THE INTERNATIONAL EMF PROJECT

Progress Report

May 2010-2011

World Health Organization

CONTENTS

1. OVERVIEW

In May 1996, in response to growing public concern in several Member States over possible health effects from exposure to an ever-increasing number and diversity of EMF sources, the World Health Organization (WHO) launched an international project to assess the health and environmental effects of exposure to electric and magnetic fields, which became known as **the International EMF Project**.

The International EMF Project brings together current knowledge and available resources of key international and national agencies and scientific institutions in order to develop scientifically-sound health risk assessments of exposure to static and time varying electric and magnetic fields in the frequency range 0-300 GHz**.**

This Project has been devised to provide authoritative and independent peer-review of the scientific literature. Since its inception, the objectives of the EMF Project have been to:

- review the scientific literature on biological effects of EMF exposure;
- identify gaps in knowledge requiring research that will improve health risk assessments;
- encourage a focused agenda of high quality EMF research;
- formally assess health risks of EMF exposure,
- encourage internationally acceptable harmonized standards;
- provide information on risk perception, risk communication, risk management; and,
- advise national programs and non-governmental institutions on policies for dealing with the EMF issues.

1. 1. MEMBERSHIP

The EMF Project is open to any WHO Member State government, i.e. department of health, or representatives of national institutions concerned with radiation protection. Since the commencement of the EMF Project, over 50 national authorities have been involved. In the past year, several countries have been in contact to join the Project, including India, Ecuador and Kenya. Also, new representatives have been delegated by their governments, including Italy, Cyprus, Spain, and Ukraine.

While further outreach is planned, the challenge remains to locate the appropriate governmental contact at country level, with interest and responsibility regarding EMF protection. In some Member States, other Ministries may show interest, such as the Ministry of Industry or of Energy (dealing with electricity applications), the Ministries of Telecommunications (e.g. mobile phones), or Transport (radar equipment for air navigation), or Environment.

Oversight of the Project is provided by the International Advisory Committee (IAC). The IAC is composed of members of international organizations, WHO collaborating centres, and over 50 national authorities. The IAC meets once a year to discuss national activities, current research programmes, legislation and public concern, and advises the International EMF Project on its activities.

The objectives of the IAC are

- to provide oversight on the conduct of the Project: review outputs of the Project, including scientific information related to public and occupational health, and management of the EMF issue
- to provide a forum for peer discussion on dealing with the health concerns raised by exposure to EMF fields.

Over the last 16 years, activities have closely followed the original work plan, and most activities have or are being implemented. The Department of Public Health and Environment is committed to ensuring that the work of the International EMF project continues subject to funding.

1. 2. COLLABORATION

The EMF Project has formal collaboration with different entities, i.e. non-governmental organizations (NGOs), international organizations and WHO collaborating centres (see below for details). It also cooperates in an *ad-hoc* manner with other institutions (e.g. co-sponsoring of meetings) and with individual experts.

International organizations

A number of international agencies are involved in the Project (http://www.who.int/peh-emf/project/intorg/en/index.html). Over the reporting period, there has been active collaboration with several of them.

The **Agency for Research on Cancer (IARC)**, a specialized institution of WHO, based in Lyon, France, has links with the International EMF Project. Its mission is to coordinate and conduct research on the causes of human cancer, the mechanisms of carcinogenesis, and to develop scientific strategies for cancer control. The Agency is involved in both epidemiological and laboratory research and disseminates scientific information through publications, meetings, courses, and fellowships.

The IARC's Section of Environment and Radiation (ENV) investigates risk factors of cancer in human populations related to environmental, lifestyle, occupational or radiation-related exposures. The main approach is the coordination of international collaborative studies of cohort and case-control design, and the coordination of international consortia.

The IARC's Radiation programme includes studies of the carcinogenic effects of radiation, in particular, low doses of ionizing radiation. With regard to non-ionizing radiation, research activities include a large international collaborative case-control study on mobile phone use and the risk of brain tumours, acoustic neuroma and salivary gland tumours (Interphone), collaboration in a Danish cohort study of mobile phone subscribers and collaboration in studies on extremely low-frequency magnetic fields and childhood cancer. The Interphone study and collaboration in an international study on brain tumours in teenagers and adolescents (Cefalo) allows investigation of various possible risk factors of brain tumours.

