Exposure to Radio Waves Near Mobile Phone Base Stations

The National Radiological Protection Board has published a report, NRPB-R321, on exposure to radio waves near to mobile phone base stations. Measurements show that, in all cases, the total exposures of people are a small fraction of national and international guidelines. This report was part of the evidence considered in the Stewart Report.

The rapid development of mobile phone networks in the UK has led to a great deal of interest in mobile phone transmission masts (base stations) and their radio-frequency (RF) emissions. There has been concern about the extent of any exposures of people in the vicinity of the masts, and whether they could cause adverse health effects.

NRPB has carried out measurements of environmental power densities due to these emissions, as an indicator of exposure of people, near mobile phone masts sited at schools, blocks of flats and residential areas. In all cases, the total exposures were a small fraction of national and international exposure guidelines.

Power density measurements were carried out at 118 locations near to 17 base station sites. Measurements were made at sites where people lived, worked, or had frequent access. People are rarely exposed to the main beam, because of close proximity to the mobile phone mast in question, or due to shielding by buildings. At the locations measured, up to 250 metres from the base stations, measurements of power density did not show any general trend of a decrease in exposure with increasing distance from the mast. Calculations assuming exposure to the main beam have shown that with typical maximum power levels, exposure at normally accessible locations will also be a small fraction of guidelines.

The measurements also show that exposures of people to radio waves from nearby masts are frequently comparable to exposures from more distant masts, and from TV, FM radio and other transmitters. The highest measured public exposure from all these sources of RF signals combined was 0.2% of international guidelines, while typical average exposures were 0.002% of the guidelines.

The Independent Expert Group on Mobile Phones (IEGMP) had access to the findings of NRPB-R321 whilst in its final draft stages, and it was referenced in the IEGMP report published on 11 May 2000 (the Stewart Report). With regard to exposures from base stations, the IEGMP concluded that:

“the balance of evidence indicates that there is no general risk to the health of people living near to base stations on the basis that exposures are expected to be small fractions of guidelines. However there can be indirect adverse effects on their well-being in some cases.” (para 1.33).

The findings of NRPB-R321 are likely to be typical but it was not an exhaustive study. A much larger study is required before we can be certain that results are applicable to the majority of mobile phone masts. Such a study was envisaged by IEGMP who recommended a random on-going audit of base stations.