

# Science, Risk and the Media – do the front pages reflect reality?

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## Foreword

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The interesting discussions below include certain common themes: that there is a mood of suspicion towards science and experts, that scientists are generally bad at getting the public to understand their work and that have little knowledge of science and love a good scare story. Hence the misunderstandings about issues like MMR.

Perhaps, however, things are not quite as bad as they seem. Firstly, more scientists are prepared to take part in public discussion and to talk more openly about their work. Some five hundred recently admitted publicly that they perform experiments using animals. Secondly, it is clear that the public is prepared to modify its suspicion of science if it sees clear benefits and if issues are explained honestly.

So far, for example, European consumers see no benefit to themselves from genetically modified crops, unlike millions of small-scale farmers in developing countries who now grow GM cotton. This attitude will probably change when GM products on the market are more nutritious or cheaper. Stem cell research was accepted because it is likely to benefit sufferers from diseases like Parkinson's and Alzheimer's. Scare stories about mobile phones were ignored because the public loves them.

We should also note the success of the Food Standards Agency under Sir John Krebs, its former chair. Nothing is subject to more false alarms than food. Yet Krebs always judged by scientific evidence and never compromised. He infuriated consumer activists by stating that there was no evidence that GM food was harmful to human health or that organic food was more nutritious than conventionally grown food. Yet public confidence in the FSA grew steadily. He achieved this by holding FSA meetings in public and never understating risk or

claiming some product was absolutely safe when it was not.

MMR, he observed, could perhaps have been handled more successfully by saying: yes, all vaccines carry some risk, but the riskiest course is not to vaccinate, the next riskiest is to vaccinate against measles, mumps and rubella separately and the least risky is the triple vaccine.

Restoring confidence in science will not happen suddenly by gimmicky solutions, such as having 'the public' decide what is worthwhile research, or treating lay opinion as just as valuable as that of experts. As the following discussions more or less illustrate, openness and honesty provide the key to trust.

**Lord Dick Taverne, Chair, Sense About Science**

## Introduction

### Jacqueline Cassidy, Head of External Affairs, SMF

Scientific discoveries and advances in technology bring profound social change, from vaccines and GM crops to the internet and mobile phones. As a result policy makers are faced with the issue of how to communicate scientific ideas, and the benefits and risks involved. This is not easy. The House of Lords Select Committee report on Science and Technology identified a chronic distrust by the public of the government and industry on scientific issues.<sup>1</sup> Gaining public confidence is not helped by the media's desire for an eye-catching story with headlines such as 'Mobile phones make you blind'<sup>2</sup> and 'Frankenstein comes to life'.<sup>3</sup> This suggests that it matters not just whether science is reported in the media, but also how it is reported. In the worst case, misrepresentation of the facts may be dangerous or even have fatal consequences.

Scientists and journalists all agree that the interests of the general public should be paramount in science reporting, but of course in practice interpreting that aim is subjective. The Social Issues Research Centre has drawn up a Code of Practice on Science and Health Communications which poses the following hypothetical scenario to be considered by journalists themselves when writing a science story:

[Imagine...] you are a scientist about to be interviewed on research results you believe to be important.  
Or, you are a journalist responsible for the same research results. Imagine that you have a relative or a close friend who is sensitive or vulnerable to information about a particular topic (for example, a cancer patient or a parent considering a vaccination for a child.). If the only source of information available to that relative or close friend was the interview you are about

to give or the report you are about to publish, would you be comfortable with the way you propose to characterise and interpret the story?<sup>4</sup>

This Code of Practice was introduced after one of the most sensationally presented stories of recent years: the reporting of the research study that connected the MMR vaccine with autism and bowel disease in children. This was published in 1998, but the repercussions continue, with the average take-up of the vaccine in the UK still only around 80% in 2004.<sup>5</sup> The way in which Andrew Wakefield's research was reported created the erroneous impression among the general public that there were competing bodies of evidence both for and against the vaccine's safety and that the scientific community was evenly divided in its opinion of the research. In fact Dr. Wakefield's research was widely criticised by the scientific community, and other studies failed to corroborate his findings. Equal amounts of coverage were given to the view espoused by just one research team as to the opposing view that was much more widely supported. Whilst in some cases this may have been an attempt to achieve balance, by covering both sides of the argument as though they had equal support amongst the scientific community, the effect was to give more weight to one side than was due on the basis of the evidence.

