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Communicating with the Public about Risk: Making Community Risk Registers Work

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The context and purpose of the Community Risk Register

Community Risk Registers had their origin in the UK government's Civil Contingencies Act 2004 (the Act). The Act lays a number of legal duties on specified local emergency responders, one of which is the requirement to make and publish risk assessments for emergencies within, or affecting, their geographical areas of responsibility (Cabinet Office, 2005a). It also requires the local multi-agency responder community to co-operate in the maintenance of a register containing these risk assessments – which the UK government Cabinet Office describes as Community Risk Registers (CRRs) (Cabinet Office, 2005b).

Thus, the CRR is a register of those civil contingency risks that have been identified, analysed and evaluated by the local emergency responder community – which is embodied in the multi-agency Local Resilience Forum (LRF). Only those risks that have the potential to create emergencies in or affecting an LRF's area of responsibility should be included, and emergencies are defined as:

…an event or situation which threatens serious damage to human welfare…the environment or war or terrorism, which threatens serious damage to security.

(Cabinet Office, 2005a)

The stated rationale for the risk assessment duty focuses on the functions of the local responder community. Its purpose is threefold; to create an informed and shared understanding of the

risks facing the local community, to provide a basis for sound planning which is proportionate to the risk profile, and to provide a consistent basis that allows plans to be evaluated and planning assumptions made.

(Cabinet Office, 2005b)

However, when discussing another duty under the Act - that of warning and informing the public about emergencies - the same government guidance also goes on to suggest that the duty to communicate with the public about risk is based on the belief that well-informed people are better able to respond to an emergency and minimise its impact on themselves and their community.

(Cabinet Office, 2005b)

This is clearly the rationale for the second aspect of the risk assessment duty – the requirement to publish. All Local Resilience Forums in Great Britain have chosen to meet the requirement to publish their assessments by publishing their CRRs as a whole on the internet.

So, it can be seen that the creation of a CRR by each Local Resilience Forum is intended to benefit its internal business activity and to improve the level of preparedness and resilience of the public. The Civil Contingencies Act received royal assent in November 2004, and each LRF in England and Wales was required to publish its CRR by November 2005. Delays in the production of supporting guidance led a significant number of local responders to feel that the government deadline was too short.

There was a sense at the time that the immediate priority was simply to publish an acceptable register within the deadline, and address quality issues later on when time allowed. One of these quality issues was the use of the register as part of an LRF's warning and informing strategy, which would require that it be written in a way that reflects good practice in risk communication. In many cases this has not happened, and the extent to which registers have been developed as public communication tools is variable – to say the least.

So, the aim of this article is present a methodology which local risk working groups can use to assess their CRR, according to accepted standards of good practice in risk communication.

Risk Communication

Risk communication concerns techniques used by risk managers to inform their audience about the nature of risks that might affect them, with a view to influencing their behaviour. The outcomes are the sort of resilience, preparedness and expectations that should follow from a greater general understanding of risks, their likelihood and, most importantly, their potential impact on the community.

The methodology this article presents gives practitioners a tool for assessing the extent to which their CRRs support this aspiration. It is not concerned directly with the quality of the assessments *per se*, but rather with the way in which the CRR is presented to the public.

It will allow practitioners to assess:

- The extent to which the purpose of the register, the manner of its creation and reason for its publication are explained to the public in clear and non-technical English.

- The extent to which each register is explicitly contextualised, giving a clear and informed sense of its relevance to the local community.

- The extent to which the registers are linked to other forms of local resilience and risk communications that the public may be exposed to.

- The extent to which members of the public are given the opportunity to engage in the process, through feedback and consultation mechanisms.

Understanding the Approaches to Risk Communication

The approaches to risk communication may be classified as representing either the “deficit” or the “sociological” models. The deficit model probably reflects the common standard, and the reader may recognise its hallmarks. Essentially, it supposes that there is a gap between “valid” expert accounts of risk and “invalid”, folk-derived lay opinion. This led Mary Douglas to conclude that:

In the technico-scientific literature on risk there is sometimes evident an ill-masked contempt for lay people's lack of what is deemed to be "appropriate" or "correct" knowledge about risk .

(in Lupton, D. 1999:19).

In the sociological model of risk communication, no single perspective (be it "expert" or "lay") is automatically privileged, and concern should focus on how views of risk are constructed by a variety of stakeholders (Borodzicz, 2005:33). This model starts with the assumption that lay and expert constructions of risk are equally valid potentially, and that to regard one perspective as intrinsically more valid than another could alienate part of the intended audience – making it more likely that one will polarize opinion rather than build consensus.

The deficit approach fails to recognize a key point that is now widely recognised. Risk is socially constructed. This means that it must be viewed in a multi-dimensional way because a particular hazard will mean different things to different people in different contexts (Royal Society, 1992:7). It follows that risk communication based on this understanding will be more effective; it will capture more of the nuances of how risks are seen by the public, and engage with their views instead of merely disregarding them as ill-informed if they do not appear to match expert opinion.

Furthermore, in today's "Risk Society" (see Beck, 1992) people are increasingly aware of the risks associated with modern life and increasingly demanding of information about them. They

recognise that the world is an increasingly hazardous place and want to have a say in the way science, technology and industry mediates those hazards. For Anthony Giddens, the risk society is one wherein people are increasingly pre-occupied with the future and with bringing it under control – an aspiration frustrated by dissent over the meaning and implications of many of the risks facing it (1998: 27-28). Deficit-model risk communication is unlikely to help people meet these concerns.

The UK government appears to be aware of this. The Cabinet Office (2005b) directs responders to the government's principles of risk communication, which show a marked emphasis on stakeholder engagement, transparency and the building of trust through openness and dialogue. The government has also produced a Concern Assessment Tool to help officials research and assess public attitudes to risk systematically, so that communication can be effectively focused on the right aspects of any particular risk – i.e. those aspects that have most to do with shaping public perceptions of it (HM Treasury, 2005). This is related to the government recognition that its own "handling of risks to the public" needs to become:

- More open, particularly in cases of uncertainty.

