

WHO INTERNATIONAL EMF PROJECT

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1. Regulations and actions of governmental agencies:

In autumn 2002 a General advice on limitation of exposure of the general public to electromagnetic fields between 0 Hz and 300 GHz has been issued by the Swedish Radiation Protection Authority (SSI). The Advice is in agreement with the European Council Recommendation from 1999. It is a recommendation without legal character, but it has to be regarded as a strong manifestation with the purpose that reference levels and basic restrictions defined in that Advice should not be exceeded. If necessary SSI has the possibility and the intention to provide mandatory regulations in order to prevent the general public from hazardous exposure.

Concerning occupational exposure to EMF there are regulations from 1987 comprising the frequency range of 3 MHz to 300 GHz only. These regulations will be adjusted by the Swedish Work Environment Authority that also takes an active part in EU:s working group of the Social Questions Working Party that has been initiated by the EU Directive on the minimum health and safety requirements regarding the exposure of workers to the risks from physical agents (electromagnetic fields).

A revision of the recommended precautionary principle for ELF EMF, published in 1996 by the Swedish consultation group for EMF representing five national authorities (Swedish Radiation Protection Authority, Swedish Work Environment Authority, National Board of Health and Welfare, Swedish National Electrical Safety Board, National Board of Housing, Building and Planning) is under discussion. It will pay attention to scientific progress about possible health effects obtained since then and to the positions taken by WHO and EU with respect to a precautionary approach to EMF health questions. It will also be adjusted to the Environmental Code that has been enforced in Sweden in 1999 and which among other things includes general rules for precautionary measures.

On behalf of SSI John D. Boice and Joseph K. McLaughlin at the International Epidemiology Institute and Vanderbilt University School of Medicine and Vandervilt-Ingram Cancer Center, Rockville, MD USA, made a review of 10 epidemiological studies on cellular telephones and cancer risk. They concluded that there was no consistent evidence for increased risk of brain cancer over a wide range of exposure measures. (SSI report 2002:16)

2. Research activities:

In parallel with the enforcement of the Environmental Code of 1999 the Swedish parliament did adopt 15 national environmental quality objectives, one of them "A Safe Radiation Environment". An interim target for that objective is to continuously follow studies on possible risks associated with EMF and to take necessary measures if potential risks are identified. In order to obtain this interim target grants for research

on EMF are necessary. Within the scope of the environmental program SSI has proposed an organisation of a national research program on EMF. However, as a consequence of the last years restructuring of research organisations, such a national research program has not been projected yet.

In Sweden research on different biological effects of EMF is pursued at at least six-seven research institutions.

Lennart Hardell at Örebro university and Kjell Hansson Mild at the National Institute for Working Life in Umeå have done a large case-control study on cellular and cordless telephones and the risk for brain tumours (1617 patients diagnosed 1997-2000). They found that use of analogue cellular telephones in total gave an increased risk for brain tumours (OR 1.3, 95 %, CI 1.02-1.6). The risk increased further (OR 1.8, 95 %, CI 1.1-2.9) for tumour induction periods of >10 years and for tumours located in the temporal area on the same side of the brain that was used during phone calls (OR 2.5, 95%, CI 1.3-4.5). (Eur J Cancer Prevention 11: 377-386, 2002). For acoustic neurinoma OR=4.4, 95%, CI 2.1-9.2, was calculated among analogue phone users (Internat J Oncol 22: 399-407, 2003).

At Karolinska Institute the group of Anders Ahlbom and Maria Feychting participates in the IARC Interphone project on mobile phones and risk of brain cancer and is going to finish the data collection for this study.

Jonna Wilén and co-workers at the National Institute for Working Life in Umeå has in an explorative study analysed subjective symptoms among mobile phone users and found that SAR values greater than 0.5 W/kg may be an important factor for the prevalence of some symptoms (Bioelectromagnetics 24: 152-159, 2003).

The group of Bertil Persson and Leif Salford at the University of Lund continues the research on effects of microwaves from GSM mobile phones on the blood-brain-barrier of rats. In a pilot study they recently reported on evidence for neuronal damage at levels as low as 20 mW/kg, 2 h. The analyses of the brain were done 50 days after the exposure (Env Health Persp, online edition 29 Jan 2003).

At Chalmers Univ of Technology in Gothenburg Michael Persson and Yngve Hamnerius are doing detailed different dosimetric calculations, for instance of the inner ear exposed to mobile phone radiation.

Mats Harms-Ringdahl and Igor Belyaev at Stockholm University are studying biochemical markers in lymphocytes for evaluation of people claiming electrical hypersensitivity.

3. Data on exposure of the general public or workers for static fields, ELF and RF:

In order to provide a basis for exposure assessment in epidemiological studies Birgitta Floderus et.al., Karolinska institute, presented measurement results for occupational exposure to EMF in the intermediate frequency range (300 Hz – 10 MHz). EMF sources comprised a number of induction furnaces, induction heaters, surface treatment equipment, units of electronic article surveillance (EAS), and medical devices for surgery and muscle stimulation. The highest mean values were found for

EAS (18 μ T at 5 and 7.5 kHz) and induction furnaces (12 μ T at 900 Hz) (Bioelectromagnetics 23: 568-577, 2002).

EMF of different EAS devices has been measured in Sweden. Some of them can cause EMF exceeding the reference levels by a factor of 10 or more. Calculations according to applicable CENELEC standards have to be done in order to test the compliance of these EAS devices with the basic restrictions for the general public. In connection with these tests and further development of anatomically realistic computational phantoms for dosimetric calculations are projected.

SSI has done measurements of the exposure of the general public, mainly in the Stockholm region, for RF. The evaluation of data is under progress and will be published later this year.

4. Public concern and information:

There is still a lot of public concern regarding potential adverse health aspects from EMF, especially in connection with the building of the 3G mobile telephone system. Action groups against 3G exist in different parts of Sweden and there are some local authorities that want to abstain from building 3G. In order to enlarge knowledge about the nature of EMF, its potential health risks, existing limit values and actual exposure situations national authorities and EMF-experts have participated during the last year in a lot of meetings and discussions with local politicians and officials, house-owners, different organisations and the general public all over the country. The authority consultation group on EMF representing six national authorities has issued and distributed an information brochure on radiation of mobile phone systems. There are also schemes for a comprehensive educational program for politicians and local officials in order to enable them to adequately meet public concern on a local plane.

5. Other topics of related interest

Last year SSI has set up an international Independent Scientific Group on EMF. It will give the Director General advice regarding health effects of EMF and related biological issues and give guidance in policy matters, where different views or positions may require scientific considerations. Once a year the group shall report in writing to SSI about its findings and conclusions about the scientific development within the field of health effects of EMF.

The Swedish council for working life and social research (FAS) has got the responsibility to cover the state of the art of research on electrical hypersensitivity.

On behalf of the government the Swedish National Electrical Safety Board has investigated methods and measures in order to reduce EMF of high voltage power lines. The Board has also accounted for costs of different measures and proposed incentives in order to induce local authorities and electricity companies to take steps against reduction of EMF close to power lines. The investigation will also be supplemented by a survey of the number of housings at different exposure levels close to power lines.