

THE INTERNATIONAL EMF PROJECT

Minutes of the 10th Meeting of the
International Advisory Committee
13-14 June 2005
Geneva, Switzerland

Note that all presentations made at the IAC meeting are available at:
http://www.who.int/pehemf/meetings/archive/iac_geneva_june2005/en/index.html

Dr Michael Repacholi, WHO Co-ordinator, Radiation and Environmental Health Unit, welcomed the participants to the 10th Anniversary Meeting of the International Advisory Committee (IAC) of the WHO International Electromagnetic Fields Project. Dr Bernard Veyret (France) was elected chairman and Dr. Qinghua He (China) was elected vice chairman. Dr Michael Repacholi then presented the [Project's organization and update of activities](#). This year, there were nearly 80 attendees at the IAC. New countries and entities included Bahrain, Greece, Lebanon, the Palestinian Authority and Portugal and new representatives of several member countries have joined the EMF Project since last year.

Report on WHO Static Fields Health Risk Assessment

Dr Eric van Rongen presented [a report on the WHO Health Risk Assessment of static fields](#). The EHC was to include both Static and Extremely Low Frequency (ELF) Fields, but a review of the literature revealed an extensive database for static fields themselves and it was decided to develop separate EHCs for ELF and Static Fields. A task group meeting for Static Fields EHC was held in WHO, Geneva on 6-10 December 2004. Follow-up work including scientific editing, reference checking and language editing has been finalized. Translation of the summary and recommendations in various languages is in progress.

Report on Progress report on WHO ELF Fields Health Risk Assessment

Dr Emilie van Deventer presented [a progress report on the WHO ELF Fields Health Risk Assessment](#), outlining the background to WHO EHC, existing and proposed EHCs on EMF, the EHC process, progress with the draft of EHC and current timetable. A task group meeting for the ELF EHC will be held at WHO, Geneva, 3-7 October 2005 and its publication is expected in early 2006. A draft of the ELF EHC is available for IAC members to download from the EMF Project website. The draft contents is organized by disease category including the following chapters; Summary and recommendations, sources, measurements and exposures, internal dosimetry, biophysical mechanisms, neurobehavioral responses, neuroendocrine system, neurodegenerative disorders, cardiovascular disorders, immune system and haematology, reproduction and development, cancer, health risk assessment and protective measures.

Report on NIR activities from collaborating institutions and international organizations

Dr Repacholi then invited reports from WHO collaborating institutions and international agencies which emphasized research programs under way.

International Electrotechnical Commission (IEC)

Dr Michel Bourdages reported that IEC/TC106, a Technical Committee concerned with Standards for Measurement and Calculation Methods for the assessment of EMF associated with human exposure, was developing a procedure for measuring the Specific Absorption Rate (SAR) in the human head from wireless communication devices in the frequency range of 300 MHz to 3 GHz. TC 106 is developing standards on measurement and calculation methods of physical quantities specified in exposure standards (electric field strength, magnetic flux density and power density) for purposes of compliance. These standards will be general and applicable to any exposure limits; however, TC 106 does not have the mandate to establish exposure limits. In the low frequency range, TC 106 will develop tools to assess the effect of a non-uniform field and calculation method of induced currents using more realistic 2D and 3D human model. In the high frequency range, TC 106 is developing standards on measurement methods of electromagnetic fields and Specific Absorption Rate (SAR), calculation methods of induced currents and SAR, and procedures to test compliance with exposure limits (conformity assessment). Additional information can be found on the IEC Internet site (www.iec.ch).

International Committee for Electromagnetic Safety (ICES)

Dr Ralf Bodemann reported that a major goal of ICES/IEEE standardization is to facilitate international standards harmonization, (e.g. closer cooperation with ICNIRP) in an open, transparent, and consensus oriented process where participation of all interested parties is welcome. IEEE draft safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz (C95.1-2005). The basic restrictions in the present draft of the revised RF standard are in agreement with those of ICNIRP. MPE values for general public exposure up to 100 GHz harmonize with ICNIRP's reference values. Other current activities include a Recommended Practice for an RF safety program.

