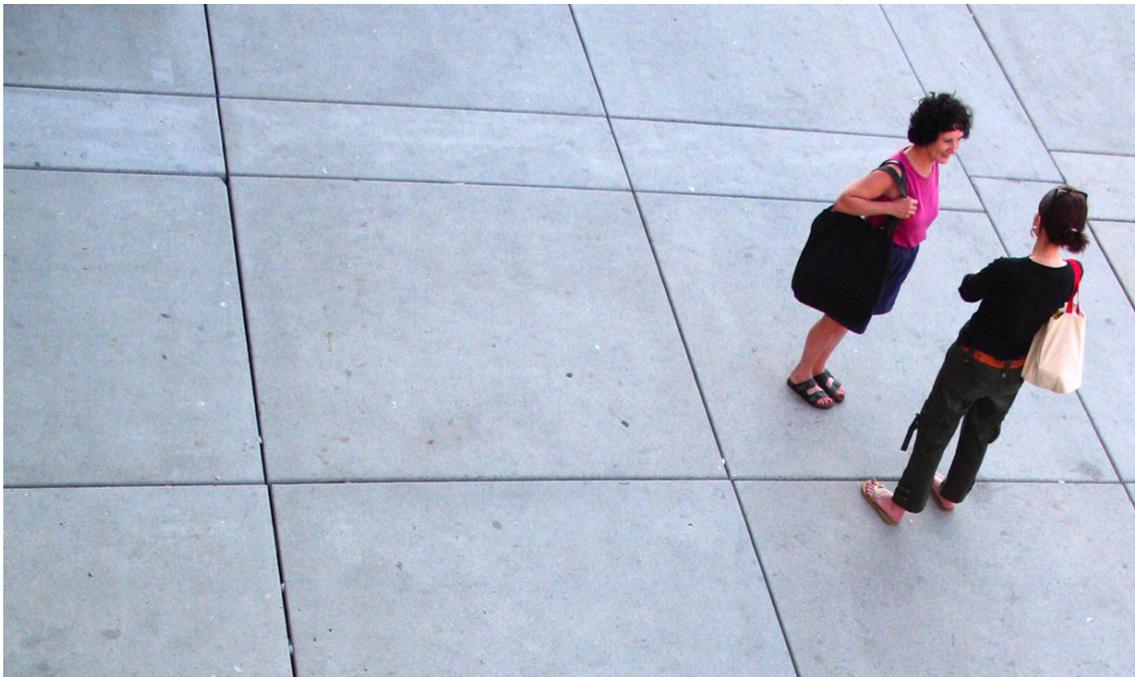


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TALK

Discussing Nanotechnologies



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November 2006

the BA

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of Great Britain

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Executive Summary

Small Talk was a three-year long collaborative project, funded through a Copus grant of £49,900, with additional support provided 'in kind' by partner organisations. The project looked at the benefits for the science communication community in working together on dialogue activities for an 'upstream' issue – nanotechnology. This report presents the findings of this project for both science communicators and policymakers.

We believe that Small Talk has been a valuable project. It has encouraged more organisations to take part in debate about nanotechnology and has helped them make use of good-practice when planning the events; it has explored the role of practitioner-led dialogue and helped us develop useful lessons for the future; it has helped a range of organisations access policymakers and provided useful evidence for policy too; most importantly, it has enabled the participating organisations to be more strategic in their approach, as well as providing the intellectual space and motivation for the partner organisations to reflect, learn and change the way we work.

During the course of the project, Small Talk has produced a wealth of resources to support organisations wishing to participate. These resources were a key tool in sharing good practice and improving the quality of our events. They include a website bringing together lessons learned and good practice guidance from a range of sources; regular e-lets to share up to the minute lessons learned; 20 events, attended by over 1200 participants, ranging from large-scale debates at the Cheltenham Science Festival and Royal Institution to school visits by nanotechnology experts; and data-collection instruments for working with large groups. These resources have been used by organisations such as the Science Museum and the British Council, increasing the quantity, as well as the quality of dialogue activities on nanotechnology.

The project has demonstrated very clearly that there are significant benefits to be gained from working together. As well as putting in place a valuable structure for learning and reflecting, we have been able to build relationships with policymakers, which one organisation alone could not have done. These relationships have allowed us to feed into the policy process regularly throughout the project. We have presented our work to policy fora such as the Nanotechnology Engagement Group and the Nanotechnology Issues Dialogue Group for instance. Small Talk was also highlighted in the UK Government's response to the Royal Society/Royal Academy of Engineering report *Nanoscience and nanotechnologies: opportunities and uncertainties*¹.

Importantly, Small Talk has enabled us to demonstrate that science communicators have a role to play in dialogue and that our approach produces outputs of value to policymakers, while at the same time reminding us that there are other useful communication skills that we need to continue to value, develop and use.

Key lessons:

- Practitioner-led dialogue provides a useful and interesting addition to the dialogue repertoire. For very practical reasons, we recognised that practitioner and academic-led dialogue will not look the same. Nevertheless, Small Talk has demonstrated that practitioners have 'evolved' an approach that offers many advantages over other techniques, but also works well along side them. In particular it is low cost, can reach large numbers of people and is effective at identifying the concerns and aspirations of common currency amongst the general population.

The collaborative approach of Small Talk enables ongoing learning, sharing of knowledge and good practice among disparate organisations and, by building relationships with policy-makers that individual institutions may not have time or ability to do, maximises the value to policy-makers of non-policy-sponsored dialogue initiatives

There remains a clear role and need for effective 'information giving' communication, according to feedback from participants and analysis of the opinions gathered. Dialogue therefore needs to be viewed as one in a full range of communication tools. Science communicators need to continue to develop this full range of skills and capacity.

Key attitudes to nanotechnology

- People's attitudes to nanotechnology are not significantly different from their attitudes to any new technology, and are generally positive
- People are not concerned about specific risks arising from the technologies themselves but, rather, about the structure of regulation that they will have to rely on to deal with any risks
- The public considers issues of safety of nanotechnologies in absolute rather than relative terms and so 'safe' is assumed to mean that all risks have been identified and eliminated
- There is a significant gap between the public's perceptions of the role and boundaries of government and the reality, which could be a potential source of tension and distrust in government and governance of science if left unresolved



Introduction

Small Talk was a collaborative project between The British Association for the Advancement of Science, the Royal Institution, Ecsite-uk and the Cheltenham Science Festival, managed by Think-Lab. The project aimed to provide coherence to a range of activities around the UK focused on discussing nanotechnologies with the public and scientists. It was about working together, examining how collaboration could help the science community, science communicators and policymakers to learn more about views around nanotechnology and about the process of gathering these views. Funding was provided for Small Talk through the Copus grant scheme and events ran from September 2004 to March 2006.

More specifically, the objectives of Small Talk were to:

- Explore the benefits to be gained from working together
- Run a variety of different events, with different formats, co-ordinated through the use of a common topic – nanotechnology
- Help organisations prepare for events with: research; appropriate speakers; front-end audience research; and possible suitable activities, including methods or recording opinions
- Learn about and improve methods for engaging the public with scientific issues
- Learn more about the public's views about nanotechnology than would have been learned in separate events
- Explore whether this kind of approach can meaningfully feed into policy decision-making
- Share findings with the science engagement community, the science community, policy-makers and the public

Throughout the project, Small Talk has organised and coordinated a range of events, provided a central resource for science communicators interested in nanotechnology and explored the role of science communication and practitioner-led dialogue in policy development. The events ranged from large-scale debates at the Royal Institution to more intimate conversations between scientists and school-children.

We have split the report up into three main sections – after a background to the project, the first section focuses on the lessons learned and issues for discussion for the science communication community. The second section presents the insights into public opinion that we have identified through the project, discussing some of the issues of relevance to policymakers and scientists. The final section draws together the lesson and discussions from the previous sections to propose a number of questions and possible directions to be explored for practitioner-led dialogue in the future.

Background

Since the publication of the report of the House of Lords Select Committee on Science and Technologyⁱⁱ the dominant view in the science communication community has been that the one-way transfer of information from scientists to non-scientists will not counter the 'crisis of confidence' in science that some perceive in certain sectors of society. The House of Lords Select Committee report called for a new mood of dialogue:

"Today's public expects not merely to know what is going on but to be consulted; science is beginning to see the wisdom of this, and to move out of the laboratory and into the community to engage in dialogue aimed at mutual understanding."

For this reason, there has been a wholesale move away from information provision on science. Instead, those organisations and individuals who were once involved in communicating and popularising science, whether for entertainment, education or for other 'deficit' reasons, are encouraged to engage in 'dialogue'. The dialogue model sees effective science communication as a multi-way communication between specialists and non-specialists. More specifically, it envisages a bigger role for the public in decision-making about science. The publication *See-through science*ⁱⁱⁱ, encouraged this dialogue process to move 'upstream', encouraging the discussion of scientific issues (such as nanotechnologies) to take place during the evolution of the subject, such that the knowledge is 'co-produced', rather than at a market testing or 'downstream' stage.

While much of this work was being led at that time by academic social researchers, Small Talk recognised that, through effective collaboration, science communication practitioners could potentially make a significant contribution to areas of national scientific importance. The project aimed to provide an opportunity for practitioners to work together and apply the lessons learned from the GM debate to another, even more 'upstream' issue: nanotechnologies. In addition, the project aimed to preserve the diversity of event formats already present within the field in order to reach a range of audiences and remain sensitive to the values of their various providers. In short, the project's primary objective was to explore whether current UK science communication activities provided an appropriate arena for upstream dialogue, and whether such activities could produce outcomes relevant to policymakers.

Outputs of Small Talk

Small Talk has produced a wealth of resources to support organisations wishing to participate. These resources were a key tool in sharing good practice and improving the quality of our events.

1. Website and resources

One of the key ways in which the Small Talk project encouraged good practice and shared lessons learned was through the project's website. The Small Talk website contains information for any practitioner wishing to develop a dialogue activity about nanotechnologies. It provides a wealth of resources on dialogue, science communication and nanotechnologies, as well as listings for events, contact details and the project outcomes to date.

The site has received 34,000 hits and 11,000 page views since its launch in January 2005, with the guidelines and resources pages proving most popular.

2. E-letters

Regular e-letters were sent to around 50 individuals who had registered an interest in Small Talk. The e-letters provided updates on lessons learned from Small Talk events.

3. Events

Small Talk comprised 20 events, attended by over 1200 participants. Events ranged from large-scale debates at the Cheltenham Science Festival and Royal Institution to school visits by nanotechnology experts. Further details of all of the events are given in Appendix 1.

4. 'Basket of questions' based on RS/RAEng report

At the beginning of the project, we provided event organisers with a 'basket of questions', based on the issues raised in the RS/RAEng report^{iv}. Event organisers were encouraged to use these key themes and questions as guidelines to the focus and outcomes of their events. They were not intended to be restrictive however and event organisers were encouraged to pick questions grouped around one or more existing themes, or choose an entirely new theme. We hoped that further themes and questions would develop out of these events, reflecting public interest and, by issuing updated questions to future event organisers, to move the debate on. The initial questions are outlined in Appendix 2.

5. Data collection instruments

All of the Small Talk events were evaluated and event organisers provided report backs of the details of the discussions and outputs of each event. In addition to these 'usual' data collection mechanisms, we adopted three other techniques to ensure that as many different sets of evidence of the discussions were available.

Speech bubble postcards

An important part of the Small Talk project was collecting the opinions of audiences and speakers on the issues under discussion and the format of the discussion events. We were also keen to allow participants who didn't want to speak in public to have a voice and so wanted to develop a recording method that enabled written opinions to contribute to the discussion, as well as spoken opinions. The data collection instruments were carefully considered, and postcards featuring speech bubbles were developed, piloted and refined.