The media has a famously short attention span, and is sometimes accused of an unwillingness to correct itself. After publishing the initial report and planting the idea of a link in the public mind, later research which put the opposite view received much less attention. Five years after the story came out, researchers at Cardiff University found that 50% of British people still believed that medical science was split down the middle over the safety of the combined jab, while 53% believed that there was equal evidence for both sides. Only 23% of people realised that the evidence was heavily weighted in favour of the jab's safety.<sup>6</sup> What is more concerning, however, is the apparent willingness on the part of the public to believe that there was collaboration between government and the scientific community to provide cover-ups in the matter of public health, despite reams of evidence from independent scientists to the contrary. As one contributor to BBC *Talking Point* says,

4 Social Issues Research Centre Code of Practice/Guidelines on Science and Health Communications, September 2000 (SIRC with Royal Institution) [www.sirc.org/publik/cop\\_guidelines\\_1.html](http://www.sirc.org/publik/cop_guidelines_1.html)

5 [www.timesonline.co.uk/article/0,,2-1610014,00.html](http://www.timesonline.co.uk/article/0,,2-1610014,00.html)

6 *Science or Sensation*: Hargreaves, Lewis & Speers, 2003: [www.hero.ac.uk/uk/research/arc\\_hives/2003/science\\_or\\_sensation5186.cfm](http://www.hero.ac.uk/uk/research/arc_hives/2003/science_or_sensation5186.cfm)

1 Lords Select Committee on Science and Technology, Third Report, 23rd February 2000

2 *Daily Mirror*, 7th August 2005.

3 Report on GM Crops. *Daily Mail*, 26th July 2005.

‘just because no evidence supports a link between the MMR vaccine and autism does not mean a link does not exist.’<sup>7</sup>

The government’s efforts to persuade people that the injection was safe have been at least partially unsuccessful. There seems to be an indication that the public may be less willing to believe that something is true if the government espouses it, even if the research or information originates from non-government sources. Unfortunately, the root of such suspicion may lie in part in the government having provided misleading information in the past on subjects such as the Porton Down medical experiments on military personnel, the BSE controversy, and links between pollution and health problems.<sup>8</sup>

This mistrust of the government and its motives coupled with a sensationalist tendency in some parts of the press (particularly amongst non-scientifically trained journalists) lie at the heart of the problem. Particular difficulties arise when a scientific story becomes a political one and balanced scientific reporting is left behind in the face of a ‘good’ political story.

The seminars on which this document reports attempted to tackle some of these difficulties and to establish the respective roles for government and industry in increasing public confidence in science. We asked the question: can governments be more open about scientific issues? Can they be more robust in countering, in the words of Evan Harris MP, ‘anti-science’? Some of the complex and difficult issues that await Tony Blair’s government in its third term will bring these debates into sharp focus: not least consideration of the possibility of further investment in nuclear energy, the use of stem cells in medical research and the on-going challenge of climate change.

7 [http://www.thefridayproject.co.uk/hi/tft/culture\\_and\\_society/001404.php](http://www.thefridayproject.co.uk/hi/tft/culture_and_society/001404.php)

8 *Fear of political embarrassment led to government cover-up of link between air pollution and lung cancer*: London School of Hygiene and Tropical Medicine, 2002  
<http://www.lshtm.ac.uk/news/2002/smogpollution.html>

## Liberal Democrat Party Conference

**Vidhya Alakeson, Director of Research, Social Market Foundation** opened the meeting by highlighting the differing ways in which public involvement in policy making can take place. On the one hand there can be the kind of ‘hands-off’ approach the government took in the case of GMOs, which resulted in a negative reaction from the public. On the other hand government can be far more open, as exemplified by the way in which the government has responded to the emergence of nano-technology. Early on in its development, government launched a review run by the Royal Academy of Engineers into the potential social and environmental risks of such innovation. These two situations provide lessons from which government can learn when and where they start to involve the public and the need to be open about the development of science.

**Sandra Gidley MP, Liberal Democrat Health Spokesperson** suggested that it sometimes seems that the only way to interest the public in science is to have something ‘wacky’ with which to hook them. She reflected that we often do not get beyond the ‘scary’ headline: and that these sensationalist headlines are sometimes not accompanied by any attempt to put them in context. She argued that this can create huge hurdles for health professionals.

Discussing the mobile phone ‘scare’, Mrs Gidley remarked that her husband is an engineer who believes that mobile phones carry greater risks than a mobile phone mast. However, she reflected that every councillor and MP receives representations from the public about the phone masts going up, and when they ring to complain about them, it is usually on their mobile phone.

Mrs Gidley expressed concern about the apparent lack of understanding of science, particularly among political journalists, who often do not take the time to get involved in the fine details. She suggested that we have to get beyond the idea that it is acceptable to be ignorant about science while it is not acceptable to be ignorant about the arts. She believes that this is something we have to address right at the beginning of children's lives at school.

