

# **Russian National Committee on Non-Ionizing Radiation Protection and EMF RF standards. New conditions of EMF RF exposure and guarantee of the health to population.**

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In Russia at estimation of criteria of electromagnetic safety for the population and development of standards the greater role is played constantly working scientific forum - RUSSIAN NATIONAL COMMITTEE ON NON-IONIZING RADIATION PROTECTION (RNCNIRP).

RNCNIRP was created 11 years ago (1997) at Russian Academy of Medical Science (RAMS) within the framework of the Russian scientific commission on radiation protection (RSCR). RSCR acts as the chair of RNCNIRP.

The structure of RNCNIRP includes 40 specialists, of whom 38 are qualified scientists and 2 members are representatives from the Ministry of health. RNCNIRP is a scientific and independent organization, and does not have financial sponsors.

## **The Russian EMF RF standards.**

The standards in Russia are federal and compliance is obligatory. The standards (SanPiN) are issued by the Ministry of Health of the Russian Federation.

The recommendations of RNCNIRP are considered by the Ministry of Health of the Russian Federation when setting standards. Last RF EMF SanPiN 2.1.8/2.2.4.1190-03 (safety standard) on mobile communications was issued by the Ministry of Health of the Russian Federation in 2003.

Max. Permissible level for the frequency range 300 MHz – 300 GHz:  $10 \mu\text{W}/\text{cm}^2$  ( $0.1 \text{ W}/\text{m}^2$ ) has been recommended by this standard. Except for that at this SanPin the following recommendations have been made: use of mobile telecommunication devices for those under 18 or pregnant should be restricted.

## **Foreign standards and standards of Russia (characteristic of conception).**

My point of view of the basic hygienic postulate:

"The hygienic standards are for the protection of the population, taking into account factors potentially harmful to health, and with the obligation of taking into account typical prevalence of these factors in the general population".

Let us consider existing International standards and how these standards conform to this postulate.

Now the International standards are worked out by ICNIRP, IEEE, CENELEC and some other national and international Commissions. All three organizations have determined the standards some years ago and continue to use EMF RF standards on the basis of THERMAL, ACUTE and PATHOLOGICAL effects only (ICNIRP Guidelines 1998, IEEE Standard C95.1-2000 and CENELEC EN 50166-2.2000).

However these foreign standards contradict real conditions of RF EMF exposure for the general population.

- The population is not typically exposed to THERMAL levels in the workplace or in everyday life.

- The establishment of a threshold level on pathological effects makes the assumption that in an organism compensative or adaptive reactions will be in effect. We strongly disagree with this assumption!

- People very rarely have contact with ACUTE exposures in everyday life.

All populations in the world have daily contact with low levels of RF EMF and are chronically exposed!

Unfortunately there are no publications that present ways of extrapolating from the various existing standards recommendations to properly assess real environmental conditions for the population. There are currently no proposals on how to estimate danger by using existing International standards recommendations: from acute influences to chronic exposure, and from thermal levels to non-thermal levels.

Methodology of Russian standards has other opposite principles. In Russia other opposite principles are based on real conditions of EMF exposure of the population:

- Non-thermal levels
- Chronic exposure
- An establishment of “working level“(Yu. G.), instead of threshold level.

Consideration of the presence of processes of adaptation in conditions of chronic influence, instead of a direct pathological effect. Database for standardization: results of the supervision in conditions of an industry (1950 onwards - 60 years) and chronic exposure experiments etc.

In 2008 has been finished joint It is Russian-Franco experiment, which has confirmed earlier the received results in the USSR at chronic EMF RF exposure on animals - at chronic EMF RF exposure with small not-thermal intensity (up to  $500 \mu \text{W}/\text{cm}^2$ ) development immunology effects. Below the primary goals and results of this experiment are briefly presented.

1. The study was conducted using the methodology of the original experiments conducted in the USSR (Vinogradov and Dumansky 1974, 1975, Shandala and Vinogradov 1982) and the agreed Protocol of the Bordeaux-Moscow Project on “Confirmation studies of the Russian data on immunological effects of microwaves” (Statement of work, 2006). Autoimmunity was evaluated using the original methodology, developed in the USSR (Vinogradov and Dumansky 1974, 1975, Shandala and Vinogradov 1982). This original methodology was a complement fixation test (CFT), however, our study was expanded to include modern ELISA test. The Russian study was conducted in accordance with WHO recommendations on EMF biological research.

