

The INTERPHONE Study

Several recent expert groups have reviewed critically the current evidence concerning the health effects of low-level exposures to radio frequency (RF) electromagnetic fields (WHO 1996, McKinlay et al. 1997, Repacholi, 1998). In view of the current state of knowledge concerning the possible adverse health effects of RF exposure, and of the increasingly widespread use of portable telephones in many countries, these groups recommended that research be carried out to determine whether radiotelephones could cause adverse health effects. Priority was given to epidemiological studies of the relationship between use of mobile telephones and the incidence of (a) brain tumours (b) salivary gland tumours, acoustic neurinomas and other head and neck tumours (c) leukaemia and lymphomas be carried out.

As a result of these recommendations, a detailed feasibility study was carried out in 1998 and 1999 in fourteen countries, co-ordinated by the International Agency for Research on Cancer (IARC) in Lyon. Using criteria established in advance, it was concluded that an international study of the relation between mobile telephone use and brain cancer risk is feasible and informative: the past prevalence of mobile telephone use and the expected number of cases are adequate to detect a 1.5 fold increase in risk five to 10 years from beginning of use, if it exists.

A series of multi-national case-control studies has therefore been set-up, co-ordinated by IARC. Separate studies are being carried out for acoustic neurinoma, gliomas and meningiomas and tumours of the parotid gland, the tumours that, if RF are carcinogenic, would be most likely to be related to mobile telephone use. A study of leukaemia risk is also planned, conditional on funding.

The primary objective of these studies is to assess whether RF exposure from mobile telephones is associated with cancer risk. A secondary objective of the studies is to investigate the relationship between these diseases and a number of potential environmental and endogenous risk factors. Possible gene-environment interactions for brain tumours will also be studied as part of a collaboration with the US National Cancer Institute consortium of brain cancer studies. The studies are based on a common "core" protocol, describing common procedures to be followed in all participating countries. National studies, however, may have specific features or a wider scope than the international study.

Participating countries are Australia, Canada, Denmark, Finland, France, Germany, Israel, Italy, Japan, New Zealand, Norway, Sweden and the UK. In order to maximise the power of finding a risk if it exists, the studies are mainly focused on tumours in relatively young people (30-59 - who had the highest prevalence of mobile phone use 5 to 10 years ago) and on regions within the participating countries with longest and highest use of mobile phones.

It is expected that the studies will include about 6000 cases of gliomas and meningiomas (both benign and malignant), 1000 cases of acoustic neurinoma, 600 cases of parotid gland tumours and their respective controls.

The primary source of information is an in-person computer assisted interview (CAPI) conducted by a trained interviewer. Retrospective and prospective validation studies are being carried out to investigate the accuracy of self-reported use of mobile phones by comparing questionnaire answers to information from records of mobile telephone companies and to information recorded by software modified phones. A subcommittee of experts in exposure assessment is developing, testing and implementing an exposure index based on information from the questionnaire, as well as on technical information on the characteristics of the network and of the telephones used and on the time period. In some countries, samples of blood or buccal cells are being collected to enable future analyses of gene-environment interactions.

Case ascertainment is complete in nearly all countries. Data from all individual countries should be received at IARC by September 2004. Data validation is under way. The first results of the study are expected in early 2005.

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The UICC received funds for this purpose from the Mobile Manufacturers' Forum and GSM Association. Provision of funds to the INTERPHONE study investigators via the UICC was governed by agreements that guaranteed INTERPHONE's complete scientific independence. The following provisions ensure the scientific independence of the conduct, analysis and reporting of the INTERPHONE study:

- The partial funds provided by the MMF/GSMA to the UICC complement funds received from non-commercial sources including the European Union and national and local research funding organisations.
- The UICC retains full responsibility for the scientific oversight and the use of these funds, as well as the financial management of these funds.
- The INTERPHONE International Study Group as a whole is responsible for the progress of the study, the choice of analyses to be conducted, and the interpretation and publications of results. All the decisions about the study are made exclusively by the INTERPHONE International Study Group.
- The funders of the INTERPHONE Study do not have access to any results of the INTERPHONE Study before their publication. They may, however, be informed, together with representatives from other concerned organisations such as consumers' groups, a maximum of seven days before the publication of the results, under strict terms of confidentiality.