**Dr Evan Harris MP** suggested that there is a war in this country between science and anti-science. He reflected that some people go out of their way to say that we must not accept something because it is science; that we should never trust scientists; or that we cannot allow an approach to be measured and judged by scientific methods because they are not appropriate. In his view, the best example of a scientific scare story was the debate about MMR, and that such scare stories are very powerful tools for selling papers. In spite of the fact that there were a number of studies which found that there is no evidence of risk of autism or bowel disease from the MMR triple vaccination, he said that these received a tiny fraction of the coverage given to the Wakefield study.

Dr Harris suggested that the solution to such problems probably relies on working more closely with editors on the policy implications and social and health consequences of the way they behave, as well as dealing with the way health researchers release their results. However, he acknowledged that politicians must also be responsible. The Liberal Democrats supported the government in the MMR case because to do otherwise would have meant urging the government to go against the advice of their scientific and medical advisors.

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*The best example of a scientific scare story was the debate about MMR, [...] such scare stories are very powerful tools for selling papers*

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He also argued that the precautionary principle should mean proceeding with caution in a research-based way, looking for early signs of problems, and being prepared to invest more in investigating those problems. Using the precautionary principle by jumping on the bandwagon and saying 'no' to something because there is an alleged scare around it is the wrong approach. Campaigners against mobile phone masts openly misquote the Stewart Review by claiming that it states that you cannot build mobile phone masts near schools because they cause harm. In fact this is nonsense. The evidence actually shows that mobile phones save the lives of people who are isolated or in trouble. Dr Evans said that we have to develop a better understanding of the correct policy response to considering the precautionary principle since this is sometimes misused. Policy should be evidence-based, meaning that political parties and government must be prepared to demonstrate the evidence base for certain policy guidance, as well as the strength of that evidence.

**Vivienne Nathanson, Head of Science and Ethics, British Medical Association** opened by saying that we often underestimate the willingness and enthusiasm of the general public to better understand what is going on in science. When the media oversimplify things or mislead, she said, it is not doing anyone a service. *The Guardian* recently made the interesting point that, until recently, all its science reporting was done by arts graduates. However, they have now taken the radical step of employing people with science backgrounds who could not only understand the science that research scientists were presenting, but had the journalistic skill to translate that into language that the ordinary public could understand.

When science is misunderstood, she said, it often seems to be considered as failure on the part of scientists to communicate the message properly. However, editorial policy can also be a problem; the editorial policy at some newspapers is such that one would think evidence-based reporting did not exist. There are also issues of balance and bias, she said. Stories on the MMR debate failed to report that there was one doctor on side A and many on side B; when you read the story, it appeared that there was an equal balance to the argument, when this was not the case.

She also discussed the fact that sub-editors can change the nature of a story. Sub-editors are skilled at writing memorable headlines, but sometimes the headline may bear no relationship to the balanced story below it. She gave the example of the situation in which a neurosurgeon had reported that he had tried the first experimental procedure to put foetal brain cells into the brains of people with advanced Parkinson's disease. One newspaper said, 'Experimental Surgery May Hold out Early Signs of Hope for Advanced Parkinson's Sufferers' but another said, 'Top Docs in Brain Swap'. In this latter case, the story below the headline was pretty accurate, and the headline would have persuaded people to read the story. But, she argued, the power of the headline to mislead is not to be underestimated.

She suggested that we do, however, underestimate the concept of relative risk. She raised the case of the anti-arthritic COX-2 agents, which are no longer on the market because of their association with heart problems. However, she reflected that the news coverage did not reflect the fact that these were amazing drugs for people experiencing unbearable pain. For some people, life would not have been worth living without these drugs. She said that we have to understand that there are groups of drugs people will take regardless of the risk because they are the only things that make their lives worth living.

**Mike Dolan, Executive Director, Mobile Operators Association** said that there are now more than 60 million mobiles in circulation in the UK, and that they bring benefits to the community in a range of ways. Without a network of base stations covering the areas in which people want to make and receive calls, phones would not work or they would lose coverage. He reflected that despite the fact that this nation and the world have embraced mobile technology wholeheartedly, some people still have concerns about both phones and base stations.

He made the point that this is an area of science that has been looked at extensively over the last few years by expert scientific committees around the world. Earlier this year a report published by the Health Protection Agency said that no evidence had been produced to suggest change. However he also made the point that although more scientific research has been conducted, this does not provide us with a guarantee

that there are no problems with the use of mobile phone technology. Some scientific questions remain unanswered, and because of this we need to continue doing research and the industry has said that it would continue to support that. The World Health Organisation also has a unit dedicated to this area.

