



End of Award Report

Divided We Stand: Bridging differential understanding of environmental risk

1. BACKGROUND

The incidence of breast cancer has increased dramatically in the over-developed world; in the UK, the lifetime risk is now one in nine women (Cancer Research UK 2004). As a prominent epidemiologist claims, 'Only a small proportion of all breast cancers can currently be explained by traditional risk factors, leaving most of the recent and world-wide increases in incidence unsolved' (Sasco 2001 p329).

As many 'traditional risk factors' – such as age at menarche and first full term pregnancy, breast feeding, use of oral contraceptives and HRT – are related to the endogenous metabolism of oestrogen, it has been suggested that chemicals which have the potential to act like oestrogen may be implicated in the 'breast cancer epidemic'. Scientists making these claims tend to be positioned as 'dissidents' (Gaventa 2002) among epidemiologists; their research has been strongly advocated by the breast cancer/environment social movement (Potts 2004a), which tends, similarly, to be regarded with suspicion by more mainstream UK breast cancer charities. Many scientists maintain, however, that the association between the environment and breast cancer is without foundation and, at worst, alarmist (Calle *et al* 2002). These different positions demand correspondingly different policy action: activists urge a collective, precautionary approach to protect women's health, while government cancer prevention policy focuses on individual hereditary and lifestyle risk factors.

Our project aimed to explore these different standpoints, and to provide opportunities for productive dialogue among them by bringing the 'communities of interest' together. These included social movement activists, women with breast cancer, scientists working on environmental risk of disease, epidemiologists, and regional and national policy makers. These opportunities (the 'hearings' we describe below) were informed by extensive initial interviews with key stakeholders. We also appraised the use in this context of the Geographical Information Systems for Participation (GIS-P) tool that was effectively applied on a first stage *Science in Society* grant ('Public Involvement, Environment and Health: evaluating GIS for participation').

Although the focus of the project is on environmental risks of breast cancer, it relates to a number of broader concerns central to the *Science in Society* programme, particularly the governance of contested scientific issues. We explicitly built on the research on public participation in science: the inclusion of 'citizen expertise' (Potts 2001) in decision making; the effectiveness and range of participatory approaches (Nowotny 2003; Abelson *et al* 2003; Jasanoff 2003; Rayner 2003; LOKA); and the debate about the rationale and justification for such involvement (Fischer 2000; Williams and Popay, 1996; Bloor, 2000; Brown *et al* 2003). The European Environment Agency concludes that lay involvement is essential in reducing environmental hazards to health: 'The point is that lay people are not necessarily more knowledgeable or environmentally committed. Rather the benefit of attending to lay knowledge rests in its complementary nature, its sometimes firmer grounding in real world operational conditions...and the associated independence from the narrow professional perspective that can be a downside of specialist expertise' (EEA 2001:177).

While the UK government has been keen to engage lay people in debate about genetics, GM crops and mobile phone masts, it is less enthusiastic about debate over issues, such as MMR vaccination, where the research is regarded as equivocal. Such is the case in relation to environmental hazards associated with breast cancer.

Recent work in the USA (McCormick *et al* 2003, 2004), which explores the environmental breast cancer movement, mirrors our study both methodologically and substantively. Their research identified a number of instances of dialogue between activists, scientists and policy makers resulting in alterations to scientific research agendas. Nonetheless, as in our project, the barriers to such engagement remained evident: 'developing/maintaining' relationships' between participants; 'methodological issues'; and 'social, political and cultural problems' (McCormick *et al* 2004: 629).

2. OBJECTIVES

Our aims were to: 'contribute to the legitimization of citizen expertise in relation to the governance of risk'; 'establish collaborative public engagement of a range of communities of interest'; and 'mediate knowledge claims about environmental risk'. We successfully achieved these aims by meeting the three objectives in our research proposal.

- **'To examine the differential understandings of environmental risks among a range of stakeholders...'**

This was realised, in the main, through the interviews, observations and discussions we carried out with key participants, which indicated how ideology shaped understandings of risk. There was a significant degree of discomfort regarding possible media interest, and fear of misinterpretation was more acute than anticipated. Our analysis yields a novel insight into how understandings of risk are rooted in epistemological positions, which we explain below in Results.