- More transparent about the processes it has used to reach its decisions and;

- More participative, by involving stakeholders and the wider public at an early stage in the process.

(Cabinet Office, 2002:16).

So, there is a clear (and fairly long-standing) government policy commitment to move away from the deficit model of risk communication and towards one that achieves greater and more meaningful levels of public engagement. Community Risk Registers (CRRs) should, therefore, be an expression of that intent, and reflect a sociological rather than deficit-oriented style of risk communication.

The perception of risk

According to Pidgeon, risk communication emerged as an area of study in the 1980s, and followed on from a large body of research into the psychology of risk perception (1992: 178). So, it seems reasonable to begin with a review of this research and an analysis of its main findings and limitations.

There have been three basic approaches to the psychological study of risk. The first of these is the cognitive approach, which mainly focused on decision-making, or what Lopes called “choices made under risk” (1987). The work of Kahneman and Tversky seems to prove that, under controlled conditions, people make choices that are predictable, replicable under experimental conditions and show an internal logic – but one that is not necessarily rational (1979). In fact, it seemed that people make irrational decisions regularly and frequently, even when presented with outcomes of a known probability. The

explanation for this lies in the existence of biases and heuristics that give people a “bounded rationality” – such as the “anchoring bias” and the “representativeness” and “availability” heuristics (Tversky and Kahneman, 1973. Gardner, D, 2008: 47-48).

The anchoring bias refers to the way in which individuals build on what they already know to create a perception of something that is new to them. The representativeness heuristic is the means by which people use their notions of the typical (or stereotypical) to build perceptions. The availability heuristic works through recent examples in the mind of the perceiver of risk, and suggests that attitudes to risk are influenced by the availability of an example of it: in other words, the easier it is to envisage a risk, the more likely it will seem to happen and the more sense people will be able to make of it.

A study of the vicarious experience of disasters on public thinking demonstrates this very clearly. A UK Health and Safety Executive report of 1992 into nuclear safety said that:

Many experts believed, and some still believe, that the quantification of risks is too uncertain and too difficult for people to grasp. Others openly said, and some still do, that most ordinary people only wish to believe that there is no risk at all from such undertakings, and are probably not interested in finding out what exactly the risks are.

(HSE: 1).

What is being suggested here is that experts who denied the validity of public risk constructions did so because they believed

the public lacked not only the technical understanding, but also the appetite to understand risk properly. Thus, their ability to take part in effective dialogue about risk is contested. The following case study examines this idea and challenges it.

Prior to a massive explosion at a chemical plant in Flixborough (UK) in 1974, the public living in the vicinity of the plant had no meaningful part in any dialogue about the risks associated with it, and were largely ignorant of them (Chartres and Osman, 1974). Kennet (1975) details the extent of misunderstanding among locals as to what went on in the plant and its risks, especially of explosion. Furthermore, Taylor (1975) confirms that the operators and their experts grossly underestimated the danger and its potential scale. At that time, the UK petro-chemical industry was seriously under-regulated, to the point of operating in an almost *laissez-faire* environment. It was also going through a phase of massive expansion, leading to bigger plants and new processes – with larger and more varied inventories of hazardous materials (Napier, 1974 and Kennet, 1975).

This was a dangerous combination of factors, to say the least. It is argued that an open, public dialogue about the risks associated with the plant would have offered the potential for two significant outcomes. First, the public living in the vicinity would have been able to develop a more informed “risk construct” and then stimulate a dialogue. Secondly, and consequently, this debate is likely to have exposed the over-optimistic risk

management within the plant and its dangerous context of under-regulation and unchecked growth.

Thus, to play a fully developed role in risk dialogue – which obviously desirable - the public must be able to establish a valid and meaningful risk construction when given the means to do so. The public is also quite capable of doing this. After the Fixborough explosion, people living in the vicinity of other dangerous plants began to learn a number of lessons. For example, the residents of Baglan Bay, who lived close to a large ethylene plant had previously only been interested in air quality issues, and their relationship with the plant's management was confrontational and poor. After Flixborough, their focus shifted to plant safety and operating risks. They also saw the need for a more constructive dialogue and quickly adopted a much more business-like and less confrontational relationship with the plant operators. This was a direct result of isomorphic learning by the local community about risk and risk management. It also exposes as a fallacy the argument that lay people are content to be ignorant of risk, and do not generally wish to engage with it in a systematic way. Rather, the case seems to be that if people are given the right tools and a clear reason for using them, they can achieve the levels of constructive engagement that make for more resilient communities.

However, it does seem that human reactions to risk are quirky. In general, people find unusual risks more worrying than more "everyday" ones. Voluntary risks tend more acceptable than ones imposed upon them by outside forces, and they do tend to

have some apparent difficulty understanding abstract concepts like probability – which is not surprising given the array of different interpretations that people put on words like “probable” and “possible”.

The second approach to studying risk perception attempted to address these issues by collecting and analysing data from sample populations and introducing a qualitative dimension to the way hazards were characterised. This psychometric approach also tried to respond to a demand for ways of understanding how and why people react to certain hazards in the way they do, and what might be done to “re-educate” them when their views differ from the expert perspective.

Fischoff *et al* made a classic study of the relationship between the perceived and actual fatalities ascribed to a range of risks, and found that people tend to overestimate the impact of low frequency risks, and underestimate the impact of high frequency risks (1981). Critically, this moved on from the cognitive approach because it offered a way of measuring the extent of popular non-rationality in relation to benchmarks – the actual fatality data for each risk. There was also another underlying pattern.

Lichtenstein *et al* showed that the risks people assessed as having a higher death-rate than was actually the case, tended to be those that evoked vivid images, were easily imaginable or salient in the popular memory (1978). This is an example of the availability heuristic in action. However, given the complexity of risks it requires more than simple statistics like a death rates to understand public perception of them. Otway and Von Winterfeldt

identified reasons why certain types of risks evoke particular anxiety. They found that these risks have in common one or more of a number of “negative hazard attributes” (1982). These are:

- Exposure to the risk is seen as involuntary; it is imposed on people irrespective of their lifestyle or choices.