On the other hand however, the media treats the issue as a scare story. The day the Stewart report was published, the afternoon front-page headline of the *Evening Standard* was: 'Mobile Phone Safety Chaos'. He said that the committee did a very good job weighing all the evidence and recommending a precautionary approach based on the findings, but that this reasoned approach was in contrast to the media's immediate reaction. He suggested that there is a continuing gap between what the media puts out and what the scientists are actually saying. This raises problems because once concerns have entered the public consciousness, it is difficult to respond to them.

He argued that politicians and all of those involved in this issue need to try to get it right. They need to understand the importance of the peer review process. The Science Media Centre – an independent centre operating out of the Royal Institution – has been of great benefit to science and the media. He said that, ultimately, this is about communicating correctly, so that the public can feel confident that it is receiving accurate information.

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## Discussion

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### Contributions from the audience included the following points:

- While engineers and scientists attempt to help people understand their stories, part of the problem is that Whitehall and Westminster are technically illiterate, something that is not helped by the media. For example, there is not a single British ambassador with a scientific or engineering background. However, we must avoid the presumption that a scientific career is necessary for people who deal with public policy.
- Anti-science people often refuse to engage in any debate, and to talk with scientists.
- Policy-makers in the Civil Service, particularly when they are

dealing with a policy that can be subjected to testing, must understand what proper trials are, and how to differentiate between different types of evidence.

- Policy-makers and the public must understand the limits of the scientific method.
- People often want certainty, but science cannot give certainty; it can only say, for example, that there is no evidence that MMR causes autism or bowel disease. However, some people will not be converted by any evidence; the issue for them can often be conceived in theological terms for example.
- Some onus should be placed on scientists to communicate their research clearly to the media in a way that does not require technical language or specialist understanding. Some research councils are trying to improve this by offering training about how to communicate research to the media. However, scientists should not believe that they are the only people who need to communicate science; their job is to communicate with the journalists, who communicate with the public.
- The link between funding and publicity for new research needs to be broken. Secure funding routes for potential scientific discoveries must be identified.
- Language is also important. For example, in its early days, BSE was an important issue on which politicians were briefed by their science advisors. There was no evidence that BSE could jump species but politicians misinterpreted this and said that the evidence is that BSE cannot jump species. Evidence of absence and absence of evidence are not the same; the absence of any evidence of crossing species, as the scientists understood it, did not mean it could not happen.
- Politicians are not standing up to the challenges of engaging in scientific debate.

## Labour Party Conference

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**Ann Rossiter, Director, Social Market Foundation** started by noting that scientific issues reported in our national press are incredibly important to people both positively and negatively: they can generate hope but they can also cause real concern. When considering the way that science is reported, it is also important to consider that people's understanding of risk is influenced by their control, or lack of control, over a given phenomenon. She gave the example that people accept the risks of smoking but may be more frightened of something like nvCJD which is a much more minor risk. The important issue for scientists, media and politicians is that if people feel that their hopes have been raised or dashed, or that they have not been given an accurate understanding of the risks they face, there is a danger that the reputation of all parties involved will suffer. She argued that there is no benefit in asking who is to blame; it is more important to ask how we can ensure that scientific developments are properly understood by the public, and communicated to them.

### **Lord Sainsbury of Turville, Parliamentary**

**Under-Secretary of State for Science and Innovation** started by noting that the public is concerned about new scientific developments; in particular people are uncertain that the government has control over new developments. We, as a society and as a government, need to respond to those concerns.

A MORI poll showed that more than 71% of the population believe that the media sensationalise science. This shows us, he said, that people are sophisticated readers of newspapers, and do not always believe what they read. However, when the media gets it wrong, as they did with MMR, the consequences can be serious. He told the audience that the number of people being inoculated against MMR fell by 20% as a result of the

MMR controversy, increasing the danger of life-threatening diseases. Not all the media treated this in the same way. One particular tabloid ran some 700 stories on this issue in 1998.

Lord Sainsbury suggested that the problem comes when a story moves off the science page and into the political pages, where it is immediately transformed into a case of villains versus the good guys. At that point, the scientific arguments are lost.

He admitted that the government had done too little in the past to address people's concerns that regulatory systems had not kept up to date with new scientific developments but stated that it had now changed its approach to these issues. The government has moved from trying to help the public understand science to helping them engage with science. He said that the new approach would look at the implications for regulation of new areas of science, and what environmental, health and safety issues might be involved in any new technology. The public needs to be engaged so that they understand the issues.

