EMF- Exposure: Risk Communication in the Face of Uncertainty

Peter M. Wiedemann, KIT-ITAS, 2010
Overview

• The EMF case
• What is needed
• COST approach
• A package solution

Overarching message

EMF is not only a scientific issue, it is a social issue too. Don’t forget to manage the social issue!
The EMF case
Social Worries

• Base stations
• Cell Phones
Cell Phones a Greater Threat Than Smoking, Asbestos?

BY TIM STEVENS — MAR 31ST 2008 AT 10:32AM
Electrosensitive refugees from wireless technology head for Drôme

Anny Boury wraps up in a metal-fibre shawl to shield herself from EMF. Claudie, in aluminium cape, says microwaves excite the brain, like nicotine
Scientists debate possible cell phone link to brain cancer

We can't ignore the links between mobile phones and cancer like we did with tobacco, top scientists tell U.S. Congress

By BARRY WIGMORE
Last updated at 11:58 AM on 25th September 2008

STORY HIGHLIGHTS
- Studies conflict; do not consistently show cell phones cause cancer, expert says
- Expert says he cannot say they are definitely dangerous or definitely safe
- Children are at higher risk for cancer-causing radiation from phone, scientist says
- Woman at House panel hearing says her husband's brain cancer from cell phone

Next Article in Health »
The EMF case

RF EMF Discourse map

- **Scientific debate**
  - Long term effects of exposure below the value limits
  - Children's special vulnerability
  - Hypersensitivity

- **Regulatory debate**
  - What are the right exposure limits?
  - How much precaution is precaution enough?

- **Governance debate**
  - Who should make the EMF policy decisions?
  - On what criteria should the decisions be based?

- **Validity debate**
  - Who provides the right information?
The EMF case: Perceived EMF Risks

How concerned are you about the potential health risks of electromagnetic fields?

Eurobarometer 2010
The EMF case: Perceived risk management

In your opinion, do public bodies act effectively or not to protect you from health risks related to electromagnetic fields?

Eurobarometer 2010
What is needed
What is needed

• Using the right science in a right way to improve risk assessment
• Applying the right risk management framework
• Tailoring the right messages
• Putting the right people at right places to get your messages across

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Package solution "EMF policy"

AMC²

- Assessment
- Management
- Cooperation
- Communication

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- Using the right science in a right way to improve risk assessment
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Focus on most credible risk assessors

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Information on the Effects of Electromagnetic Fields

Publication Query  Glossary  Exposure Sources  Basics

New Extractions

11.11.08: Extremely low frequency magnetic fields cause oxidative DNA damage in rats.

06.11.08: Can evidence change belief? Reported mobile phone sensitivity following individual feedback of an inability to discriminate active from sham signals.

05.11.08: Microwaves from UMTS/GSM mobile phones induce long-lasting inhibition of 53BP1/γH2AX DNA repair foci in human lymphocytes.
Belyav YI, Markova E, Hillar L, Malmgren LÖ, Persson BR in: Bioelectromagnetics 2008

05.11.08: Blood-brain barrier permeability and nerve cell damage in rat brain 14 and 28 days after exposure to microwaves from GSM mobile phones.

New Publications

12.11.2008: Proportion-corrected scaled voxel models for Japanese children and their application to the numerical dosimetry of specific absorption rate for frequencies from 30 MHz to 3 GHz.


10.11.2008: Use of wireless telephones and serum S100B levels: A descriptive cross-sectional study among healthy Swedish adults aged 18-65 years.

10.11.2008: Exposure to mobile telecommunication networks assessed using personal dosimetry and well-being in children and adolescents: the German MobilEx-study.

06.11.2008: Extremely low frequency magnetic fields cause oxidative DNA damage in rats.
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FRAMEWORK FOR DEVELOPING HEALTH-BASED EMF STANDARDS

Section 3
- Select Scientific Database
- Perform Risk Assessment
- Determine Threshold Levels
- Select Safety Factors
- Set Exposure Limits
- Ensure Overall Practicability

Considerations
- Types of studies
- Criteria for inclusion

Section 4
- Interpretation of threshold
- Biological effects
- Interaction mechanisms
- Multiple tiers/different populations
- Level of scientific uncertainty

Section 5
- Basic restrictions
- Reference levels
- Frequency extrapolation
- Explanatory supporting document
- Compliance measures
- Monitoring system

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• Using the right science in a right way to improve risk assessment
• Applying the right risk management framework
• **Tailoring the right messages**
• Putting the right people at right places to get your messages across

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“Risk communication is not just a matter of good intentions ... Risk messages must be understood by the recipients, and their impacts and effectiveness must be understood by communicators. To that end, it is not longer appropriate to rely on hunches and intuitions regarding the details of message formulation.”

