

2. Meetings



2.1 - Public opinion on EMF

Date: 8th May 2006

Witness:

Liz Owen, Associate Director of Opinion Leader Research

Members of the Inquiry considered quantitative and qualitative public opinion research commissioned by CHILDREN with LEUKAEMIA on the public's views on EMF exposure, presented by Liz Owen of Opinion Leader Research (OLR). The quantitative survey '*Electricity Omnibus Survey*' was carried out by TNS. The qualitative survey '*The public's view on an appropriate response to the relationship between EMF and childhood leukaemia*' was undertaken by OLR.

Quantitative research

OLR conducted a quantitative survey using a demographically representative sample of 1000 adults in the UK, taking into account gender, age and socio-economic group.

Key findings presented to the Inquiry were:

- With a small amount of background information, three out of five people expressed concern about the link between childhood leukaemia and exposure to EMF.
- 1 in 3 people would choose to bury power cables ('undergrounding') as their preferred action to reduce exposure to EMF.
- 3 out of 4 people thought that action should be taken to reduce public exposure to EMF.
- About 1 in 3 people were prepared to pay an additional sum on their monthly electricity bill to fund action to reduce exposure to EMF (on average people were prepared to pay £3.66).
- Other popular measures to reduce EMF exposure included developing the use of alternative energy sources and conducting more research into the issue.

Figures from National Grid estimate that it would cost approximately £30 billion to fund the burying of the 3000km of high-voltage power lines closest to homes and would take approximately 30 years to bury these lines. If electricity bills in the UK increased by £3.66 per month, the cost would be covered in 30 years.

Members discussed how undergrounding might be funded, given its high cost. Would a cost / benefit analysis need to be undertaken? Would this option be funded by the consumer, the Government or electricity companies?

Dr Stoate questioned the large sums of money needed to underground power lines, and wondered whether this was a convenient excuse for the power companies to do nothing by claiming undergrounding is too expensive. Dr Stoate felt that other alternatives for dealing with the problem ought to be explored by the power companies, in particular having a lower voltage level and larger cables.

Mr Hurd asked whether the high public approval levels for burying of power lines might be for aesthetic rather than health reasons.

Qualitative research

OLR also conducted qualitative research, in the form of a small scale, in-depth study carried out with 20 (demographically nationally representative) people, from three North London boroughs. The process involved taking people's initial views in one discussion session and then again, a week after being given more detailed reading materials on the subject. OLR worked to ensure that the information given to participants was as neutral as possible.

The main findings reported to the Inquiry were:

- People given information about the association between childhood leukaemia and EMF, expressed strong support for addressing the issue, even on the basis of the current scientific evidence (which was characterised as 'inconclusive').
- The group supported the idea of a moratorium on new building, although participants recognised this was not a comprehensive long-term resolution.



- In the longer term, the preferred course of action was to bury cables, as this was viewed as the most complete solution to the problem. However, concerns were raised about the possible environmental effects of undergrounding cables.
- It was felt that responsibility and cost should be shared by Government, electricity companies and consumers.
- The group felt that the public should have more say on the siting of new high voltage power lines through an improved notification procedure for people living and working close to proposed developments.

Significantly, these choices were made by the participants in the knowledge that there was no established causal link between EMF and childhood leukaemia.

Questions were raised by members about how these precautionary measures might affect the housing market, for example; compensation for land owners near power lines; devaluation of houses and land close to power lines; estate agents' views on a building moratorium; and existing market research on the price of homes near to power lines. The Inquiry subsequently obtained written evidence on these specific issues from estate agents and house builders (*see 6.3 below*).

2.2 - Scientific evidence for and against a link between childhood leukaemia and EMF

Date: 15th May 2006

Witness:

Dr Adrienne Morgan, Staff Scientist, CHILDREN with LEUKAEMIA
Roger Coghill, Coghill Research Laboratories

Dr Adrienne Morgan presented the findings of the report 'Do EMFs cause childhood leukaemia? A review of scientific evidence' ('the report'), which Dr Morgan co-wrote with Katie Martin, Grants Manager for CHILDREN with LEUKAEMIA.

The report is a review of both epidemiological and the experimental studies conducted with EMF in biological systems over the last 30 years on the association between childhood leukaemia and exposure to EMF.

Epidemiological evidence

The epidemiological studies reviewed by Dr Morgan studied the incidence of childhood leukaemia in relation to different levels of exposure to EMF.