- The outcomes are beyond the control of the individual. It is believed that the risk cannot be mitigated by the individual.

- There is uncertainty about the probabilities or the consequences of exposure. This implies a lack of definitive science or a conflict in expert opinion.

- There is a lack of personal experience with the risk, making it new to the individual.

- There is difficulty in imagining what exposure to the risk would be like. It is seen to produce or threaten effects that cannot be related to experience.

- They have long-term effects.

- They are a threat to future generations, especially children.

- They are associated with a large number of casualties, however infrequently they may occur.

- The benefits are not visible, and therefore cannot be used to counterbalance the danger.

- There is inequitable distribution of whatever benefits are associated with the risk.

- They are seen as the product of human intent or failure, rather than a natural cause.

(after the Royal Society, 1992: 101)

This makes popular construction of risk seem highly rational, and so it is not surprising that social scientists have contested the notion of irrationality in risk perception for some time. Apparently "irrational" reactions to risks may, in fact, be perfectly logical perceptions. However, this raised a methodological issue. If a given risk means different things to different people, in different situations and at different times, it may be impossible to gather and manage enough data to make quantitative analysis achievable.

The mental models approach was developed in part to introduce more qualitative analysis of the ways in which population groups perceive risk, and to relate risk perception research to the developing field of risk communication. The approach worked by using a methodology of interview-based enquiry to examine expert and lay perceptions of risk, before overlaying the two in order to identify errors (deficits) in the latter. It was assumed that the public, when presented with the evidence, would see the errors of their ways! So this approach is based on creating a form of

corrective dialogue between the expert and lay communities, and as such it is different to earlier forms of risk perception research and (arguably) less reductionistic (if still rather patronising). However, it is still predicated on the assumption that the expert view is correct, uniform and disinterested - and that different perceptions on the part of the lay community are the products of wrong understanding or incomplete knowledge.

Is there such a thing as scientific rationality?

The natural answer is “yes, of course there is”. But in fact the notion of scientific rationality is highly (and rightly) contested – principally because science is a culture which is, like all other cultures, is open to the influence of social, economic and political forces that affect and shape it. As Kuhn points out, it reflects the world-view of those who practice it and the institutional settings in which it happens, as well as the prevailing political, economic and social context (1962). For Irwin, this means:

Science is constituted within particular social contexts, and these will shape what eventually counts as ***certified knowledge*** (author’s emphasis).

(1995: 58).

Thus, science is not necessarily a disinterested or objective activity. It has an osmotic relationship with its environment – affecting it and being affected by it simultaneously and being institutionally conditioned by the values of those who manage and practice it. Scientific rationality has also been challenged on the

grounds of its contingency. The outcomes of a scientific enquiry are, to some extent, influenced by the assumptions made at the start of it. This seems to be especially significant when there is some uncertainty in the science and where the problem under analysis crosses the boundaries of different scientific disciplines – each of which will tend to generate a different perspective and may create a different conclusion. Thus, several conflicting interpretations may have to be reconciled if a corporate or governmental position on a given risk is to be established and used as a basis for policy or decision-making. Uncertainty and conflict over the impacts of acid rain and global warming are examples of this tension.

Giddens points out that many modern risks are beyond precise calculation, and uses global warming as an example of how expert perspectives and conclusions differ as to the nature of the risk and how serious it is (1998: 28). For him, it is a feature of modernity that all knowledge is contestable and open to revision. The paradox is that our dependence on scientific and expert reasoning has grown, in an attempt to explain the increasingly complex and interdependent world around us. However, the product is greater levels of dispute and uncertainty:

The fact that experts frequently disagree becomes familiar terrain for almost everyone.

(Giddens, 1994: 186)

According to Perrow (1994) in the case of complex, dynamic and socio-technical systems, it is likely that not all the variables or

interdependencies within a given system are fully understood – or even understandable. Furthermore, as Yearley (1991) points out, environmental scientists often work at the “margins of observability” - uncertain as to the weight, measurability or even existence of key variables.

Thus, potentially hazardous outcomes can sometimes defy safe prediction. Risk assessments, therefore, can have more to do with individual judgement than empirical fact. Furthermore, experts tend to disagree in their assessments and estimates. This is clear in Pigeon’s analysis of the psychology of risk. He points out that assessments of the probabilities of risks in modern socio-technical systems are mostly Bayesian, in that they represent a view based on an individual’s state of knowledge about the world. Probability is therefore a behavioural concept rather than an empirical fact (1992: 177).

Pidgeon goes on to identify an interesting paradox in risk communication, which reflects the influence of the different perspectives of expert groups. Operators, owners and government proponents of a system are driven fundamentally by a desire to convince the public that it is safe. Contingency planners and managers, however, are driven by the need to warn of the system’s dangers and recommend courses of action that should be taken if it fails – whilst not giving unnecessary or disproportionate cause for alarm (1992: 179). The key point is that the public are seen as rational and active seekers of information about risks they deem relevant to their lives. However, attitudes to risks will be conditioned by their negative hazard attributes and the

extent to which they trust the authorities who dispense the information (Pidgeon, 1992: 180). Wynne also noted that trust is often related to the way in which authorities have dealt with risks in the past (1989, 1996). For Lupton, this is proof that the relationship between the public and the experts is complex and ambivalent (1999: 110). It is not a matter of the public deciding which of the competing expert perspectives to trust. Instead, they often do what Wynne described as constructing their own expert perspectives, with or without the wisdom of the risk professionals (1989).

An example of this is visible in the aftermath of the Exxon Valdez disaster. Browning and Shetler (1992) confirm that both the experts' risk management practices, and the way they set about dealing with the oil spill, were both inadequate. Public involvement, they argue, could have mitigated the first and did eventually improve the latter. After 12 years of successful tanker operations in Prince William Sound, Alaska, the management had clearly become complacent - believing they had what the local Coast Guard commander called "the perfect system" (Meidt, 1991). According to Browning and Shetler:

Self-delusion that their past record guaranteed the adequacy and competence of their procedures locked them into repetitive behaviour.

(1992: 479).

