



# Foresight Intelligent Infrastructure Systems Project

## Science Review Summary: Public Perception of Risk

### Risk Perception

The growing life expectancy of people in the developed world suggests that for this part of humanity, risk has never been farther away. But risk has become an increasing part of public debate. Much of this discussion centres upon the rapid pace of modern innovation, and increasingly divided opinions about how dangerous it might be. Other concerns arise from our increasing expectations of protection from disaster, crime and disease. The question of who should be responsible for managing risks is also raised with increasing frequency. Governments, employers, individuals or suppliers (in the case of product liability) can all have responsibility for risk.

The Foresight Directorate of the Office of Science and Technology, has encountered risk as a concern in many of its projects, which look at social, scientific and economic issues on a 15-20 year timescale. Risk is a key concern for two of its current projects, on Brain Science, Addiction and Drugs and on the Detection and Identification of Infectious Diseases, and for two recent projects, on Flood and Coastal Defence and Cyber Trust and Crime Prevention. Foresight asked Richard Eiser, professor of psychology at the University of Sheffield, to look at the many issues which affect the way the public perceives risk.

Risk is something we deal with every time we take a decision which involves uncertainty. The decisions we take are based on new information which we receive at the time (someone tells us they think the train is late), on the status of the person who tells us that information (was it a formal announcement, or someone walking out of the station?) our previous experience (the train is often late) and what we want (I need to get home from work so I will risk going to the station in the hope that the train will not be too late).

In any discussion of a possible risk with somebody, we need to understand what new information we need to provide, and also to consider their view of who is delivering the message, their existing experience, and the possible benefits they might consider they stand to gain from taking that risk.

Eiser's paper sets out the current scientific understanding of each of these factors and explains how they interact. This document is a short version of his longer analysis.

While the Office of Science and Technology commissioned the work, the findings are independent of Government and do not constitute Government policy.

## Providing new information about risk

*Who provides the information? Are experts the answer?*

Much of the debate about risk has centred on the apparent gap between experts and the public. But although experts are by definition better-informed than others, they do not have a monopoly of wisdom. By the same token, the general public may be regarded as too risk-averse in their dealings with innovations such as the internet or genetic engineering.

But such caution about possibly risky developments has stood the human race in good stead during its long evolution. In addition to being dangerous, a new activity involves effort, both in informing oneself about it and in performing it, that may turn out to be a waste of time and resources.

*Who to trust: seeking information carries psychological danger*

At some time in our lives, we all have to take decisions about which our information is incomplete. Then the opinions of friends and of experts come into play, more or less modulated by the media.

The key to these information flows is trust. We are likeliest to trust people we know well, and they are inherently likely to be people who share our views. This applies in corporations or government departments as much as it does in people's own lives. It reinforces the importance of having diverse opinions available when difficult decisions are being taken.

By contrast, it is more difficult to trust people we do not know and organisations with which we have not had personal contact. Experts may seem untrustworthy if they seem to have conflicts of interest, for example if a researcher is funded by big business or indeed by a pressure group. Experts can also lose trust rapidly if they are seen to be unreliable or dishonest. We rely on experts both to keep us informed about risks – where bias is a key hazard to trust – and to actually carry out difficult tasks. In this context, trust can also be damaged, for example when a simple attack on an online banking system penetrates its security or when a major rail crash occurs.

*Social amplification*

A key concept, along with risk, uncertainty, and trust, is social amplification. This term describes the many ways in which information about risks is amplified by some social processes and reduced by others. In processes of social amplification, a person's own knowledge is supplemented by other opinions which have been gathered and modulated by more or less official media. Individuals use such information to determine their own opinions. In addition, such signals can have more public consequences, for example when a public protest arises about some proposed new development. These developments also ripple outwards to other people, to new areas and to new groups. The opposite effect is social attenuation, when media and other key influencers decide not to stress a specific subject and interest in it becomes reduced.

Social amplification can lead to decisions that are politically unavoidable and are perhaps socially understandable, but which produce less than optimum results if the problem is regarded as being one of resource allocation. An example is policing. Public opinion often reveals a desire for police officers to be more visible ("Bobbies on the Beat") but this may well not be the best use of their time.

Not all media choose to amplify all risks. For example, the European media's approach to genetically modified foods has been far more sceptical than that taken by US media, and the US public is much less aware of GM as a controversial issue than Europeans are.

## **How we use information on risk on the basis of our previous knowledge and experience**

### *Rule of Thumb*

In practice, people take decisions on the basis of information available to them, which they put through a variety of filters. Rules of thumb (known more formally as cognitive heuristics) allow us to take decisions on the basis of imperfect information. For example, people often decide that something new is like something they have already experienced directly, which helps them decide whether it is a risk worth taking. Thus a member of the public may decide that using a PIN to verify a credit card transaction is like using a signature but slightly safer, so the change to using a PIN is worthwhile. By contrast, an expert on digital security would be aware of a wide range of possible future threats to credit card transactions and would see the change to PINs in a wider context.

Our decision-making capacities are not designed primarily for finding the "truth" but for getting us what we want without an excessive expenditure of physical or mental effort.

People also vary in their ability to cope with random events in the world around them, which may be damaging or beneficial. Some gamblers have elaborate rituals which give them an illusion of control over the world around them. Some individuals believe that some malign influence is disrupting their existence while others are more inclined to accept life's ups and downs as natural.

### *Learning involves risk, but failing to learn can be fatal*

But although caution about innovation may keep people safe in the short term, someone who decides not to try something new also fails to find out what the experience would have been like. It might have been enjoyable, or the gain, whether financial or personal, might have been worth the risk. This means that caution involves risks of its own, especially when the benefits of novelty are uncertain but its potential hazards are all too apparent.

In some cases, avoiding a new experience may carry its own risks. If you do not go for a new job you may never become a Director. For an addict, doing without the drug, or the visit to the betting shop, is a "risk" because it means giving up a definite reward for an uncertain benefit.

In any case, a decision to take a risk does not always end in disaster. People often drive badly without having an accident, and although most lung cancer is related to smoking, most smokers do not get lung cancer. Even when there is a bad outcome, it is often delayed, especially with health hazards such as those related to smoking and excessive alcohol consumption. The same applies to climate change, a long-term process which by definition happens on a global scale and to which any individual's personal contribution is slight. There is no connection between a particular person's frequent flying and a specific heatwave or hurricane. So people can form a false impression that an activity which is dangerous is in fact safe. This applies especially to addictive behaviour, in which addicts are seeking to rationalise actions which others might see as harmful.

Likewise indirect experience such as TV documentaries about drug abusers may well be unconvincing as precedents for an individual's own expectations, especially when the individual has an addictive behaviour pattern. Indeed, people's vicarious experience of risky behaviour can lead them to overestimate how dangerous a specific course of action might be. There are few news stories about successful operations or about flights that land safely.

## Conclusions

How can society deal with risk better? Eiser stresses that because risk is about uncertainty, people and organisations will continue to have differing views of risk. Their approach to uncertainty and incomplete information will emerge from their personal or organisational values.

He says that selectivity will always form part of the way in which risk is communicated, which means that it is essential for it to be accepted and admitted. The problems can be reduced if the communication of risk involves public engagement and a two-way flow of information. Experts often fail to appreciate that the issues which they regard as vital may not always be the ones that most concern the public.

Eiser's full paper, *Public Perception of Risk*, is available online at [www.foresight.gov.uk](http://www.foresight.gov.uk) and can be ordered in hard copy there. This summary is by Martin Ince, [martin@martinince.com](mailto:martin@martinince.com).