Dr Morgan told the group that the two most recent studies (Greenland, 2000 and Ahlbom, 2000) using pooled analysis of data (where data is gathered from a number of studies allowing patterns to be identified more easily) and a meta analysis by Wartenburg (2001) show an association between childhood leukaemia and exposure to EMF.

'The Draper Report' (2005) lends further weight to this association, as it is the largest ever single study of childhood cancer and power lines, conducted using the UK Cancer Registry records of 29,081 children with cancer (including 9,700 with leukaemia). Draper reported that children living within 200 metres of high voltage overhead transmission lines had a higher risk of leukaemia (a 69% increase in incidence) than those living 600m or more away. Children living between 200m and 600m of HVOTL had a 23% increase in risk. In her report, Dr Morgan states that '[t]here was a significant trend in risk



in relation to the reciprocal of distance from the line [HVOTL] – i.e. the risk increased as the distance decreased' (p.16, chapter 2.4.4 'A review of the scientific evidence').

Although confounding factors have not yet been ruled out, overall, the epidemiological evidence suggests that children living in homes in close proximity to power lines have an increased risk of developing leukaemia.

Biological evidence

The report considered 25 years of peer-reviewed scientific publications on the effect of EMF on DNA, cell function and in animal models.

Of the 64 studies into DNA damage in cells exposed to EMF reviewed by the report, the results were as follows:

- In 14 studies EMF exposure **did** have a biological effect on DNA;
- In 21 studies EMF exposure **did not** have a biological effect on DNA;
- 29 studies were inconclusive.

The experimental data relating to the effects of EMF on cell function and in animal model systems are also contradictory and inconclusive. There are a number of good and reproducible studies that demonstrate an effect caused by EMF. There are also many other equally good studies that do not show such an effect.

Dr Morgan told the Inquiry that, as a biologist, she viewed the fact that there was *any* demonstrated effect of EMF in biological systems as a cause for concern.

Professor Tony Barker, Chairman of the Institution of Engineering and Technology (IET) Biological Effects Policy Advisory Group on Low-Level Electromagnetic Fields, an observer at the meeting, provided the Inquiry with the IET position statement on EMF and health. Professor Barker told the Inquiry that his group would be glad to assist members at a later date after the SAGE group had published its report. Subsequently, Professor Barker met with Dr Stoate to outline the IET's position on the science of EMF.

Summarising her findings, Dr Morgan explained that the epidemiological evidence for a link was “quite convincing” but no clear biological mechanism has yet emerged. One of the difficulties in biological experiments is that they are not easy to reproduce. She illustrated this point with the example of two studies, both using lab rats to examine whether EMF exposure promoted cancer growth. Results from one study showed EMF exposure speeding the growth of a tumour, but in a second study designed to corroborate this finding, did not show the same effect. It emerged that the groups were using different breeds of rat, with seemingly different sensitivities to EMF. This demonstrated that although evidence linking EMF to cancer growth should not be ignored, much more research is needed to fully elucidate the biological mechanisms.

Dr Stoate summarised at the end of this meeting that although the biological link seems to be uncertain, the epidemiological association between childhood leukaemia and EMF seems clear.



2.3 - Legal and planning issues surrounding power lines and EMF

Date: 14th June 2006

Witnesses:

Mark Challis and Sarah Wotton of Bircham Dyson Bell (solicitors)
Brenda Short (lecturer in environmental law, SAGE member and legal advisor to Powerwatch)

Dermot Finnigan (an individual whose house sale has been hindered by high voltage overhead power lines)

Mr Challis described to the Inquiry the main legal and planning issues relevant to the construction of, and consenting arrangements for, power lines and substations. He covered three distinct areas:

How licences are granted for the generation, transmission or supply of electricity

The Electricity Act 1989 provides that licences are required for the generation, transmission or supply of electricity. These licences are granted by the Gas and Electricity Markets Authority. The Inquiry heard that at present the decision to grant a licence is based largely on commercial factors and not health issues. Mr Challis went on to explain that conditions might be attached to electricity licences.

The Inquiry members asked whether the Secretary of State for Trade & Industry could impose conditions requiring health and safety issues to be considered before granting a licence. Mr Challis referred to the report prepared by Bircham Dyson Bell which states that 'there does not appear to be any reason in law why the Secretary of State should not impose such conditions'.

In addition, the Secretary of State could modify the 'standard conditions' for licences to include a duty to protect public health. There is some question over what the standard conditions should be: the Gas and Electricity Markets Authority has carried out a recent consultation exercise, seeking views on what should be included in the standard conditions. It seems that there has been little mention of health and safety issues.