Tankers used to be escorted in and out of the sound by a pilot vessel. Some time before the Exxon Valdez grounded on a reef

and caused its massive oil spill, this safety measure was withdrawn. Browning and Shetler point out that:

The lack of any accident was felt to be good evidence that such a precaution was unnecessary, rather than being interpreted as good evidence for its continuance.

(1992: 479-80).

Thus, the risk constructions of the experts were flawed, data were interpreted wrongly and safety standards were allowed to decline. It is speculative, but nonetheless compelling, to suggest that wider consultation - and a degree of scrutiny from outside the self-referencing expert group – may have mitigated these tendencies. In terms of the response to the disaster, the limitations of the experts' constructs also became clear. Disagreements over whether to burn off the spill or disperse it chemically slowed the response down. Also, neither of these courses of action took into account the knowledge, views and risk constructions of the local community. Burning off the oil produced air pollution with serious consequences for public health and the environment. Chemical dispersal would have killed the fish hatchery stocks upon which the local economy depended. In the end, it was the local community's *ad hoc* actions to contain the spill with booms that worked best – and it was the product of a lay risk construct that was excluded from initial planning and response management (Browning and Shetler, 1992).

As a result of the disaster and its management, community interest groups became fully engaged and effective elements of the terminal's safety regime. As Browning and Shetler point out:

*The production of information from these multivocal sources is by its nature less likely to have a systemic bias, and can work to foresee and (*otherwise) *counter unintended consequences ….*

(1992: 492).

This makes a strong case for public involvement in open dialogue about risk, and suggests that it adds value in a number of ways. These are; scrutiny, ensuring that risk constructs reflect local concerns and local knowledge, and a check against the tendency of expert risk constructions to become self-referencing and disconnected from their environment.

Another criticism of the notion of scientific rationality stems from the relationship between "laboratory models" and social reality. A classic example is the case of the insecticide 2,4,5-T. Wynne (1989) found that when experts decided that the material was safe for farm workers to use, they did so on the basis of:

…optimistic fantasies about behaviour in the real world.

(1989: 39)

In particular, their assumptions about safe use depended on agricultural workers behaving in a way that was actually impractical and unrealistic in their workplace. The result was that unfeasible safety procedures were routinely ignored, because they

were impractical in the field (Irwin, 1995: 18). Cook and Kaufman (1982) described the realities of working with the insecticide as:

…a long way from the laboratory in which tests may be conducted. (1982:53)

The result was a significant number of cases of poisoning, as well as an institutional "expert" reluctance to accept that the insecticide was actually the cause (Irwin, 1995:18). The government's position reflected an idealised view of how the pesticide would be managed at the point of use, and no attempt was made to contextualise their understanding by reference to the people who actually used it. When a farmers' union catalogued accounts of what it saw as consequential ill-health among workers and their families, this was dismissed as "anecdotal" evidence and the impartiality of the accounts challenged. Issues were also raised about the advisory committee reflecting the interests of the chemical industry, suggesting that the lack of dialogue, deficit-model risk communication and the privileging of one perspective not only produced a poor construct – it also generated mistrust and suspicion on all sides.

A similar lesson can be drawn from Bennet and Shaw's analysis of accidents amongst aircraft ground handlers (2003). They demonstrate that risk assessments were routinely made, and safety practices decided, by managers without reference to the staff most affected by them or to the realities of working in an under-staffed and highly pressurised environment. The result was disillusionment with, and contempt for, the managers who were

responsible for this one-sided dialogue and the unrealistic policies that it produced. This confirms Irwin's argument that lay accounts of work environments represent the "lived reality", which may be in disjuncture with the detached and idealised perspective of the experts (Bennet & Shaw, 2003: 345).

This is also visible in Irwin and Wynne's study of the conflict between the UK Ministry of Agriculture, Fisheries and Food (MAFF) and farmers affected by contaminated fall-out from the Chernobyl reactor explosion. The government scientists relied exclusively on abstract modelling techniques as a basis for their instructions, and were – as a result - both naïve and inaccurate in their assumptions and recommendations. They ignored the farmers' arguments, discounted their knowledge and their concerns and alienated them by what came to be perceived as arrogance and indifference (1996: 36). This case, and that of 2,4,5-T demonstrate a marked bias in favour of quantified assessments and "rational" modelling, and a tendency to be less comfortable, if not actually dismissive, when dealing with qualitative data, such as personal testimonies and the "voice of experience". It also relates to Browning and Shetler's description of the self-referencing nature of expert groups (1992).

The solution, of course, is dialogue, grounded in a willingness to respect the validity of lay constructs and a recognition that useful knowledge about risks is not the sole preserve of an expert minority. To paraphrase Bennet and Shaw (2003: 346) the basis of risk communication should, therefore, be a systematic and routine dialogue between the experts and the

public, which recognises the validity of multiple perspectives and does not privilege one of them at the expense of others.

The main characteristics of the deficit model of risk communication

The deficit model is essentially science-centric. It tends to regard lay opinions about risk as at least non-legitimate and possibly irrational. This means that risk communication takes as its start point the need to correct the in-valid and ill-informed perceptions of the public and replace them with valid and definitive, scientific-technical understandings. This may be associated with a denial of uncertainty and a claim to be regarded as objective, disinterested and rational.

These notions have been challenged in the previous section on scientific rationality and expert perspectives. However, it is worth noting that in this paradigm the public are also effectively barred from the risk debate by factors such as technical language, the rules of expert discourse and the assumption of ignorance on their part. The public is regarded as an undifferentiated mass which is prone to stereotypical forms of behaviour and social organisation. People are blank slates, needing to be inscribed with the correct perception of risk as it is perceived by the expert community – and thus reassured.

As a result, risk communication, quite naturally, becomes a one-way process of transmitting selected information. Because this militates against a need for feedback and consultation, deficit-

model risk communications tend to be isolated events that use a single medium and make little or no evaluation of the impact of the message.

