, two focused on emerging technologies that had not previously been focus of public debate with the purpose of directly informing Research Council strategy towards the novel research area (Geoengineering, 2010 and Synthetic Biology, 2009); two focused on established broad research programmes with the purpose of understanding public priorities as part of on-going stakeholder engagement (LWEC, 2010 and Energy Research, 2007); one was focused on a specific potential area of research for an emerging technology with the purpose of informing a funding call (Nanotechnologies for Healthcare, 2008); and finally one focused on an established, but controversial area of research, with the purpose of contributing to a wider public debate on the technology (Stem Cell, 2008).

This variation of topics has, perhaps unsurprisingly, led to considerable variation in the discussion, findings and impacts. It also appears that the framing of the dialogue, its location within the Research Council structures, and the dialogue oversight are all highly context dependent. The roles played by other stakeholders (i.e. other than participating publics) were highly variable, ranging from active involvement in the design and oversight of the dialogue process to no role at all.

Table 2 Comparing RCUK public dialogues

	Geo-engineering	LWEC Forum	Synthetic Biology	Nano for healthcare	Stem Cells	Energy
Budget (£k)	155	30	334	n/a	300	n/a
Impact (at Council, Programme, Call or Project level)	Council Project	Call	Council	Council Call	Council	Programme
Methods						
Deliberative workshops	✓		✓	✓	✓	✓
Short discussion groups	✓					
Reconvened workshops	✓		✓			✓
Citizens panels		✓				
Open-access events	✓					
Quant public opinion survey					✓	
Qual. online survey	✓					
Stakeholder workshop	✓					
Stakeholder interviews			✓		✓	

Outcomes and Impacts

The 'impact' row of Table 2 represents the level at which the public dialogue had an impact on Research Council work. Each dialogue had some level of impact, although the dialogues contributed to different levels within Research Councils, from the development of overall strategy (Council), framing the themes of a programme of research (Programme), shaping a specific call (Call), to feeding into specific projects (Project). It is important to note that the impacts may be 'slow burning' and may not yet have occurred, or if they have, may not yet have been recorded. The review underlines the important point that where a dialogue has had a positive impact, a necessary condition has always been that relevant decision makers have been involved in the dialogue in some way, therefore ensuring 'buy-in' and knowledge of the dialogue's process and outcomes.

Taking a slightly wider view, the impact of public dialogues can be considered on a number of different audiences, from the impact on immediate participants, to the Research Council and wider public debate. The dialogues differed in their stated ambitions for impact and in the extent to which they achieved impact at these different levels. In order to address the question of 'impact' we need to consider the different routes along which public dialogue can inform and influence research and innovation. This review of RCUK public dialogues has identified six main areas where public dialogues have provided value and made tangible positive impacts to the work of Research Councils:

- Better understanding of public attitudes relating to an emerging area of research;
- Better understanding of publics as potential end-users or consumers of research;
- Researchers stimulated to reflect on the social implications of their research;
- Directly inform Research Council thinking, strategy and decision making;
- Promote stronger stakeholder engagement with NGOs and civil society; and
- Contribute to wider public debate about emerging research and technologies.

The dialogues have used different combinations of methods and activities, and the evaluations have found that in all the dialogues most or all of the activities were carried out to a high standard. However, when it comes to explaining the positive impact of the dialogue on the work of the Research Councils it is not the detailed choice of the dialogue method that is significant. Appropriate dialogue methods carried out to a high standard are necessary, but insufficient to ensure positive impact on the work of the Research Councils.

There are five organisational factors that are critical to ensuring that dialogues play their part in ensuring that public aspirations and concerns contribute to Councils' policies and research strategies.

1. Devote sufficient time to **upfront planning** of the dialogue, this includes clarifying the purpose, ensuring timing is appropriate for feeding into specific decision;
2. Ensure the dialogue has visible and **active high-level support** from senior managers within the Research Councils and also relevant senior researchers;
3. **Value of being there** – it is widely acknowledged that the most powerful impact from dialogues is on those individuals who participate in (or at least observe) the dialogues;
4. **Appropriate oversight** – the role of advisers from within Research Councils and external stakeholders is critical to steering a successful dialogue, but also it is an important mechanism to link the dialogue into relevant Council processes and external agendas; and
5. Ensure there **is organisational capacity to learn from the dialogue** – this could mean staff with knowledge and experience of dialogue, and as in the case of the BBSRC and EPSRC having societal issue advisory groups.