Over the past year, close collaboration was maintained with Dr. Christopher Wild, Director IARC, and the new Head of the ENV Section, Joachim Schuz. One of the common activities was the preparation of an international conference on

"Environmental and Occupational Determinants of Cancer: Interventions for Primary Prevention". This meeting was held on 17-18 March 2011 in Asturias (Avilés, Gijón), Spain and co-sponsored with IARC and UICC. The meeting included a session on non-ionizing radiation.
http://www.who.int/phe/news/events/international_conference/en/

During a courtesy visit in February 2011, Dr van Deventer held discussions with Dr Robert Baan (IARC Monograph Section) to coordinate efforts for the WHO Environmental Health Criteria on Radiofrequency Fields and the IARC monograph on Non-Ionizing Radiation, Part 2: Radiofrequency electromagnetic fields and radar (including mobile telephones), scheduled for 24-31 May 2011.

The **International Labour Office (ILO)**, a sister UN agency in Geneva, works closely with WHO in the area of occupational exposure to radiation, both ionizing and non-ionizing. Dr Shengli Niu from the Programme on Safety and Health at Work and the Environment (SafeWork) kindly participated with WHO in a meeting with a Chinese delegation regarding ELF fields in November 2010.

The **International Telecommunications Union** (**ITU**) is the leading United Nations agency for information and communication technology issues, and the global focal point for governments and the private sector in developing networks and services. This year for the first time, all three of its sectors have been involved with the WHO EMF Project through the Telecommunication Standardization Sector (ITU-T) Study Group 5 - Protection from Electromagnetic Environment Effects, the Radiocommunication sector (ITU-R), and now also the Telecommunication Development Sector (ITU-D).

WHO was invited to attend an ITU-T Workshop on "Delivering Good Quality Telecommunication Service in a Safe Environment in Africa", in Nairobi, Kenya in July 2010. Also, following the World Telecommunication Development Conference (Hyderabad, 2010), where a resolution was developed on "Measurement concerns related to human exposure to electromagnetic fields", ITU-D invited WHO to contribute to Question 23/1 [Strategies and policies concerning human exposure to electromagnetic Fields]. In September 2010, Dr van Deventer participated in a meeting of ITU-D SG1 and presented the activities of the WHO EMF Project.

Active collaboration is ongoing with the **International Commission on Non-Ionizing Radiation Protection** (**ICNIRP**) - an NGO in *formal relations* with WHO (for more information, see http://www.who.int/civilsociety/). Within the reporting period, WHO has worked with ICNIRP on the organization of the workshop on "Non-Ionizing Radiation and Children's health" to be held right after the WHO International Advisory Committee on May 18-20, 2011. The conference is co-sponsored by WHO, and co-organized by COST Action BM0704, the German Federal Office for Radiation Protection (BfS), and the European Society for Skin Cancer Prevention (EUROSKIN) and will be hosted by the Slovenian Institute of Non-Ionizing Radiation (INIS) in Ljubljana, Slovenia.

The **European Commission's** European Health Risk Assessment Network on Electromagnetic Fields Exposure (**EFHRAN**) officially started in February 2009 for a 3-year duration sits within the EC Second Programme of Community Action in the field

of health (2008-2013). The WHO EMF Project was invited to serve as member of its Advisory Board. WHO is participating as a collaborating partner, i.e. with no contractual commitments neither with the EC nor with the network. A special agreement between EC DG SANCO and WHO/EURO only allows this type of limited participation.

Further dialogue was held with the **European Commission Directorate-General for Employment, Social Affairs and Equal Opportunities (DG Employment**) based in Luxembourg, regarding activities related to occupational exposure to EMF, and in particular the EC Directive 2004/40/EC. On this topic, WHO was invited to attend a meeting of the Preparatory Commission of stakeholders in July 2010 in Luxembourg.

Discussions were also held with the **European Commission Directorate-General for Health and Consumers (DG SANCO)** and **Directorate General for Research and Innovation (DG Research)** based in Brussels, regarding activities related to EMF.

WHO collaborating centres

A WHO collaborating centre (CC) is an institution designated by the Director-General to form part of an international collaborative network carrying out activities in support of the Organization's programme at all levels. Such designation follows a formal procedure within WHO, with specified terms of reference for a period of 4 years and annual reporting of joint activities. With effect from 1 June 2007, processing of designations, re-designations and discontinuations of CCs are being done electronically (http://intranet.who.int/homes/kcs/collaborating_centres).