Deficit risk communication in practice

The classic case-studies in deficit-model risk communication were carried out by Irwin (1995). The one most applicable to this study is the one that concerns the Carrington petrochemical plant which engaged – in co-operation with the Local Authority - in a risk communication exercise to satisfy the statutory requirements of what were then the CIMAH regulations (since replaced by COMAH – the Control of Major Accident Hazard regulations). This involved sending a pamphlet to each home in the plant's designated Public Information Zone (PIZ). Irwin's analysis showed that the exercise had a number of key features. These were:

- The leaflet gave minimal information about the risks associated with the plant, and confined itself to the most basic advice on what should be done in an emergency. The local people were assumed to be largely ignorant of the risks and capable of absorbing only very simple instructions.

- The instructions assumed that the local people would all be at home at the time of the emergency, and were simply advised to stay there and await further instructions.

- The leaflet was a “one-off”. It was not repeated, only one version was issued and there were no supporting messages delivered by any other medium.

- The public was not given the opportunity to address queries to the communicators, except in writing, and there was no encouragement to engage in dialogue. No attempt was made to assess the impact of the leaflet on those who received it.

The first two of the above features deal with the level of sophistication evident in the message and in its understanding of the community. These issues are addressed in the first and second objectives the CRR assessment methodology. The third and fourth objectives deal with the lack of context or reference to other risk communications and dialogues. The Carrington study shows a clear match with the deficit model of risk communication – in 6 main ways:

- The authoritative and unequivocal tone of the leaflet served to deny any scientific uncertainty. In reality, the airborne dispersal of gases is complex and depends on a large number of variables. The Carrington leaflet over-simplified a difficult issue.

- It treated the public as if they were ignorant of the plant and its activities – which was a naïve assumption. In fact, their understanding of the plant and its business was quite sophisticated.

- It assumed that the local public had no other means of finding out about the plant, its activities and its safety record, and no interest in doing so.

- Issuing only a single version of the leaflet is evidence of an assumption that the public was thought of as a single and undifferentiated mass. Even at the small scale of the plant's PIZ, there was no attempt to achieve granularity in the way the local community was perceived.

- The leaflet made no allowance for the fact that different people might be doing different things when the emergency occurred, and assumed that they would be at or near their home.

- Apart from writing a letter, the public were given no means to engage in dialogue about the leaflet or what it represented. This is significant; in an age of electronic and social media there is a public expectation of accessibility, and the need to write a letter should be regarded as a disincentive to communicate.

Shortcomings of the deficit model

The main criticism of the deficit model of risk communication must be that it is simply so sub-optimal. The examples analysed by Irwin all demonstrate similar patterns of failure to achieve the aim and, therefore, wasted resources. Most importantly, however,

they all deny the public a valid role in risk assessment and risk management and effectively bar it from the debate.

Furthermore, its assumptions – including that of scientific rationality and objectivity – have been challenged, and its sociological naivety exposed. If the government is committed to building social confidence in its handling of risks to the public, and achieving greater transparency and engagement in the way that it does it – as HM Treasury (2005) asserts – it follows that its risk communication needs to be more sophisticated and reflexive than the deficit model would allow.

Principles of the sociological model of risk communication

In contrast, the model of sociological risk communication requires close adherence to 10 main principles. These are:

- It must be based on a willingness to engage actively with the public, and respect their different perspectives - because what appears to be logical or accurate to one person may not be so to another.

- It must recognise that technical experts cannot expect public trust as of right, and that the scientific method is only one way of constructing reality.

- It must not privilege one form of knowledge over any other, and must respect the authenticity and validity of non-expert or “folk” opinion.

- It must be reflexive. This means openly spelling out the agendas, interests and the uncertainties in the risk assessment process.

- It must provide vehicles for the expression of the multiple social realities of those affected by the risk, and facilitate debate by avoiding the technical language and abstractions of an expert minority.

- It must (at least) attempt to aggregate these multiple world views and work towards a mutually acceptable perspective.

- It must promote dialogue, rather than use didaction.

- It must use a multi-media approach, ensuring equality of access to the debate.

- It must be adjusted as feedback and responses are acquired.

- It must be actively and impartially evaluated, in order to judge the effectiveness of the whole process.

This may sound idealistic. It certainly makes the business of risk communication more difficult and more resource-intensive. However, it stands to reason that it makes the chances of a successful outcome more likely and it offers a measurable return on the investment.

However, it is acknowledged that there are limitations to the public understanding of risks. Slovic argues that people's perceptions of risk are often inaccurate, and distorted by the influence of various heuristics and innate biases. He also notes that ingrained beliefs about risks are often resistant to change even in the face of convincing evidence. He calls for risk communicators to:

…appreciate the wisdom and folly in public attitudes and perceptions.

(2000: 184)

But Pidgeon *et al* note that the distinction between "objective" (scientific) and "subjective" (or perceived) risks is "conceptually simplistic" and:

… devalues the importance of public attitudes and beliefs in favour of an abstract rationality.

(The Royal Society, 1992: 94).

Douglas and Wildavsky argue that if the science about a risk is unequivocal and popular perception is at variance with it, then:

…it follows that the gap between the expert and the lay public ought to be closed in one direction – toward the opinion of the experts: the lay public must be taught the facts; the scientific message must be clearly labelled.

(1983: 193)

However, for cultural theorists like them it is a vital point that the experts do not always agree. The objective "facts" are not always ascertainable and psychologists who study risk perception do so from the individual standpoint; their findings lack "social significance" and an appreciation of the influence of culture (1983: 188). For the purposes of this article, the key points of cultural theory (in relation to risk) can be summarised as follows:

- It argues that the public is not a cohesive mass and that there is no single "public opinion" or perception of risk.

- People choose to accept, reject or mitigate risks in ways that support a lifestyle.

- No single interpretation or assessment of a risk will be correct for the whole audience.

The logical conclusion is that there are no right or wrong perceptions of risk, but a variety of perspectives that need to be accommodated in the debate and reflected in its conclusions – because they represent the different realities of the people affected by the risk.

Thus, risk assessment and communication need to take into account a broad range of perspectives without automatically privileging any single view. Therefore, reflexive engagement and dialogue with the public is a requirement for effective risk communication. The 10 principles of the sociological model

identified above are an ideal type, against which the sociological character of risk communication can be assessed.

