Expert Advisory Board (EAB) – Bulgaria, Ministry of Health

International EMF Project

REPORT

24rd International Advisory Committee Meeting
WHO, Geneva, 27th – 28nd May 2019
Geneva, Switzerland,
(for the period June 2018 – May 2019)

I. General research activities in Bulgaria related to EMF health

Ongoing projects

Project: ***Training in the field of the European legislation for protection of workers exposed to non-ionizing radiation: electromagnetic fields, optical, laser radiation***

Funds: "Working conditions fund", Ministry of Labour and Social Affairs

Research team: National Centre of Public Health and Analyses (NCPHA); Expert Advisory Board (EAB) on non-ionizing radiation protection

Finished: November 2018

Overall objective: Training of managers and specialists from the Regional Health Inspectorates in the requirements of Directive 35/2013/EC and Directive 2006/25/EC transposed in Bulgaria as Ordinance No. RD 07-5, State gazette 95, 2017, and as Ordinance No.5, State gazette 49, 2010.

Project: ***Study of the public concern with EMF exposure to the general population. Risk communication and risk management***

Funds: National budget: National Centre of Public Health and Analyses (NCPHA)

Research team: V. Zaryabova – Ph.D. Theses. Supervisor: Prof. M. Israel, Ph.D.

Finished: 2020

Overall objective: Analyze the reasons for public concern by using different methods as communication with the people, retrospective analysis of the complaints, questionnaire, epidemiological results compared to EMF exposure.

Project: ***Risk assessment in thermal power plant – working places with sources of non-ionizing radiation.***

Funds: Thermal power plant "Maritza East"

Research team: Faraday Foundation

Finished: November 2018

Overall objective: Measurements, exposure and risk evaluation of electromagnetic fields, optical (UV) radiation at workplaces in a big governmental thermal power plant, on the basis of Directive 35/2013/EC and Directive 2006/25/EC transposed in Bulgaria as Ordinance No. RD 07-5, State gazette 95, 2017, and as Ordinance No.5, State gazette 49, 2010.

Project: ***Injury thresholds of high power pulsed radiofrequency (RF) emission***, RTG 198, NATO

Funds: Research Task Group (RTG) 198

Meeting in Rome "Human Factors and Medicine" (HFM) 298, NATO Science and Technology Organization (STO), Funds for our attendance – from the NCPHA, Bulgaria

Research team: Michel Israel

Finished: 2020

Overall objective: Discussion on the field of standards for pulsed radiofrequency fields and on the possible exposure limit values based on RF injury for military personnel and for the population exposed to high power radiofrequency pulsed fields used by the army.

Scientific forums and publications:

1. Scientific forums

RAD Conference, June 18 to June 22, 2018, Ohrid, Macedonia

XXXVI Coloquium "Physics in protection of humans and environment", June 29 to Julay 1st, Gyoletciza, Rila, Bulgaria

NATO Science and Technology Organization (STO), Human Factors and Medicine (HFM), Research Task Group (RTG) HFM-298, Kick Off Meeting 13-15 Nov 2018, Rome.

2. Publications

Israel M., M.Ivanova, V.Zaryabova, Ts. Shalamanova, Iv.Topalova - *Protection of personnel and patients in diagnosis and therapy with ionizing and non-ionizing radiation*, Physica Medica, European Journal of Medical Physics, Vol.58, p.167, 2019

Israel M., M.Ivanova, Ts.Shalamanova, P.Ivanova - *Professional realization of specialists in medical sanitary physics and sanitary engineering*, Physica Medica, European Journal of Medical Physics, Vol.58, p.167, 2019

M. Ivanova, Ts. Shalamanova, V. Zaryabova, P. Ivanova, Iv. Topalova, M. Israel - *Evaluation of electromagnetic field exposure of general public around telecommunication sources*. RAD Conference Proceedings, Vol. 3, p. 1–4, 2018. ISSN 2466-4626 (ONLINE). DOI: 10.21175/RADPROC.2018.00

