18.5.2016

WHO International EMF Project
Report on activities in Finland from June 2015 to May 2016

General research activities related to EMF health

An international epidemiological follow-up study on health effects of mobile phone use (COSMOS, COhort Study of MObile phone uSe and health) was started in Finland in 2009. The study was initiated by STUK - Radiation and Nuclear Safety Authority, but later transferred to University of Tampere (UTA). The Finnish cohort comprises approximately 15,500 participants recruited during 2009-2011. Information on numbers and durations of out-going and in-coming calls was obtained from the two major mobile network operators. The second questionnaire survey was carried out in 2014-15. The first analyses will focus on new-onset symptoms (headache, tinnitus, hearing loss, sleep disorders) in collaboration with other COSMOS collaborators from Sweden, Denmark, UK and the Netherlands. Subsequently, analyses of cancer, cerebrovascular and cardiovascular disease, as well as neurological disease are planned.

A register-based case-control study of childhood leukemia is on-going in UTA with 1100 cases and 330 controls. Exposure to RF-EMF from high-power TV and radio transmitters will be assessed. Exposure history will be reconstructed based on residential history and comprehensive data on transmitters obtained from the broadcast operator (Digita).

Incidence trends of glioma in 1970-2014 are being evaluated by UTA to assess any increase following large-scale adoption of mobile phone use in the population. Join-point regression is used in the analysis. A collaborative analysis of all Nordic countries is planned with coordination of IARC.

The exposure to electromagnetic (EM) fields from radio devices used near the body at workplaces in Finland were surveyed in 2015 in a project conducted by STUK and financed by the Ministry of Social Affairs and Health. The ways of using the devices were studied and the exposure was preliminarily estimated by carrying out a literary survey. The survey revealed that radio telephones with maximum power of several watts cause the highest exposure when used near the head or body. The exposure may exceed the local exposure limits for general public but probably not the local exposure limits for workers. Radiation safety measurements were performed for two TETRA phone models and for radiofrequency identification (RFID) devices. The maximum specific absorption rate (SAR) measured for the TETRA phones with a peak power of 1 W was 0.83 W/kg when used in close proximity to the ear. Electric and magnetic field strength measurements carried out in the vicinity of RFID devices showed that the action levels for workers given in the EU directive 2013/35/EU were not exceeded at distances greater than 20 cm from the devices. Based on the results obtained from the literary survey and radiation safety measurements, guidance was written for the safe use of the radio devices near the body. The guidance can be utilized by the employers in the risk evaluations which are required at workplaces by the new government decree enforced on 1 July 2016. The decree is the national implementation of the EU directive which was given to protect workers against risks arising from the exposure to EM fields.

STUK and Finnish Institute of Occupational Health (FIOH) collaborated in a research project on safety and well-being of MRI personnel at their work. The project was started in 2011 and it ended in November 2015. The main outcome of the project was a practical guide for the personnel. The guide gives advice on how to work safely near MRI devices. The project also included a questionnaire and magnet-

STUK • **SÄTEILYTURVAKESKUS** Osoite / Address• Laippatie 4, 00880 Helsinki
STRÅLSÄKERHETSCENTRALEN Postiosoite / Postal address • PL / P.O.Box 14, FI-00881 Helsinki, FINLAND
RADIATION AND NUCLEAR SAFETY AUTHORITY Puh. / Tel. (09) 759 881, +358 9 759 881 • Fax (09) 759 88 500, +358 9 759 88 500 • www.stuk.fi

ic field and motion velocity measurements near MRI devices. The project was funded by the Finnish Work Environment Fund.

Radio frequency (RF) radiation is used in several cosmetic applications for e.g. cellulite treatment or skin rejuvenation. The power levels used in the treatments can be high (> 100 W) and even a short treatment period may result in tissue damage. STUK made numerical simulations to assess the exposure levels during RF treatments. The exposure limits for general public (ICNIRP 1998 guidelines) were exceeded in a very short time. In Finland treatments exceeding the RF exposure limits are allowed only in health care procedures.

New policies and legislations regarding EMF exposure

The directive 2013/35/EU will be implemented to national legislation on 1 July 2016 as a decree given by the Ministry of Social Affairs and Health.

Work on renewal of radiation act is in progress. The new radiation act will be implemented on 2018.

Areas of public concern and national responses

Possible health effects from base stations and wireless local area networks (WLAN) have been the main areas of public concern during last couple of years. Some schools have inquired information from STUK on the safety of WLANs and base stations in schools.

Municipal authorities requested statements from STUK on several proposals for a town plan where new residential areas were located near existing power lines or on new power lines planned to be constructed near residential houses. STUK evaluated the magnetic fields near power lines and gave recommendations for spatial planning. STUK recommends that premises where the presence of children is permanent should not be located so that the average magnetic flux density exceeds 0.4 μT.

New public information activities

Entire STUK's website was renewed in autumn. All information on non-ionizing radiation was revised. Information on safety of WLANs in schools was added to the website.

Osoite / Address• Laippatie 4, 00880 Helsinki
Postiosoite / Postal address • PL / P.O.Box 14, FI-00881 Helsinki, FINLAND
Puh. / Tel. (09) 759 881, +358 9 759 881 • Fax (09) 759 88 500, +358 9 759 88 500 • www.stuk.fi