- **'...to test whether deliberately staging interventions in which dialogue between communities of interest are facilitated can establish more consensual and trusting relations...'**

This objective was met by holding a national and three local hearings, which aimed to bring together representatives of the various communities of interest involved in the debate, as discussed below in Methods. Certain perspectives, most notably those from the medical profession and research science, were under-represented at the hearings, while those sympathetic to environmental risk hypotheses tended to be over-represented. This was despite considerable explanation and encouragement at the invitation stage. Nonetheless, the processes involved in trying to bring people together enabled us to gain a better appreciation of the fences and defences that mitigate against productive debate between the interests involved.

Notably, it was the more small scale, traditional ethnographic work which best established trust and dialogue. Perhaps the most successful project initiative was bringing together an epidemiologist and research scientist, who acknowledged their suspicion of each other's work and conclusions, and that they would never have listened to each other without the interviewer's intervention. This meeting yielded one of the richest sources of data.

- **'To investigate citizen participation in policy planning regarding hazard reduction ...[and] comparable initiatives in the USA...to gain better understanding of how communities of expertise effectively participate in risk governance.'**

This objective was met by a series of literature reviews on participatory processes, social movements, risk and policy making, and by maintaining contact with the breast cancer/environment movement and researchers in the US. We were unable to visit US projects due to the need to undertake far more preparatory work (interviews, discussions, preparing evidence for those who requested it) for the hearings then we had anticipated.

3. METHODS

Our findings derive from the use of the traditional techniques of focus groups, interviews and observations, and, more innovatively, from the hearings we set up to bring together participants who held divergent, competing and often conflicting views.

We also applied our Geographic Information Systems for Participation (GIS-P) tool at the local hearings; GIS-P is a form of Public Participation GIS (PPGIS) developed to improve communication between lay groups, official experts and policy makers (Cinderby 1999). The technique proved useful, in a previous ESRC pilot project, in identifying local stakeholders' knowledge of environmental risks that might be linked to breast cancer. This, and the apparent success of implementing GIS techniques to examine potential links between environmental hazards and breast cancer in the US, led to optimism that the technique would be useful for this project. The intention was to use GIS-P as a communication tool between stakeholder groups and official health experts, leading to mutually improved understanding.

3.1 Sample

The principal criterion for inviting participants was interest in breast cancer causation, whether their involvement was professional or personal. Our sample therefore included women with personal experience of breast cancer, lay health activists, environmental campaigners, (from NGOs and social movements), specialist breast cancer nurses, oncologists, public health practitioners, epidemiologists, geneticists and toxicologists. Issues of confidentiality are invariably sensitive in this type of study as the participants – who are often representatives of campaigns or hold high profile positions – are easily identifiable. For this reason, to ensure anonymity, we refer to types of participants in general terms.

3.2 Data collection

Our enquiry focused on the participants' perception of the issue of breast cancer causation, their views on the risk from environmental hazards, and their role in, and attitude to, preventative policy making.

Focus groups

We carried out two focus groups, one with a breast cancer support group and another with specialist breast cancer nurses, convened through existing contacts. The discussions were tape-recorded and notes taken.

Interviews

Ten semi-structured tape-recorded interviews were carried out with individuals involved in public health policy, cancer research, environmental campaigns, and epidemiology. The PI twice held meetings with the chairs of the All Party Parliamentary Group on Breast Cancer (APPGBC). In addition, nine telephone interviews were carried out with members of breast cancer organisations in the USA, and with representatives from UK government agencies (the Environment Agency, Health Development Agency and the Department of Health's Cancer Policy Unit).

Participant observation

Members of the team's long-standing involvement in breast cancer advocacy presented a number of opportunities: we participated in meetings of the Women's Environmental Network, Yorkshire Cancer Network User Partnership Group, and UNISON's women's conference. We presented papers and participated in several conferences, including (in addition to academic conferences) UK Public Health Forum, Britain Against Cancer and the launch of the Yorkshire Public Health Observatory. These gave insight into the 'public' views of stakeholders, as well as providing opportunities to invite their 'personal' views. The PI also prepared a briefing paper for an adjournment debate secured, following the first meeting with the APPGBC, on primary prevention of breast cancer in Westminster; this process and the debate yielded additional documentary data.

'Graffiti exercise'

We collated twelve brief claims about the aetiology of breast cancer, from published sources, and displayed these without attribution, inviting comments to be written on the mounting sheets by participants. We used this technique at the English and Welsh hearings, and in the corridor of a regional Cancer Research office. (We attempted to use the *Science in Society* web site in a similar way, by posting the 'graffiti' statements and inviting comments from a wider constituency; very regrettably, the programme's technical support was not able to make this work).