Morgan & Lave, 1990, 358

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WHY STUDY RISK PERCEPTION?

RISK PERCEPTION research aims

(i) to discover what people mean when they say that something is (or is not) “risky,” and to determine what factors underlie those perceptions,

(ii) to develop a theory of risk perception that predicts how people will respond to new hazards and management strategies,

(iii) to develop techniques for assessing the complex and subtle opinions that people have about risk.
POPULATION SURVEYS
• shows public opinion on certain issues often across countries

SURVEY INPUT:
• general quantitative overview over reported EMF risk perception
• representative data

EMF POPULATION SURVEY

Question: QB2. Are you concerned over the potential health risks of electromagnetic fields?

Very concerned: 3% Fairly concerned: 13% Not very concerned: 35% Not at all concerned: 35% DK: 14%

Source: Special Eurobarometer 2006

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PSYCHOMETRIC INPUT

• more in-depth
• qualitative factors can be identified
• highlights variances between different technologies

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LIMITATIONS:

- limited explanatory power within one technology
- correlation studies do not allow causal conclusions

### Table VIII. Beliefs About Potential Sources of Interference with Normal Operation of Nervous System

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<td>Moderate or strong interference (%)</td>
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<td><strong>1990 study</strong></td>
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<td>Microwave oven</td>
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<td>Marijuana</td>
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* Significance test comparing the control group with the 1993 posttest group (see Fig. 1).
EXPERIMENTAL STUDIES

- concerned with employing empirical principles and procedures to study psychological phenomena
- in controlled conditions
- test in order to discover an unknown effect or law, to examine or establish a hypothesis, or to illustrate a known law

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EXPERIMENTAL INPUT:

• hypothesis driven
• identifies causal factors/relationships

LIMITATIONS:

• external validity – limited generalizability of results
THE INFLUENCE OF SOCIAL CONTEXT FACTORS - EMOTIONS

- Lay People approach risk questions different to experts.
- They perceive risks primarily in a social and relationship context.
- They transfer questions of risks into their every day life framework of routine events.
- This perspective is based on common patterns of interpreting events, which are heavily influenced by media.

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RISK STORY EXPERIMENT

Aim: Investigate the influence of social context factors/ affective factors which induce outrage vs. leniency on risk perception.

1. Step: Two stories were constructed focusing around the theme "it was bound to happen sooner or later" arousing either outrage or leniency. Presentation of identical risk information but variation in context: company description, cause of incident, possible motives behind the incident …

2. Step: Stories were given to people for evaluation. Subjects had to rate the severity (badness) of the risks

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Effects of informing about precautionary measures


Be aware of side effects of your communication
Quality of information

What counts in information policies

• Impartiality
• Expertise
• Transparency
• Simplicity
• Proactivity

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• Using the right science in a right way to improve risk assessment
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Develop strong community ties

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The Ten Commitments

1. Develop, with other stakeholders, clear standards and procedures to deliver significantly improved consultation with local communities.

2. Participate in obligatory pre-rollout and pre-application consultation with local planning authorities.

3. Publish clear, transparent and accountable criteria and cross-industry agreement on site sharing, against which progress will be published regularly.

4. Establish professional development workshops on technological developments within telecommunications for local authority officers and elected members.

5. Deliver, with the government, a database of information available to the public on radio base stations.

6. Assess all radio base stations for international (ICNIRP) compliance for public exposure, and produce a programme for ICNIRP compliance for all radio base stations as recommended by the Independent Expert Group on Mobile Phones.

7. Provide, as part of planning applications for radio base stations, a certification of compliance with ICNIRP public exposure guidelines.

8. Provide specific staff resources to respond to complaints and enquiries about radio base stations, within ten working days.

9. Begin financially supporting the government's independent scientific research programme on mobile communications health issues.

10. Develop standard supporting documentation for all planning submissions whether full planning or Prior Approval.

NOTE: * International Commission on Non-Ionising Radiation Protection
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“What is simple is wrong, what is complex is useless.”

Paul Valéry