The issue goes beyond educating people about risk; the issue is how they react to it. Most people make a calculation between risk and reward. Why do we view mobile phones differently from mobile phone masts? The benefits of phones discount any risks; the trouble with masts is people think that, living nearby, they suffer the risks whilst others gain the rewards. People will accept high risks as long as they have a choice about it. They will climb mountains if doing so is their decision. Furthermore, if there is any indication that the government can deal with a risk, but does not, people will become unhappy.

The government's new approach will also look at the implications for regulation of new areas of science, and what environmental, health and safety issues might be involved in any new technology. The public needs to be engaged so that they understand the issues. Having done the research, when the first problem arises we will be prepared, rather than facing a situation in which scientists come forward voicing contrary views.

**Vivienne Parry, Science Journalist, *The Guardian*** asked, 'Do the front pages reflect reality?' Her conclusion was that, for the public, they do; for the scientists, they do not. The everyday miracles of science do not appear in the headlines. People cross the Severn Bridge every day without

worrying that it will fall down. Journalists only like to write about the controversial science, she said, which is what goes wrong, not what goes right.

A story can also have a political agenda, she argued. MMR was not an enormous story until the *Daily Mail* used it as a way to lambaste the Prime Minister over whether his son had been vaccinated or not. That story moved from the back pages to the front pages, where it stopped being a story about science at all, and turned into something about politics or belief systems.

Turning to risk, she said that the public is addicted to risk: we watch scary films and go on big dippers. We love a frightening story. We love our phones, but we hate phone masts. We know we need our phones to talk to our mums, but we cannot see what we are getting from phone masts. All the things which have scared the British public recently share something in common, she said: they are new. We do not worry about electromagnetic radiation from electricity substations, but about phone masts, BSE, etc: the things with unknown consequences.

Public concerns are not fabricated by the press. The newspapers that most accurately reflect what their readers are saying are bought by those readers again and again, creating a vicious circle between those readers and the newspapers themselves. She argued that the public are swayed by anecdote; we are influenced more by things told to us by our friends and neighbours than issues with which we do not have that personal connection. This often has nothing to do with science at all, although the scientists and the press still have to tackle it.

Within science, there is an enormous pressure to hype your study in order to get funding, she argued. Blame does not entirely lie with the media folk. We rely on scientists to tell us

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*MMR was not an enormous story until the Daily Mail used it as a way to lambaste the Prime Minister over whether his son had been vaccinated or not.*

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what is what, and we are being bamboozled. This is particularly difficult in new areas, where there are not many people from whom we can gauge a counter opinion.

What might we do to overcome all of this? To move on we must accept that not everybody needs to know what scientists know – the public needs a Bluffers' Guide to science. Politicians and scientists must also accept that they are not going to change the media, she said. There will always be people with perverse views, people who stand out in the street and yell about them.

Dr Vivienne Parry made a number of recommendations for journalists:

- Check your source.
- Peer review is immensely important.
- Do not accept what you read on a press release.
- No journalist should be allowed to work without an understanding of statistics, and how to read a scientific paper.
- Use the Science Media Centre when science is in the headlines.
- Bring out the scientists, who are often reluctant to talk about controversial issues. Wheel out your best and brightest to counter the maverick opinions quickly, before the damage is done.

**Dr Vivienne Nathanson, Head of Science and Ethics, British Medical Association** said that top news stories always concern ethics – that is a way to sell stories. However, news stories are not given coverage that is proportional to the number of deaths with which they are concerned. Smoking, for example, has received less media coverage than nvCJD. Smoking is a big issue with enormous health implications, but 'smoking kills' is not a new story.

She argued that relative risks are not used by the medical profession in the same way as they are viewed in everyday life. For example, she believes that mobile phones are so useful that people would still want to use them even if medical risks were discovered. The most dangerous thing about commercial flying is not DVT or the plane, but the drive to the airport. Who is

getting this wrong, she asked? Too often, the scientists and the doctors are not good enough at communicating. They do not put things in context, but oversell new discoveries, saying they are the greatest things yet, before knowing just how valuable that discovery is.

**Mike Dolan, Executive Director, Mobile Operators Association** noted that the amount of radio wave emissions you receive when using a phone is 1,000 times more than you would ever receive from a mobile base station, yet it is the station with which people are concerned. The industry tries to address these concerns in a transparent way. It supports ongoing international research organised through the World Health Organisation. UK mobile operators alone have contributed 50% of the funding for independent Mobile Telecommunications and Health Research Programme.

There is a worldwide consensus on the status of science in relation to mobile telephony, he said. A report issued by the Health Protection Agency summarised the conclusions of 26 independent reviews released over the past few years: the balance of evidence does not suggest that mobile phones generate any risk to health under international guidelines.