3.3 The hearings

In order to establish opportunities for dialogue between the various communities of interest, we aimed to bring together an extensive range of people with relevant knowledge and expertise, to participate in a focussed discussion on key questions relating to policy making around environmental risk of breast cancer: to air their own views, and to hear the views of others and the evidence cited. The hearings were the heart of our project. Through effective facilitation, the use of GIS-P and the graffiti exercise, we were able to gain a sound understanding of participants' perspectives and the constraints on consensual dialogue. Each hearing was tape-recorded, and transcribed; extensive notes were also taken by allocated team members.

In line with our proposal, three local hearings were held: in an urban and a rural area, and where there was already concern about local environmental hazards and breast cancer. We aimed for a wide geographical distribution, and the three hearings took place in Yorkshire (England), Flintshire (Wales), and Lanarkshire (Scotland). The Scottish hearing was opportunistically arranged; part of our ongoing contextual work was to compile a contemporaneous chronology of national and international news about environmental hazards and their governance. In the summer of 2004, BBC News Online published a story of an extraordinarily high number of cases of breast cancer around a small primary school; this was of great local concern, and the focus of media attention. With community leaders, we organised an evening hearing to map local people's concerns, which were relayed to officers of the local Health Board and Education Board the next day.

We invited a wide range of participants to the urban and rural hearings: public health specialists, oncologists, nurses, epidemiologists, research scientists, health activists, environmentalists, and women from breast cancer support groups. Considerable background work was invested in contacting those invited. We built on existing networks, using a snowballing technique to widen our contact lists; in addition to formal letters of invitation, both telephone and face-to-face discussions were had with prospective participants to explain the research project and the rationale for the hearings. These discussions in themselves yielded invaluable data, particularly from those participants who were under-represented at the hearing. Oral and written communication provided us with explicit

explanations for their reluctance to attend the hearings. We discuss issues of engagement below in more detail.

The urban and rural hearings used a series of clips we edited from the film 'Exposure' (1997), in addition to the graffiti and mapping exercises, and focused group discussion. A written questionnaire of just two questions was completed by participants at the beginning and end, and maps were sent to all participants when the data had been compiled and digitised.

Having established contacts through the interviews, participant observation and local hearings we set up a national hearing which was held at the House of Commons, through the PI's contact with Ian Gibson MP. A briefing paper was prepared for all participants, and the structured discussion was steered around three headings: 'the precautionary principle as a basis for policy making'; 'the research agenda for environmental risk and primary prevention'; and 'evidence of harm: necessary and sufficient data'. This more formal, and familiar, process of meeting and debating, where participants were invited to contribute by the facilitator, produced better articulated argument and more effective engagement.

Representation at this meeting was diverse and in addition to the public health practitioners, advocacy groups, activists, environmental NGOs, 'dissident scientists', women with experience of breast cancer, and health professionals who were represented in the local hearings, epidemiologists, research scientists, and a politician were also present. A notable epidemiologist and the director of a breast cancer advocacy organisation joined the discussion by video link from the USA. A summary report of the national hearing was sent to all those invited.

The national hearing was both audio and video recorded, and two scribes took notes. Great care will need to be taken in the presentation of the discussion, to ensure confidentiality.

4. RESULTS

Our analysis of the data is ongoing. We have a better sense of why 'research hypotheses about environmental causes of breast cancer' are not being 'taken up by epidemiologists and national policy makers', and this is a very useful finding indeed – particularly as we are able to speculate why the UK situation is so different from the US context.

Here we summarise some themes emerging from the data, in relation to our core objectives.

4.1 Differential understandings of environmental risk of breast cancer

From our richly diverse sources of data we identify significant diversity and contention between those engaged in this debate; we present these competing visions under six thematic headings.

i. The search for explanation

There was considerable (though not complete) consensus that the reasons for the significant increased incidence of breast cancer remains unexplained and that there is a need to explain this. Such a search may be personal or political, or part of the scientific enterprise – and for many it is all of these (see Potts, 2004b; McCormick, 2003; Brown et al 2004). Patients attempt to make sense of their diagnosis by a process of enquiry related by one clinician interviewed: "why when I had a mammogram two years ago...why when I'm very careful about self-examination...why when it's never happened to any of my family..."; he added, "and of course none of us has any answers to those questions".