The original speech bubble postcards (see figure 1) were joined by a new design that gave participants more scope to express their own opinions, yet still provided focus. They proved to be an effective and relatively painless way of extracting priorities from participants by inviting them to address comments (as if) to a scientist and the Science Minister (see figure 2)

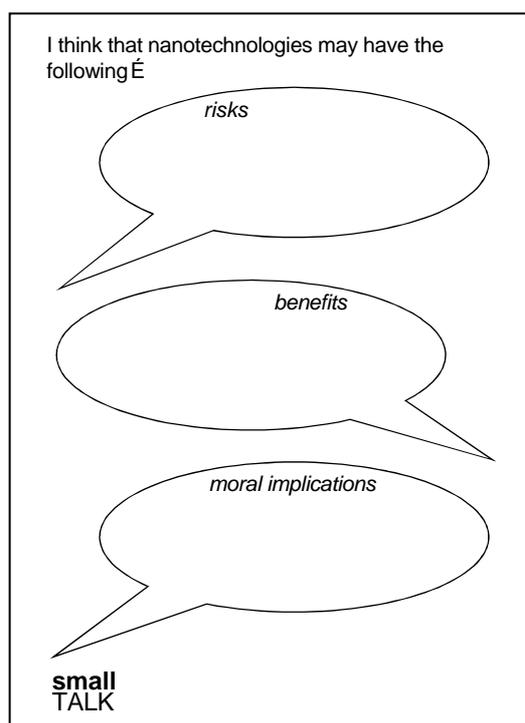


Figure 1: Original speech bubbles device for extracting participants' opinions

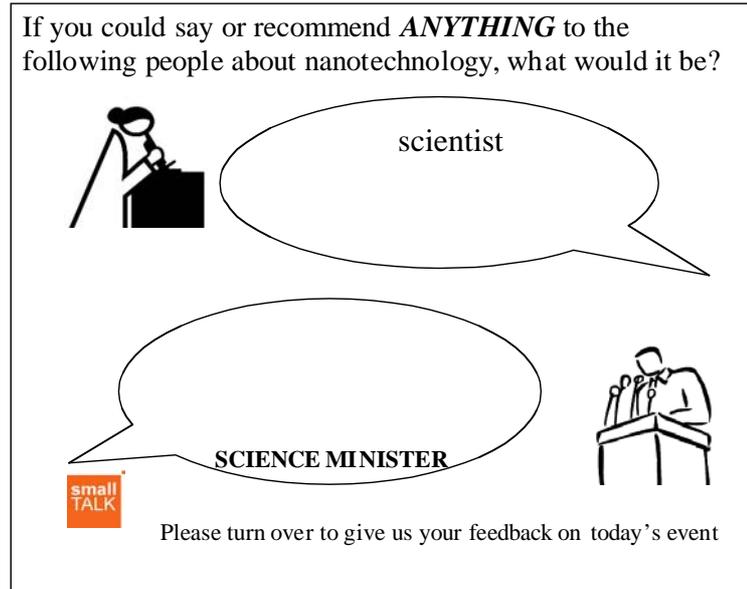


FIGURE 2: Modified speech bubbles device for extracting participants' opinions

The speech bubbles provided insight into the way participants approached the issues as much as they indicated which issues participants considered most important. This was particularly clear in questions of safety, where the speech bubbles revealed more than mere anxieties (discussed further later).

The postcards were well received by audiences, and good response rates were achieved. The questions on the cards were intentionally open in order that a wide range of opinions could be gathered. Further details of responses are given in Appendix 3: Examples of responses.

Electronic Voting

Electronic voting was also used at a number of events and served a variety of purposes. For example, at the start of the Young People's Parliament event, students were given an electronic voting exercise that aimed to gauge how much prior knowledge of nanotechnology they had, and to explore their attitudes related to science and society. Further details of the electronic voting responses are given in Appendix 3: Examples of responses.

Electronic surveys

Electronic questionnaires, consisting mostly of open questions, were distributed to organisers and contributors following the events. These aimed to collect feedback on the success of the individual event formats, as well as the impact of involvement in the process on scientists or others working in the field. Data gathered from each of these questionnaires were shared amongst the project team and interested practitioners, through the e-lets, helping ensure that learning was ongoing and informed future practice.

Learning from Small Talk: lessons for science communicators

Small Talk's experience provides lessons for both science communication practitioners and for policymakers and scientists. It also raises questions for discussion about the role of dialogue and communication in the future.

In the following chapters we will look first at lessons for practitioners (including an evaluative summary of Small Talk as a whole). Secondly we will summarise the social intelligence that can be extracted from Small Talk and discuss the issues arising of relevance to policymakers. Finally, a discussion provides more detailed commentary of the conclusions drawn and explores the potential for the approach pioneered by Small Talk.

Who are science communicators?

Throughout the project, we have often been asked 'who are the science communicators'. In January 2006, we asked a workshop of science communicators to answer just that question. The workshop defined the science communication community as:

- A broad group including the media and science centres
- An overlap of other communities, e.g. policy and education. But it also includes some 'specific' science communicators
- The community that debates issues such as 'What is science communication?'
- The community that participates in the psci-com email discussion list and the Science Communication Conference



Key Messages for Science Communicators

- ➔ Working together is valuable, helping improve learning, share expertise and improve impact on policy
- ➔ Practitioner-led dialogue produced outputs of value to policymakers
- ➔ Influencing policy is however a long-term and resource intensive activity
- ➔ There is also a vital role for other forms of communication, including the mass media.

The benefits of working together

For reasons explored in greater detail in the discussion below, Small Talk's approach offers particular advantages to science communicators involved in dialogue and consultation. Coordinating science communication activities:

- Allowed event organisers to learn from each other's experience and improve the quality of events in an iterative manner
- Helped to identify interesting issues to explore (with respect both to nanotechnology and upstream engagement generally)
- Added value to individual events because participants could feel that they were part of a larger whole
- Added value to data obtained at individual events because the coordinated activities together provide a larger data landscape
- Aided the recruitment of experts, etc. because participants can be attracted to the project as much as to the event
- Enabled the outputs of practitioner-led dialogue to access policymakers in a meaningful way, significantly increasing the impact of the individual projects
- Helped increase the visibility of individual events through joint and coordinated marketing

Strengths and weaknesses of practitioner-led dialogue

As discussed above, throughout the project, it was clear that there were some very practical reasons why practitioner-led dialogue looked different from social-research led dialogue. The evaluation of the events, the experience of the organisers and participants and the analysis of the outputs of the events however suggest that while practitioner-led dialogue events might not appear to follow all of the rules laid down by the social researchers, we have 'evolved' an approach that offers many advantages over other techniques and could provide an interesting and useful addition to the dialogue repertoire:

Strengths of practitioner led dialogue

On the basis of our work with practitioners over the past three years, we have identified the following strengths of practitioner led dialogue:

- Quick and low cost to organise. As a consequence, they can be effective in gauging responses to topical matters – they can be put together in days rather than months, enabling us to gain an almost immediate reaction to events
- Can reach large numbers of people, enabling many to take part and feel that their voice has been heard
- Formats, locations and players can be familiar to some, therefore unchallenging, allowing participants to focus on the subject matter
- They appear to be effective in identifying and exploring the concerns and aspirations regarding a new technology, or common currency amongst the general population
- Can form part of the longer-term opinion forming process that is likely to take place over future years

Weaknesses of practitioner led dialogue

- Participants at individual events are not necessarily representative of the population as a whole, although taken collectively, the outputs of multiple events might be more indicative
- Processes tend to be shorter (participants usually involved for an evening rather than several) and so will not be as deliberative as some techniques
- Practitioners tend not to be trained in collecting data useful to policymakers
- Participants' expectations of science communication events do not, as yet, include dialogue
- Influencing policy on a one-off basis is difficult if not part of a bigger scheme

Small Talk events – what worked and what didn't?

Audience perspectives

From our feedback, it appears that the events were well-received by audiences. Overall, 289 questionnaires were completed:

- 67% rated the events as 'good'
- 70% rated the quality of speakers as 'good'
- 76% said they would attend a similar event again; 18% were not sure
- 51% said the level of involvement was 'good'; 37% said it was 'average'
- 69% said they would continue to discuss the issues after the event; 24% were not sure whether they would
- 91% felt at least 'a little involved' in the discussions; 58% felt 'involved' or 'very involved'
- 68% thought that the discussions would have at least a little policy impact

It was interesting to note that school students were more likely to give indifferent responses, possibly because the choice to attend the events was not their own. Some events were less successful than others due to a combination of factors, including:

- Overestimation of audiences' pre-existing knowledge of nanoscience and nanotechnologies
- The fact that many audience members attend science communication events to learn about science, rather than engage in discussion about what that science could be
- Audiences found it difficult to discuss an upstream issue with few current applications

One important difference between Small Talk events and social research led dialogue events is how audiences are selected. In Small Talk, adult participants were self-selected and had often paid to attend events, so they brought a number of

expectations. For schools events, the choice to attend had come from teachers rather than students; however in many instances students had stronger expectations (usually related to how 'educational' events should be) than the adult audiences. In contrast, members of the public attending a social-research led event are usually given a financial incentive to participate and so may have fewer expectations of what they are set to gain personally from participation. Some Small Talk participants appeared to have attended events expecting to 'receive' knowledge or entertainment, whereas it is possible that individuals attending a social research-led dialogue event are more likely to attend expecting to 'give' or share their views or experiences. This is an interesting dimension to contrasting the two approaches to participation, and we learned early on that we needed to manage audience expectations at Small Talk events.

Speaker perspectives

Seven specialists completed the Small Talk speakers' survey:

- Three of the specialists said Small Talk had raised issues they had not previously considered. The issues included fear of loss of control of new technologies and fears for military applications
- Five specialists said that participation in Small Talk would have a little impact on their work, and one said it would have a considerable impact.
- For scientists, impacts included appreciation of the wider context of the science in society, and a fresh perspective on the science and its consequences. Science communicators felt their involvement with Small Talk would inform their work.
- Opinions on how useful Small Talk would be in informing policy were varied. They felt that policy impact would depend on the event being part of a programme rather than stand-alone, and on what happened to the outcomes from the discussions.
- When asked about the Small Talk project, they felt it to be a good idea.
- They felt the project and its policy impact could be improved by greater media coverage and involving more policymakers in the events

Organiser perspectives

As well as the points discussed above, organisers raised the following two issues:

- Scientists can be wary of talking about future applications that may or may not become reality
- Small Talk-type events need to find a balance between keeping the 'wow' factor to interest audiences, and maintaining credibility

Advice for organisers

At the start of the Small Talk project, the difference between social researcher led and practitioner led dialogue events were significant. The move towards dialogue was being driven by social researchers and while science communicators were keen to learn new techniques, there was a risk that they might be alienated and feel 'left out' by the new players in the field. One of the objectives of Small Talk therefore was to support practitioners in making use of the techniques and principles developed by academics. Rather than duplicate effort and produce 'another' good-practice document, we collated and provided links to all current good-practice guidelines, as a starting point for event organisers.

Each Small Talk event was also evaluated to find out what worked well and how we could do things better. From these evaluations, we drew a number of lessons, which we communicated immediately with future and potential event organisers, to ensure that learning took place throughout the project rather than at the end.

At the beginning of the project, the lessons being learned by practitioners were fairly simple, practical lessons that reflected the fact that few had organised dialogue events before:

1. Speakers should be well briefed

It is important that there is a dialogue between speakers and organisers beforehand to ensure that everyone is clear about the aims of the Small Talk events, that the scientific level of the presentations are appropriate to the audience and that duplication of material by different speakers is minimised. Be confident enough to give speakers advice on the audience's understanding of nanotechnologies and guidance on good practice in presenting nanotechnologies – using everyday examples, existing applications, simple descriptions and explanations and avoiding use of scientific jargon for instance. The time allocated to each speaker should also be made clear and speakers warned that the chair will enforce this!

After our first event, we developed a briefing note for Small Talk speakers, which we used to prepare for future events. Those speakers who have taken the briefing into account have proved to be better at pitching and timing their presentations and received much more positive feedback from participants. In some cases we even asked to see presenters' slides beforehand and provided feedback to make them more lively and appropriate for the audience – while the feedback had to be handled carefully, they were the most successful presentations of all

2. The framing of the debates is important

Speakers' presentations and the topics chosen for discussion should have common threads and focus to avoid confusion and reflect the interests of audiences. A clearer context for each discussion may make it easier for audiences to engage whatever their level of scientific understanding.

3. The role of the chair is important

Perhaps more so in Small Talk events than those not included in a similar programme. By introducing Small Talk to audiences and explaining its aims and objectives, the chair of an event can help to frame the debate and encourage participants to share their views. In future, the chair could also possibly outline the science of nanotechnologies – avoiding the risk of expert speakers misjudging the level of knowledge of the audience. The chair's role is also important in keeping speakers to time and facilitating open discussion.