International Commission on Non-Ionizing Radiation Protection (ICNIRP)

Dr Paolo Vecchia reported that ICNIRP conducts activities in the whole range of the frequency spectrum. The term of the former Commission expired at the end of May, 2004. Dr Vecchia presented the composition of the new Commission and of its Standing Committees. Present activities of ICNIRP in the area of EMF include a comprehensive review of the literature on RF fields (physics and dosimetry, biological studies, epidemiology), a revision of guidelines on static magnetic fields, a revision of guidelines on low frequency electric and magnetic fields (up to 100 kHz), and a statement on health issues related to emerging technologies. A revision of guidelines on RF electromagnetic fields (100 kHz – 300 GHz) is also planned, with a lower priority.

Radiation Protection Division of the UK Health Protection Agency (HPA-RPD)

On 1 April 2005 the National Radiological Protection Board merged with the Health Protection Agency (HPA) forming its new Radiation Protection Division (RPD). In May 2004, NRPB recommended that the UK adopt the guidelines recommended by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) on exposure to EMFs. Dr. Alastair McKinlay summarized ongoing studies at HPA-RPD. Studies include "Effects of exposure to RF fields on spatial learning processes in mice", "Theoretical dosimetry studies" and "Experimental dosimetry studies". Some recent EMF-related publications from NRPB/HPA-RPD can be found at

www.hpa.org.uk/radiation/publications/documents_of_nrp/abstracts/
www.hpa.org.uk/radiation/publications/w_series_reports/

He also summarized activities of the Independent Advisory Group on Non-Ionising Radiation Protection (AGNIR) whose ongoing program of work includes "Exposure to static magnetic fields", "Ultrasound and infrasound" and "Radiofrequency radiation and Power frequency electromagnetic fields". Further information on AGNIR can be found at:

www.hpa.org.uk/radiation/advisory_groups/agnir/index.htm#prog

Australian Radiation Protection and Nuclear Safety Agency (ARPANSA)

Dr Colin Roy reported that the government continues to provide funds for the EME Program until 2009. This program supports research and provides information to the public on health issues associated with RF-EMF. The EME program is coordinated by the Committee on Electromagnetic Energy Public Health Issues (CEMPHI) and is run by ARPANSA. The Australian component of the Interphone study, which is supported by this program, has been completed and submitted to scientific journals. Fact sheets in the ARPANSA CEMPHI EME series are available on the ARPANSA web site at: www.arpansa.gov.au/eme_pubs.htm

National Institute of Environmental Studies (NIES)

Dr Tomohiro Saito reported that the paper of a Japanese case-control study on childhood leukemia in relation to residential EMF-ELF exposure was accepted for publication in *Int J Cancer*. The Institute is also conducting assessments of individual exposure from domestic appliances.

Report on national concerns and key issues

Participating countries were asked to provide written reports on national activities over the past year, including current research programs, development or update of standards, and level of public concern associated with EMF. The national reports submitted are available at <http://www.who.int/peh-emf/project/mapnatreps/en/index.html>.

Standards

Following lunch, Dr Emilie van Deventer presented an updated draft of the [WHO Framework for Developing Health-Based EMF Standards](#). She explained that WHO performs health risk assessment but does not develop EMF standards. ICNIRP, a full partner in the EMF Project, develops international standards. The EMF Project facilitates international consensus on standards. Dr Deventer outlined reasons for setting up a standards framework, and discussed the key elements of EMF standard setting.

Dr. Tom McManus then presented the draft [WHO Model EMF Legislation](#). The document comprises the following three elements:

- A model act to enable an authority to initiate regulations and statutes that limit the exposure of its population to electromagnetic fields in the frequency range 0Hz to 300 GHz.
- A model regulation, which sets out in detail the scope, application, exposure limits and compliance procedures that are permitted under the act to limit a population's exposure to electromagnetic fields.
- An explanatory memorandum describing the approach to the act and its regulations

He outlined the model act and model regulation including the following topics: purpose, objectives, scope, definitions and principles, exposure limits, compliance procedures, enforcement, record keeping and information.

Dr Michael Repacholi presented an update on the Precautionary Framework. In his presentation, he modified the presentation title into Framework to Guide Public Health Policy in Areas of Scientific Uncertainty. This framework aims to encourage the development of reasonable and realistic options. It includes consideration of cost-effectiveness instead of cost-benefit because of the difficulty in defining benefits in areas of scientific uncertainty and called for iterative evaluations of policies and broad stakeholder participation. The framework will be finalized at the upcoming workshop at Ottawa, July 2005 and completed for EMF at the end of 2005.