The EMF Project works with the following scientific institutions that are formally recognized as collaborating centers of WHO (http://www.who.int/peh-emf/project/Org_Stru/en/index.html).

- Australian Radiation and Nuclear Safety Agency, ARPANSA (Australia)
- Institut für Strahlenhygiene, Bundesamt für Strahlenschutz, BfS (Germany)
- Health Protection Agency - Radiation Protection Division (UK) - in discussion for renewed designation
- Norwegian Radiation Protection Authority - in discussion for designation

1. 3. SECRETARIAT

The Project is managed through the Radiation Programme which has the responsibility for activities related to ionizing and non-ionizing radiation. This Programme is located at WHO Headquarters in Geneva, within the Department of Public Health and Environment (PHE). PHE has for main objective to "promote a healthier environment, intensify primary prevention and influence public policies in all sectors so as to address the root causes of environmental threats to health" as described in the Medium-Term Strategic Plan (MTSP) of the organization for 2008-2013 under Strategic Objective 8.

While the priorities, strategic objectives and expected results of the Organization are delineated in the MTSP 2008-2013, more specific short-term programmatic outputs are described in two-year workplans. The current reporting biennium spans 2010-2011.

The Secretariat of the WHO International EMF Project facilitates all activities and provides regular reports to the International Advisory Committee and contributors to the Project. WHO Regional Offices participate where possible and facilitate communications with countries in their respective regions. WHO staff provide coordination and project management and are available to respond to enquiries. They organize and conduct review group meetings, key research meetings, prepare and publish reports and brochures, organize the preparation and publication of monographs and scientific reports, and liaise with consultants, collaborating agencies and key institutions to prepare material as required.

A key challenge has been and remains to ensure alignment between activities planned and the resources mobilized, both human and financial.

Personnel

Dr van Deventer is the Team Leader of the Radiation (RAD) programme, with administrative responsibility for both the Ionizing Radiation team and technical responsibility for the Non-Ionizing programme, which includes the WHO EMF Project and the Intersun UV Project. Mrs Lisa Ravenscroft currently provides secretarial support to the RAD programme.

During this reporting period, the RAD programme has lost a staff member, which has put added responsibilities on the team members to cover the various radiation-related health topics. Since March 11, following the earthquake and tsunami in Japan, the Fukushima nuclear accident has had major repercussions on RAD staff, who have suspended all other activities until now. Dr van Deventer was posted to the International Atomic Energy Agency (IAEA) in Vienna as the WHO liaison officer over a period of three weeks in March and April.

In view of this situation, the EMF Project continues to encourage Member States to promote direct involvement of their staff in the work of the International EMF Project through different means, including secondment. Other mechanisms are available through Junior Professional Officer (JPO) programs[1] or through WHO's Internship Programme which provides a wide range of opportunities for students to gain insight into the work of WHO. Every year a limited number of places for internships are available.
http://www.who.int/employment/internship/en/

Funding

WHO receives its funding principally through assessed contributions from Member States and voluntary contributions. With the economic crisis over the past couple of years, assessed contributions have become a smaller proportion of the total resources received, and reliance is increasing on voluntary contributions provided by partners and donors.

[1] The Junior Professional Officer (JPO) Programme provides young professionals who wish to pursue a career in development with hands-on experience in multi-lateral technical co-operation. JPOs are sponsored by their respective governments. Currently the following 11 donor governments sponsor JPOs for WHO: Austria, Belgium, Denmark, Finland, France, Germany, Italy, Japan, Luxembourg, Republic of Korea and Sweden

All contributions and accounting are audited by WHO. For any contribution, 13% of expenditure is deducted by WHO to cover administrative costs related to administering the funds, in accordance with World Health Assembly Resolution WHA 34.17.

Technical Units may follow up on any funding interest from the part of Ministries of Health, or other governmental bodies involved in NIR. The EMF Project is currently solely funded through voluntary contributions from participating countries. These contributions cover both activities of the Project and salaries of the personnel.