4. Ice breaker discussions amongst audience were valuable

Giving the audience members the opportunity to discuss the presentations with their neighbour before questions or comments were taken was useful in allowing each participant to get the chance to discuss their interests and concerns with at least one other person and to think about these issues before open discussion takes place.

5. Think about whether you want speakers in breakout groups

Participants enjoyed being able to interact in small groups with the speakers as they could quiz the 'experts' further and use the experts' knowledge to inform their discussions. More importantly, it enabled the speakers (the majority of whom were scientists) to hear the views of the participants and gain valuable perspectives on their work. This worked particularly well at and the February 2005, event at the Royal Institution, where the speakers who introduced the topic of nanotechnology were PhD students.

Involving the speakers in the discussions will however inevitably change the nature of the discussion. There are also issues of power and balance of authority, particularly if you have a small audience and lots of speakers. It's important then that you give these questions careful thought while planning your event.

6. Consider the layout of the room

Arranging the room in the traditional way with the speakers placed on a stage at the front of the room doesn't encourage discussion or for participants to feel that their views were as valuable as the 'expert' views. Moving the speakers to sit amongst the audience allows them to speak from a much more 'equal' position.

7. Plan enough time for discussions

Leaving a few minutes at the end of an event isn't enough time for discussions. Plan the focus of the event around the discussions, with presentations supplementing these activities.

Discussions also ask participants to work and can be tiring, so think about using presentations to break up the sessions and allow some breathing and thinking space for participants.

8. Clearly focused presentations and discussions work well

We found that focusing on particular aspects nanotechnology such as risks, benefits and moral implications encourages deeper and more meaningful debate. The questions to the participants tended to be better framed using this approach and there was no sense of confusion over the reason for the discussions.

9. Allowing time for evaluation encourages participant feedback

Allowing 5 minutes at the end of the event for evaluation, can help you achieve a response rate of around 90% with the postcards, and encourage speakers and both organisers completed the surveys.

10. What impact do your participants expect to have on policy?

Participants often do not understand how events can have a policy impact. Summarising how the results of your event feed into policy and encouraging policymakers to attend and contribute helps.

The relative simplicity of these lessons learned reflected the nature of the events organised. Most of the events had taken the format of a panel of 'experts' describing various aspects of nanotechnology, followed by a discussion with and amongst the audience. One of the questions that arose for us during the project's mid-term review was why were event organisers not trying out more innovative techniques. It

was important to get a steer on the answers to this question, in order to develop the latter part of the project in a way that would facilitate the exploration of more adventurous formats.

We recognised that there could be a number of explanations for this ‘conservatism’ – organisational pressures, budget, available timescale, confidence and knowledge for instance. To explore further, we held a ‘working lunch’ in January 2006, to discuss with science communication practitioners the barriers to them organising innovative dialogue events:

Challenges to adopting good practice in practitioner led dialogue

1. Recruiting an audience

Most practitioner-led dialogue events did not have the budget to pay for the recruitment of and incentives for an audience, so relied upon the events being appealing enough to attract participants through usual marketing routes. As a result, events tend to need an ‘entertainment’ factor (in the case of adult events) or a strong educational content with links to the National Curriculum (in the case of student events).

2. New methodology

Science communicators are still learning “how to do dialogue”, but recognised that they have to do it to learn to do it. At the same time, they acknowledged that different organisations had different comfort zones and so were learning at different paces.

3. Time and resources

Practitioners recognised that organising a deliberative forum took much more time and planning than organising a more traditional event. While they acknowledged the extra value gained from this time investment, organisational pressures meant that for some a ‘lighter’ version of dialogue was more appropriate.

4. Subject

There are often organisational factors dictating the subject to be focused upon in a public event. At the same time, some issues lend themselves more to dialogue than others – the example given was “fertility”, which was considered to be easier than “nanotechnology” to discuss as nanotechnology is less focused, tangible or curriculum-tailored. Practitioners also felt that it was easier to persuade people to discuss issues that related to themselves and everyday life. More nebulous topics run the risk of making people feel stupid. Practitioners felt that scientists were also less willing to speculate about developing areas of research, making it quite difficult to involve them in upstream engagement too.

5. Motivation

Just as there are organisational reasons for selecting a particular topic, there are often legitimate reasons, specific to a particular organisation, for choosing to organise a dialogue event in a particular way – wanting to gain publicity through a one-off large scale event, needing voting data for media coverage, running stakeholder workshops to build contacts and understanding for example.

How can science communicators contribute to policy?

One of Small Talk's roles was to work with policymakers to investigate the scope for practitioner led dialogue initiatives to contribute to the process of developing policy for nanotechnologies.

Small Talk itself has been effective in working with policymakers. Throughout we have worked to make contacts with the key individuals in government involved in policy on nanosciences, maintaining the dialogue and building relationships with these individuals for the duration of the project. Key policymakers have been regularly updated on lessons and attitudes learned, as well as commenting upon the various outputs of the project, helping us to make them as useful to policymakers as possible. As a result, Small Talk has played a role in the government's actions to facilitate dialogue with the public on nanotechnologies and has been mentioned as such in the government's response to the RS/RAEng report as well as the forthcoming response to the CST's progress report on dialogue initiatives.

We have drawn the lessons we have learned from this experience, and from that of other practitioners, to develop a guide for practitioners wishing to influence policy – Appendix 5: *Influencing policy: a guide for science communicators*.

Further to that, we have also examined the Government's own published statements, to identify opportunities and challenges for practitioner-led dialogue (full details in Appendix 4).

Opportunities and Challenges

Opportunities

- For the past 5 years there has been a move within government towards evidence-based policymaking. In particular, there has been a more recent move towards broadening the evidence base to include more social and economic evidence. This is a good opportunity for the outputs of dialogue to have a role in government.
- The Government aims to continually improve methods of dialogue and so is interested in the practitioner led processes themselves, as well as their outputs.
- Government recognises that it can't do or fund all of the evidence it needs, so will be relying on other sources. Policymakers will be increasingly interested in sources of evidence relevant to their area of work.
- The OSI recognises that to have this pool of resources, it must help build capacity in the field outside government and help develop learning within government.
- There is a need for good communication within the dialogue process - information exchange during the dialogue, promotion of the event, feedback to participants and communication of outputs to policymakers, scientists and wider audiences.
- One of the common outputs of dialogue processes is the desire of participants to have more information about the science being discussed. There is still a clear need for science communication.

Challenges

- There are different views of the purpose and characteristics of good dialogue between policymakers, social researchers and science communication practitioners – science communicators tend to focus on the participants' experience and learning, social researchers on the process and policymakers on the outputs.
- Dialogue activities have the most impact on policy when they are driven and owned by the policymakers. If a dialogue activity is not commissioned by the policymakers but instead originates from the event organisers or other funders, there will be a particular set of challenges in engaging the policymakers and ensuring the outputs are policy relevant and have an impact. It is important not to underestimate the scale and value of this task.

- The OSI is leading the drive for dialogue in science policy development but policymakers are situated in a number of different government departments, working to multiple additional agendas. Policymakers throughout government are at different stages of understanding of and agreement with the OSI's move towards dialogue.
- Policymakers have clear ideas about the 'type' of evidence they need. Outputs of dialogue events need to be relevant to policy – answer questions that policymakers are currently thinking about or raise issues that they need to consider in the future. Dialogue events, particularly those driven by the desire to allow the participants to set the agenda, often produce less focused feedback, of limited use to policymakers.
- Policymakers are likely to have conceptions of who and what constitutes good social intelligence. Will they ever be comfortable using the outputs of a process organised by a small learned society vs. one by Mori? How much do they know about and value science communication organisations and the contribution they could make? Do the various guidelines and governance arrangements for dialogue and consultation that have been specified recently allow enough flexibility for potential collaboration with science communication organisations?
- Grant mode funding opportunities have recently become much more limited for science communication activities, so it is unclear where support for non-commissioned work will come from in the future.

This analysis and the guide raise an important issue for science communicators – to be more effective in influencing policy, you need a stake in the policy. This for several reasons: in order to be effective you need to take a long view of the issue and follow it through the lengthy policy making and legislative process; you need to have contacts and relationships with policymakers – taking time again; most importantly, you need a place at the table – reserved for those with stakes.

This poses an interesting dilemma for practitioners: while it points a clear way forward for those with a particular perspective (medical science organisations and stem cell policy; environmental organisations and nuclear waste), there are a number of 'science communication' organisations that claim to be 'channels' for public opinion on science. In these roles, organisations pick and choose topics that they wish to examine and influence policy on. While this is an entirely appropriate role within civic society, unless they are specifically commissioned to carry out the dialogue on behalf of policymakers, it is a very difficult role to fulfil effectively – such organisations don't obviously have a place at the policymaking table as they aren't key stakeholders; they haven't been sufficiently involved nor have a sufficient reputation in the subject area to have acquired contacts amongst policymakers; politicians are unused to such a role, so they do not necessarily understand their necessity; traditional campaign techniques for delivering messages are inappropriate in this context, leaving a communication tool gap and raising the questions of what role (if any) non-policy-sponsored dialogue initiatives might play in policy development.

By working collectively and collaboratively, Small Talk has been able to devote the time and resources necessary to build the knowledge and relationships needed to influence policy effectively, for a relatively modest amount of money (less than £50k over three years). We believe that the value of this for the science communication and policymaking community is evident from the links we have made with policymakers on behalf of a range of organisations. Such collaborations could prove valuable in the future.

Discussion 1: What does this mean for communication?

Small Talk has demonstrated that by working together and adopting (and adapting) good practice, science communication practitioner-led dialogue activities can provide interesting insight into public attitudes. Importantly, discussions with policymakers indicate that these insights, and the relative speed with which we were able to produce them, are of value to policy – there clearly is a role for science communicators in the policy process.

The picture for the future however is unlikely to be that straightforward. As we have suggested above, the practitioner-led approach is still evolving. We still have many lessons to learn and ideas to share before our approach is ‘grown up’. Perhaps more significantly, while we are drawing heavily upon social science, as practitioners we are also adapting these ‘ideals’ to suit our own real-world situations and needs. For the reasons outlined above, just as a family saloon car looks significantly different to a formula one racing car, practitioner-led dialogue is never going to look the same as academic-led social research in this field. These differences are entirely appropriate but will be scrutinised and debated. If science communication practitioners are to continue to play a significant role in this field then we will need to develop the confidence to argue our position so that we are comfortable in developing our own practice-led approaches rather than apologising for not using more academically pure techniques.

Furthermore, as discussed in our review of government statements on dialogue and in lessons learned for policymakers, it is becoming increasingly clear that while the old ‘deficit’ model of ‘to know science is to love it’ is insufficient, if we are to build public support for particular new technologies, so too is a ‘dialogue only’ approach. In every dialogue event, participants said that they would like more information about these new technologies; interpretation of the aspirations and concerns raised by participants indicates a significant gap between the perceived and actual role of government in developing and regulating new technologies. Dissatisfaction and distrust is likely to arise when the reality of government fails to meet these perceptions. Now we know that this situation exists, only effective communication is going to resolve these differences. There is an important role in this process for dialogue, but it is also sensible to look at a broader repertoire of communication tools.

The question facing science communicators then is what role do we want? While we can play a role in informing policymaking, is this a role we want and if so, are we ready to be confident in developing and promoting our approach? On the other hand, there is also clearly a vital role to be played in communicating science, not just within a dialogue context, but as an activity in its own right. There is therefore a further role for us in developing and utilising this broader science communication skill-set, a role that we have perhaps neglected over the past few years.

Learning from Small Talk: lessons for policymakers and scientists

One of Small Talk's roles was to discover what types of social intelligence could come from upstream dialogue events instigated by science communication practitioners.

While each individual event reached a relatively small and particular audience, taken collectively, Small Talk reached more than 1200 people from diverse backgrounds, building up a more detailed understanding of attitudes.

Small Talk events were practitioner led activities and while not generally developed or run by social scientists, they did draw on good practice developed by the social science sector. While there are variations in approach, we believe that the data collected at multiple Small Talk events (using the means described above) and the organisers' impressions of individual events provide an interesting insight into attitudes towards nanotechnologies that is likely to be of use to policymakers.

