

# RF exposure assessment in EU

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Average levels of exposure to radiofrequency (RF) electromagnetic fields (EMFs) of the general public in EU are difficult to summarize, as exposure levels have been reported differently in those studies in which they have been measured, and a large proportion of reported measurements were very low, sometimes falling below detection limits of the equipment used.

A comparative analysis of the literature of spot or long-term RF EMF measurements in the EU indicated that mean electric field strengths were between 0.08 V/m and 1.8 V/m. The overwhelming majority of measured mean electric field strengths were < 1 V/m. It is estimated that <1 % were above 6 V/m and < 0.1 % were above 20 V/m. No exposure levels exceeding ICNIRP guidelines were identified in these studies. Most population exposures from signals of radio and television broadcast towers were observed to be weak because these transmitters are usually far away from exposed individuals and are spatially sparsely distributed. On the other hand, the contribution made to RF exposure from wireless telecommunications technology is continuously increasing and its contribution was above 60 % of the total exposure.

As part of the GERoNiMO project (Generalized EMF Research using Novel Methods), a personal exposure survey which is one of the largest personal measurement surveys on RF-EMF so far, was carried out among child-parent couples in five European countries (Slovenia, Switzerland, Spain, Denmark, and the Netherlands).

Generally speaking, personal environmental RF-EMF exposures in all different collaborating countries were much lower than International Commission on Non-Ionizing Radiation Protection (ICNIRP) reference levels (< 1 %).

Main contributors to personal RF-EMF exposure were downlink followed by broadcast. Uplink contributed less to exposure, except in Switzerland where broadcast, uplink, and downlink contributed almost equally. DECT and WiFi contributed very little to exposure. Individual characteristics, such as age and sex of child, urbanicity of home, and highest level of parent education, were associated with exposure in general frequency bands.

The generation gap between children and their parents is mostly evident in uplink exposure, due to more and longer uplink and cordless phone calls among parents, and their tendency to spend slightly more time in activities with higher environmental RF-EMF exposure, such as travel. Despite these differences in personal behavior, time-weighted average exposures from children and their parents show a moderate spearman correlation of 0.45 for total exposure, with higher correlations for environmental exposures like downlink (0.57) and broadcast (0.62) and lower correlations for behavior-related exposures such as uplink (0.29). Mean exposures experienced by parents and children while engaged in the same activity mostly showed low to moderate correlations.

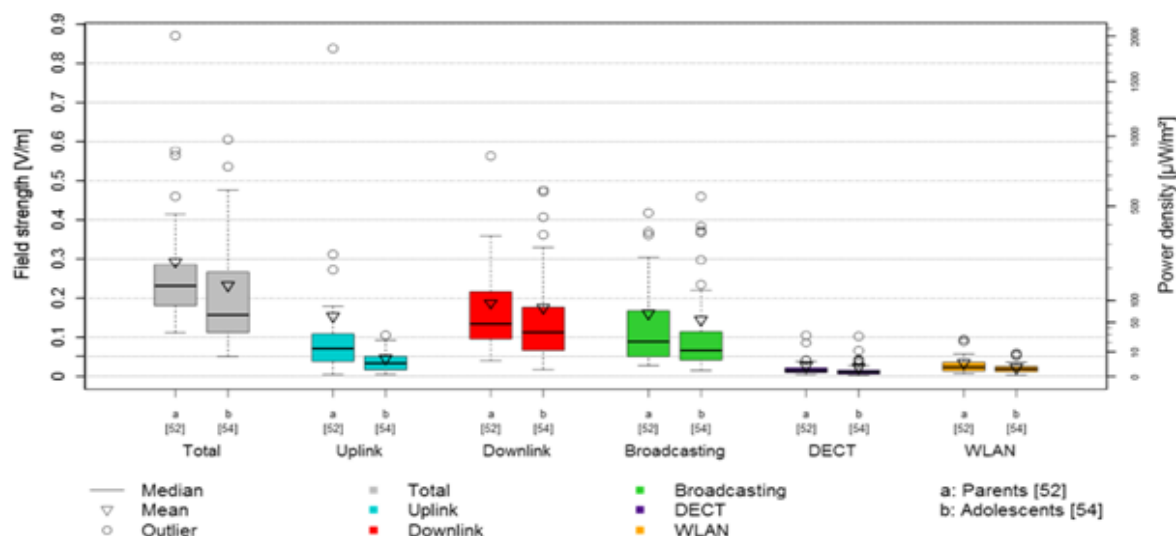


Figure 1. Distribution of the average personal exposure for parents and adolescents in Slovenia shown for the total exposure, mobile phone downlink and uplink, DECT, WiFi and Broadcasting (Total = Downlink + Uplink + DECT + WiFi + Broadcasting; Downlink = 800 + 900 + 1800 + 2100 + 2600; Uplink = 800 + 900 + 1800 + 2100 + 2600; DECT = DECT; WIFI = 2.4 + 5.8; Broadcasting = FM + DVB-T).

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