Several governments have given direct contributions to the WHO EMF Project, either on a periodic or ad-hoc basis. Since May 2010, funding has been received from the following institutions:

- Department of Health, United Kingdom
- Health & Safety Executive, United Kingdom
- Ministry of Health of New Zealand
- Swedish Radiation Safety Authority (SSM)
- National Board of Health and Safety, Sweden
- Post and Telecom Agency, Sweden
- Swedish Work Environment Authority
- Australian Radiation Protection And Nuclear Safety Agency (ARPANSA), Australia
- National Agency of Food, Environnement and Occupational Health (ANSES, Agence nationale de sécurité sanitaire de l'alimentation, de l' environnement et du travail), France.

Some countries provide financial support for specific earmarked activities within the Project. For example, in 2010, the French Ministry of Health and Sports gave funds towards the running costs of the 15th IAC Meeting in Bordeaux. This year, Health Canada is paying for the hire of equipment for the 16th IAC Meeting in Ljubljana, and the Ministry of Health Slovenia is covering the hospitality costs for the meeting.

Other countries provide in-kind contributions in the form of staff time. This is the case, for example, of the Health Council of the Netherlands, and the UK Heath Protection Agency for the 2010 WHO Research Agenda for RF fields or through the development and translation of documents.

2. RISK ASSESSMENT AND SCIENTIFIC ACTIVITIES

The primary goal of the International EMF Project is to assess the health risks from EMF within the frequency range 0 to 300 GHz and to develop policy options for protection of people from EMF exposure. The key **scientific objectives** of the Project are to:

- Assess the scientific literature and make a status report on health effects,
- Incorporate research results into WHO's Environmental Health Criteria (EHC) monographs where formal health risk assessments are conducted on EMF,
- Identify gaps in knowledge needing further research,
- Encourage a focused research program in conjunction with funding agencies and the global scientific community.

2. 1. RESEARCH EVALUATION

Environmental Health Criteria (EHC)
The health risk assessments related to chemical, biological and physical agents developed by WHO are published in the Environmental Health Criteria (EHC) series (http://www.who.int/ipcs/publications/ehc/en/). For over 20 years, WHO has addressed possible health effects from exposure to EMF through three monographs on extremely low frequency (ELF) fields (1984), static and ELF magnetic fields (1987), and radiofrequency (RF) fields (1993).

The EHC monographs are usually revised if new data are available that would substantially change the evaluation, if there is public concern for health or environmental effects of the agent because of greater exposure, or if an appreciable time period has elapsed since the last evaluation. Three monographs spanning the 0-300 GHz EMF frequency range have been planned: static fields (0Hz), ELF fields (up to 100 kHz) and RF fields (100 kHz – 300 GHz). So far, the EMF Project has developed the first two volumes on Static Fields and ELF fields. These documents were developed following the publication of the IARC monograph on Non-Ionizing Radiation, Part 1: Static and ELF fields (2002). The IARC monographs provide a hazard identification regarding cancer, while the EHCs represent a health risk assessment of all studied (published) health endpoints, including the four classical steps of (i) hazard identification, (ii) exposure assessment, (iii) dose-response assessment and (iv) risk characterization. EHCs usually also include recommendations for protective measures.

Upcoming EHC on Radiofrequency fields
The next major task in this evaluation process is the health risk assessment of radiofrequency fields. The EHC development will follow the expected IARC monograph on *Non-Ionizing Radiation, Part 2: Radiofrequency (RF) electromagnetic fields and radar (including mobile telephones)*. The IARC monograph meeting for vol. 102 on RF will be held on 24-31 May 2011 in Lyon, France.

Possible areas of collaboration have been discussed with IARC, regarding developing a common introduction sections for both documents (subject to copyright laws),

developing a common literature database, and gathering exposure data from other sources than published scientific literature.

A review of scientific literature on the health effects of RF fields was commissioned by WHO to ICNIRP in 2005. This review was published in July 2009 and will serve as an input to the WHO Environmental Health Criteria monograph on RF fields, together with recently published peer-reviewed data. A core group has been identified and a funding proposal and work plan is being developed.

2. 2. RESEARCH COORDINATION

To avoid unnecessary duplication of research effort and to make sure that all important questions are being studied, research coordination on a global level is important. To that end, the WHO International EMF Project has been providing such an umbrella for worldwide coordination and exchange of information about planned and ongoing projects.