Consenting mechanisms for granting planning consent for the construction of overhead power lines

Section 36 of the Electricity Act provides 'consent of the Secretary of State must be obtained in order to construct, extend or operate an electricity generating station with capacity exceeding 50 megawatts'.

Section 37 of the Electricity Act provides 'consent of the Secretary of State is always required for the installation of overhead power lines'. Once an application has been made to the Secretary of State, the local planning authority has the opportunity to object, in which case a public inquiry must be held.

Mr Challis explained that the consenting mechanisms for planning consent vary depending on the voltage in question. There are guidelines for granting consent, however these are predominantly based on visual impact and do not relate to health and safety. It is not clear whether or not the Government believes that these guidelines should be updated to include a requirement for the Secretary of State to consider health and safety concerns before granting consent for new HVOTL, especially given public opinion on the issue, as well as current and emerging scientific evidence linking EMF to adverse health effects, particularly childhood leukaemia.

For overhead power lines above 132kV, the Secretary of State must consider radiation emissions (including EMF) under the Environmental Impact Assessment (EIA) regulations before granting consent for an overhead power line. An electricity company seeking the consent of the Secretary of State must provide an Environmental Statement to the Secretary of State, detailing this and other information regarding the possible 'significant effects' on the environment of the proposed development as part of the EIA.

For power lines below 132kV, an Environmental Statement is not currently required. Members of the Inquiry felt that the Government might wish to review this requirement, given the volume of scientific evidence and public opinion surveys which have been published since the regulations were introduced.



Case law and redress

Sarah Wotton presented an overview of existing case law on EMF and the possibility of redress under current human rights and civil liability legislation and the precautionary principle. Ms Wotton's comments on the possibility of legal redress for complainants with a grievance relating to power lines and / or EMF issues were of interest to the members.

The Inquiry also heard evidence from Brenda Short, a lecturer in environmental law, who gave a summary of her assessment of the areas of law which could be used to challenge the siting of power lines and substations next to housing. Members asked whether she thought there was any combination of existing legislation that would enable someone to prevent planning consent being granted on the grounds of health considerations relating to EMF. Ms Short explained that there was currently no legislation that could secure such an objection.

Case Study

The Inquiry had the opportunity of hearing from a private individual who has for some time been unable to sell his home because of a pylon (erected after he built his house), located 30 metres from his house and 10 metres from the edge of his land. A dispute has arisen with National Grid because they do not recognise the boundary lines he has given and therefore have not offered any compensation for the loss of market value to the property. Mr Finnigan explained that the value of the house has suffered a further decrease since the publication of the Draper Report in 2005. The case highlighted to the Inquiry the potential problems faced by people living in close proximity to power lines.

Responses from the housing industry

During the first Inquiry meeting, questions were raised concerning compensation for land owners near power lines; the devaluation of houses and land close to power lines; estate agents' views on a building moratorium; and existing market research on the price of homes near power lines.



The Inquiry contacted the UK's biggest house builders and estate agents, as well as the real estate industry organisation, the National Association of Estate Agents. These witnesses were asked for their opinion on the EMF issues outlined by the Inquiry.

Many of the respondents felt unable to comment in detail on a direct link between house prices and proximity to power lines. Other, however, gave a more detailed analysis of the situation. The following responses in particular were noted by the members:

- The National Association of Estate Agents stated that “in some cases [agents are] finding it almost impossible to sell such houses [i.e. those under power lines]...it is apparent there is a problem.”
- In response to the question on the value of houses located near to power lines, the Developments Sales Director of Barratt Homes advised that “the likely discount needed to sell properties....close to overhead power lines might be between 15% and 25%....”
- Representatives from George Wimpey Homes stated that they currently have ‘an internal guideline’ which prevents the building of homes within 200 metres of HVOTL and they estimate that a discount of around 10% is required to sell homes near to power lines.



2.4 – Views of the Electricity Industry

Date: 28th June 2006

Witnesses:

Tony Glover, Public Affairs Manager, Energy Networks Association (ENA)

Dr John Swanson, Scientific Advisor, National Grid

Energy Networks Association (ENA)

Tony Glover spoke on behalf of the Energy Networks Association (which represents electricity transmission and distribution licence holders).