The opinions gathered fall into four clusters:

- Concerns and aspirations about nanotechnology in particular
- Attitudes towards technological development in general
- Public conceptions of the role of government
- Publics and scientists' conceptions of the role of dialogue

The following section summarises the conclusions drawn from the data collected. The conclusions, and their scope, are explored in greater depth in the discussion (below).



Key messages for policymakers

\ Nanotechnology is not seen as different to other technologies and people are generally positive, recognising that it could bring benefits to society and the environment

\ Participants were not concerned about the technologies but about the regulations ensure that they are safe

\ People see government as the main source of funding for nanotechnology and for research into the safety

\ Participants believe that 'safe' is an absolute and non-contested term

\ Many participants expect regulation to be restrictive until safety is proven

Attitudes to nanotechnology

The main issues to emerge at Small Talk events on the subject of nanotechnology were:

Concerns about nanotechnologies

Small Talk participants asked:

- Who is in control, and can we trust them?
- Will nanotechnologies be adequately regulated?
- Will there be adequate funding to explore the risks?

Small Talk participants expressed concern that nanotechnologies:

- Draw on so many different areas of science that they might slip through existing regulation frameworks
- May fall into the ‘wrong hands’
- Are developing faster than we have time to understand
- May increase the divide between rich and poor countries

Small Talk participants were concerned about:

- Military applications for nanotechnologies
- Environmental and health risks from nanotechnologies
- Unexpected risks from nanotechnologies (risks we cannot anticipate)

Aspirations for nanotechnologies

Small Talk participants felt that nanotechnologies could bring benefits in:

- Medicine
- Economy
- Environment
- They also recognised that there could be unexpected benefits from nanotechnologies that we have not yet anticipated.

Moral implications of nanotechnologies

Participants felt that:

- Morally, nanotechnology is no different from any new technology
- The moral implications of nanotechnology depend on use (nanotechnology is considered morally neutral but there is concern that it could be used for evil)
- The safety and regulation of nanotechnology is considered a moral issue
- The impact of nanotechnologies on the economies and environments of developing countries is considered a moral issue

Other issues raised by nanotechnologies

Small Talk participants felt:

- The public needs more information about nanotechnologies
- There is a need to involve ordinary people in decisions about nanotechnology
- The UK should be a world leader in nanotechnology
- Nanotechnology needs proper funding both to ensure the UK is a leader in the field and to ensure that risks and other implications are fully explored

Safety

In our discussions public concerns about safety were couched not in terms of the technology itself but almost wholly in terms of the social structures in place to ensure that hazards will be identified and products regulated. It's not 'grey-goo' that people worry about or any specific hazard, but rather whether funding will be available to test new products adequately and whether regulation will prevent untested products from coming to market.

Further, what constitutes adequate testing is presumed to be 'given'. That is, taking Small Talk participants' responses en-masse seems to indicate a lack of awareness that 'safe' might be a contested term. Rather, there was a sense that everyone would agree on what safe means, and would agree that it means almost no uncertainty. The question of where responsibility lay for ensuring safety rarely came up explicitly. On the whole, there seemed to be an assumption that it was government's job to establish standards and manufacturers' job to do the testing.

Aspirations for nanotechnologies tend not (in Small Talk's experience) to make reference to specific applications either, but rather to the institutions that will ensure good comes from them. That is, rather than saying, "I'm looking forward to buying a pair of nanopants" (or whatever application) participants recognised nanotechnologies' potential as 'enabling technologies' – basic technologies that would make a range of applications possible. The question of whether they would bring benefits was couched in terms of who was empowered to develop applications and how.

It was rare for people to comment on specific aspects of nanotechnologies, even if these had been discussed at the event. For instance, even if the difference between bulk nanoparticles and other nanotechnologies has been discussed at length, people didn't make comments such as, "technologies built on silicon wafers are ok but bulk nanoparticles may turn out to be hazardous if inhaled so their release should be strictly controlled". Indeed, they didn't make reference to the technologies or the specific hazards at all but rather to the system that will ensure that any problems are picked up.

Such responses reveal two things about the public's response to hazards presented by new technology, or rather the combined results from Small Talk make the following hypotheses worth considering. Firstly, responses gathered at Small Talk events seem to indicate a pervasive assumption that hazards can be and should be discovered and eliminated. An interesting comparison can be made with drug licensing here as it represents the current gold-standard of evaluation for new technologies. The standards many Small Talk participants seemed to expect for nanotechnologies were even greater than the standards they might expect for drugs. For many people, drug safety is understood in relative terms – uncertainty about the safety of drugs is offset by their efficacy in relation to the condition they are designed to treat. In contrast, the environmental safety of new technologies tends to be understood in absolute terms – benefits do not have the same mitigating role as they

do for drugs. Small Talk participants on the whole considered the safety of nanotechnologies in absolute rather than relative terms.

Secondly, the results from Small Talk events suggest that people have a clear sense of their own agency and the boundaries of their expertise. This means that they express fears in terms of the social structures in place to protect them rather than the specific hazards posed by technologies (which is somebody else's job to determine). For instance, when asked to list risks of nanotechnology, a participant at the Dana Centre event in April 2005 wrote:

“Responsibility for release of nanoparticles – whose jurisdiction... so many disciplines interlinked”

This participant's concern relates to jurisdiction rather than any actual hazard. In principle, any actual hazard could be dealt with by people with sufficient expertise. What makes nanotechnology risky (according to this participant) is not the potential hazards themselves but the number of disciplines required to deal with them, which for social (bureaucratic) reasons, may mean the hazards are not dealt with as they should be. The technology itself is considered 'potentially dangerous' rather than 'inherently dangerous'. The perception of risk stems from the institutions we are forced to rely on rather than the technology itself.

Finally, there was also a strong desire to remain informed of developments and for consultation to continue. This desire was combined in some participants with a lack of trust towards the way news media would cover nanotechnology. The mediating role of science communicators is clearly valued. In general, we had the sense from participants that they regarded a Small Talk event as the start of an on-going conversation in which their contribution would become increasingly important. Conversely, as discussed below (p 24) we gained a sense from many of the participating experts that there was not much to be learned from the public. (Scientists are, after all, already members of the public themselves.)

Public conceptions of the role of government

Regulation of nanotechnologies was a key theme that was raised and discussed repeatedly in Small Talk events. Responses collected from participants and the discussions within Small Talk events indicate that:

- Small Talk participants consider the most important source of regulation for nanotechnology (and for new technologies in general) to be the Government. Many Small Talk participants see the Government as the *only* source of regulation.
- Many Small Talk participants expect regulation of products and industrial practices to be highly restrictive until their safety is proven.
- A common underlying assumption amongst Small Talk participants appeared to be that decisions made by regulators and policymakers are based on certain knowledge. That is that risks can be understood precisely. The governance of nanotechnology is not generally perceived by Small Talk participants as a process of 'managing uncertainty'. Participants appeared to tend to feel that uncertainty (especially over questions of safety) should always be resolved (e.g. through research). Whilst regulators may see their role as using available (if limited) evidence to control risk to the public, participants seem to expect regulations to be free from doubt – with no unknowns (neither known unknowns nor unknown unknowns). This is reflected in a comment addressed to the Science Minister (captured in a speech bubble postcard):

“You shouldn't decide anything unless you know all the risks involved and how you can find a cure. You shouldn't decide anything unless you have a cure.”

- Another common theme seemed to be the idea that those charged with regulating nanotechnology would respond to gaps in their knowledge (for instance about the toxicity of bulk bucky-tubes) by commissioning research.
- Small Talk participants perceive the Government to be the most important source of funding for nanotechnology research, and the only source of funding for research into the potential risks associated with nanotechnology.
- On the whole, Small Talk participants' understanding of *how* the Government invests in nanoscience and nanotechnology is sketchy and tends to assume a more direct relationship between central government and scientists than is actually the case.
- Small Talk participants' understanding of how nanotechnology policy is developed is sketchier even than their understanding of science funding.

Public and scientists' conceptions of the role of dialogue

The feedback from Small Talk events suggests that there is still a difference in the value attached to participating in dialogue events for the public and for scientists.

Many participants in Small Talk events saw a role for the public in the governance of nanotechnology, believing that insight provided by ordinary people could be useful to scientists and policymakers. They felt that policymakers and scientists should:

- Inform the public about developments in nanotechnology
- Solicit opinions from the public on nanotechnology (and listen to them)
- Act on the feedback they receive

The speakers however brought a range of expectations to the events. Some of the more senior scientists felt their role was to *educate* audiences about nanotechnology, whereas younger researchers (notably PhD students) saw the events as a chance to *discuss* their work and its context with a wider audience. The format of the events probably helped shape these expectations - the role of a more senior scientist tended to be to give an introductory presentation, while younger researchers might have been involved in workshops or breakout discussions.

The quotes below are from two PhD students that participated in the RI event targeted at teenagers. They were asked in the e-survey to comment on the impact the event would have on their work.

“It makes me think about how the public perceive my work. It helps put my research in perspective to the bigger picture of science and society. It has made me keener to educate people about the benefits and dangers of science.” (Male PhD student 1)

“I made a point to link public trust of scientists to the impartiality and thus their funding sources. This link seemed to make sense to most participants and I will thus continue pushing for less military funding of research in nanotechnology.” (Male PhD student 2)

Most of the speakers also expressed an interest in receiving a copy of this report and other documents that would share the findings from Small Talk.

Attitudes to Technology in General

The attitudes expressed towards nanosciences in Small Talk appear to be consistent with attitudes expressed towards other technologies such as nuclear power or GM crops. Indeed a number of participants made reference and clearly draw on these experiences when articulating views about nanotechnologies.

What was not clear however was whether participants were using these past examples as proxies for nanotechnology (i.e. judging new technologies on the basis of how the last one worked out) or whether they were using these examples to recall and test a framework of principles by which new technologies, or indeed change in general, is evaluated. Nevertheless, while the ‘why?’ is an interesting academic question, the attitudes themselves provide a useful overview of attitudes to new technologies:

- People want to know who is in control and can we trust them?
- People worry whether new technologies will be adequately regulated
- Technologies are good if they tackle health, environment and economic problems
- Technologies are bad if they increase divide between rich and poor and pose a risk to health or environment
- Government is seen as the most important part of regulation and funding
- People believe that regulation should be restrictive until safety is proven
- People recognize that there are risks and benefits that we can’t anticipate
- People feel that technology is developing faster than we can understand

Discussion 2: What does this mean for scientists and policymakers?

Based upon the attitudes and views outlined above, we have developed the following key messages for policymakers and scientists working with new technologies:

People's attitudes to nanotechnologies are not significantly different from their attitudes to any new technology – and they are generally positive. Many people want Britain to be a world leader in nanotechnology.

There are significant parallels with attitudes to GM that emerged in the UK National Consensus Conference on Plant Biotechnology - particularly the call for openness and public involvement in decision-making.

On the subject of safety, people see danger in poor regulation rather than specific hazards associated with nanotechnology. (Nanotechnologies are not perceived as inherently dangerous, but many people have doubts about regulatory authorities' power and competence.)

For nanotechnologies to be acceptable to the public, you need to ensure that:

- Any possible risks are offset by real benefits (health and/or environmental) to the consumer, not just the manufacturer
- They do not exploit less-well off people (here or abroad)
- You help the public to inform themselves about nanotechnologies
- You help the public to understand the relations between government, science and industry
- You help the public understand how nanotechnologies are regulated, ideally discussing your plans with them
- You fund research to clarify any gaps in knowledge regarding safety
- If regulation involves managing uncertainty (because of gaps in knowledge regarding safety or any other issue) you explain this clearly (because the public is likely to expect that regulation is based on firm evidence and is a guarantee of safety)

While the points might at first appear to provide a relatively straightforward (and perhaps obvious) framework, on further consideration they reveal some fundamental and problematic issues and assumptions. Firstly, the points indicate a particular view of regulation in the UK - people see an active role for government in regulating new technologies. No mention was ever made of market forces or market self-regulation.