Research agenda

WHO defines as one of its six core functions to "shape the research agenda, and stimulate the generation, dissemination and application of valuable knowledge". From its inception, the WHO International EMF Project has strived to identify gaps in knowledge needing further research to make better health risk assessments, and to encourage a focused research programme in conjunction with funding agencies (http://www.who.int/peh-emf/research/agenda/en/index.html). Over the past 15 years, several countries have funded research programmes and, in some cases, set up foundations to sponsor studies relating to this area.

The WHO Research Agendas have been used by most agencies that have funded EMF research as a basis for their national research programs when developing calls for proposals. In order to better measure the impact of this WHO function, a questionnaire was sent to national IAC representatives in January 2011. This information will enable an impact analysis of previously established priorities, of research performed and/or funding allocated based on previously established priorities. As such, it should provide insight into priorities that have remained devoid of attention, and to inform discussions on implementation issues.

For radiofrequency fields, the latest EMF Research Agenda was published electronically and in print in Summer 2010 following a Technical Consultation meeting held in February 2010 in Geneva, Switzerland (http://whqlibdoc.who.int/publications/2010/9789241599948_eng.pdf).

To further disseminate the RF priorities to the research community, a short paper was submitted to the Journal Bioelectromagnetics and published in March 2011. [van Deventer, E., van Rongen, E. and Saunders, R. (2011), WHO research agenda for radiofrequency fields. Bioelectromagnetics, 32: n/a. doi: 10.1002/bem.20660].

WHO input to national agencies

The EMF Project actively works with international donors and national authorities to review, promote, and fund research topics identified by WHO. Dr van Deventer currently serves on the Programme Committee Management of the Mobile

Telephone Health Research program (MTHR) in the United Kingdom, and as a member of the Swedish independent expert group on EMF, commissioned by the Swedish Radiation Safety Authority.

Research database

WHO has for many years provided a web-based database of research projects as a service to the research community (http://www.who.int/peh-emf/research/database/en/index.html). Its purpose is to inform researchers about ongoing and completed projects relevant to the EMF Project's mandate.

Until recently, the database was actively updated and formed the core tool for each 5-year revision cycle of the IEEE C95.1 (radiofrequency) and IEEE C95.6 (static and low frequency) exposure standards. Because other excellent databases exist with similar functionality, there is no longer a strong justification for WHO to maintain such a database. It has been proposed instead to provide a link on WHO's website to other relevant databases, such as

- The FEMU EMF Portal (http://www.emf-portal.de/)
- The IEEE ICES database (http://ieee-emf.com/)
- The University of Ottawa database (http://www.rfcom.ca/welcome/index.shtml)

3. RISK MANAGEMENT ACTIVITIES

WHO's International EMF Project provides a unique opportunity to bring countries together, identify criteria for science-based standards setting and encourage the establishment of exposure limits and other control measures that provide the same or similar level of health protection for all people.

The key **risk management objectives** of the Project are to:

- facilitate the development of internationally acceptable standards for EMF exposure,
- provide information on the management of EMF protection programs for national and other authorities, including monographs on EMF risk perception, communication and management, and
- provide advice to national authorities, other institutions, the general public and workers, about potential hazards resulting from EMF exposure and possible mitigation measures.

3. 1. MODEL LEGISLATION

The EMF Project has developed a Model Act and Model Regulation that provide the legal framework to provide this protection. This document was produced to assist countries that do not yet have appropriate legislation to protect their population. The Model Legislation follows the widely accepted practice among lawmakers of setting out an enabling Act which permits the responsible Minister to subsequently issue Regulations, Statutory Orders or Ordinances, as appropriate, to deal with specific areas of concern.

This legislation recommends the use of international standards that limits EMF exposure of people (ICNIRP exposure guidelines) and international standards that limit the emissions of EMF from devices (IEC and IEEE device emission standards). This model legislation is available in English, Spanish, Chinese and has been translated into French. The need for an update of this document and feedback about its impact will be raised at the IAC meeting in Ljubljana.