4. Conclusions and recommendations

The present review comes at a good time to take stock of lessons learned from recent RCUK public dialogues. Not only because there is now a substantial body of dialogues to review, but also because of wider lessons from reflection on public dialogue with science and research. This concluding section has three parts. The first summarises the review's main findings. In the second section these findings are briefly placed within the wider context of the literature on public engagement with science and research. Finally, in the third section, three broad recommendations are made to the RCUK for consideration in the development of future public engagement practice.

Summary of main points made in this review

This review has found that there are six principal forms of benefit that public dialogue can deliver to support the work of Research Councils. These are:

1. Better understanding of public attitudes relating to an emerging area of research;
2. Better understanding of publics as potential end-users or consumers of research;
3. Researchers stimulated to reflect on the social implications of their research;
4. Directly inform Research Council thinking, strategy and decision making;
5. Promote stronger stakeholder engagement with NGOs and civil society; and
6. Contribute to wider public debate about emerging research and technologies.

Public attitudes to the questions raised by dialogue on emerging areas of research and innovation can be divided into those that are specific to the topic, and those that are cross-cutting. It is these cross-cutting issues that are of particular relevance when considering whether to set up a public dialogue, and how to frame, plan, manage and oversee the dialogue. This review has identified eight main cross-cutting public themes:

1. **Conditional support** for the area of research being discussed;
2. Desire to see **equitable distribution** of both potential benefits and potential risks
3. **Business** participation in research is welcomed, however, society as a whole rather business should set public research agendas;
4. Desire to see research focused on **clearly articulated societal needs**;
5. Preference for targeting **incremental solutions** to societal challenges;
6. Valuing '**naturalness**' – that is scepticism of the value of high-tech solutions to complex social and environmental problems;
7. Focus on **value for money** of both the research and the envisaged applications of research; and
8. **Anticipatory regulation** of emerging technologies should be considered simultaneously with the research and innovation of these technologies.

The review compared the different methods and activities used by the various public dialogues. It also considered the range and extent of the value public dialogues have delivered to Research Councils. This review has found that while the quality of delivery of dialogue is a necessary condition, it is not sufficient in order to ensure that the dialogue has impact. Once the quality of delivery has reached a certain threshold, greater impact can be achieved through focusing on improving performance of five key organisational factors:

1. Devote sufficient time to **upfront planning** of the dialogue, this includes clarifying the purpose, ensuring timing is appropriate for feeding into specific decision;
2. Ensure the dialogue has visible and **active high-level support** from senior managers within the Research Councils and also relevant senior researchers;
3. **Value of being there** – it is widely acknowledged that the most powerful impact from dialogues is on those individuals who participate in (or at least observe) the dialogues;
4. **Appropriate oversight** – the role of advisors from within Research Councils and external stakeholders is critical to steering a successful dialogue, but also it is an important mechanism to link the dialogue into relevant Council processes and external agendas; and
5. Ensure there **is organisational capacity to learn from the dialogue** – this could mean staff with knowledge and experience of dialogue, and as in the case of the BBSRC and EPSRC having societal issue advisory groups.

Wider context

This report's main findings are consistent with recent work undertaken by the Sciencewise-ERC project on *Science, Trust and Public Engagement*.[8] In this project extensive interviews and a workshop were carried out to explore the impact of past public dialogue activities. In addition to this empirical work, the project reviewed 17 Sciencewise dialogue project reports. This desk-review identified five questions underpinning public attitudes identified by the Sciencewise-ERC dialogues.

These five questions are: **Purposes**, what motivations are driving particular research agendas, and whose interests are being served? **Trust,** is government, or other institutions able to promote and safeguard public interest? **Inclusion**, is the governance of research open? **Speed and direction**, is research and innovation proceeding too fast for regulatory and other social processes to manage? **Ethics, trade-offs and inequality**, how are the implications of research are discussed and evaluated?[9]

These five questions are clearly in line with the eight cross-cutting issues identified in this report. 'Value for money' and 'incremental solutions' are the only two issues that do not have direct equivalents among the five questions identified by the *Science, Trust and Public Engagement* report. It is also worth noting that this report's findings about organisational factors influencing the positive impact of public dialogue also resonate with the *Science, Trust and Public Engagement* study. The main findings of which pointed to the importance of high-level support within an organisation for public dialogue and the importance of linking public dialogue directly to the strategic function of an organisation.