Secondly, none of the points in the framework above are easily achievable through government alone. While the public might perceive a strong role for government in funding and regulating, the reality is that the private sector plays a significant role. The majority of the work to develop the basic research into products is carried out by the private sector for instance. Even if all publicly funded research was aiming to provide consumer benefits, government policy would have limited control over the actual products produced by industry. This is arguably what

happened in the case of GM crops. Most publicly funded research into GM crops in the 1980s and 1990s was looking to bring real benefits to consumers, often aiming to solve significant social problems – crops that could be grown in drought ridden parts of the world or that would reduce our reliance on fertilizer or pesticides for instance. Yet the first applications of GM crops to come onto the market were developed by the private sector and appeared to offer few benefits to the consumers and maximum profits for the companies involved. While government policy had little potential to affect this, it took a significant part of the blame and impact.

There is then a significant gap between the public's perceptions of the role and boundaries of government and the reality. If unresolved this gap could be a potential source of tension and distrust in government and governance of science. So how can we resolve it? It will undoubtedly be tempting to continue research to understand more and more about this tension and relationship, but while more research and dialogue will help understand the nature of the problem, there are already pointers for action. The question for policymakers now is how much more do we need to understand before we act?' and are the benefits of greater understanding offset by the risks of not acting? Dialogue will be useful in changing the understanding and knowledge of government amongst a small number of specific groups or individuals, but policymakers need to be able to change perception and expectation on a mass scale. This must involve using a wider range of communication tools.

Finally, throughout the project, we have been conscious of a lack of clarity about the purpose of dialogue for policymakers. This lack of clarity came to a head when we started to present the findings of our dialogue events. One particularly striking feature of the attitudes gathered during Small Talk is their homogeneity and their resonance, not just with other nanotechnology dialogue activities (such as Nanojury run by the Policy, Ethics and Life-Sciences Research Centre at the University of Newcastle), but also with other activities exploring attitudes towards other new technologies (such as the 1994 Consensus Conference on Plant Biotechnology). But surely a process run by science communication practitioners for a few hundred pounds cannot do the same job as the more deliberative processes run by academic groups? Over the past few months we have discussed this question with academics and policymakers in the field. The conversations have revealed interesting differences in perspectives.

The prevailing view amongst the 'dialogue academics' that we spoke to, was that the Small Talk approach is not and cannot be comparable to their techniques. What is lacking from our approach is the in-depth, extended and high quality contact with participants offered by activities such as consensus conferences. While the substantive outputs might appear to be the same, the processes by which these opinions have been reached are not the same. The prolonged and intensive contact with the subject that participants have in more deliberative fora will undoubtedly have a significant long-term impact on the participants themselves and provide more meaningful insight into the process of opinion forming and the framework behind the attitudes themselves. Furthermore, for some, engaging the public in upstream dialogue is part of a bigger democratisation of science agenda.

The policymakers we spoke to however had different motivations for dialogue. They were interested in the outputs rather than the process and felt that the opinions gathered by Small Talk were of value to them. They appeared to be involved in dialogue because they believed that widening the evidence base for would improve the quality of the decision-making, in turn building trust and confidence because the decisions were better. They did not necessarily have an agenda to democratise science, nor were wedded to the dialogue technique, beyond that it helped make better policy. For many policy situations, the additional features of the more social research led techniques are 'added extras'. What is often more important is to gain an understanding of the attitude landscape within which policy decisions are being

made, and to provide many members of the public with an opportunity to be listened to, within limited timescales and budgets.

Policymakers did however appreciate that for some issues and situations a more deliberative approach would be appropriate, in order to gain a deeper understanding of the thinking behind the opinions. In other words, the policymakers were keen to think about the relative strengths and weaknesses of the full range of social intelligence gathering techniques available to them, before making a commissioning decision. While this opens up a big opportunity for practitioner-led dialogue, it does present a double challenge to those of us involved in public dialogue – to focus on producing the deliverables that the policymakers want and to be as open-handed as we can about the relative strengths and appropriateness of our techniques in a given situation.

Conclusion

Through Small Talk, we have developed a collaborative approach that adds value to public dialogue by providing support, coordination and analysis at a meta-level. The project has allowed a diversity of approaches, and helped the adoption of good practice, the quality of the events and their outputs over time.

Through the project we have also explored the challenges for the science communication community in adopting social research techniques for dialogue. We conclude that because we are by necessity adapting techniques to suit our own real-world situations and needs, practitioner led approaches are never going to look the same as those used by social researchers. Nevertheless, we believe that Small Talk has demonstrated that with the right support, practitioners can raise their game. More importantly, we have shown that while the practitioner-led approach is not yet fully grown, it does have the potential to develop into an approach that, while being different to social research approach, will have strengths and benefits in its own right and provide insights of value to policymakers.

Our work with policymakers has also helped clarify our understanding of the needs of policy. Firstly, perhaps unsurprisingly, it is clear that working with and influencing policy is a significant and long-term undertaking. Relationships need to be built over time and outputs of dialogue need to be presented as part of an ongoing narrative. Organisations wanting to dip in and out of different issue or topics are likely to have limited success in linking this to policy. This was one of the key benefits of Small Talk for science communicators – we built the relationships, enabling our partners to dip in and out as they wished. Small Talk was mentioned in the Government’s response to the Royal Society/Royal Academy of Engineering report and we have been invited to present our findings to a range of government policy stakeholders for example. In this way we have been successful in working with policymakers, an aspect of dialogue that is often considered to be problematic and which individual organisations would have found difficult to achieve without considerable staff investment.

Secondly, from extensive discussions with key nanotechnology policymakers across government and in Europe, it is clear to us that there is no mystery about what policymakers want or their motivations for commissioning dialogue – they are aiming to make more robust and trustworthy policy by widening the evidence base to include public and non-expert perspectives. They want to know what people think about the issues relating to the policy they are making. As Small Talk demonstrates, a practitioner-led approach to dialogue can be effective at quickly identifying key attitudes that are common currency amongst the population. Given that these attitudes are likely to be formed over a long time period (i.e. years), this approach can also be useful in reaching large numbers of individuals and allowing them to take part as they wish over this long opinion-forming timeframe.

Policymakers also understand that the process of dialogue has an impact on the individuals involved – a key strength of the more deliberative techniques available –

but are concerned that these techniques reach few. If this 'experience' is the significant benefit of dialogue over other opinion research techniques, then we need to develop and communicate the evidence that the process rather than the better policy, is the significant factor in building trust amongst the population. We should also develop techniques to widen the reach of such processes. A small talk approach offers on possible way of developing this wider reach.

For the future, Small Talk raises some interesting and exciting possibilities for science communicators, positioning us at an interesting point in our field's development. On the one hand, we have demonstrated that the practitioner-led approach can be of value to policy. The focus so far has been on nanotechnologies, but there are many other issues that warrant similar attention in the future. With the commitment to developing this approach further and the confidence to argue our position, there could be very interesting role to be played in helping inform policy.

On the other hand, the attitudes and opinions identified by the Small Talk events point towards an additional role for science communicators in the future. From the attitudes identified, it is already clear that there is a significant and widespread gap between the perceived and actual role of government in the development and regulation of new technologies. Dissatisfaction and distrust is likely to arise when the government fails to meet these unrealistic expectations. Dialogue will be useful in changing the understanding and knowledge of government amongst a small number of specific groups or individuals, but policymakers need to be able to change perception and expectation on a mass scale. This must involve using a wider range of communication tools, including the media – tools that science communicators are ideally placed to develop and demonstrate.

Finally, Small Talk has demonstrated very clearly the benefits of working together. We do however recognise that working together is a commitment that needs to be resourced in order to work properly. While the Small Talk budget was modest (£49,900) it enabled us to employ a part-time coordinator, a role that was critical in bringing the collaboration to life. Apart from the tangible benefits gained from the improved coordination, information sharing, focus and economies of scale, the project has built trust, support and interpersonal relationships amongst the partner organisations. As well as being an endowment for the partner organisations and possibly the field, these relationships have enabled us to try new ideas and to take new opportunities and some risks, playing significant roles in the success of the project. Whichever path science communication takes in the future, we hope that collaboration, partnership, learning and sharing will be Small Talk's most lasting legacy.

Appendix 1: Small Talk Events

Nano: tiny technologies that are going to be huge!

Date: Friday 17th March 2006 (National Science Week!)

Venue: The Young People's Parliament, Millennium Point, Birmingham

Organiser: Young People's Parliament

Participants: 140 year 8 to year 13 school students

This event was designed to give participants aged 14-19 an appreciation of the different issues and viewpoints surrounding the development and use of nanotechnology, giving them a chance to contribute to the national debate. Students worked in groups on different tasks to investigate the major scientific and ethical issues, and to engage in focused conversations and debates on the topic. Instead of choosing a "right" answer, the activities encouraged participants to form and explain their own views and feelings.

Schools' debates on nanotech for Brighton Science Festival

Date: Week of 20-26 February 2006

Venue: Brighton Schools

Organiser: Ecsite-uk

Participants: 120 year 10 school students

This event built on Scizmic's 'Debates with a Difference' to bring issues on nanoscience and technological futures directly into Brighton schools. It was supported by Dr. Ray Whitby, a nanochemist from the University of Sussex.

Debate with a Difference

Date: 23 November 2005

Venue: Life Science Centre, Newcastle

Organiser: Ecsite-uk

Participants: 25 school students (14-19 years old)

This event was designed to give participants aged 14-19 an appreciation of the different issues and viewpoints surrounding the development and use of nanotechnology. Students worked in groups on different tasks to investigate the major scientific and ethical issues, and to engage in focused conversations and debates on the topic. Instead of choosing a "right" answer, the activities encouraged participants to form and explain their own views and feelings.

Debate with a Difference

Date: 6 & 7 October 2005

Venue: Manchester Museum of Science and Industry

Organiser: Ecsite-uk

Participants: 25 school students (14-19 years old)

Einstein's legacy

Date: 6 September 2005 **Time:** 14.00-17.30

Venue: BA Festival of Science, Trinity College, Dublin

Organisation: The BA Physics and Astronomy Section

Participants: Adult science festival visitors (approx. 50)

Einstein's momentous year of 1905 was celebrated with a series of four lectures. Three of these discussed cutting edge current research that has led from his three papers and there was also a lecture on the famous Bohr-Einstein debate on the meaning of quantum mechanics.

Just say nano!

Date: 8 September 2005 **Time:** 15.00-17.00

Venue: BA Festival of Science, Trinity College, Dublin

Organisation: Centre for Research on Adaptive Nanostructures and Nanodevices

Participants: Adult science festival visitors (approx: 50)

A debate involving a panel of experts from the worlds of science and science communication with the following remit: Is the future nano? Nano-products are already widely available on shop shelves and prospects for new applications are seemingly endless. Should we be excited or alarmed?

Smalltalk

Date: Thursday 9 June 2005, **Time:** 13.15-4.15

Venue: Cheltenham Town Hall

Organiser: Cheltenham Festival of Science

Participants: 80 adult science festival visitors

Session about ethical, political and social questions raised by nanotechnology with social scientist Rob Doubleday, physicist Terry McMaster and materials scientist George Smith.

Patient and carer focus group

Date: Thursday 9 June 2005, **Time:** 18.30-20.30

Venue: Dana Centre, 165 Queen's Gate, London SW7 5HE

Organiser: The BA

Participants: Patients and carers (8 participants)

Focus group specifically for patients or carers of patients to discuss nanotechnology - its potential impact on their lives and also what the benefits could be for looking into their disorders, developing new treatments and eventually cures.

Small Talk: the impact of nanotechnologies on healthcare professionals

Date: Thursday 11 April 2005, **Time:** 18.30-20.30

Venue: Dana Centre, 165 Queen's Gate, London SW7 5HE

Organiser: The BA

Participants: 25 invited healthcare professionals

An evening for healthcare professionals to question the scientists working in the field of nanotechnology, and feed their comments to policy makers.

Small Talk Working Lunch

Date: Thursday 5 April 2005

Venue: Our Dynamic Earth, Edinburgh

Organiser: The BA

Participants: 15 science communicators

An open seminar about Small Talk and nanotechnology engagement generally.

Nano-games: play the nanotechnology card game

Date: Thursday 5 April 2005, **Time:** 18.30-20.30

Venue: Dana Centre, 165 Queen's Gate, London SW7 5HE

Organiser: The BA

Participants: Self-selected Dana Centre audience (40 participants)

You are the Science Minister - what will you do to control nanotechnology? Play the Democs game to find out more about the ethical issues surrounding nanotechnology. Debate your views with the rest of the team before choosing your policy position.