Iv. Topalova, Ts. Shalamanova, V. Zaryabova, M. Israel - *Electromagnetic field exposure from telecommunication sources in areas with "sensitive" buildings and places.* RAD Conference Proceedings, Vol. 3, p. 1–4, 2018. ISSN 2466-4626 (ONLINE). DOI: 10.21175/RADPROC.2018.00

M. Israel, M. Ivanova, V. Zaryabova, Ts. Shalamanova, P. Ivanova - *Occupational exposure to electromagnetic field – transposition of the European policy*. RAD Conference Proceedings, Vol. 3, p. 1–4, 2018. ISSN 2466-4626 (ONLINE). DOI: 10.21175/RADPROC.2018.00

II. New Policies and Legislation regarding EMF exposure

1. The managers (directors) of the Regional Health Inspectorates (the control bodies of the Ministry of Health) had been trained in the field of the new legislation concerning non-ionizing radiation.

The main discussed areas of interest were the followings:

- Non-ionizing radiation hazards determination at the working environment
- Biological criteria for establishing exposure limits
- Thermal and non-thermal effects at EMF exposure
- Short and long-term effects at optical radiation exposure
- Laser safety
- Exposure limit values and action levels
- Problems of control of the electromagnetic exposure in working places.

All 28 managers of all Regional Health Inspectorates and experts for the same control bodies participated at the course, and their knowledge has been tested after the training.

2. Measurement of EMF exposure performed by the Regional Health Inspectorates

The 28 Regional Health Inspectorates (RHI) involved in the process of measurement and exposure assessment of EMF in residential areas continued to collect information. They performed monitoring of 10% (annually) of the registered communication sources in the region, in "sensitive" areas around hospitals, schools and kindergarten, and in response to complaints of citizens, following a special instruction disseminated by the Ministry of Health.

All measurements were made following a *Method for measurement and exposure assessment of EMF emitted by communication sources (at the request of citizens),* developed by the team at the National Centre of Public Health and Analyses (NCPHA).

RHI sent to the NCPHA a summary annual report of this monitoring for including the results in the electronic database and further analyses.

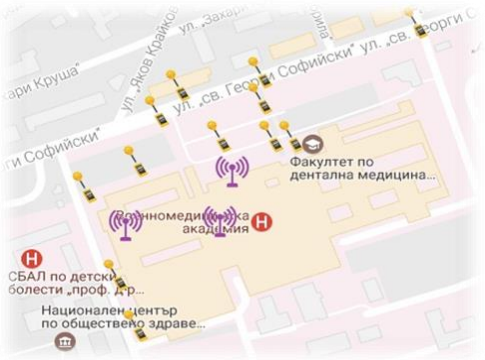
The results of the monitoring show that all data of measurement are below the limit value of 10 μW/cm^2 that is in use in Bulgaria for the residential areas for the frequency range 300 MHz – 30 GHz.

3. Collecting data for the electronic register of communication sources of EMF radiation in residential areas.

One of the obligations of NCPHA is to measure and collect data of EMF radiation in residential areas.

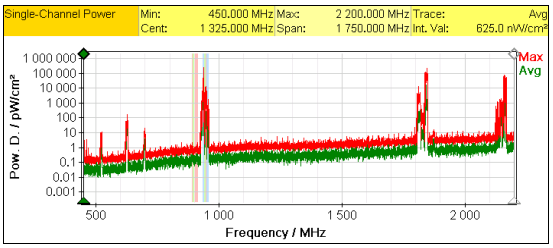
The measurement sites were selected applying the *"Controlled method for selection of measurement points in an area with higher density of EMF sources"* developed for this purpose. According to the above mentioned method, the available information about the emitters in a selected region was processed. Detailed information on the location and technical characteristics of EMF transmitters in the certain areas was obtained from the electronic register of telecommunication sources stored at the NCPHA.

The measurement points were selected to be within the calculated safety zones of the known source of EMF, and after on-site field inspection. They were selected to meet the "worst case" criterion regarding the exposure of the population.