3. 2. STANDARDS DATABASE

A number of national and international organizations have formulated guidelines establishing limits for occupational and residential EMF exposure. The International EMF Project provides information on worldwide EMF standards in a web-accessible database which was set up in 2001 and revised in 2004. This database includes details of a number of EMF standards worldwide, with details on the limits and a link to the national web site where possible.
(http://www.who.int/docstore/peh-emf/EMFStandards/who-0102/Worldmap5.htm)

The current database is no longer maintained and its content needs to be migrated to another server platform. An interactive site is being designed to enable users to view national legislations and will enable comparison between national approaches to EMF protection. A small group has been assembled to carry out this task, including stakeholders from national governments (France, Germany, Norway), industry

representatives (electricity and mobile telephony) and researchers. Over the reporting period, most of the communication has been performed by electronic means, with a couple of face-to-face meetings held in Geneva in July and November 2010. A template of the proposed supporting web text and tables of national information has been sent to the IAC members for comment. This topic is tabled for further discussion at the IAC meeting in Ljubljana.

A new WHO web-based platform, called the Global Health Observatory (GHO), has recently been launched with the goal to gather and display health-related statistics from around the world. Use of this forum to display EMF standards needs further discussion with the developers of this very new tool.

3. 3. LOCAL AUTHORITIES BROCHURE

At the local level, municipalities often have authority over land use and building and installation permits for power lines and mobile telephony base stations. As such, they are often confronted directly by public anxiety and discontent. To help municipalities, a brochure for local authorities has been developed on Base Stations and Wireless Networks that provides local authorities with all the information they need to plan and approve the installation of mobile phone base stations. The Brochure is also intended to provide information on levels of RF fields and risks of exposure to all current wireless network fields.

The current draft version has been reviewed by a few countries. A small working group, including Australia, New Zealand, Tunisia, France, UK and Peru has been assembled through electronic means to advise on the way forward and provide guidance as to the content and format.

3. 4. COUNTRY FOCUS

In line with WHO's focus on supporting Member States , the EMF Project has provided technical support for meetings held in regions and countries that face concerns with respect to EMF. Countries visited over the past year to support national or regional EMF programs include:

- **Kenya**: Workshop on "Delivering Good Quality Telecommunication Service in a Safe Environment in Africa" organized by ITU-T, July 26-27, 2010, in Nairobi
- **Ecuador**: International Forum on "New Technologies, Health And Environment, August 26-27, 2010, organized by the Ecuadorian Ministry of Telecommunications and Society Information, Quito
- **Palestine**: 1st Palestinian Conference on Electromagnetic Radiation, Al-Quds University, organized by the Center For Radiation Science & Technology, Department of Earth & Environmental Sciences, Jerusalem in December 2010
- **Japan**: Meeting with several stakeholders at the Japan EMF Information Center (JEIC), Tokyo in December 2010

4. RISK COMMUNICATION ACTIVITIES AND RESOURCES

4. 1. ENQUIRIES

A large number of enquiries are sent to the EMF Project from the general public, the media and governments. Depending on the nature of the enquiries, these are usually handled by the Project staff or by the communications officers of WHO. Technical support is regularly needed - and given - as requests in other languages are often forwarded to IAC members for translation and/or response. Over the past year, a sizeable fraction of queires have come from the Americas (Argentina, Barbados, Canada, Colombia, Ecuador, Guatemala, Paraguay, Peru, USA), as well as India and Europe.

4. 2. WEBSITE INFORMATION

In December 2010, the corporate WHO website underwent a major visual redesign to improve accessibility, usability and branding. The main pages currently provide information in 6 languages (Arabic, Chinese, English, French, Russian, and Spanish).

EMF Home page
With the rebranding of the WHO site, the EMF Project page has changed in look but not as much in content. An internal offer has been made to translate some of the EMF pages into all 6 languages. A questionnaire has been developed to gather feedback from IAC members as to the ease of navigation of the website.

National contacts and information
Because many enquiries to the EMF Project are of a local nature, a country-focused database of information that lists the Member States of the EMF Project has been set up. Thanks to the input of the IAC members (http://www.who.int/peh-emf/project/mapnatreps/en/)who provide annually updated information for their respective pages, this has proved to be a very useful tool worldwide. Over the past year, several new country pages were built (e.g. Tunisia, Norway).

4. 3. EDUCATION AND LEARNING PROGRAMS

WHO promotes health education and research, and the EMF Project has invested in developing distance learning programs as well as co-sponsoring bioelectromagnetic courses.