Naked Science: where is the UK in the nano-world?

Date: Thursday 17 March 2005, **Time:** 18.30-20.30

Venue: Dana Centre, 165 Queen's Gate, London SW7 5HE

Organiser: The BA

Participants: Self-selected Dana Centre audience (42 participants)

Are attitudes to nanotechnology the same the world over? Are there particular differences between the UK and US? A chance for participants to share their views with international experts and decide whether we should follow America's lead or find our own nano-niche.

Speakers:

George Gaskell, Professor of Social Psychology, London School of Economics

Harry Kroto, Professor of Chemistry, Florida State University (video linkup)

Jack Stilgoe, science and society researcher, Demos

Alexis Vlandas, graduate nanotechnology researcher, Oxford University

Nano-products: coming to a store near you

Date: Thursday 3 March 2005, **Time:** 18.30-20.30

Venue: Dana Centre, 165 Queen's Gate, London SW7 5HE

Organiser: The BA at the Dana Centre

Participants: Self-selected Dana Centre audience (52 participants)

Nanotechnology is hitting our high streets in fashion, sports equipment and cosmetics. Find out more through demonstrations, object handling and quizzing the nano-product experts. What would you love, and hate, to see nanotechnology change in the future?

Speakers:

Tim Gabriel, School of Chemistry, University of Southampton

Quentin Pankhurst, Deputy Director, London Centre for Nanotechnology

Barry Park, Chief Operating Officer, Oxonica Ltd

Michael Pitkethly, Commercial Director, QinetiQ Nanomaterials

Naked Science: is a nano-future fact or fantasy?

Date: Tuesday 1 March 2005, **Time:** 19.00-20.30

Venue: Dana Centre, 165 Queen's Gate, London SW7 5HE

Organiser: The BA

Participants: Self-selected Dana Centre audience (52 participants)

An opportunity for participants to discuss hopes and fears. Science fiction portrays nanotechnology as both our saviour and destroyer. Are these ideas pure fantasy or could they become a future reality? How will nanotechnology change our lives?

Speakers:

Richard Jones, Department of Physics and Astronomy, University of Sheffield

David Kirby, Lecturer in Science Communication, University of Manchester

Clare Wilkinson, School of Sociology, Politics and Law, University of Plymouth

Nanotechnology: is small beautiful?

Date: Thursday 22 February 2005, **Time:** 18:30-20.30

Venue: Dana Centre, 165 Queen's Gate, London SW7 5HE

Organiser: The BA

Participants: Self-selected Dana Centre audience (70 participants)

A chance to join our panel of leading commentators at the x-change to discuss nanotechnology and other issues in the news. Can something so small promise something so big? How will nanotechnology change the way we view ourselves and the world in which we live? When will the promised scientific revolution take place and what can we expect from it?

Small Talk on big issues: nanoscience and nanotechnologies – risks and opportunities

Date: Wednesday 9 February 2005, **Time:** 18:30-20.30

Venue: Biomedical Centre, Lund University, Sweden

Organiser: British Embassies in Sweden and Denmark

Participants: A range of invited experts (approx. 15)

A half-day workshop hosted by the British Embassies in Sweden and Denmark considering the social, economic and ethical questions and issues regarding the development of nanoscience and nanotechnologies, with particular focus on nanomedicine and its technical applications. The workshop aims to discuss different stakeholders' opinions about the potential opportunities and threats linked to the development of nanoscience and to establish contacts between British, Danish and Swedish actors in these fields.

Post 16 science lectures

Date: Tuesday 1 February 2005, **Time:** 13:30

Venue: Royal Institution

Organiser: Royal Institution

Participants: 35 year 12 and 13 students

This half day session of talks and discussion exercises helped to clear the mists of confusion about what nanotechnologies will mean for medicine, engineering and technology. Students had the chance to be involved with scientists actually working in the field of nanoscience, to ask them about the ethical implications of their work, and quiz them about the risks and the potential benefits of these new technologies. Not only was this day a chance to learn first hand about the latest hot topic, it also developed communication skills and extended students' knowledge.

Nanotechnology: can something so tiny promise something so big?

Date: Monday 1 November 2004, **Time:** 19:00

Venue: Royal Institution

Organiser: Royal Institution

Participants: Self-selected Royal Institution audience (300 participants)

A joint panel discussion with Professor Richard Jones, Professor Raymond Oliver and James Wilsdon. Rather than speculate about how nanotechnologies will transform our future, this debate focused on what is happening now, what scientists are currently working on and how their work will affect society. Audiences joined the discussion to find out who is controlling the research and discover how much we really know. Participants could question scientists about what drives them, hear what they hope their research will achieve and explore their visions, assumptions and uncertainties.

Nanotechnology: who benefits from technology like this – and who is accountable?

Date: Wednesday 20 October 2004, **Time:** 18:00

Venue: RSA

Organiser: RSA

Participants: Self-selected RSA audience (approx. 40 participants)

Professor George Smith (University of Oxford), Professor Paul Atherton (European Society for Precision Engineering and Nanotechnology), Dr Doug Parr (Greenpeace) and Dr Ian Gibson MP. Chaired by Philip Ball, presenter BBC4 'Small Worlds'. As part of the RSA Forum for Technology, Citizens and the Market project this discussion considered some of the issues surrounding nanotechnologies: Where do the main uses lie? Who will benefit? Who is accountable? What will be the social impact on behaviour and norms? What could be unintended consequences of nanotechnologies?

Exploring nanotechnologies

Date: Wednesday 29 September 2004, **Time:** 18:30

Venue: Royal Society

Organiser: Royal Society

Participants: Self-selected Royal Society audience (approx. 50 participants)
Chaired by Nick Ross, a panel discussion featuring Ann Dowling (University of Cambridge), Deidre Hutton (National Consumers Council), Doug Parr (Greenpeace), and Ian Pearson (BT Futurologist) exploring the benefits and uncertainties of the development of nanotechnologies highlighted by the joint Royal Society and Royal Academy of Engineering report 'Nanoscience and nanotechnologies: opportunities and uncertainties'.

Appendix 2: Key themes & questions for event organisers

We have developed a set of key themes to be approached and questions to be posed in dialogue events on nanotechnology. These are based on the issues raised in the RS/RAEng report plus other reports, events and experience. This 'basket of questions' was intended as a guideline but they were not intended to be prescriptive. Event organisers were encouraged to pick questions grouped around one or more existing themes, or choose an entirely new theme.

Nanotechnologies

- What encompasses the term nanotechnology? How is it different to other sciences and technologies?
- Who is developing nanotechnology? Who is it being developed for?
- What different types of nanotechnology are possible? Should they be treated differently?
- What current and potential future uses can nanotechnology be put to?
- What issues do different types of nanotechnology raise?

Regulation & Funding

- Should nanotechnology be treated differently to other science and technology? Why?
- What regulations/assurance would you want to see in place?
- Who should regulate the development and use of nanotechnology? How?
- Are there any areas of research or uses of nanotechnology that should not be allowed?
- How much money should be put into nanotechnology research? By who?
- Where should the funding go? How should it be distributed between different areas of research?

Benefits & Concerns

- How could nanotechnology improve our lives?
- Who will benefit from nanotechnology? How will they benefit?
- What concerns does this new technology raise?
- How might it affect society?
- What do you think are the main risks associated with nanotechnology?
- How should these risks be dealt with?

Fact v fiction

- What is nanotechnology currently used for?
- What possibilities are there for uses of nanotechnology in the future?
- When will these future uses of nanotechnology become available?
- Which stories of future benefits are possible? Which are science fiction?
- Which stories of future risks are possible? Which are science fiction?
- Who should decide the future direction of nanotechnology?
- How far can we go with nanotechnology? How far should we go?

Appendix 3: Examples of responses

Speech bubbles

To give an indication of the types of comments collected, the following is a sample from various events:

“What safeguards are there to ensure tech not hijacked by multinationals?” (Cheltenham Science Festival, to science minister)

“Ensure that nano technology poses no risk to the health of the consumer at all.” (Young People’s Parliament, to a scientist)

“Unexpected results that may not be reversible” (Dana Centre, in ‘Risks’ bubble)

“Get your information from the people working in this field and not the spin doctors” (Royal Institution, to science minister)

“You shouldn't decide anything unless you know all the risks involved and how you can find a cure. You shouldn't decide anything unless you have a cure.” (Young People’s Parliament, to science minister)

“Do not research into armament application of NT” (Royal Institution, to a scientist)

“Not sure - see this as incremental not paradigmatic” (Dana Centre, in ‘Moral Implications’ bubble)

“Hopefully, profits - engine of progress! Improved health treatments” (Cheltenham Science Festival, in ‘Benefits’ bubble)

To give a sense of the range of responses from the speech bubble forms, the following tables group comments collected at the Young People’s Parliament event into broad categories:

Question 1: If you could say or recommend anything to the following people about nanotechnology, what would it be?

Table 1: Scientist

Answer	Number of responses
Research the potential risks of nanotechnology	16
Do more research (unspecified)	14
Research the potential benefits of nanotechnology	4
Consider ethics	4
Inform/engage the public	3

Table 2: Science Minister

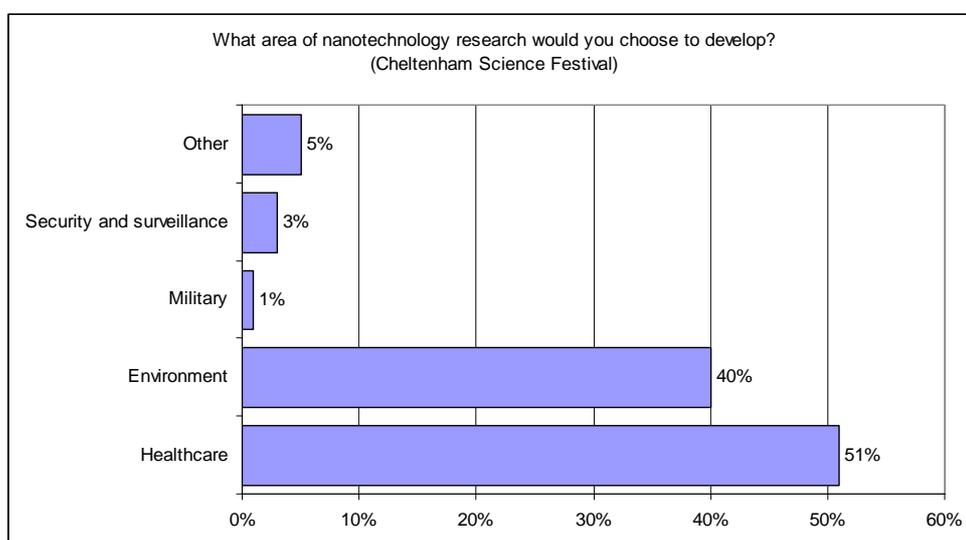
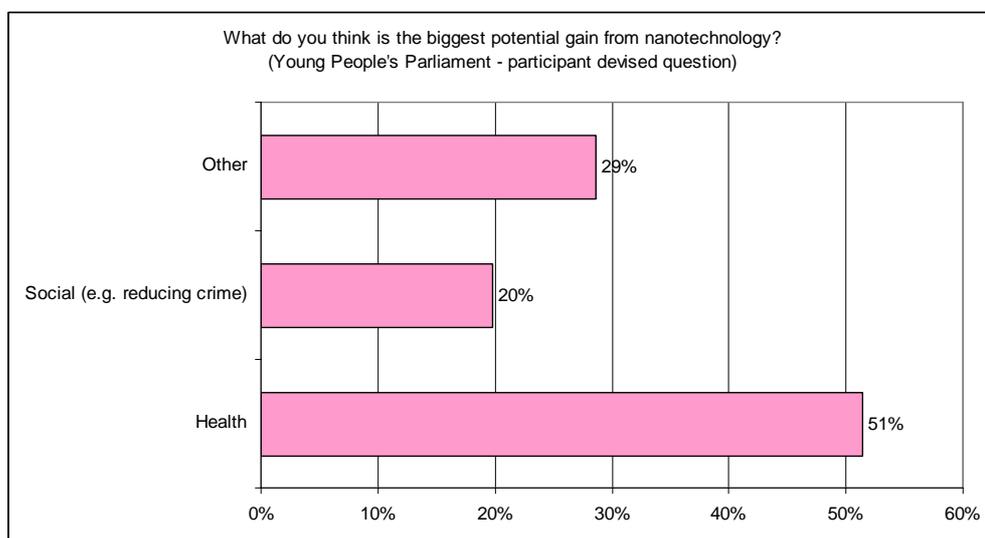
Answer	Number of responses
Test risks and safety	9

