Chapter 1: Risk Assessment and Risk Communication for Electromagnetic Fields: A World Health Organization Perspective (T. Emilie van Deventer and Kenneth R. Foster)
Controversy/Unresolved Issues

- Some biological effects have been reported in nonhuman systems from exposure to EMF at levels below internationally accepted exposure limits. Many of these effects cannot be explained in terms of known interaction mechanisms. However, the quality of the evidence is very mixed.
- Some epidemiological studies suggesting health effects
  - ELF fields and cancer (childhood leukemia)
  - Long term use of mobile phones and brain tumors (?)
- Other effects in humans have been reported
- Wide variation in exposure limits in different countries

International EMF Project

- Established in 1996
- Coordinated by WHO HQ (SDE/PHE/RAD)
- A multinational, multidisciplinary effort to create and disseminate information appropriate to human health risk assessment for EMF
  - To assess health and environmental effects of exposure to non-ionizing radiation (0-300 GHz)
  - To provide technical assistance in strengthening national capacities for the sound management of EMF

WHO Health Risk Assessment

Risk assessment of all health outcomes (Environmental Health Criteria)

Hazard identification and classification of possible carcinogens (Monographs)

Other outputs:
- Risk communication
- Facilitate harmonization of exposure limits

WHO risk assessment is based on the NAS “Red Book” of 1983

(National Academy Press 1983)
### Risk Assessment

#### Relative Weight

- Most
- Least

#### Evidence:
- Human research
- Long-term animal research
- Short-term animal research
- Cell research

#### Risk Characterization

1. **Hazard Identification**
2. **Dose-Response Assessment**
3. **Exposure Assessment**
4. **Risk Characterization**

### Outputs for different audiences

<table>
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<tr>
<th>Professional</th>
<th>Static</th>
<th>ELF</th>
<th>RF</th>
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<tr>
<td>EHC 2007</td>
<td>EHC 2007</td>
<td>EHC 2009-10?</td>
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#### Professionals

- EHC monograph #232 (2006)
- EHC monograph #237 (2007)

#### Public

- Fact sheet #299
- Fact sheet #322

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Risk Communication—Technocratic Approach

[scientists are] “presumed to be in possession of ‘the truth’, or at least reliable knowledge about risk (defined as an objective probability of harm), whereas the general public was understood or represented as being at best ignorant, and at worst possessed of false and unscientific beliefs…. representations of technical risk, provided by the officially selected scientific experts, were deemed to be unproblematically correct and adequate.

(Zwanenberg and Millstone, in Dora p. 181, 183)

Risk Communication—The Decisionist Approach

“risk communication is understood as a two-way rather than a one-way process… stress the importance of both understanding the attitudes to risk of affected and interested citizens and of incorporating those views and preferences into policy.”

“Policy-makers who acknowledge that risk communication, under the decisionist approach, is a two-way process typically conceive of the relationship between science and policy as one in which science is necessary but not sufficient for policy decision-making.”

(Zwanenberg and Millstone, in Dora, p. 170)

Risk Communication—The Deliberative Approach

nonscientist stakeholders be involved in the risk assessment process itself:

“deliberative processes — involving all interested and affected parties —are necessary when deciding which types of harm to analyse, deciding how to describe scientific uncertainty and disagreement, analysing evidence, generating policy options, and deciding on policy outcomes.”

“risk communication … needs to involve dialogue about the definition and analysis, as well as the evaluation, of any particular risk issue.”

(Zwanenberg and Millstone, in Dora, p. 173, 187)

WHO risk assessment is based on the NAS “Red Book” of 1983

paradigm example of a technocratic approach?

(National Academy Press 1983)
WHO-EMF Project stresses the importance of communication:

“Risk communication is therefore not only a presentation of the scientific calculation of risk, but also a forum for discussion on broader issues of ethical and moral concern. Environmental issues that involve uncertainty as to health risks require supportable decisions. To that end, scientists must communicate scientific evidence clearly; government agencies must inform people about safety regulations and policy measures; and concerned citizens must decide to what extent they are willing to accept such risk. In this process, it is important that communication between these stakeholders be done clearly and effectively.”

WHO-EMF Project stresses the limitations of existing knowledge:

“Government and industry should promote research programs to reduce the uncertainty of the scientific evidence on the health effects of ELF field exposure.”

(document offers numerous research recommendations)
Conclusion: WHO-EMF Project avoids some of the limitations of a technocratic approach as described by Zwanenberg and Millstone

WHO-EMF Project:
- Stresses limitations of current knowledge and open questions
- Stresses importance of public involvement in risk decisions

However, the diverse social and cultural aspects of risk, which vary tremendously in different Member States, cannot be included easily in risk analysis at the international stage at which WHO operates.

A More Balanced Approach to Risk Communication (about EMF) May Be Needed:

- There is a need to better identify potential health risks of EMF and improve communications between the public and governments about them. There is a similar need to identify and communicate possible health benefits of these technologies.