Occupational Exposure to EMF Fields

Dr Michael Repacholi presented the WHO/NIOSH document. The US National Institute of Occupational Safety and Health (NIOSH) is assisting in drafting a report "Managing EMF Workplace Exposures". The report will consist of 9 chapters including introduction (scope, purpose, audience and motivation), physical characteristics and interaction mechanisms, exposure measurements, occupational exposure guidelines on EMFs, description of typical exposure situations, guidelines for reducing occupational exposures, management plan/strategy/approach, responsibility and conclusions. The first draft will be distributed by the end of 2005 and reviewed before finalization and printing.

Dr K Hansson Mild presented the EU Directive, Directive 2004/40/EC of the European parliament of 29 April 2004, on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields). By 2008, it will be necessary in Europe to introduce measures protecting workers from the risks associated with electromagnetic fields, owing to their effects on the health and safety of workers. However, the long-term effects are not addressed in this Directive. These measures are intended not only to ensure the health and safety of each worker on an individual basis, but also to create a minimum basis of protection for all workers.

Meeting adjourned on June 13 at 17:40

Meeting reconvened on June 14 at 09:00

Summary of WHO sponsored workshop

Dr Michael Repacholi reported on the Istanbul meeting on "Children and EMF" which was held 9-11 June 2004. There have been suggestions that exposure of young children to EMF may be detrimental to their health, especially during the development and maturation of the central nervous system, immune system and other critical organs. In addition children are exposed to EMF for a much greater part of their lifespan than adults. Use of mobile telephones by young children has been a concern expressed by the Stewart Committee report in the United Kingdom and others. The purpose of this workshop was to evaluate available information and summarize what conclusions can be made and what research is still needed to fill gaps in knowledge about any health concerns related to children's exposure to EMF. The Workshop concluded that children do not appear to be more sensitive, but there is insufficient evidence available to make firm conclusions. Focused research needed. ICNIRP guidelines appear to be protective of children (large safety factors in public limits). Speakers presentations can be found at: http://www.who.int/peh-emf/meetings/children_turkey_june2004/en/index.html.

Dr K Hansson Mild summarized the Prague meeting on "electrical hypersensitivity" which was held 25-27 October 2004. Sensitivity to EMF has been given the general name "Electromagnetic Hypersensitivity" or EHS. It comprises nervous system symptoms like headache, fatigue, stress, sleep disturbances, skin symptoms like prickling, burning sensations and rashes, pain and ache in muscles and many other health problems. EHS is sometimes a disabling problem for the affected persons, while the level of EMF in their neighborhood is usually no greater than is encountered in normal living environments. Their exposures are generally several orders of magnitude under the limits in internationally accepted standards. The aim of the conference was to review current state of knowledge, provide a forum for discussion among the conference participants and propose ways forward on this issue. The Workshop concluded that EHS is characterized by a variety of non-specific symptoms that differ from individual to individual. The symptoms are certainly real and can vary widely in their severity. For some individuals the symptoms can change their lifestyle. The term "Idiopathic Environmental Intolerance (IEI) with attribution to EMF" was proposed by the working group to replace EHS since the latter implies

that a causal relationship has been established between the reported symptoms and EMF. The provocation studies indicate that IEI individuals cannot detect EMF exposure, a result which makes no difference when compared with the non-IEI individuals.. By and large, well controlled and conducted double-blind studies have shown that symptoms do not seem to be correlated with EMF exposure. Speakers presentations can be found at:

http://www.who.int/peh-emf/meetings/hypersensitivity_prague2004/en/index.html.