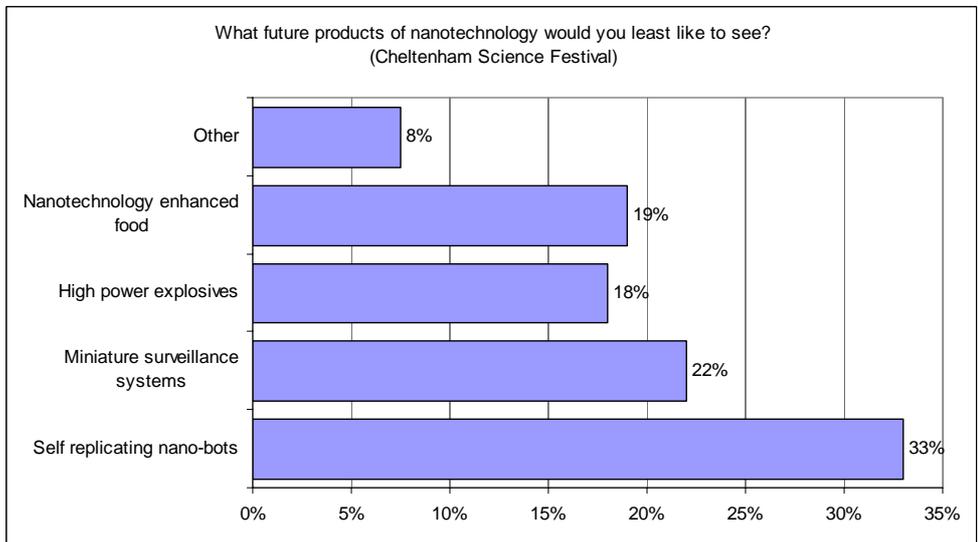
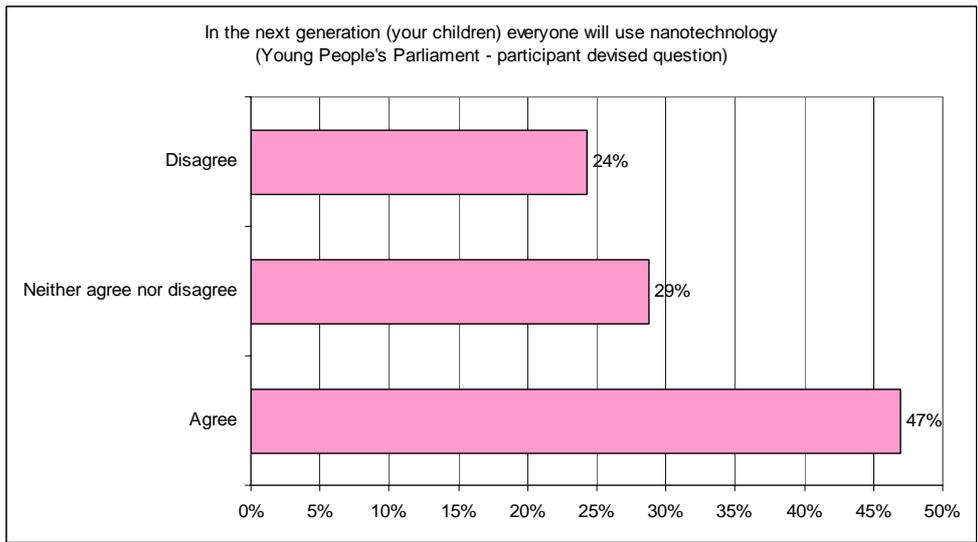
Keep the public informed/engaged	8
Provide more funding for research	7
More regulation	3
Less regulation	1

Electronic voting

For the science and society questions, items from the Wellcome/OST (2000) study *Science and the Public* and the MORI (2005) *Science in Society* survey were used, so the results could be compared with a larger baseline. The voting system was limited to three response options, so responses were pooled where appropriate. In the final plenary session, the students voted on questions they had devised themselves.

Similar questions were also asked at the Cheltenham Science Festival. The two sets of results are presented for comparison below:





Appendix 4: A summary of UK Government statements on the use of dialogue in nanotechnology policy development

This appendix is a summary for sci-com practitioners of government statements on dialogue. One of Small Talk's roles is to investigate the scope for sci-com practitioner-led dialogue initiatives to contribute to the process of developing policy for nanotechnologies. As part of this investigation we have examined the Government's current attitudes towards dialogue in general and its role in the development of nanotechnologies in particular.

This summary draws on four recent documents:

HM Government, Sept. 2005, Government Response to 'Council for Science and Technology, March 2005, *Policy through dialogue: informing policies based on science and technology*' (<http://www2.cst.gov.uk/cst/reports/files/policy-through-dialogue/response.pdf>) April 2006.

HM Government in consultation with the Devolved Administrations, August 2005, *The government's outline programme for public engagement on nanotechnologies* (<http://www.dti.gov.uk/files/file27705.pdf>) April 2006.

HM Treasury, DTI, DfES, July 2005, *The ten-year science and innovation investment framework annual report* (London: HMSO) (http://www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm) April 2006.

HM Treasury, DTI, DfES, July 2004, *Science and Innovation Investment Framework 2004–2014* (London: HMSO) (http://www.hm-treasury.gov.uk/spending_review/spend_sr04/associated_documents/spending_sr04_science.cfm) April 2006.

Summary

The Government:

- Does not see itself as the sole arbiter of public debate on nanotechnologies
- Wants to promote coherence in public engagement with science
- Wants to build capacity for engaging with the public
- Wants to develop a corporate memory of past experience to enable collective learning with regard to public dialogue on science and technology
- Is committed to supporting other organisations involved in dialogue
- Recognises that skills necessary to plan, organise, deliver and evaluate participatory process of public dialogue may be held by sci-com practitioners rather than government departments and agencies
- Believes that consultation and public dialogue processes are important routes for enhancing the evidence base for policy
- Intends get the Nanotechnology Engagement Group to mediate partnership between government and other organisations by organising face-to-face meetings and workshops, as well as by providing an online platform

The Government sees the purpose of dialogue on nanotechnology as:

- Enabling citizens to understand and reflect on issues related to nanoscience
- Exploring both aspirations and concerns about nanotechnologies.
- Enabling institutions working in the area of nanotechnologies to understand, reflect on and respond to public aspirations and concerns.
- Establishing and maintaining public confidence by understanding the public's concerns and showing their impact on Government regulation.
- Contributing to wider Government initiatives to improve the general trustworthiness of science and technology-related institutions.
- Contributing to wider citizen participation in public policy and service delivery.

However, the Government is keen to point out that the purpose of dialogue is not to determine but to inform policy and that the responsibility for decision-making must remain with the Government.

Good dialogue, according to the Government, ensures:

- The conditions leading to the dialogue process are conducive to the best outcomes
- The range of issues covered in the dialogue are relevant to participants' interests
- The dialogue process itself represent best practice in design and execution
- The outputs of dialogue can deliver the desired outcomes
- The process is shown to be robust and contributes to learning

More specifically, good dialogue should:

- Feed into policy along with commitment and buy-in from policy actors
- Be well timed in relation to public and political concerns and commence as early as possible in the policy/decision process
- Ensure that participants' views are taken into account
- Make clear to participants how their views will be taken into account
- Make clear to participants the extent to which they may be able to influence outcomes
- Be directed towards those best placed to act upon its outputs
- Be conducted fairly – with no in-built bias
- Be non-confrontational, with no faction allowed to dominate
- Include early statements of purpose and objectives
- Be conducted by people with necessary skills

However, these principles are not set in stone - the Government will continue to review them.

On the management of the dialogue process, the Government believes:

- Any consultation must follow Cabinet Office guidance. (What this means for sci-com practitioners who want to work in collaboration with the Government is not clear.)
- Public dialogue on science and technology must be driven forward within an explicit framework with top-level commitment
- Efforts to build the capacity for dialogue in science must be embedded within the broader context of the wider use of public dialogue to inform policy development more generally
- Each instance of dialogue should have clear governance arrangements

On the management of the dialogue process, the Government intends:

- To seek clear ways to identify where dialogue can inform policy and decision-making on science and technology
- To develop generic advice for identifying when to adopt dialogue. (It is not clear whether this advice is intended for or aimed at sci-com practitioners.)
- To ensure that the processes of participative dialogue connect to the machinery of government by linking them with the Nanotechnologies Issues Dialogue Group. (It's not clear whether this commitment applies to collaborations with outside providers of dialogue.)

Detailed Review

The following is a summary (with references) of government statements on:

- **Working with others on delivering dialogue**
- **The purpose of dialogue**
- **The characteristics of good dialogue**
- **The management of dialogue**
- **Linking dialogue to policy**

Government commitment to working with others on dialogue

- The Government's clearest commitment on working with the sci-com community on delivering dialogue is in the *Outline programme for public engagement on nanotechnologies*:
 - ... Government does not see itself as the sole arbiter of public debate on nanotechnologies. The debate is already live, and is occurring in many fora for which Government does not have, nor seeks, any direct control... Rather, we wish to work in partnership with those other initiatives (and any that may arise in the coming years) in order to gain a fully rounded view of the extent, scope and depth of public aspirations and concerns around issues emerging during the development of nanotechnologies. (OPPEN, para 15, p5)
- The Government sees its Sciencewise initiatives as complementary to other engagement activities:
 - The Government recognises that work funded through Sciencewise could not, and should not, be the sole vehicle for fostering wider public discussions around nanotechnologies, and that other groups are commissioning their own activities in this area. (OPPEN, para 5, p 2)
- It is committed to continue supporting other organisations (PTD-Response, para 21, p 6)
- One reason the Government is keen to work with others is to promote coherence in public engagement in science and technology (10YFW para 7.21, pp 108)
- The Government believes that it is essential to build the capacity for engaging with the public through dialogue on science and technology-related issues. (PTD-Response, para 15, p 5)
- The Government is also keen to develop a "corporate memory" of past experience that will enable collective learning with regard to public dialogue on science and technology (PTD-Response, para 3, p 1). Sci-com practitioners' experience may have a role to play here.
- The Government recognises that the skills necessary to plan, organise, deliver and evaluate participatory process of public dialogue may be held by sci-com practitioners rather than government departments and agencies. (PTD-Response, para 16, p 5)
- The Government's policy on consultation is developed by The Cabinet Office Better Regulation Executive. Any consultation must follow Cabinet Office guidance. (PTD-Response, Box 1, p 2). What this means for sci-com practitioners who want to work in collaboration with the Government is not clear.

