

Assessment of the workers' exposure produced by radio base stations placed on rural lands.

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Aims

The rapid spread of mobile telephone technology has greatly increased the number of the radio base stations (RBS) in Italy during the recent years. The analysis of the electromagnetic field levels generated by radio base stations (RBS) situated on rural-agricultural lands allows evaluating the farm workers exposure in the surrounding area. These workers are generally unaware of their exposure and the potential risks, and are not trained to take appropriate precautions. The aim of this paper is to evaluate the electromagnetic field produced by a mobile phone RBS situated on a rural area according to the Italian Regulation concerning the exposure of workers to EMF and the recent European Standard that assesses "Exposure Limit Values" (ELV) and "Action Levels" (AL) in the frequency range used by the RBS.

Methodology

The electromagnetic field produced by a mobile phone RBS situated on a rural area is evaluated using an electromagnetic field forecasting software, which meets the requirements of the Italian Technical Standard. The E-fields generated by some mobile telephone RBS operating in the GSM and UMTS bands and situated on agricultural land in the rural areas of Apulia (Italy) will be measured according to the Italian technical standard. All instrumentation will be set for E-field values data acquisition. Taking into account that the traffic in rural areas is lighter than in the urban areas and that the transmitted power is generally lower at weekends, the in situ measurements will be carried out and recorded on day-time of working days, when it is reasonable to assume that most mobile telephone use takes place.

Expected Results

The simulations will show the combinations of Radio Electric Centre (RECh) and DownTilt that produce E-field values: i) over 6.0 V m^{-1} at heights more than 1.70 m above ground level; ii) equal to the "Attention Value" ($E = 6.0 \text{ V m}^{-1}$) at 1.70 m above ground level, that is at the mean human head. The results of the in situ measurements will show the actual E-field values even at a short distance from the antennas. Possible differences between the calculated and measured E-fields could be explained considering that the calculated E-field values are obtained with the RBS working constantly at full power allow assessment. This hypothetical situation may occur only during specific circumstances in order to manage traffic peaks, while in reality the average output is lower than the maximum most of the time.