Dr. Yury Grigoriev reported on the Moscow meeting on "Mobile Communication and Health: medical, biological, and social problems" which was held 20-22 September 2004. There has been a need to fully characterize exposure levels around base stations, to check compliance with national and international exposure standards, and to assess possible health risks of public exposure. These issues were debated within the conference and experience on the handling of base stations in some of the participating countries was also discussed. The conference conclusions were as follows: The level of safety of electromagnetic sources should be evaluated with reference to accepted, science-based standards; Large discrepancies exist between Russian and international standards that justify actions towards harmonization; In view of the continuous development of telecommunications, it is recommended that further research be promoted and international collaboration and information exchange be encouraged; In setting research needs and priorities, reference should be made to WHO's research agenda; active contribution of Russian scientists to the periodical update of such agenda is sought. Further information can be found at: <http://www.who.int/peh-emf/meetings/archive/moscow04/en/index.html>.

Dr. Peter Gajsek reported on the Slovenia meeting "From Bioeffects to Legislation-International Conference on Electromagnetic Fields" which was held 8-9 November 2004. The aim of the conference was to provide an answer to our information based society's most commonly asked question: Do current EMF standards provide sufficient protection against EMF exposure? This question is particularly important since some new EU member states and candidate Members of the EU use lower limit values in their standards and legislation in the field of EMF. However, there has been a strong move to use precautionary measures in the face of uncertainties in the science. Unfortunately, some countries have seen fit to use the precautionary principle in a way that undermines the science on which the guidelines on exposure limits are based. The speakers discussed the sound scientific background of the EMF guidelines and provided advice to the governmental representatives on how to manage the EMF issue. In addition, a meeting on the different models for EMF standards in new EU member states and candidate Members of the EU and their possible harmonization including review of the current research activities in those countries was organized. Conference conclusions were: An assessment of the scientific evidence to date suggests that no adverse health consequences have been established at exposure levels below current international ICNIRP guidelines. National authorities in the EU, particularly in the new EU member states and candidate Members of the EU should protect their citizens and workers by adopting international guidelines or use the WHO framework for developing EMF standards for limiting exposure from EMF sources and encouraging compliance with these standards. Additional precautionary measures can be adopted, provided they do not undermine the science-based guidelines. The measures could address aspects such as emission limits or technical measures to reduce fields from the EMF sources, but should not modify exposure. Speakers presentations can be found at

<http://www.jrc.cec.eu.int/emf-net/events.cfm?yearevent=2004>.

Research

Dr Bernard Veyret presented a research review of the past year. He reviewed studies published in peer reviewed journals at all frequency ranges except for epidemiological studies and studies on hypersensitivity. He concluded that most of the WHO recommendations in the WHO research agenda are being addressed. Improvement in the quality of RF- EMF exposure systems is continuing. About half of laboratory investigations are replication studies. Studies on therapeutic effects of EMF are increasing.

Dr Michael Repacholi reported on the WHO Research Agenda (<http://www.who.int/peh-emf/research/agenda/en/index.html>) which was set up to identify gaps in knowledge and formulate research areas that will help inform health risk assessment of EMF fields. Over the past year, research recommendations have followed the Children's Workshop and Static Fields EHC. Research needs for ELF will be updated during the Task Group meeting in October 2005. The RF research agenda was updated in 2003 and in 2004 following the Children's Workshop. The next update will follow the RF Task Group meeting in 2006-7.

Dr Repacholi also mentioned the French-Russian study. Studies conducted in the former Soviet Union suggested that microwave irradiation of rats disrupted the antigenic structure of brain tissue. The studies formed a basis for the Soviet microwave standard and still do for the Russian and Chinese standards. Replication of the studies will be carried jointly by Russian and French researchers commencing mid 2005 and take a year to complete and a protocol of the replication studies has been agreed and funding obtained. WHO provides oversight to study.

Dr Anders Ahlbom reported on the mobile phone cohort study which was set up to determine if a full cohort study could be carried to identify any adverse health consequences of using a mobile phone. A full cohort study is now being planned. The study aims to establish cohort of 250,000 mobile phone users, aged 18 and above, to characterize mobile phone use repeatedly, with traffic data and questionnaires, to obtain baseline information on health status and confounders, to follow the cohort, initially for five years, and collect health information through registries and questionnaire. Five countries (Denmark, Finland, Germany, Sweden and the United Kingdom) are involved in the study.

Dr Elizabeth Cardis gave an update of the INTERPHONE study. She also proposed a new cohort study, "INTERPHONE kids", for children using mobile phones. A pilot study needs to be developed and implemented prior to a full cohort being conducted.