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## Discussion

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**Contributions from the audience included the following points:**

- One contributor recalled being told that asbestos was perfectly safe, and not to have any concerns about leaded petrol. The press is duty bound to pay attention to distant voices, and to give them a face. He felt that public confidence would increase when the government properly assessed and grasped risk.
- Lone voices do need to be heard, because occasionally they are right. The difficulty is when that story keeps going long after it has been proven that the lone voice was wrong.
- Perhaps there is a role for an interdisciplinary science course, it was suggested. The speaker was a working scientist, but had never studied ethics, which might be applied to experimentation on animals, for example. Scientists are not trained in sociology, just as artists do not attend courses on science. Dr Nathanson

had been working with the Foreign Office in an attempt to prevent them from becoming involved in dual-use research – research that could lead to the development of weapons. As scientists are not usually educated in ethics, there was a need for a more cohesive strategy to teach scientists how to avoid dual-use research.

- Recent evidence has been used to assess the possible dangers of pesticides. Pesticides are vital to protect crops; but that benefit has to be matched by any problems. There has to be balance in the adoption of any new policy.
- It is the application of science that causes ethical questions in so many cases. If the government wants to gain better public trust when making pronouncements on safety issues, they should work more closely with the leading public bodies on such issues.
- The government has a bigger role to play in explaining the importance of technology and engineering to our economy.
- The Warnock Committee, which considered assisted conception, offers the model process for legislating new scientific issues. Its methods have been closely adapted for stem-cell research, ensuring that scientists can openly lead the public debate. The potential dangers of nanoparticles need to be assessed at this same early stage.

## Conservative Party Conference

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**Ann Rossiter, Director, Social Market Foundation** opened by noting that poor reporting of science results in the media losing credibility, as well as the scientists. This is dangerous because people stop paying attention to real risks. She said that the purpose of the discussion was about how best to explain science and its associated risks to the public.

**David Ball, Professor of Risk Management, Middlesex University**, highlighted the fact that everyone involved in risk comes across media stories which use high-impact imagery to shock people and implant ideas in their minds. For example, articles discussing nuclear reprocessing are coupled with pictures of people in skeleton suits lying outside government buildings. Therefore, we all have to be very careful about how we interpret headlines and images and how we convey information.

Research illustrates that human beings have two approaches to decision making, he explained. One is emotional reasoning, the ‘affective response’ or ‘gut reaction’. If we like the look of something we are attracted to it, and if we do not, we are repelled. This is a very rapid mechanism – occurring in fractions of a second – and it is mediated by all that we have seen and heard. The other is our analytic mechanism, which is mediated by conscious thought. This is logical and often numeric; it involves assessing risks and probabilities and it takes time. Most experts agree that we need both approaches to be good decision-makers.

Professor Ball said that people who wish to make a quick impression upon us use shocking imagery because this appeals to our immediate affective response. Nobody who saw the

planes hit the twin towers will forget those images. However, one result of 9/11 was that many Americans took to their cars for a period rather than flying. Many more people died on the roads as a result of those additional car journeys than were killed in the 9/11 attacks. Everyone knows about our emotional response to things, and we are exploited all the time, he said. This is not just true of advertising. For example, the money the US government allocates for clearing up environmental problems follows public opinion much more closely than it does the results of informed risk assessments.

He argued that a type of relativism has emerged as a result: a view that science and scientists are now discredited and everyone's view on these issues is as valuable as everyone else's. Professor Ball said that he understood the value of engaging the public with scientific debate. However, proponents of this relativism want to engage the public primarily – i.e. they believe the layman's opinion is just as important as expert opinion.

Professor Ball also noted the suggestion by Bob Hawke, the former Labour Prime Minister of Australia, that Australia should become the nuclear waste dump of the world because it has huge tracts of uninhabited land, the right geology, and because it would be paid handsomely for this service. The negative public response to this suggestion meant the Australian government totally ruled out the idea, even though it makes sense. It is tragic, said Professor Ball, that the emotional approach sometimes trumps more objective decision-making.

The front pages of newspapers are designed to sell copy, and therefore try to appeal to the emotional response. Analytic discussion will never be found there, but if you delve further into newspapers you can find detailed, analytic articles.

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*The money the US government allocates for clearing up environmental problems follows public opinion much more closely than it does the results of informed risk assessments*

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Politicians are in a difficult position because the public is swayed by headlines, pictures etc, creating pressure to respond immediately.