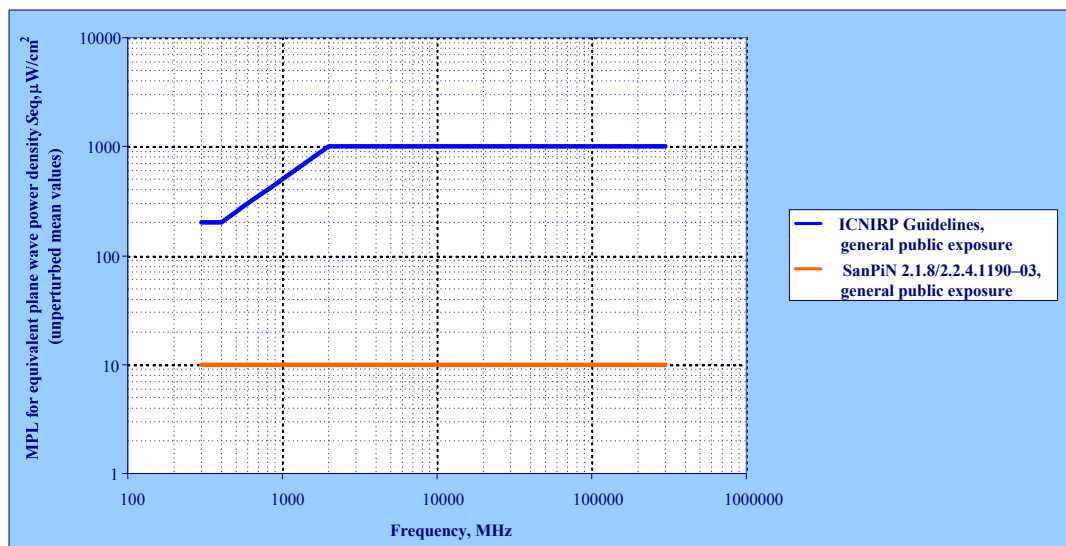
2. The results of our immunology study using the CFT and ELISA tests generally confirmed the results of the Soviet research groups on the possible induction of autoimmune responses (formation of antibodies to brain tissues) and stress-reactions from long-term non-thermal level of RF exposure (30-day exposure for 7 hours daily for 5 days per week at a power density of  $5 \text{ W}/\text{m}^2$  – non-thermal level of EMF exposure)..

3. The results of our teratology study suggest possible adverse effects of the blood serum from exposed rats (30-day exposure for 7 hours daily for 5 days per week at a power density of  $5 \text{ W}/\text{m}^2$ ) on pregnancy, foetal and postnatal development in rats in agreement with the earlier results of Shandala and Vinogradov .

We consider that processes of compensation at some situations can become critical and can lead to disturbance of health. / Griroriev Yu., Shafirkin A., Vasin A., 2004).

M. Reprcholy (2008) confirms that our position is real: «Annoyance or discomforts caused by **EMF exposure may not the pathological per se but, if substantiated, can affect the physical and** mental well being of a person and resultant effect may be considered as a health hazard».

As a result of available divergences in methodology of EMF RF standardization for today we have essential divergences in levels MPL (Fig. 1).



### Unresolved problems.

It is necessary to pay attention to following actual problems without which decision it is impossible to estimate electromagnetic safety for the population.

- Problem of accumulation of effect. If at chronic EMF RF exposure there is an accumulation of adverse bioeffects, ICNIRP concept « acute exposure is a basis of EMF RF standardization » there is an illusion.
- Remote somatic effects and cancer. The remote somatic effects have special attention for an estimation of health hazard of children of EMF mobile communication.
- Problems of adaptation and compensation of functions in conditions of repeated and chronic Problem of indemnification of functions in conditions of repeated and chronic exposures.
- Estimation of the influence of simultaneous exposure to various frequencies.
- Estimation of the role of signal modulation.
- Coordination of the criterion to establish a threshold or appropriate “working level”.
- Problem of changing reactivity and appearance of electromagnetic hypersensitivity.

### Children - new group of risk.

The necessity of development of the standards for children, as new group of risk. The potential risk to children’s health is very high and is a completely new problem. В этой связи, очень важная констатация WHO:

"CHILDREN ARE DIFFERENT FROM ADULTS. Children have a unique vulnerability. As they grow and develop, there are "windows of susceptibility": periods when their organs and systems maybe particularly sensitive to the effect of certain environmental threats". WHO, Backgrounder N 3, 2003. 5p.