This makes an act of large-scale sociological risk communication a very complex and challenging affair – if it is to be done in accordance with this model of communication. However, the consequences of ignoring these principles are likely to be significant. They might include wasted effort and resources and a failure to achieve the behavioural and attitudinal changes that are desired in the public interest. In the case of CRRs, the production of which is resource-intensive, the intended impact on community awareness and resilience may not be forthcoming.

The result could be avoidable levels of shock and dislocation during and after an emergency, exposing the authorities to potentially higher levels of hostile scrutiny. Pidgeon *et al* also mention that, since the public are often the "primary risk bearers in society" there are strong ethical and intellectual grounds for challenging perspectives that do not reflect their attitudes and beliefs about the risks they may face (The Royal Society, 1992: 94).

Using the Assessment Tool

Practitioners need to study their CRR in detail, with a view to answering 17 questions about it. These questions are grouped under 4 objectives.

Objective 1

- Establish the extent to which the purpose of the register, the manner of its creation and reason for its publication are explained to the public in clear and non-technical English.

Questions

1. Is it a stated purpose of the CRR to give members of the public a balanced understanding of the risks they face, in order to make them better able to respond to an emergency and reduce its impact on the community?

2. Is it made clear, down to the level of participating organisations, who was responsible for the CRR's production, how it was produced and how it is maintained?

3. Are the underlying concepts of risk, likelihood and impact explained clearly and without technical language?

4. Are the underlying concepts of controls, risk treatment and lead agencies explained clearly and without technical language?

5. Is there any discussion of the limitations of risk assessment and risk management - especially in

respect of issues such uncertainty, professional judgement, scientific evidence and environmental change.

6. Does the design and presentation of the document suggest a deliberate attempt to make it “user-friendly” for a lay readership?

Objective 2

- Determine the extent to which each register is explicitly contextualised, giving a clear and informed sense of its relevance to the local community.

Questions

7. Is the CRR locally contextualised throughout, so that readers should be able to grasp easily its relevance and applicability to themselves and the local community?

8. Does it provide information about the local history of emergencies?

9. Does it provide information about local risk control measures that are in place?

10. Does it provide information about local risk control measures that are planned or under development?

11. Are the reasons for withholding information, including the locations of hazardous sites, explained and justified.

Objective 3

- Establish the extent to which the registers are linked to other forms of local resilience and risk communications that the public may be exposed to.

Questions

12. Does the CRR make reference made to other forms of communication about emergency preparedness that the public are likely to receive?

13. Does it give reference to other forms of emergency preparedness information that are available to those who wish to learn more?

Objective 4

- Assess the extent to which the public are given the opportunity to engage in the process, through feedback and consultation mechanisms.

Questions

14. Are the public given a point of contact to use if they want to ask questions about the purpose or content of the CRR?

15. Is that point of contact accessible by means other than letter?

16. Are public views about risks in the CRR area actively solicited?

17. Is there a statement of intent to engage with the public on the assessment of risks in their area at any time in the future?

Each question must be answered with a response of “no”, “to some extent” or “yes”. These responses are given numerical values of 0, 1 or 2 respectively. The survey form requires a short, supporting statement where a score of 1 is given, but no statement is required to support an unequivocal score of 0 or 2.

A CRR that coheres with the reflexive sociological model of risk communication will attract mostly positive answers to the above questions. Those displaying the characteristics of deficit-oriented risk communication, will attract mostly negatives.

Once this is done, practitioners will have a rigorous and quite objective assessment of their CRR’s risk communication

credentials, as well as a set of well-defined ways in which it could be developed or improved. If it was applied on a large scale it would also allow CRRs to be comparatively and collectively assessed as to the extent to which, by these criteria, they have been used by LRFs to reflexively engage their public in risk communication. They will also give a broad impression of the general state of CRRs as instruments of risk communication.

Methodology Issues

This tool only examines one dimension or expression of an LRF's risk communication strategy (its published risk register) unless it makes specific reference to any other linked documents. It is acknowledged that a strategy may find expression in other ways that this study will not capture, and that certain elements of the CRR may have been withheld from publication on the grounds of perceived commercial sensitivity, security or similar issues. However, it is argued that the CRR is the LRF's primary instrument of risk communication, and as such it can be taken as a true reflection of the organisation's approach to it. The document also demonstrates unequivocally what has been done, irrespective of what future intentions may be claimed.

There is a subjective dimension to the analysis, especially regarding what constitutes, for example, clarity, reasonableness, a full explanation or ease of understanding. For this reason, supporting comments are needed to substantiate the assessment where an objective is met "to some extent". A useful addition to

the process would be the use of an external assessor, or more than one to give balance and detachment to the analysis.

Objective 1 (Questions 1-6)

Objective 1 focuses on the way in which the purpose of the CRR is explained and presented to the public. It leads the practitioner to test the extent to which it tries to educate the public and advise them, through an understanding of how local risks might affect them and what they might do to mitigate their impact on themselves, their households and businesses. Conversely, it will expose CRRs that have been produced with little or no awareness or concern for their public impact. This tool has been tested extensively on risk management courses at the Emergency Planning College. It is not the purpose of this article to share those results, but it has created enough evidence for the author to assert that a significant number of CRRs fall very firmly into this category.

Questions 1-6 explore the extent to which the underlying processes and methodology used in the assessment, and the underlying concepts of risk management in this context, are explained in non-technical language for a public readership. This implies some attempt to explain to the public how and by whom the registers were created, and what the fundamental concepts of risk, likelihood and impact mean.

There are also some complex issues around uncertainty, and the limitations of professional judgement in assessing the

likelihood of low-incidence risks, which deserve consideration. Also, a reasonably well developed discussion of the inevitable uncertainties in risk management would help to generate a more balanced understanding of the process and its advantages and limitations. It would also concur with the government's intention to become more open about risk, especially where uncertainty is involved (HM Treasury, 2005). Also, there are generic issues around the extent to which the CRR has been designed to be "user-friendly" to a lay readership, rather than – perhaps – an arid table of assessments.