On the request of WHO, Dr Bernard Veyret, of the University of Bordeaux in France developed an online course called "Methodology in Bioelectromagnetics Research." Its primary audience is the community of young scientists, world-wide, undertaking bioelectromagnetics research. The intent of the course is to introduce young scientists to the subject of bioelectromagnetics research and present physics to the biologists and biology to the physicists. It should also be of interest to teachers and the general public. It can be accessed via the EMF Project's web site at http://www.who.int/peh-emf/about/Training/en/index.html. Further divulgation of this website is encouraged.

WHO co-sponsored the **5th Course of the International School of**

Bioelectromagnetics "Alessandro Chiabrera", on Medical Applications of Electromagnetic Fields, (Erice, Sicily, Italy): November 23 to November 28. This course, organized by the International School of Bioelectromagnetics "Alessandro Chiabrera" was addressed to young researchers, biologists, engineers and physicians who conduct research on bioelectromagnetics or work in a medical environment. The aim of the Course was to present the most advanced knowledge on the mechanism of action of EMF, to identify cellular targets and to discuss the rational basis for the use of EMF in clinical practice. The Course was focused on non-thermal effects.

4. 4. WHO PUBLICATIONS

The publications of the EMF Project are reviewed by the International Advisory Committee before seeking formal approval by WHO management. Recent documents are available electronically for download on the Project's website. Some of the materials are available free of charge, while priced publications are on sale through the WHO Online Bookstore http://apps.who.int/bookorders/.

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- This is a non-exclusive permission to translate and reproduce a specific item(s).
- The Translation shall be faithful to the original English text and rendered into good literary and scientific language.
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- The WHO logo and emblem shall not be reproduced.
- It is ensured that the original WHO source is appropriately acknowledged with the appropriate bibliographical reference.

Since the Project's inception, translations were encouraged, many of which being undertaken by members of the IAC. These translations have proven to make the EMF Project a web site well visited over the years.
(http://www.who.int/peh-emf/publications/facts/factsheets/en/index.html)

Since May 2010, WHO has received requests to translate the following documents:

- Spanish version of the 2010 Research Agenda for Radiofrequency Fields from Peru & Spain. Rights granted to Spanish Ministry of Health and Social Policy.
- Polish version of the handbook Establishing a Dialogue on Risks from Electromagnetic Fields (published)
- German, Italian, Japanese and Swedish translations of Fact Sheet N° 193 Mobile Phones and Base Stations (2010 revision)

Bilateral discussions regarding translation have been held for:

- Model Legislation for Electromagnetic Fields Protection - French (done), Arabic

- Framework for Developing Health-based EMF Standards - French (done), Arabic
- Establishing a Dialogue on Risks from Electromagnetic Fields - Arabic

Fact sheets
Simple, easy to read information is provided through fact sheets that are formally approved by the Director General's Office. The latest EMF Fact Sheets can be found on the corporate WHO **Media Centre website**, which is aimed primarily at the press and general public (http://www.who.int/mediacentre/factsheets/en/). These include the following Fact sheets:

- Fact sheet N° 304: Base stations and wireless technologies (May 2006)
- Fact sheet N° 296: Electromagnetic hypersensitivity (December 2005)
- Fact sheet N°322: Exposure to extremely low frequency fields (June 2007)
- Fact sheet N°193: Mobile phones (May 2010)
- Fact sheet N° 299: Static electric and magnetic fields (March 2006)

The fact sheet No. 304 on base stations and wireless networks is being reviewed, following the publication of a systematic review of randomized human trials conducted in laboratory settings and of epidemiological studies that investigated the health effects of mobile phone base stations radiation in the everyday environment. This systematic review was commissioned by WHO in a view to incorporate scientific findings published since 2006 (date of publication of the last Fact sheet on base stations). The review was published in December 2010 in the WHO Bulletin. [**Systematic review on the health effects of exposure to radiofrequency electromagnetic fields from mobile phone base stations** - Martin Röösli et al., doi: 10.2471/BLT.09.071852, Bull World Health Organ 2010;88:887–896G].