The breast care nurses focus group drew on a range of 'scientific' and 'personal' theories of breast cancer causation, as health professionals and as women. They included genetic

factors, internal hormonal factors such as contraceptive pill and HRT use, smoking, drinking, 'diet' (particularly dairy products), the 'environment' (plastics and pesticides) and the relationship between immune system, stress and environment.

Interviews with oncologists and clinicians, and the researchers' graffiti exercise showed these 'cancer professionals' tended to distance themselves from this search for explanation, arguing that that looking for causes was part of a bigger picture with which they are not qualified to engage. Despite the view in the medical literature that 'the causes of breast cancer are not fully understood, and some of what is known remains contentious' (Driedger & Eyles 2001:1589), both a notable academic epidemiologist, and a 'dissident' scientist claimed that the aetiology has been comprehensively explained.

ii. The complexity of the aetiology of breast cancer

The majority of participants held the view that the aetiology of breast cancer is highly complex: as an epidemiologist commented, "...breast cancer is extremely complicated as a disease...it's very difficult to understand" (interview). Several participants regarded this complexity as a barrier to effective research; environmental factors may play but are less amenable to scientific scrutiny and controls. Participants from a range of communities of interest highlighted the complexity and diffuseness in conjunction with the inability of established scientific processes effectively to study the topic.

In contrast, a few participants regarded the question of causation as a closed case: an epidemiologist claimed of a colleague: 'She thinks she's got it, there's nothing left...it's all about age of menarche, breast feeding and age of first pregnancy and menopause...she'll say forget it, we know what the causes of breast cancer are, what are you on about...' And a hearing participant was convinced there was "one major cause", exposure to non-ionising radiation.

The majority of participants, however, occupied a cautious middle ground, seeing breast cancer as very complex in its origins "...very very complicated, incredibly complicated, for most people that get cancer there isn't a simple answer, I don't think so anyway"(research scientist, interview). The national hearing participants were agreed that there was a complex interaction of causative factors.

iii. Differing interpretations of the data and 'flawed methodologies'

From the data we discerned two opposing positions in relation to the evidence for environmental risk of breast cancer: that science has not yet provided good enough data, or that the dominant scientific approach is inappropriate. Certainly, our own review of the epidemiology indicates a number of methodological difficulties: the lack of comparable studies, problems of confounding variables and controls, and differing interpretations of the same data. Research scientists, epidemiologists and cancer professionals cited methodological flaws and technical difficulties of carrying out studies as reasons for incomplete understanding. While several argued that what was needed was more of the same, others claimed the problem was the focus of study: "all the big solid epidemiology studies we've got have all ... been done on blood and they don't show any association, but the few that have been done using breast tissue, breast fat do show an association" (research scientist, interview). One epidemiologist, urging an 'alternative methodology', thought the laboratory evidence implicating environmental pollutants was convincing, but not been picked up in epidemiological studies of incidence due to difficulties of measurement.

As Driedger & Eyles (2001) found in relation to the claims made by Greenpeace about the role of chlorine in breast cancer causation, 'despite the inconclusive nature of the science, each side within the debate uses and interprets that data to suit its claims' (p1598).

iv. Ideological positions

Most participants were suspicious of the motives and claims made by those whose conclusions differed from their own. A shared ideology –the ideas and concepts a person holds to make sense of society and their role in it – was more predictive of alliances between participants in the hearings than their identity (as scientist or activist, for instance) (Potts 2004b). The fences and defences that inhibited full engagement in the local hearings evidently derived from ideological positions about the nature of scientific enquiry, political processes and the role of capitalism in relation to the state.

Not just the activists spoke from a political economy perspective: epidemiologists spoke of leverage and power, and it being impossible to ask questions about suspected environmental hazards. A research scientist asserted that “public health cover up the existence of clusters” (hearing), and a public health specialist similarly claimed “when it comes to making a public statement, as with BSE, everyone gets behind the barricades and the line is agreed”(interview).

v. The translation of science into policy

Participants were at variance regarding how available evidence might be translated into policy. The dissident research scientists claimed there was adequate evidence but that policy makers, and journal editors, were frightened to act on what was known. An epidemiologist (interview) pointed out that the government has long failed to act on smoking, where the evidence is ‘grotesquely strong’. The ‘cancer professionals’ felt more powerful evidence was needed before any policy could be proposed. This was echoed in the revision by the APPGBC secretariat of the Westminster adjournment debate speeches to stress the need for ‘more information’.