Objective 2 (Questions 7-11)

Objective 2 addresses the extent to which local risk assessors have taken the nationally-produced guidance and contextualised it - to fit their area and make it explicitly relevant to their communities.

One important factor here is reference to the local history of emergencies. This is significant because research indicates that communities are generally very capable of using event history to frame their perceptions of risk. They also help them shape their dialogue with the authorities, and give the issues sharper relevance (Irwin, 1995; Browning and Shetler, 1992).

It follows that there should be a discussion of risk controls and of the responsibilities of lead agencies – so that it may be understood what has been done to mitigate the risk and by whom.

Questions 9 and 10 help the practitioner assess the extent to which the CRR presents a meaningful description of control measures designed to mitigate emergencies should any of the risks be realised. Explaining the concept of risk control is dealt with under objective 1. Here the emphasis is on what that means in practice – in terms of what is actually in place to protect the public and who is responsible for it.

Question 11 relates to the withholding of information – particularly about hazardous sites. Essentially, the argument for withholding information about risks needs to be explained in detail. To do so without a reasonable and understood justification could lead to uncertainty, doubt and suspicion. The discipline of doing this may also force the debate. It is the author's view that many CRRs withhold information on the grounds of security that is actually available publicly, easily accessible – and sometimes in quite lavish detail. This makes blanket withholding of such information look like an ill-informed and unrealistic policy.

Objective 3 (Questions 12 & 13)

Objective 3 focuses on linkages between the CRR and other forms of risk communication to which the public may be exposed. The government's guidance on "warning and informing" makes it clear that the CRR is only one dimension of an integrated approach to developing the public's awareness of civil contingency risk (Cabinet Office, 2005b). Thus, it is entirely reasonable to examine the extent to which Local Resilience Forums relate their CRR to other forms of risk communication.

It seems that relatively few CRRs make reference to any other form of locally-generated risk communication, or to any materials produced specifically for the public. It is also worth considering whether they describe the role of local media in disseminating emergency information or make reference to other local sources of information. This might include the identification of the related information activities of, for example, parish or town councils, community organisations or the emergency services. If it does not do any of this, the CRR may in fact be an isolated document, actually standing outside the LRF partners' wider communication strategies. Clearly, token reference to central government guidance is not enough. Given that such publications tend to be written for the practitioner, and not the public, some more focused direction as to how to use these resources would be appropriate and useful, as well as making the CRR more obviously relevant to its audience.

Objective 4 (Questions 14-17)

Objective 4 examines the extent to which Local Resilience Forums have used their CRRs to engage with their public. The evidence under scrutiny is the public's means of contact with the producers of the assessment, whether or not the public's views are actively solicited and whether or not there is any stated intention to open a risk dialogue in the future. The literature on the benefits of public engagement about emergency risk has been reviewed above, and it has already been argued that the risk assessment duty is based on the assumption that a better informed public

makes for a more resilient society. It has also been argued that a sociological model of risk communication is predicated on public involvement and dialogue.

Questions 16 and 17 assess, respectively, whether or not custodians of the CRR solicit the views of the public and whether or not there is any expressed intention to engage with the public in the maintenance of the register in future. It has already been mentioned that the legislative deadline for the first version of the registers was short. This militated against consultation with the public in the first instance, but it is argued that public involvement in their subsequent maintenance has been possible and is highly desirable.

Pidgeon noted that:

…(an) important consideration is that risk communication is not merely driven by risk communicators. It is important to recognise that individuals are active seekers, generators and processors of information about hazards.

(1992:180)

To ignore the logic of social engagement with community risk is to treat the public as nothing more than what Irwin calls a *tabula rasa*, a perspective he describes as “sociologically inaccurate” and an “obstacle to social learning on all sides” (1995: 92).

In his Carrington plant study of risk communication, Irwin identified four main elements in the local council’s strategy:

- There was no hint of uncertainty in the risk statements in the leaflet that was distributed to homes around the plant. The world was presented as one of “robust knowledge (and of robust authority)”.

- There was no development of the rationale for the exercise or for the information and advice that was disseminated. The deliverers of the messages expected them to be accepted without question.

- The overall tone was of reassurance, which implied legitimising the authority of the bearers of the messages.

- There was no attempt to encourage dialogue about the risks, and no attempt to establish the level or nature of local understanding of them.

In Irwin’s words:

The implicit model of the local public was one of ignorance. They (were) the receptors for selectively managed information.

(Irwin, 1995: 86)

Scientific complexities and uncertainties are filtered out in a “clear and simple” form so as to avoid confusion or unnecessary panic among a population assumed to have no prior knowledge or understanding of the issues – or much interest in them. The “facts” are then presented in an authoritative fashion – backed by

the social legitimacy of the industrial operators together with the local authority and the emergency services. No encouragement is given to debate or discussion. Nor is there any suggestion that local views, opinions or assessments would be useful. The model is one of informing rather than empowering the public. In such an exercise, the community are witnesses rather than participants. If your CRR fits this bill, then one of your main platforms for communicating with the public on civil protection issues is likely to be out of step with your other strategies and standards in communication.

Conclusions

It is a legal duty under the Civil Contingencies Act 2004 for LRFs in England and Wales to make assessments of the risk of emergencies in or affecting their areas. They are required to apply a prescribed methodology and publish these assessments. All of them have since been published in the form of a Community Risk register on the internet. It has been argued that the duty to publish is a clear expression of the government's policy to encourage public dialogue about risks, increase public awareness about them and so contribute to improved community resilience. This is based on the assumption that a well-informed and risk-aware public will be better able to respond to emergencies, and so their impact on the community will be reduced. It is given legal expression in another of the duties defined under the Act; the duty to warn and inform the public about emergencies before and after their onset.

The registers were produced against a deadline that militated against widespread consultation. However, since then there has been ample time to develop the document and its production processes. Good practice in risk communication is what has been called here, for want of a standard title, the sociological model – in contradistinction to the deficit model. The character and elements of both have been examined in detail and the case made for the absolute primacy of the former.