Publications
WHO International EMF Project. 2010. 2010 WHO Research Agenda for Radiofrequency Fields. Geneva, Switzerland: WHO International EMF Project. http://whqlibdoc.who.int/publications/2010/9789241599948_eng.pdf

van Deventer, E., van Rongen, E. and Saunders, R. (2011), WHO research agenda for radiofrequency fields. Bioelectromagnetics, 32: n/a. doi: 10.1002/bem.20660WHO

Neira, M.; Pérez, M. R.; Shannoun, F.; Carr, Z.; van Deventer, E. The WHO Programme on Radiation and Health World Health Organization. Proceedings of Third European IRPA Congress 2010 June 14-16, Helsinki, Finland.

M. Neira, E. van Deventer. Status Of Levels And Effects Of Non-Ionizing Radiation (NIR), Proceedings of the 12th Congress Of The International Radiation Protection Association (IRPA12), Buenos Aires, 19–24 October 2008, pp. 65-75, IAEA, 2010 http://www-pub.iaea.org/MTCD/publications/PDF/Pub1460_web.pdf

4. 5. MEETINGS

WHO staff members and consultants participated in a number of local, national and regional scientific and coordination meetings:

When	Where	Title
June 6, 2010	**Paris, FRANCE**	Meeting of the Independent Expert Group on Electromagnetic Field (Swedish Radiation Safety Authority of Sweden)
June 21, 2010	**Vienna, AUSTRIA**	Screening devices using NIR, Radiation Safety Standards Committee (RASSC), IAEA
July 13, 2010	**LUXEMBOURG**	Meeting with the EC DG EMPLOYMENT on the EMF Directive for workers
July 26-27, 2010	**Nairobi, KENYA**	ITU-T Workshop on "Delivering Good Quality Telecommunication Service in a Safe Environment in Africa"
August 13, 2010	**Ljubljana, SLOVENIA**	Organizing Committee for the NIR and Children Conference
August 26-27, 2010	**Quito, ECUADOR**	International Forum on "New Technologies, Health And Environment
September 22, 2010	**Geneva, SWITZERLAND**	Meeting on Question 23/1 of ITU-D Study Group 1
October 6-8, 2010	**Stockholm, SWEDEN**	Bi-annual meeting of the Swedish Radiation Safety Authority Independent Expert Group for EMF and Health
November 29-30, 2010	**Paris, FRANCE**	Meeting of the Global Coordination of RF Communications on Research and Health Policy
December 6-7, 2010	**Jerusalem, PALESTINE**	1st Palestinian Conference on Electromagnetic Radiation, Al-Quds University
December 13, 2010	**Tokyo, JAPAN**	Meeting at the Japan EMF Information Center (JEIC)
February 2, 2011	**Lyon, FRANCE**	Delegation visit to IARC
February 15, 2011	**Barcelona, SPAIN**	Participate as a panelist in the Ministerial Programme of the Government Mobile Forum
March 11, 2011	**Madrid, SPAIN**	Lunch seminar on NIR at the Spanish Nuclear Safety Council, CSN
March 16-17, 2011	**Oviedo, SPAIN**	WHO International Conference on "Environmental and occupational determinants of cancer: Interventions for Primary Prevention (cancelled participation due to Fukushima)
May 6, 2011	**Basel, SWITZERLAND**	Bi-annual Meeting of the Swedish Radiation Safety Authority Independent Expert Group

4. 6. UPCOMING MEETINGS

International Joint Conference on Non-Ionizing Radiation and Children's Health, 18-20 May 2011, Ljubljana, Slovenia
http://www.icnirp.org/Kids/kids&NIRprog.htm

33rd Annual BEMS Meeting, 12-17 June 2011, Halifax, Canada
https://www.bems.org/node/1188

30th URSI General Assembly and Scientific Symposium, 13-20 August 2011, Istanbul, Turkey
http://www.ursigass2011.org/

23rd International Society for Environmental Epidemiology Conference, 13-16 September 2011, Barcelona, Spain
www.isee2011.org/

2012 World Congresses on Occupational Health, 18-23 March 2012, Cancun Mexico
http://www.icohcongress2012cancun.org/

7th ICNIRP International NIR Workshop, 9-11 May 2012, Edinburgh, Scotland, United Kingdom
http://www.icnirp.de/upcoming.htm

13th International Congress of the International Radiation Protection Association, 13-18 May 2012, Glasgow, Scotland, United Kingdom
http://www.irpa13glasgow.com/

FOR FURTHER INFORMATION ON THE INTERNATIONAL EMF PROJECT

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