Participants were divided on both ideological and pragmatic grounds regarding a precautionary approach to breast cancer prevention. The debate was evidently more sophisticated in US policy circles than in the UK. The European Environmental Agency points out: “Preventive and precautionary public action...requires a minimum measure of agreement between governments and stakeholders about the approach to causality under conditions of uncertainty, ignorance, disputed values and the high stakes of 'being wrong' in both directions, i.e. failing to reduce harmful exposures; or taking precautionary measures that turn out to be unnecessary” (EEA 2003:3). While the approach to breast cancer causality is not agreed, the adoption of precautionary public health actions remains impossible. But the key contention, from our research, is not *who* participates, but the nature of the evidence they cite.

vi. Epistemological positions

It is difficult to foster a dialogue between people who occupy different epistemological positions. These positions provide a framework for the sorts of questions that can be asked, the kind of evidence or proof required and the accepted procedures for generating knowledge: a paradigm. Adherence to a particular paradigm may, however, be implicit rather than explicit, and part of our ongoing analysis of the data is to make sense of these epistemological positions. The table below attempts a preliminary organisation of those evident in our study.

Epistemological positions and approaches to the governance of risk

Epistemological positions Examples of representatives of the positions	Acceptable research questions	Acceptable means for the production of knowledge	Acceptable evidence	Position in relation to risk governance	Examples of communities of interest
Traditionalists Including oncologists, politicians, a research scientist, major cancer charities, public health specialists, epidemiologists	Good science only asks questions for 'scientific' reasons. Eschews value based questions.	Conventional study designs; clear models to reveal linear causation, deterministic. Must be scientifically robust; 'bigger is better' school of epidemiology.	Must be proven, does not tolerate uncertainty.	Act only on the basis of established knowledge. Rejects precautionary principle as alarmist.	Academic scientists, politicians, clinicians
Dissident/ Traditionalists Research scientists, some of the NGOs, breast cancer nurses, cancer specialist, some activists, an epidemiologist	Good science will ask politically and scientifically challenging questions.	Assumes science is imbued with politics and values but that rigorous science takes account of these. Works within traditional models of science, but asserts the admissibility of evidence for other scientific fields.	Will tolerate uncertainty, accepts that clear cut findings in relation to complex problems are difficult, but claims there is sufficient scientific evidence to act.	Accepts precautionary principle, on the basis of sound available evidence. Suggestive evidence demands some policy action.	Scientists often funding from less conventional sources; academic scientists in USA, environmental pressure groups, some NGOs
Dissident/ Challengers A public health specialist, some NGOs, activists, an epidemiologist	Asks questions that are unacceptable to most scientists and to many politicians.	Recognises non linear complex systems and similar debates in contemporary science. Seeks to work within new models (e.g. new paradigm in toxicology)	Will tolerate uncertainty, acceptance of 'grey' literatures and suggestive findings.	Urges the precautionary principle as a foundation of policy making	Academic scientists (not many), activist, feminist scientists, environmental pressure groups

4.2 Geographical Information Systems for Participation

We are better able to suggest when and how GIS-P works effectively, as the technique met with mixed success. The mapping was useful in identifying where local knowledge, as opposed to a broader understanding of the issues, was lacking. The technique stimulated discussion between participants at the meetings leading to greater understanding of each other's perceptions. The GIS-P maps were useful in helping health professionals identify whether local concerns had any recognised vector to a recognized cause of breast cancer. So while the GIS-P mapping proved useful in encouraging discussions, captured local understanding of environmental concerns (where they existed) and was a valuable communication tool between local stakeholders and health professionals, its use was not implemented or tested as hoped due to the lack of engagement from the official health experts. In this respect it is still unclear whether GIS-P would have proved a useful process in this context.

4.3 Fences and defences: problems of engagement

The six themes above suggest the constraints on establishing dialogue between different communities of interest. Further pragmatic considerations help to explain the difficulties in engaging oncologists, public health specialists, epidemiologists and policy makers to the hearings in particular and to the debate more generally (Potts and Nettleton, 2004). Many professionals we approached felt the issue was not their 'specialism' and thus they had no legitimate role in participating. A related concern was that involvement in controversial debate could compromise their professional and career prospects in terms of funding, promotion, and professional acceptance.