**Andrew Lansley MP, Shadow Secretary of State for Health** said that Harold Wilson claimed science for his own 40 years ago when he said 'we are going to adopt the white heat of technology'. At that time, the public retained its belief in science and how much it could do for them. This belief no longer exists in the same way. The media has drifted from discussing scientific applications/benefits to a 'clever tricks' and 'lets see how it works' approach. Although interesting, this does not advance our understanding of the benefits of science.

Public confidence in science has seriously declined in the past decade, but more perniciously, this seems to have given rise to a certain self-sustaining scepticism. Mr Lansley argued that the genesis of this was the BSE disaster. Time and again politicians announced that they were acting on scientific advice and then had to come back and admit these measures were inadequate. In the absence of certainty, assertions of relative certainties were made, bringing scientific assessment of risks into disrepute and giving opponents of science the opportunity to say 'they tell you it is safe now, but what about BSE?' Frankly, he said, the evidence emerging years later about the limited number of cases of nvCJD is irrelevant. In the public mind, science was used to disguise the reality of the risks, and to offset their concerns, particularly of some extreme, horrible outcome.

Mr Lansley suggested that the job of scientists is to engage in scientific debates, but that we need to be clear that we are not all operating in this objective world of scientific debate. We need to be clear that science only offers legislators information. Ministers should not claim they have received categorical advice when they make decisions. Rather, they should challenge the advice they do receive in a scientific and transparent way.

Pressure groups and part of the media are also galvanised to sustain these confused debates, as was obvious in respect of GM crops, he said. Although that debate suffered from early, counter-productive interventions by US companies, the real problem emerged when the debate became less about whether scientists could be clear about what was going to happen, but

rather whether they could be certain of what would not happen. There is a lot of copy in reporting the tiny possibility of a major event, but that is not the same as discussing the reality of genetic modification. Beyond the furore there is a genuine scientific debate to be had. We have seen good articles from both sides on the impact of GM crops on biodiversity. However, rather than pursuing an ongoing scientific debate, we have actually seen a public debate, he said. Lay people have been asked not only to decide which research is right, but also, and more worryingly, whether there is a case for utilising this kind of science at all, whatever its potential benefits.

Mr Lansley argued that media coverage always seems to apply the precautionary principle – i.e. if one cannot entirely exclude risk in a certain course of action, then this course of action should be dismissed. If this approach continues, he said, the potential opportunity cost is enormous. Imagine if the principle had been applied to concerns over mobile phone masts: there would be no mobile phones in the UK. The precautionary principle must always be tempered with the proportionality principle.

Mr Lansley said that more ministers must champion scientists. If not, our scientists will leave the country. If our scientists leave because ministers do not champion them then the US and China will march ever further ahead of us.

We must be clear about the role of scientists. They are not policy-makers; they are professionals and should be treated as such. Policy-makers must be clear that just because negatives cannot be proven, it does not mean we should not exploit science and technology where it has clear benefits. Moreover, they must use the scientific method, retaining serious reservations about the veracity of their own findings, and report all clinical trial data openly as well as all data/advice provided to government.

**Mike Dolan, Executive Director, Mobile Operators Association**, noted that the scientific community, industry, politicians and the media all have a role to play in communicating scientific stories. We must all be cautious of reacting to a single study, he said. It is true that most of the public do not understand the scientific method, and although science correspondents may have a better understanding, news desk journalists do

not. There are organisations trying to raise the level of debate and educate the public generally. In respect of the media, he mentioned the Science Media Centre which is an independent body, and which acts as a press office for science and constitutes a very good resource. He argued that ultimately, the media has a responsibility to provide a balanced view, not least because it is the only source of information for 70%-80% of people. There is no quick fix and the industry will continue to experience unbalanced reporting, but all of us have to get in there, tell it as it is, and make sure there is balanced information for people to make judgements on.

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## Discussion

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### Contributions from the audience included the following points:

- It was argued that ‘beef on the bone’ and GM foods provided two interesting examples of scientific controversy where consumers knew the risks and wanted the choice to buy, suggesting that consumers simply want the right to choose, and to act rationally. Two key issues lie at the heart of risk management for consumers: having transparent, independent information, and the choice to manage risk themselves.
- In the case of the MMR vaccine, the NHS has stated that it is inappropriate to offer interventions they know to be worse for patients – i.e. single vaccines. Politicians have wrestled with the consequences of this failure to offer parents a choice, which was that many children were not being vaccinated. There is in fact no good scientific outcome except for people to use the MMR vaccine. However, the government has only stated that MMR is safe, instead of carrying the public with them by explaining the difference between correlation and causation. The debate would never have taken off if the public understood science better.
- Nobody working in risk uses the term ‘safe’ professionally because it gives the impression of zero risk, and nothing is risk-free.
- This country has a wonderful philosophy on risk decision making, as stated in the Health and Safety at Work Act. This was based on setting a maximum tolerable level of risk and the

lowest level of risk deemed to be broadly acceptable – anything below this is unacceptable. Then, for anything between, the risk should be made as low as reasonably practicable. The speaker claimed that this is a crucial set of concepts because it takes account of the costs and benefits of different safety interventions, and that everyone should be taught about it in school because it is so important to our way of life and our prosperity.