Modern children will use mobile phones for longer periods than adults of the present generation because they started to use mobile phones at an early age and will continue use them when they became adults.

RNCNIRP (April, 2008) has let out already the third decision on possible danger EMF RF for children: “CHILDREN AND MOBILE PHONES: THE HEALTH OF THE FOLLOWING GENERATIONS IS IN DANGER” (2008). In this decision it has been paid attention of scientific community, Ministry of Health and controls by the country, that for the first time in history, we face a situation when most children and teenagers in the world are continuously exposed to the potentially adverse influence of the electromagnetic fields (EMF) from mobile phones. Radiation directly affects human brain when people use mobile phones. Children and teenagers became the target group for the marketing the mobile communications.

The current safety standards for exposure to microwaves from the mobile phones have been developed for the adults and don’t consider the characteristic features of the children’s organism. The WHO considers the protection of the children’s health from possible negative influence of the EMF of the mobile phones as a highest priority task. This problem has also been

confirmed by the Scientific Committee of the European Commission, by national authorities of the European and Asian countries, by participants of the International scientific conferences on biological effects of the EMF.

Potential risk for the children's health is very high:

- the absorption of the electromagnetic energy in a child's head is considerably higher than that in the head of an adult (children's brain has higher conductivity, smaller size, thin skull bones, smaller distance from the antenna etc.);
- children's organism has more sensitivity to the EMF, than the adult's;
- children's brain has higher sensitivity to the accumulation of the adverse effects under conditions of chronic exposure to the EMF;
- EMF affects the formation of the process of the higher nervous activity;
- today's children will spend essentially longer time using mobile phones, than today's adults will.

According to the opinion of the Russian National Committee on Non-Ionizing Radiation Protection, the following health hazards are likely to be faced by the children mobile phone users in the nearest future: disruption of memory, decline of attention, diminishing learning and cognitive abilities, increased irritability, sleep problems, increase in sensitivity to the stress, increased epileptic readiness.

Expected (possible) remote health risks: brain tumors, tumors of acoustical and vestibular nerves (in the age of 25-30 years), Alzheimer's disease, "got dementia", depressive syndrome, and the other types of degeneration of the nervous structures of the brain (in the age of 50 to 60).

The members of the Russian National Committee on Non-Ionizing Radiation Protection emphasize ultimate urgency to defend children's health from the influence of the EMF of the mobile communication systems.

The children using mobile communication are not able to realize that they subject their brain to the EMF radiation and their health – to the risk.

Необходимо обратить Ваше внимание на очень важное положение: « *It is impossible to use data obtained on adults for children* ».

It is necessary to develop standards for local exposure conditions of the head brain and a corresponding study. There are no studies of chronic EMF-RF exposure of the head brain, including developing brains. It strange and unexpectedly, but it so!

### **Have we got the guarantees of the health for the population including children?**

#### **Our conclusion:**

1. The available scientific basis for developing standards does not correspond to modern conditions of RF EMF exposure in the population (population and mobile communication).
2. The existing standards (Foreign and Russian) have become outdated – modern accumulative RF EMF exposures have changed considerably.
3. The existing standards can not guarantee the safe, healthy development of the next generation.

In Russia this situation corresponds to the phrase "The train had gone".

In this very critical situation rather optimistically looks, but it is difficultly explainable the view point of MMF (Mobil Manufactures Forum) «We believe that there is a strong scientific basis for all consumers to have confidence in the safety of mobile phones». (MMF. View point, mobile phones and children, January 2008)

It is necessary to emphasize that the brochure is devoted to a problem mobile phones and children and has been published in 2008.

**It's necessary:**

1. To accumulate knowledge for preparation of new standards. To carry out appropriate research: for example, to study the repeated RF EMF exposure during several years on the head brain of the adult user, teenagers and children, since seven years of age.
2. To put forward more rigid requirements from the industry.
3. Actively to introduce a precautionary principle. The thesis that mobile communication is absolutely safe is both premature and potentially dangerous. It is necessary to spend appropriate effort explaining the possible risks to the general population, including parents and children: the mobile phone is not a toy, it requires care and it is important to be well-informed.

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