It therefore becomes a matter of some importance to assess the CRR against this benchmark. The rationale is that, if the registers are intended to encourage and frame dialogue and openness about risk management in the context of civil contingencies, as they clearly are, it follows that they should be written and presented in ways that make them accessible and meaningful to a lay readership. Their presentation should be appropriate to their purpose, the messages they contain and their intended audiences. The registers are clearly meant – at least by the government – to be read by the public, to inform their understanding of local civil contingency risks and to promote dialogue. They are instruments of risk communication, whether the authors consider them to be so or not. It follows that their presentation should follow the standards of good practice.

In a discussion of theoretical perspectives and concepts, and a review of the literature, it was argued that most forms of risk communication conform to what is called the deficit model. This model was analysed and its inherent shortcomings identified. These limit the utility and effectiveness of risk communications

based on it, and make it an unsuitable model for a risk communication exercise of this magnitude and ambition. It is fair to conclude that deficit-based risk communications would not meet the aim of government legislators in promoting public awareness, constructive engagement and community resilience.

When risk communication emerged as a discipline, growing out of a tradition of risk perception research, it was initially rooted in the deficit model. This was explored by reference to a variety of case studies. The notion of scientific rationality was also critically analysed, because the deficit model of risk communication is typically science-centric. It tends to make a number of flawed assumptions about the universality, disinterestedness and objectivity of science and, by contrast, tends to be dismissive of folk-derived or lay opinions and risk constructs.

This analysis, and studies of deficit-model risk communication in action – in particular Irwin's studies relating to the Carrington petrochemical plant and the insecticide 2,4,5-T, expose the shortcomings of communication strategies based on these assumptions and the error in supposing that lay risks constructs are necessarily less valid than those of the experts. It was also argued that such perspectives are sociologically naïve, and tend to generalise about lay audiences – treating them as an undifferentiated mass and displaying little or no sense of the granularity of a community - and its social, political, cultural and economic diversity.

Having examined the reasons why the deficit model is ineffective, the discussion than identified the essential characteristics of its corollary – the sociological model of risk communication. It was argued that this displays 10 essential principles, the application of which is much more likely to lead to a sociologically nuanced and more sophisticated approach to the issue. This should, it is argued, increase the likelihood that the communication exercise will be effective and meet its aims. Its most basic assumption is that no one perspective – expert or lay – is privileged. It argues for inclusivity, the recognition of multiple (and equally valid) risk constructs and, above all, reflexive dialogue. In counterpoint, the deficit model tends to reflect the desire to convince an ignorant public of the rightness of an expert perspective. This may be one that is favoured over a variety of competing expert views, reflecting the essentially non-reflexive approach to science and "facts" that is another characteristic of the model.

The assessment tool described above gives practitioners responsible for their CRR a simple means of rigorously assessing its validity as a socially-inclusive example of risk communication. It is based on accepted standards of good practice in the field, and reflects the findings of a substantial body of research into the discipline. Once the tool has been used to make the assessment, the findings will also provide a clear way forward, identifying overall design features and detailed steps that will provide the means of improving and developing a CRR – so that it can be made to work better as an instrument of risk communication.

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COMMUNITY RISK REGISTERS

Assessment Tool

The aim of this exercise is to carry out a documentary analysis of community risk registers, assessing them against a set of criteria which are generally accepted as indicators of good practice in public risk communication.

There is a template below for recording the scores you allocate.

Objective 1

Establish the extent to which the purpose of the register, the manner of its creation and reason for its publication are explained to the public in clear and non-technical English.

Questions

1. Is it a stated purpose of the CRR to give members of the public a balanced

understanding of the risks they face, in order to make them better able to respond to an emergency and reduce its impact on the community?

2. Is it made clear, down to the level of participating organisations, who was responsible for the CRR's production, how it was produced and how it is maintained?

3. Are the underlying concepts of risk, likelihood and impact explained clearly and without technical language?

4. Are the underlying concepts of controls, risk treatment and lead agencies explained
clearly and without technical language?

5. Is there any discussion of the limitations of risk assessment and risk management –
especially in respect of issues such uncertainty, professional judgement, scientific evidence and environmental change.

6. Does the design and presentation of the document suggest a deliberate attempt to
make it "user-friendly" for a lay readership?

Objective 2

Determine the extent to which each register is explicitly contextualised, giving a clear and informed sense of its relevance to the local community.

Questions

7. Is the CRR locally contextualised throughout, so that readers should be able to grasp easily its relevance and applicability to themselves and the local community?

8. Does it provide information about the local history of emergencies?

9. Does it provide information about local risk control measures that are in place?

10. Does it provide information about local risk control measures that are planned or under development?

11. Are the reasons for withholding information, including the locations of hazardous sites, explained and justified?

Objective 3

Establish the extent to which the registers are linked to other forms of local resilience and risk communications that the public may be exposed to.

Questions

12. Does the CRR make reference made to other forms of communication about emergency preparedness that the public are likely to receive?

13. Does it give reference to other forms of emergency preparedness information that are available to those who wish to learn more?

Objective 4

Assess the extent to which the public are given the opportunity to engage in the process, through feedback and consultation mechanisms.

Questions

14. Are the public given a point of contact to use if they want to ask questions about the purpose or content of the CRR?

15. Is that point of contact accessible by means other than letter?

16. Are public views about risks in the CRR area actively solicited?

17. Is there a statement of intent to engage with the public on the assessment of risks in their area at any time in the future?

Each question will be answered with a response of “no”, “to some extent” or “yes”. These responses are given numerical values of 0, 1 or 2 respectively. The survey form requires a short, supporting statement where a score of 1 is given, but no statement is required to support an unequivocal score of 0 or 2.

Objective	Scores for Each Question	Comments
1	1	
	2	
	3	
	4	
	5	
	6	
		Total for Objective 1 (out of 12) …….
2	7	
	8	
	9	
	10	
	11	
		Total for Objective 2 (out of 10) …….
3	12	
	13	
		Total for Objective 3 (out of 4) …….
4	14	
	15	
	16	
	17	
		Total for Objective 3 (out of 8) …….
		Grand Total (out of 34) ……