Mr Glover emphasised that the energy industry has been instrumental in investigating the issue of EMF and believes this is important for reassuring the public that industry is prepared to work in partnership with others on this matters. The ENA is keen to discuss EMF issues with all appropriate stakeholders, including the Cross-Party Inquiry and SAGE.

Although the ENA's position on EMF is mainly 'science driven', Mr Glover informed the Inquiry members that the ENA believes that other factors, such as public opinion, should be taken into account.

National Grid

Dr Swanson explained that, in addition to his work for National Grid, he also works for the Energy Networks Association. He was also one of four authors of the Draper Report.

Dr Swanson told the group that the issue of EMF is very important both to National Grid, which manages the UK's electricity transmission network, and to the public. He gave the Inquiry copies of National Grid's position statement on EMF.

National Grid funds 'high quality research' in the field of EMF (including funding for the UKCCS) and spends approximately £1 million per annum on research into the possible health effects of EMF exposure.

Dr Ian Gibson asked Dr Swanson to explain how the research funded by National Grid is kept independent and unbiased. Dr Swanson told the Inquiry that National Grid has “done all it can” to ensure that the research is conducted independently. The National Grid Charitable Trust has around £300,000 per year to fund independent research, while National Grid itself spends approximately £1m. When questioned about National Grid’s possible influence on research, Dr Swanson stated that there would be no point in funding research if the company or the research had no credibility.

Dr Swanson told the group that the majority of research into the health effects of EMF exposure is funded by either National Grid or CHILDREN with LEUKAEMIA and that Government funding has recently been reduced. It was pointed out there is an issue about how health research is funded and Sir David Cooksey is leading a Treasury review which began in the spring of 2006.

Dr Swanson described how, in his opinion, most scientists believe only that there *might* be a risk of childhood leukaemia due to exposure to EMF and that the balance of opinion seems to be *against* taking measures to prevent exposure. The practical policy question is therefore how best to respond to the ‘possibility’ of a link between childhood leukaemia and exposure to EMF. He stated that in his opinion, policy questions such as this will be best answered when SAGE publishes its report.

Dr Howard Stoate asked about the policy position on preventative measures to reduce EMF exposure in other European countries. Dr Swanson replied that precautionary measures have not been adopted at a European Union level; however countries such as Denmark and Sweden have taken precautionary measures at a national level. He did say that implementation has not been straightforward and it is difficult to discern exactly how effective the measures are in practice.

Sandra Gidley asked Dr Swanson: if you could commission a definitive study on EMF and childhood leukaemia, what form would it take? Dr Swanson replied that there had been a lot of biological research done already that has produced laboratory-based results showing no effect from exposure to EMF. More epidemiological studies are required to show whether disease is due to causation or bias in the demographics or socio-economic factors of those living close to power lines.



The need for cost / benefit analysis of any precautionary measures, both by Government and by the electricity industry was also discussed. Dr Swanson said that he recognised that it would be very difficult to attach a value on the implementation of precautionary measures. For example, if the electricity industry decided to raise electricity costs in order to fund measures to reduce EMF exposure, the extra cost on bills could mean an increase in 'energy poverty', a problem that is already affecting vulnerable population, including the elderly and those with lower incomes.



1.5 – The SAGE report

Date: 13th June 2007

Witnesses:

Mr Nick Goodall, Chief Executive and Dr John Swanson, Scientific Adviser, Energy Networks Association (ENA); From the Health Protection Agency - Radiation Protection Division (HPA-RPD), Dr Jill Meara FFPH, Deputy Director; Dr Mike Clark, Head of Press and Communications; Dr Zenon Sienkiewicz, Principal Scientific Officer; Dr M P Maslanyi, Senior Scientific Officer EMF Dosimetry Group.

Dr Jill Meara provided a description of the HPA-RPD in terms of its main interests and functions, namely to undertake and review research into ionising and non-ionising radiations and to increase our understanding about protection from the risks of these radiations.

Dr Meara discussed the HPA's 2004 guidance towards a precautionary approach to EMF, recalling that the "evidence was weak" but that the "least weak evidence related to childhood leukaemia." In 2004 the HPA recommended that the Government should consider the need for precautionary measures in respect of EMF (which, in part, led to the SAGE process). Dr Meara told the Inquiry that "any decision on the enactment of precaution should come from Government."

Other members from the HPA-RPD, Dr Zenon Sienkiewicz, Dr M P Maslanyi and Dr Mike Clark, felt that, since 2004, further scientific studies into EMF "had not moved one way or the other." They commented on the need for further biological studies but not for further epidemiological studies.