- A single newspaper chose to campaign on the issue of MMR, and was resistant to the increasing weight of evidence against the case they were making. There was no plan to deceive the public, but that can happen.
- There is an issue about the mechanics of journalism and how journalists balance competing voices. How can a journalist decide whether one scientist's view is more legitimate than that of a very media-savvy lobby group? How can journalists resolve this dilemma?
- A recent technical paper alleged that when scientists undertake research relating to a potential hazard, there is a far greater probability they will get it published if they find a positive result than a negative one – i.e. if they find it to be hazardous rather than that there is no harm. In the speaker's view this was evidence this bias is rife within academic journals and not just the media. While peer-reviewed papers are generally considered reliable, his experience of peer reviewing and being peer reviewed meant he was not confident.
- It was argued that if it is a one-off story or something out of the blue, a journalist has to report it, albeit preferably as something being suggested, rather than fact. However, when it is clear a story will run for some time, that is when responsible publications should do their homework.

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9 *The Guardian*, Bad Science, 8th September 2005

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10 *Sense About Science*, an 'independent charitable trust responding to the misrepresentation of science and scientific evidence on issues that matter to society'; the Science Media Centre is 'first and foremost a press office for science when science hits the headlines.' It is housed within the Royal Institution but independent from it. It is guided by a Science Advisory Panel and a Board.

## Conclusions

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It is clear from the debates that there is a cross party consensus on the need to ensure that policy is based on sound scientific evidence; that journalists should aim for greater balance in their reporting; and that a greater knowledge of scientific research is needed amongst the public and the policy community.

In order to achieve better scientific understanding, and science-based policy making:

- There needs to be improved communication by all parties concerned – the media, the scientific profession and the government.
- A greater understanding of public perceptions of risk is needed. Feelings of choice and control influence how the general public responds to scientific developments.
- There must be an acknowledgement that the public gains its understanding of science from the media and therefore that journalists have a responsibility to be rigorous in their investigations, checking sources and not just relying on press releases, as well as distinguishing between theory and evidence. Measuring the weight of evidence, in particular peer review, is crucial rather than just amplifying lone voices.
- Scientific understanding must also filter further down the communication chain, to editors and sub-editors, to avoid the scenario suggested by Ben Goldacre where 'at least one person...is just juggling words about on a page'.<sup>9</sup> Where stories are handled by non-science trained staff, they should try to balance their reporting using resources such as the Science Media Centre and *Sense about Science*.<sup>10</sup>
- Newspapers and broadcasters should be encouraged to employ more science graduates on their staff, as some are beginning to do.

- It must be understood that academia also has a role to play in presenting an accurate science story. The message that scientists need to communicate better is slowly being heard, with universities now offering courses in Science Communication. Scientists and science graduates should be encouraged to undertake media training, if they are going to be expected to present their findings to journalists and broadcasters. But again balanced reporting is paramount.
- The connection between funding and media coverage needs to be broken, in order to avoid the sensationalism in the presentation of new scientific research.
- The precautionary principle needs to be married with the proportionality principle. Politicians, as well as scientists, should avoid the temptation to go for the headlines.
- Politicians need to learn how to counter a media scare story quickly. Having leading, and well-respected scientists ready to counter would help. They also need to lead on science and technology issues.
- Politicians need to weigh the risks and benefits of science-based policy, but most importantly they need to be scrupulous in providing the evidence base for policy making.

### **Information sources**

[www.senseaboutscience.org.uk](http://www.senseaboutscience.org.uk)

[www.sciencemediacentre.org](http://www.sciencemediacentre.org)

As scientific discovery and technology, from vaccines and GM crops to the internet and mobile phones, drive forward our society, policy makers are confronted with the increasingly difficult issue of how to communicate scientific ideas, and the benefits and risks associated with them, to the public.

The SMF held a series of debates during the Party Conferences, featuring leading experts including the Science Minister Lord Sainsbury, Vivienne Nathanson, Head of Ethics at the BMA and Vivienne Parry, Science Correspondent at the Guardian, to consider how policy makers can better engage with the public on scientific and technological issue.

This report of the events highlights the main issues surrounding this debate, as well as making recommendations for improving communication for policy makers, the media, scientists and the public.

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