The topic provoked pernicious anxiety about possible media interest; several people mentioned examples of how scientific debates have been misrepresented, and the public misinformed about possible health risks (MMR was frequently cited). It is significant that over the period of the project, issues of environmental health risks received high profile media coverage. Project researchers were keenly approached by the Scottish press in relation to the Lanarkshire hearing, but we remained resolute, throughout the project, that no media would attend any of the hearings, to allow open dialogue.

To summarise: Throughout the project we successfully explored the substantive issue with people who hitherto had not engaged with each other. This was not a straightforward task, and analysis of the processes involved in generating such engagement reveal that ideological, epistemological and political factors constrain effective dialogue

5. ACTIVITIES

5.1 Conferences

- March 2004, British Sociological Association, University of York, Potts L. *'I wouldn't have thought of it like that': re-mapping self and the environment as the result of illness.*
- March 2004, Sociology of Cancer, University of Warwick, Potts L. *Differential understandings of environmental risk of breast cancer: towards primary prevention.*
- March 2004, Centre for Social Justice seminar University of Coventry, Potts L. *Mapping citizen expertise about breast cancer risk: a model of environmental justice for public health policy.*
- April 2004, UK Public Health Forum, Brighton, Potts L. *A public health strategy for prevention of breast cancer.*

- September 2004, BSA Medical Sociology at University of York, Potts L. and Nettleton S. 'You're barking up the wrong tree': what will change the dominant medical paradigm of breast cancer causation?
- November 2004, launch of the Yorkshire Public Health Observatory poster presentation, Potts L. *Divided We Stand: bridging differential understanding of environmental risk of breast cancer.*
- November 2004, Science in Society programme workshop, Potts L. 'You're barking up the wrong tree': what will change the dominant medical paradigm of breast cancer causation?

5.2 Networks:

- While visiting on an ESRC Innovative Health Technologies travel fellowship, Sarah Nettleton met Rosemary du Plessis at the University of Canterbury in Christchurch, New Zealand, who is working on a similar study.
- We maintained regular contact with breast cancer campaign groups in the US, charting their activities and progress through the life span of the project.
- Rachael Dixey maintained an active link with Yorkshire Cancer Network's User Partnership Group, and contact with the Asian Cancer Support Group, and the Airedale Breast Cancer Support Group.
- Arising from our paper at the Medical Sociology conference, we had useful debate with academic colleagues about issues and processes of deliberative participation, which contributed to planning the national hearing.

6. OUTPUTS

- Potts, L. (2004) 'Mapping citizen expertise about environmental risk of breast cancer' in *Critical Social Policy* vol. 24(4), 550-574, 2004
- Potts, L (2004) 'Looking for Answers' in *Public Health News* May
- Potts, L. (2004) 'Time to take prevention seriously' in *Health Matters* no.56, summer

In preparation:

- 'Using GIS-P to map perceptions of environmental risk of breast cancer: a comparative analysis', for either *Applied Geography* or *Health and Place*.
- 'Fences and defences: paradigms of breast cancer risk', for either *Health Risk and Society* or *Critical Public Health*.
- 'Obstacles to the implementation of the precautionary principle in relation to environmental risk of breast cancer', for *Journal of Health Education*.

7. IMPACTS

- The Fourth World Conference on Breast Cancer, to be held in Canada in June 2005, has accepted a proposal and is funding the PI to co-ordinate an international forum considering effective national strategies for primary prevention. She will also present a paper on the project findings at the conference.
- UKPHA has a new Special Interest Group on Toxics and Health, following the presentation given by the PI at the Forum in 2004; the PI has been invited to become a founding member.
- The PI has been invited to act as consultant to a drama piece being written about Rachel Carson and her legacy, which will take the concerns about environmental risk of breast cancer to new audiences.
- The Chair of the All Party Parliamentary Group on Cancer has announced (in January 2005) that the group will revise its membership to include a wider range of NGOs with relevant expertise.

- The team has been invited to discuss the project and its findings at the Trent Cancer Services Users' conference in March 2005.
- *Breast UK* has invited the PI to participate in a bid for funding to provide information to support a primary prevention agenda.

8. FUTURE RESEARCH PRIORITIES

- An ethnographic study of the precautionary principle within science and policy making; how it is differently understood and perceived as political impediment or as a lever for change.
- The costs of participation in deliberative policy formulation: is participation differently regarded depending on the substantive topic? Or is the attitude of citizens, policy makers, scientists and media shaped by ideological position in relation to the process itself?

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