
Preface: To the Reader

At the end of the second decade of the twenty-first century, we evidence a dramatic increase of all means of mobile communications, which includes space signals, smartphones, and smart meters. Recent data indicate that the number of mobile devices surpasses 7.5 billion users. The integration between the mobile devices and smart home environments and the emerging advances in mobile phone technology including recent 4G and 5G modalities open the discussions on the potential hazard for the biosphere and mankind.

Unfortunately, the scientific, medical, and public health communities, after more than a quarter of century of discussions, still do not have a common opinion on the issue of if, and to what extent, the EMF from mobile communications represent a hazard for public health. The entire world population is exposed to various RF EMF signals. The problem here is that the population has no knowledge of the exposure or of the parameters of the received EMF. It would be correct to say that the international system for control and regulation had failed.

Obviously, it is impossible to evaluate the daily, monthly, and yearly rate of use, or the total value of the absorbed energy. This is even more important because mobile devices and cell phones may be seen in the hands of children as young as 1–3 years in age. It is already recognized that children have a unique vulnerability to external adverse factors of the environment.

As wireless broadband technology has evolved from generation to generation, the manufacturers were able to upgrade and adapt to necessary changes in the products. Today, the situation is different—the problem is not to upgrade—any new generation is basically new technology, and 5G is an especially deep step in the millimeter range of the electromagnetic spectrum. In addition to the new frequency range, the distribution of the signal requires a large number of antenna elements which need to be integrated into advanced device packaging. It is clear now that the standards for 5G are not yet available. Therefore, it is another jump in developing technology which will lead the entire biosphere and civilization to be exposed to new levels of electromagnetic pollution that are not defined and for which there are no standards and methods of control.

This was the reason that I started this project—to emphasize the necessity of terminology clarification, the specific absorption rate (SAR) use, and the thermal versus nonthermal effects.

Due to the courtesy of Drs. Rainer Nyberg and Lennart Hardell, I am able to open this book with the petition to the European Union that nearly 200 scientists from three continents signed asking that the 5G generation of mobile communications not be allowed before the standards for protection of the human population are developed and introduced.

This book would not be possible without the contribution of scientists from Europe and North America. Igor Belyaev and Carl Blackman helped in clarification of biological issues, Peter Gajšek, Jolanta Karpowicz, Dina Šimunić and Krzysztof Gryz wrote about the engineering problems. Biomedical engineer Lucas A. Portelli reported the recent advances in studying low-level thermal signals, while Henry Lai

offered the readers a summary of recent literature on the neurobiological effects of radio frequency radiation. Martin Pall proposed a possible mechanism explaining how cancer can be caused by microwave frequency EMF exposures. Yury Grigoriev and Natalia Khortzeva reported Russian experience in setting standards and the investigations of the RF EMF effects on children in Russian schools.

Dear reader, please do not forget that we are at the bottom of the ocean of electromagnetic waves. The mobile communication industry is creating newer and newer tools in order to eventually increase the speed of communications. Smartphones and smart meters significantly change the electromagnetic environment not only for occupational conditions, but in every home. Billions of people are even not informed about the fact that their homes and their organisms are subjected to the "new and advanced" technological development. This cohort includes babies and elderly people, schoolboys and professionals.

It is our duty, we biologists, physicists, engineers, and medical professionals need to help today and future generations in the creation of standards for healthy life. **It is time to ring the bell.** Please help.