A connected set of debates relates to the processes and frameworks needed to ensure that the commissioning organisation is able to learn from and respond to wider public and stakeholder input about the societal dimensions of research. Within the Research Councils there are examples of well-established mechanisms that are embedded at multiple levels within the organisation and provide organisational capacity to initiate and respond to public dialogues. For example, the societal issues advisory groups in both the BBSRC and EPSRC have made substantial contributions to ensuring the intelligent commissioning and effective use of public dialogue.

A recurring theme emerging from the dialogues is that public participants do not expect to be directly involved in decision making, but they wish to see a more open approach to the governance of research. Work on *Responsible Innovation* being developed by EPSRC and, separately, the European Commission is exploring ways to open up deliberation over research strategies and draw connections with public aspirations and concerns, such as the eight cross-cutting issues identified in this report.

[8] TNS-BMRB (2011) *Science, governance and public engagement*, final report of the BIS /Sciencewise-ERC 'Science, Trust and Public Engagement' project.

[9] Chilvers J and Macnaghten P (2011) *The future of science governance: A review of public concerns, governance and institutional response*, Literature review for the BIS /Sciencewise-ERC 'Science, Trust and Public Engagement' project.

Recommendations

This review makes three broad recommendations. The first relates to the implications of the finding that eight common cross-cutting public themes emerge from public dialogues, the second relates to the five organisational factors needed to support effective impact, and the third highlights one of those factors, the value of having a senior group within the structure of the Research Council that has expertise on public dialogues and societal issues.

When setting up a new research programme a Research Council should reflect on how this programme relates to the eight cross-cutting public concerns. This reflection could lead to better planning of the public dialogue, or it could point the way to other action to address public concerns, such as other forms of public engagement or research on societal dimensions as an integrated element of the research programme.

In order to ensure that a dialogue has impact within a Research Council ensure that the five key organisational factors identified by this review are given proper weight before a dialogue is commissioned. Dialogues will be more likely to contribute substantive value to research if they are tailored to specific research areas or programmes; if they are built into the early development of the programme; and if care is taken to ensure involvement of key stakeholders (including from the research community) in the design, delivery, and oversight of the dialogue.

This may mean that the model moves towards one in which greater attention is given upfront to increasing buy-in to dialogue from key stakeholders. Dialogue will necessarily look different in different areas. With greater investment in framing and proportionately reduced investment in delivery, therefore, we may see a further diversification of types of dialogue.

Research Councils should ensure that there are appropriate connections between the dialogue and organisational structures that can reflect on the outcome of the dialogues, and that are able to interpret the findings in ways that are meaningful to decision makers. Mechanisms for organisational learning and memory are vital. For example the Synthetic Biology dialogue has been particularly successful in contributing to development of Research Council strategy and practice because of the role played by members of the EPSRC and BBSRC societal issues groups. These bodies have helped build capacity, develop public dialogue strategy, reflect on findings, and encouraged action in response to the dialogues.

This review has found that Research Council public dialogues with research have been carried out to high standards and have led to important and productive impacts on Research Council work. RCUK's commitment to public dialogue and innovation in upstream engagement is internationally recognised. There is much good practice and organisational strength to build on.

Public dialogue has specific and important roles to play in contributing directly to research funders taking a systematic approach to their organisational capacity to learn, reflect and respond to public aspirations and concerns. And, if dialogue is to be effective and sustainable, organisational structures are needed to reflect on, and be responsive to, the issues raised by public dialogue.

Annex 1. List of RCUK public dialogues

RCUK dialogues to be considered within this review are:

1. Geoengineering 2010 (NERC)
2. Living with Environmental Change (LWEC) Citizens Advisory Forum 2010
3. Synthetic Biology 2009 (BBSRC and EPSRC)
4. Nanotechnology for healthcare 2008 (EPSRC, BBSRC and MRC).
5. Stem Cell Dialogue 2008 (BBSRC and MRC)
6. Energy Research 2007 (RCUK)

The following dialogue and consultation exercises are also reviewed:

7. Nanodialogues 2007 (EPSRC and BBSRC)
8. NanoJury UK 2005 (BBSRC)
9. Public Attitudes to Ageing 2006 (MRC and BBSRC)
10. Public Attitudes to Industry Funded Research 2006 (BBSRC)
11. Diet and Health 2005 (BBSRC)
12. Use of personal health information 2007 (MRC)
13. Use of animals in research 2005 (MRC)
14. Use of human embryos in medical research 2003 (MRC)

Note:
The review analysed publicly available documents relating to the fourteen RCUK public dialogues using an iterative two-stage coding process. Additional insight came from a workshop with Research Council staff on 29 February 2012 and interviews with four members of Research Council staff.