Review of Fact Sheets

Following lunch, Dr Chiyoji Ohkubo gave a review of the fact and information sheets. The WHO International EMF Project has published many fact sheets and information sheets regarding electromagnetic fields and public health. Currently, simple and easy to read information is provided through two formats. The Facts Sheets provide a list of facts only and are formally approved at the Director General's level. Information Sheets contain both facts and general recommendations for national authorities and are approved at the Director's level. Archives of WHO fact sheets on electromagnetic fields and public health have already published into 15 different languages. Over the past year, fact sheets have been translated into Slovenian, Greek, Arabic and Spanish. Information sheets have been published on the Project web site over the past year. These include Effects of EMF on the Environment, Intermediate Frequencies (IF) and Microwave Ovens. These information sheets can be found in several different languages, Arabic, Japanese and Spanish.

Several new fact sheets, resulting from activities over the past year, are being compiled and will be placed on the web site shortly, including Medical Response to RF Overexposure, Children and EMF, Electrical Hypersensitivity and Mobile Phone Base Stations and Wireless Networks (to be published following the workshop in June 2005).

Communication activities

Dr, Emilie van Deventer gave an update of the WHO publications and web site. Six scientific papers were published over the past year (*Droit de l'environnement dans la pratique*, 8, 708-724, 2004, *Progress in Biophysics and Molecular Biology*, 87, 355-363, 2005, *Pediatrics*; to be published August 2005 and *Risk Analysis*; to be published August 2005). Other publications include the Risk handbook being translated into Dutch, French, German, Italian, Japanese,

Russian and Spanish and are on the WHO EMF Project web site. The EMF Project pamphlet has been replaced by a new version which can be also downloaded from the web site. Resulting from activities over the past year, information regarding national contact and national activities of each member states are updated on the web site.

Dr. Colin Roy reported on a new wireless communications brochure for local authorities, that would update the WHO EURO brochure dated 1999,. The draft document includes the following: Summary, What are EMF & Radiation, Background to public concern, RFR and health, Regulation aspects, What can a local authority do about RFR, Common sources of public exposure, Typical exposure from these sources, Recommendations, Q & A and a Technical annex.

Dr Chiyoji Ohkubo reported on the WHO Research Database (<http://www.who.int/peh-emf/research/database/en/index.html>). The database has been assembled as a service to the research community. Its purpose is to inform researchers worldwide about projects relevant to WHO's EMF Research Agenda that still need to be conducted or those that are in progress. In cooperation with WHO, FGF (The Research Association for Radio Applications, Germany) regular updates are made to the research database. The database is divided into 8 categories. He explained the major study types (Dosimetry, Epidemiology, Animal study, Cellular study and Human provocation study). As of 27 May 2005, 1199 studies have been submitted to the WHO database, and, 611 studies have already published.

Dr Heinz-Günter Neuse from FGF also gave a report on the Research Database. One hundred and sixty one studies are declared as "ongoing". When FGF started its investigation in March 2004 to find out whether all studies marked with "ongoing" are still ongoing, the database contained 894 studies and 170 were marked with "ongoing". First FGF asked Funding Agencies to update database. Secondly, FGF asked the Principal Investigators. Up to the end of 2004, FGF could clarify around 100 studies. FGF could not get information on 70 studies.

Dr Dina Simunic gave an update of the Worldwide Standards Database (<http://www.who.int/docstore/peh-emf/EMFStandards/who-0102/Worldmap5.htm>). The EMF project has compiled an EMF worldwide standards data base. Over 50 countries in all continents have already added their national table. Three quarters of all the countries have introduced the ICNIRP guidelines (1998). Each country were requested to add their original documents on EMF standards, and possibly with English translation, to the WHO web site. Approximately half of the countries in the data base have information in the form of an EMF handbook, reports, pamphlets or fact sheets.

Administrative business

Finally, Dr Michael Repacholi reported on administrative business. Nine future meetings will be expected by the end of 2005. Several booklets are planned for the coming year. Other future activities include distance leaning programs and drafting RF EHC chapter.

Finally, he explained the current status of funding. There is a small reserve of funds which will soon be depleted. A concerted funding drive is needed to complete the Project activities already started.

The next IAC meeting will be held in June 2006 at a time to be determined.