Location of measuring points in one of the selected “sensitive” areas

For each monitored area, ***non-selective and selective measurement methods***, as well as ***24-hour monitoring*** of EMF values for estimating real-time exposure to EMF, were applied. For an integral exposure assessment, a non-selective (broadband) method was used at all points defined by the cited methodology. This method was suitable for carrying out a cumulative assessment of EMF levels, i.e. pooling the contributions of all radio frequency sources in the spot to be measured. Broadband measurement had been used to indicate whether it was necessary to make a detailed (frequency and 24-hour exposure monitoring) study of the field at a given point. At the points where the highest EMF value was measured, a selective (frequency analysis) method for detailed exposure estimation and information on the contribution of each transmitter in the total measured EMF at the metering point was applied. They also provided 24-hour monitoring by setting monitoring stations to collect real-time exposure data for the selected location.



Spectrum view of the signals in the frequency range 450 ÷ 2200 MHz in a region

All measurements were made in far field zone of the emitters at 1,5÷1,8 m from ground level, at places where higher electromagnetic exposure values are expected. For the on-site survey, geographic coordinates of the measurement points were taken in order to put them into the electronic register of EMF sources to be accessible for the general public.

Measuring data show that only at 1% of the points the power density is above the limit of 10 μW/cm^2.

4. The EU Directive 2013/35/EC for protection of workers against EMF radiation has been transposed in Ordinance RD 07-5, Official State Gazette 95, 2016**.** The Practical Guides were published on the webpage of the Ministry of Labour and Social Affairs and on the NCPHA website.

The training of specialists in the industry, in occupational health services, in control bodies continues but many problems still exist concerning the practical implementation of the Ordinance.

As a consequence of the existing problems, an European Forum was created to discuss the problems of implementation of the Directive 2013/35/EC in different countries. This Forum had two online meetings (web seminars), and it is preparing to organize a meeting for discussion of the problems that every country has met in practical application of the Directive. The meeting is planned to be in 2020 funded by COST.

5. The Council Recommendations 1999/519/EC on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) formally is not in use in Bulgaria yet. Nevertheless, the transposition of the EU Directive 2013/35/EC gives the possibility of the control bodies to apply the Council Recommendations in cases when general population have an access to working places with EMF exposure. It can be used also for exposure assessment of workers at specific risk. This is a start for its implementation.

6. Safety during MRI diagnostics

Working group for development of rules, procedures and practices for safety of medical personnel and patients during MRI diagnostics was created to the Ministry of Health. The main topics of the document will cover as follows: MRI principles, mounting, zones, terms, exposure of the personnel and possible biological effects, exposure limit values and action levels, exposure assessment, risk of overexposure on different procedures, competence of the persons applying MRI, technical and organizational measures for reducing exposure; personnel and patients protection; persons at specific risk, safety practices. In this document, the role of the medical physicists will be discussed in details.

III. Areas of public concern and national responses

The developed electronic registers for sources of EMF radiation, and for complaints of individuals concerning the exposure are in use since May 2017, and they continues to be filled in.

The trend of reduction of the public concern – less people (less complaints), the same

complaining people for a long period continued in the reported period. Our analyses showed that one reason for this reduction is the availability of the electronic register of sources of radiation where the team of NCPHA continued to fill in information about the sources of EMF and exposure to the general public.

The main communication network in Bulgaria is built, and no many new stations are in construction. Mobile operators are preparing for the 5G technology and there is not enough information about its possible adverse effects for the population.

IV. New public information activities:

Several publications in media, and interviews for daily news, radiobroadcasting and TV were conducted at this period. Special interview for radiobroadcasting media has been performed on the theme of the 5G technology and its possible health risks.

The main information activity during this period is the electronic register with data for the sources and EMF exposures available for the general public.

Every year, the Ministry of Health issues annual report on the health of the nation, which contains chapter on non-ionizing radiation. There activities of the EAB, the NCPHA, RHI are presented. The information included in the field of NIR the level of public concern, the state and changes in the legislation for the working environment, results from measurements, results of EMF monitoring in the populated areas, analysis of the results, etc. The report is available to the public at the web site of the Ministry of Health.

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