- The Nanotechnology Engagement Group will support partnership with other initiatives working through face-to-face meetings and workshops, as well as providing an online platform. (OPPEN, para 15, p 5)

Government statements on the purpose of dialogue

- The Government's clearest statement on the purpose of public engagement on nanotechnologies (OPPEN, para 4, p 1-2) lists six reasons:
 - Enable citizens to understand and reflect on issues related to nanoscience
 - Explore both aspirations and concerns about nanotechnologies.
 - Enable institutions working in the area of nanotechnologies to understand, reflect on and respond to public aspirations and concerns.
 - Establish and maintain public confidence by understanding the public's concerns and showing their impact on Government regulation.
 - Contribute to wider Government initiatives to improve the general trustworthiness of science and technology-related institutions.
 - Contribute to wider citizen participation in public policy and service delivery.
- The 10-Year Framework also talks about the role of dialogue in fostering public confidence (10YFW para 7.7, pp 104-105) and its role in understanding the public's concerns and expectations (10YFW para 7.8, pp 105).
- The Government is keen to point out that, "The purpose of dialogue is not to determine but to inform policy" and that the responsibility for decision-making must remain with the Government (PTD-Response, para 7, pp 2-3)

Government statements on good dialogue

- The clearest expression of what the Government believes characterises good dialogue is found in *Government's Principles for Public Dialogue on Science and Technology* (OPPEN, Annex 1, p 7-9) which lists key principles organised into six categories that seek to ensure that:
 - The conditions leading to the dialogue process are conducive to the best outcomes (Context);
 - The range of issues covered in the dialogue are relevant to participants' interests (Scope);
 - The dialogue process itself represent best practice in design and execution (Delivery);
 - The outputs of dialogue can deliver the desired outcomes (Impact);
 - The process is shown to be robust and contributes to learning (Evaluation).
- These principles include the following:

- It may not be advisable to embark upon a dialogue process if it does not feed into public policy with commitment and buy-in from policy actors. (OPPEN, Annex 1, p 7)
- A dialogue process should ensure that participants' views are taken into account, with clear and transparent mechanisms to show how these views have been taken into account in policy and decision-making (OPPEN, Annex 1, p 9)
- A dialogue process should be well timed in relation to public and political concerns and commence as early as possible in the policy/decision process. (OPPEN, Annex 1, p 7)
- A dialogue process should be directed towards those best placed to act upon its outputs. (OPPEN, Annex 1, p 9)
- A dialogue process should be clear about the extent to which participants will be able to influence outcomes. (OPPEN, Annex 1, p 8)
- A dialogue process should be conducted fairly - with no in-built bias; non-confrontational, with no faction allowed to dominate. (OPPEN, Annex 1, p 8)
- The Government's response to the CST's Policy Through Dialogue document adds the following:
 - Early statements of the purpose and objectives of dialogue, and clarity over how such dialogue will be taken forward into policy and decision-making will be essential. (PTD-Response, para 11, p 4)
 - Public dialogue must be delivered by individuals and groups with the necessary skills to plan, organise, deliver and evaluate participatory process of public dialogue. (PTD-Response, para 16, p 5)
 - Government must retain responsibility for decision-making. The purpose of dialogue is not to determine but to inform policy. (PTD-Response, para 7, pp 2-3)
- However, these principles are not set in stone. The Government has undertaken to continue to review and revise the guiding principles for undertaking dialogue, and will be flexible in their application (PTD-Response, para 6, p 1-2)

Government statements on the management of dialogue

- The Government's policy on consultation is developed by The Cabinet Office Better Regulation Executive. Any consultation must follow Cabinet Office guidance. (PTD-Response, Box 1, p 2). What this means for sci-com practitioners who want to work in collaboration with the Government is not clear.
- The Government embraced the CST's idea to develop a corporate memory of past experience that will enable collective learning with regard to public dialogue on science and technology. (PTD-Response, para 3, p 1 & para 17, p 5)
- The Government believes that public dialogue on science and technology must be driven forward within an explicit framework with top-level commitment. (PTD-Response, para 4, p 1)

- The Government will continue to review and revise the guiding principles for undertaking dialogue, and will be flexible in their application. (PTD-Response, para 6, p 1-2)
- The Government believes that each instance of dialogue should have clear governance arrangements and that a good starting point is the CST's suggestion for three specific roles:
 - sponsor (responsible for setting objectives and using the outcomes of the dialogue process);
 - directors (to oversee the process) and
 - contractors (to manage the process)

However, they argue that flexibility over such arrangements is important, but agree that whatever governance arrangements are adopted are communicated clearly. (PTD-Response, para 10, p 3)

- The Government believes that there must be clear ways to identify where dialogue can inform policy and decision-making on science and technology (PTD-Response, para 8, p 3) and intends to develop generic advice for identifying when to adopt dialogue (PTD-Response, para 9, p 3). It is not clear whether this advice is intended for or aimed at sci-com practitioners.
- The Government believes public dialogue initiatives should be adequately resourced from the outset but argues for flexibility and on-going learning in some circumstances (e.g. where the full scope of issues around a topic has not been defined). (PTD-Response, para 13, p 4)
- The Science and Society Directorate within the Office of Science and Technology is responsible for implementing the CST's recommendations on dialogue. (PTD-Response, para 22, p 6)
- The Government will ensure that the processes of participative dialogue connect to the machinery of government through linkage with the Nanotechnologies Issues Dialogue Group. (OPPEN, para 13, p 5)
- The Nanotechnology Engagement Group will support partnership with other initiatives working through face-to-face meetings and workshops, as well as providing an online platform. (OPPEN, para 15, p 5)
- The Government will establish a comprehensive programme for policy co-ordination and public dialogue around the development of nanotechnologies. (10YFW-Report, §1.28 p 11)
- The Government believes that departments and agencies seeking to embark on public dialogue on science and technology-related issues should have access to the skills necessary to plan, organise, deliver and evaluate participatory process of public dialogue and notes that these skills may be found outside government, for example in voluntary and community groups, among academic researchers, and within private businesses. (PTD-Response, para 16, p 5)

Linking to policy

- The Government believes that consultation and public dialogue processes are important routes for enhancing the evidence base for policy. The regulatory impact assessment process requires that policies and regulations are developed on the basis of robust evidence. (PTD-Response, Box 1, p 2)
- There must be clear ways to identify where dialogue can inform policy and decision-making on science and technology. (PTD-Response, para 8, p 3)
- The most valuable dialogue processes will not feed into public policy with commitment and buy-in from policy actors. (OPPEN, Annex 1, p 7-9)
- The Government will establish a comprehensive programme for policy co-ordination and public dialogue around the development of nanotechnologies. (10YFW-Report, §1.28 p 11)
- The outcomes of dialogue will help decision and policy makers in relation to their role in setting the direction of research and the regulation of nanotechnologies where this is needed. (OPPEN, para 2, p 1)
- Efforts to build the capacity for engaging with the public through dialogue must be embedded firmly within the broader context of the wider use of public dialogue to inform policy development. (PTD-Response, para 15, p 5)
- The Government will ensure that the processes of participative dialogue connect to the machinery of government through linkage with the Nanotechnologies Issues Dialogue Group. (OPPEN, para 13, p 5)

Appendix 5: Influencing Policy: A Guide for Science Communicators

*“Laws are like sausages. It's better not to see them being made.”
Otto von Bismarck (1815 - 1898)*

Introduction

Often, one of the objectives of public dialogue events is to influence policy. But we're often asked, how do you influence policy? Who do you need to speak to and what are the secrets of success?

We don't believe that there are any magic answers to this question. Our experience and discussions with policymakers has taught us that influencing policy means communicating with policymakers. And that is no different to communicating with any other audience – you need to do your homework and develop a clear and effective communication strategy.

This guide is written specifically for science communicators and aims to show how the skills and tools we use every-day to communicate our science to wider audiences, are the same vital skills we need for influencing policy.

Step 1 –Do your homework

Understand how government works

To influence policy, the first step is to understand IN DETAIL how legislation and public policy is conceived, formed, debated, approved and implemented. There are many guides that will help you learn more about these processes, including the Houses of Parliament's website, which gives links to the Welsh, Scottish and Northern Ireland Assemblies. More details in the links at the end of this document.

Understand how Government REALLY WORKS

Government legislation is rarely written by the elected representatives themselves – outside the formal procedures and structures, there are tens of thousands of civil servants, local government officers, political staff and advisers who are involved in shaping and influencing public policy. Getting to know who these people are and how they work is difficult, but important if you want to make an impact at the earliest stages of thinking. Unfortunately there's no directory listing their names and government department websites rarely give officers' names, so you need to think creatively about how to identify these people.

Government departments regularly publish consultation documents on their websites, so keep an eye out for consultations on relevant topics – giving a useful and thoughtful response to a consultation that might not touch your lobbying point but is related nevertheless could put you in contact with the relevant civil servant; members of advisory bodies are usually listed on websites and are often academics so much more easily contactable; don't forget that civil servants (particularly younger ones) tend to move posts frequently, so maintain contact to keep track.

Above all, this is a big and long-term networking job – you and your organisation needs to invest time and effort in building these relationships if you're to have real impact on policy.

Don't forget regional and local government

Increasingly power is being devolved from National government to regional and local authorities and their role in matters such as climate change, education and health is significant. While reaching them can involve many individual contacts, local councillors are often more accessible than Members of Parliament and targeting the right individuals (executive members) can be very productive. There are also umbrella bodies such as the Local Government Association who might be able to help you reach the right people, or raise the profile of your issue.

Know your stuff

You need to be very clear about the issue you are hoping to influence – what's the background and history to the matter? What is your evidence? Where has it come from? What other evidence, perhaps to the contrary, is there and why is yours the most robust?

Step 2: Develop an effective campaign

The things you need to think about when developing an effective public affairs campaign are the same things you think about when developing any effective communications strategy:

1. Market Research

Who is proposing what at the moment? At what stage in the decision-making process is the policy? Is it in discussion, draft or has a firm proposal been made? Is there a realistic chance of changing it at this stage?

Keeping informed of pending legislation relevant to your issue will be important here. Details can be found on websites such as the UK Parliament site and theyworkforyou.org.uk Some of these sites even offer the opportunity to sign up for regular updates of forthcoming parliamentary business.

2. What is your message/position?

What message do you want policymakers to take away? Do you want legislation changed, delayed, stopped? How?

3. Know your audience

As well as knowing who will be making the decision and when, who do they take advice from? Who are potential allies and who are potential opponents?

4. How can you reach them?

The approach you take to developing your campaign needs to depend upon the best ways of catching your audience's attention – are MPs more likely to read a letter to their constituency office or an article in 'the House' magazine? Would responding to a timely consultation survey be more effective in reaching key civil servants than a seminar in Westminster?

Things to think about:

- Are there any external, national events happening that your message could chime with?
- Will your work be more effective done publicly or quietly? Great media coverage can help raise the profile of your campaign and bring greater

pressure to bear on policymakers but becoming a ‘renowned critic’ of government can undermine your credibility and close you out of discussions.

- Will working with others to form a collective voice, through an industry or professional association increase your impact significantly? Think about the impact that the Royal Society would have compared to the impact of an individual scientist.

Step 3: Presenting your case

Evidence, stupid

Policymakers, whether civil servants or politicians, need evidence for the basis of their decisions. If you want your case to be heard, present them with the evidence – no amount of emotion and passion will make up for cold hard facts based upon thorough research.

And don't forget your audience

Think about the policymakers objectives and present your evidence in a way that demonstrates how it relates to their policy objectives

What's next?

Ministers, politicians and policymakers are busy people, so get your points into a one page bulleted document. If they want more detail they'll ask. And be prepared to answer their questions – while politicians have to know about lots of issues, they are usually very good at getting to the nub of the matter and so don't be shocked if they ask you very direct and insightful questions. You'll lose any credibility if you flounder at the first one.

Seize your moment

It's very rare to get invited in for an hours' meeting with a minister. You might get 30 seconds with them when you shake hands at a drinks reception at party conference though, so make sure you have the point you want to make ready in a 10 second sound-bite.

Case study

A scientific society was carrying out a series of dialogue activities looking at genetics and health. The dialogue events had produced a number of issues of interest to policymakers in the Department of Health and while the society had send details to the relevant civil servants, none appeared to engage with the issue.

By coincidence, this piece of work coincided with the Labour party's Spring Conference. One of the project team was attending in a personal capacity and found themselves sitting next to the public health minister at breakfast. Taking a chance, the project member introduced themselves and explained that the society had some interesting research on health and medicine, offering to forward more information. The minister was immediately interested, explaining they had a personal passion for public involvement in decision making and later arranged for the project team to present their findings at a formal meeting for the Secretary of State.

Notes

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Endnotes

ⁱ Royal Society & Royal Academy of Engineering, 29 July 2004, Nanoscience and nanotechnologies: opportunities and uncertainties (URI: <http://www.nanotec.org.uk/finalReport.htm>, Aug. 2006)

ⁱⁱ House of Lords Select Committee on Science and Technology, *Third Report* (February 2000), (<http://www.parliament.the-stationery-office.co.uk/pa/ld199900/ldselect/ldsctech/38/3801.htm> Aug. 2006)

ⁱⁱⁱ Rebecca Willis, James Wilsdon 2004, *See through science: why public engagement needs to move upstream* DEMOS (URI: <http://www.demos.co.uk/publications/paddlingupstream>, Aug. 2006)

^{iv} Royal Society & Royal Academy of Engineering, 29 July 2004, Nanoscience and nanotechnologies: opportunities and uncertainties (URI: <http://www.nanotec.org.uk/finalReport.htm>, Aug. 2006)