



Monitoring of EMF exposure levels in Japan

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Recent progress in wireless technologies has made human exposures to electromagnetic fields (EMF) more and more complex. The situation may increase public concerns related to possible health effect due to the EMF exposures. Clarification of EMF exposure levels is indispensable for risk communication concerning EMF. From the background, a project of acquisition, accumulation, and applications of monitoring EMF exposure levels in Japan was started in 2019. The objectives of this project are: 1) Comprehensive clarification of exposure characteristics in daily life 2) The long-term accumulation of these data 3) Investigation of risk communication methods using EMF exposure level monitoring data 4) The results of this study used in cohort studies to utilize radiofrequency (RF) EMF exposure level for epidemiological studies. In addition, the data collected in this study will be made available as exposure data for use in trend analysis to analyze the correlation between trends in RF-EMF exposure and disease. The project is a 5-year project but it is recognized as a subject of high research priority from 2020 to 2040.

There is the brief summary what we have done so far. We measured the RF-EMF exposure level from mobile phone base stations and broadcasting transmit towers in urban and suburban areas around Tokyo and compared them with the past measured results [1-3]. It is confirmed that the RF EMF exposure levels from mobile phone base stations is about three times higher than those of the past measurements in both urban and suburban areas, however, it is sufficiently low against the Japanese radio radiation protection guidelines [4] with approximately 1/10,000 or less in the median value [1]. Additional spot measurements in dwellings have confirmed that, due to the widespread use of wireless local area network (W-LAN), the RF-EMF exposure levels from W-LANs is approximately 50% of the exposure from mobile phone base stations and other sources [5]. A wide-area mobile measurements by an electric field measuring equipment mounted on a car are also conducted. Amount distance of about 13,000 km within a radius of 100 km centered on Nihonbashi area, Tokyo were carried out. It is shown that the electric field strength of the mobile phone base stations is positively related to population density. Two web-based surveys were carried out to contribute to research on risk communication regarding RF-EMF exposure in living environment. One is on the use of wireless devices in residences conducted in July 2021, the other is on awareness of radio wave in daily life in December 2021. Both of the surveys were targeted approximately 5,000 people in their 20s to 60s nationwide in Japan. The results suggest that some trends concerning the use of devices and awareness of RF-EMF exposure are differed by age and home environment [7].

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