All members of the HPA-RPD present stressed that precautionary measures should be considered, but that the measures must be proportionate.

Turning to the SAGE report and process, Dr Meara commented that the HPA board was very keen to "stamp" its own view on SAGE. The Department of Health has now referred the SAGE report and its recommendations to the HPA; however, she was unable to say what conclusions the HPA would ultimately reach.

In answer to a question from Dr Ian Gibson MP – “What further biological tests into EMF would the HPA-RPD conduct?” - Dr Sienkiewicz explained that the HPA-RPD would want to undertake studies that look at molecular evidence in order to establish what causes childhood leukaemia. Furthermore, the HPA-RPD would seek to establish whether these tests can be repeated with the same results. Dr Sienkiewicz described these outcomes as the “missing piece to the puzzle... we have so far been unable to achieve repetition.”

Dr Stoate and Dr Gibson both asked why the HPA-RPD needed biological evidence when ample epidemiological evidence exists. The HPA-RPD pointed to the fact that epidemiological studies were unable to address the question of ‘confounding factors’ which may instead be the cause of childhood leukaemia.

Dr Adrienne Morgan, staff scientist for CHILDREN with LEUKAEMIA, asked the HPA-RPD for their view on a number of recent scientific papers published since the CWL review of scientific evidence in 2005, and referred to a new report from Tasmania, published by Lowenthal et al this week in the Australian Internal Medicine Journal, which showed a marked increase in risk of development of a lymphoproliferative disease including leukaemia in adulthood for subjects who resided close to power lines in childhood (OR 6.18, 95%CI 1.37–27.90). Dr Morgan also commented, in response to a question from Dr Gibson, that the opinion on an association between childhood leukaemia and EMF of Prof Mel Grieves from the Institute of Cancer Research and a noted expert on Childhood Leukaemia had moved from ‘no’ to ‘possibly’.

The HPA-RPD found that the papers mentioned by Dr Morgan showed “a possibility, but no more than that”, again pointing to the fact that there was no replication in these studies.

Edward Copisarow, chief executive of CHILDREN with LEUKAEMIA, asked the HPA-RPD’s view of Professor Denis Henshaw’s work on linear no-thresholds.

HPA-RPD found this to be a “good hypothesis” but went on to say that “these thresholds are quite rare.” This method can show an increase in attributable cases but the ‘snag’ is that it includes many people with low exposures to EMF.

Oral evidence heard from ENA

Nick Goodall, Chief Executive of ENA told members of the Inquiry about the background and purpose of the association. He went on to explain the association’s involvement with - and interest in - health issues surrounding the energy industry, including ENA’s membership of the SAGE process. The ENA remains committed to a process of dialogue with the various stakeholders involved with the SAGE process and sees the work of SAGE as ongoing.

DR Stoate pointed out that there should be a duty on any provider of a public service, e.g. an energy provider, to take a precautionary approach to public health.

Mr Goodall agreed but stated his belief that any precaution must be based on “sound science.” He went on to say that any precautionary measures should be “proportionate”. The ENA did not view the ‘corridors option’ contained in the SAGE report as proportionate – though NG accepted that some members of SAGE took the opposite view.

Discussing the public opinion element within the SAGE report, Mr Goodall told the MPs that SAGE took account of a range of different public opinion, including the surveys commissioned by CHILDREN with LEUKAEMIA.

Dr Stoate asked Dr Swanson what precautions he believed the electricity industry was prepared to take, in the light of the SAGE report.

Dr Swanson echoed the comments made by Mr Goodall about the need for precaution to be proportionate and stated the need for the Government to consider “low cost measures such as greater public information.” He did not believe that the corridors option was proportionate.

Dr Stoate asked whether the ENA had considered the option of implementing 'Direct Current (DC) power transfer'.

Dr Swanson explained that DC power transfer is effective only over very long distances. Because the UK transmission network is largely inter-connected it is not feasible to implement such an option. Mr Goodall added that implementing this option would involve "starting from scratch."

Dr Swanson mentioned the forthcoming World Health Organisation report on EMF. Dr Stoate said that the Inquiry would seek to consider the WHO report in its deliberations.

Towards the end of the meeting, Mr Copisarow asked the HPA-RPD, approximately how long would a new review of EMF take? And did they see any value in beginning a comprehensive review of EMF scientific evidence at this stage?

- The HPA-RPD said that a comprehensive review would take approximately 2-3 years.