

### **APPENDIX 3**

#### **Mobile Phone Telecommunications and Health: Summary of Stewart Report (2000) with updates on actions and other relevant reports**

The widespread use of mobile phones is a fairly recent phenomenon. Over the past decade, mobile phones have become an essential part of business, commerce and society. There are now close to fifty million mobile phones in circulation in the UK, representing an average of nearly one phone for every person. The phones are supported by over 36,000 base stations, which provide the link between the mobile phone user and the phone network. As the mobile phone industry continues to expand, in order to keep pace with demand and serve the new Digital network, the number of masts required is set to increase greatly.

The extensive use of mobile phones and the erection of masts to facilitate this have been accompanied by intense public debate about possible adverse health effects. The main concerns relate to perceived harm from the emissions of radiofrequency (RF) radiation (in particular micro-waves) from the phones and from the base stations that receive and transmit the signals and allow communication with the network.

Despite public concern about the safety of mobile phone stations, relatively little research specifically related to emissions has been published in peer-reviewed literature. This presumably reflects the fact that it is only recently that mobile phones have been widely used by the public and, as yet, there has been little opportunity for any health effects to become manifest.

#### ***The Stewart Report***

In order to address developing concerns throughout the late 1990s, the Department of Health (DH) and the Department of Trade and Industry (DTI) decided to sponsor a review of the health effects associated with mobile phone telecommunications. Public Health Minister at that time, Tessa Jowell, asked the chairman of the National Radiological Protection Board (NRPB) to set up an Independent Expert Group on Mobile Phones (IEGMP). The remit of the IEGMP was:

“To consider present concerns about the possible health effects from the use of mobile phones, base stations and transmitters. To conduct a rigorous assessment of existing research and to give advice based on the present state of knowledge. To make recommendations on further work that should be carried out to improve the basis for sound advice.”

The IEGMP came together in September 1999, under the chairmanship of Sir William Stewart. Following ten meetings of IEGMP through to April 2000, after hearing evidence from thirty witnesses, listening to public views at five open meetings in Belfast, London, Liverpool, Edinburgh and Cardiff and reviewing hundreds of scientific papers and extensive media coverage of the issue, the IEGMP published a report entitled *Mobile Phones and Health* (the Stewart Report) in May 2000.

The Stewart Report provides information on the interaction of radiofrequency fields with tissues. It examines epidemiological (human health) studies, research on cells in culture, experimental animals as well as on volunteers, and concerns about the use of mobile phones whilst driving. It also describes the operation of mobile phones and reviews recommendations on exposure standards for RF radiation.

The main conclusions on health effects in the Stewart Report can be summarised as follows:

- exposure to RF radiation below guidelines does not cause adverse health effects to the general population;
- there is some scientific evidence which suggests that there may be biological effects occurring at exposures below these guidelines;
- biological effects do not necessarily result in health effects;
- gaps in knowledge justify a precautionary approach to the use of mobile phone technologies until more detailed and scientifically robust information on any health effects becomes available.

The review of the scientific information relevant to concerns about exposure to RF radiation was comprehensive and did not demonstrate any clear health effects caused by the use of mobile phones or being in proximity to base stations. However, from the evidence heard by IEGMP, it was clear that there was considerable public concern about the possible health implications of the use of this rapidly developing technology. The Stewart Report contained 33 recommendations, many of which were designed to provide more information about phones and base stations. The recommendations focused on five areas:

- advice to government
- advice to industry
- identification of research requirements
- the need for better public information and consumer choice
- the role of the NRPB

### ***Advice to government***

#### *Exposure guidelines*

Advising on exposure guidelines for the UK is the responsibility of the NRPB. Exposure guidelines recommended by the NRPB (NRPB, 1993 and 1999) and by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) (ICNIRP, 1998) for limiting exposure to electromagnetic fields and radiations are based on comprehensive reviews of the scientific information available and are designed to prevent established adverse health effects. The earlier recommendations by NRPB (NRPB, 1993) were designed to limit any increase in body temperature to a fraction of a degree. The rationale behind ICNIRP exposure guidelines (ICNIRP, 1998) was essentially the same as those of NRPB but a two-tier system was recommended by ICNIRP that made a distinction between occupational and general public exposure. Reductions in basic restrictions by a factor of five were recommended for members of the public compared with those for workers, on the assumption that age and health status, and hence thermal sensitivity may be different from those for workers. Although little scientific justification for this reduction factor was given, members of the public include the frail, infants and young children and people with disease or

talking medicine that may compromise thermal tolerance. The IEGMP recommended that, as a precautionary approach, the ICNIRP guidelines for public exposure be adopted for use in the UK rather than the NRPB guidelines, thus bringing the UK into line with other countries in the European Union and accord with the recommendations of the House of Commons Select Committee on Science and Technology (Science and Technology Committee, 1999).

*Exposures of the general public from base stations*

One of the recommendations of the IEGMP was that there should be an independent, ongoing audit of base stations, with base stations near schools and other sensitive sites as priority.

It has been suggested that children might be especially vulnerable to any adverse health effects of RF radiation. There is evidence that, at the frequencies used in mobile phone technology, children will absorb more energy per kilogram of body weight from an external electromagnetic field than adults (Stewart Report, 2000). Additionally, since children are being exposed to RF radiation from base stations from a younger age than adults, they will have a longer time in which to accumulate exposure over the course of their lives and a longer time for any delayed effects of exposure to develop.

In 2001, the Radiocommunications Agency (RA) (an executive agency of the Department of Trade and Industry) measured emissions from 100 base stations throughout the UK, with emphasis on measurements of sites near to schools. Recorded exposures were well within guidelines and not considered hazardous. A further 109 sites (82 schools and 27 hospitals) were sampled last year in the second phase of the audit. Results of the study, published in February 2003, showed that readings ranged between 1/731 to 1/19,907,515 of the international exposure limits set by the International Commission for Non-Ionizing Radiation Protection (ICNIRP). The lowest and highest readings of the study were recorded at Enniskillen Model Primary School (1/19,907,515) and Aintree Hospital in Liverpool (1/731) respectively.

The Sitefinder website, a database of mobile phone base stations, has been devised by the RA to provide information on the location of all existing macrocell base stations throughout the UK, with details of their radio power, type of transmission, height and the operator.

The NRPB measurements provide spectral information on the various sources of RF exposure of the population. These measurements demonstrate that exposures arise not only from base stations but also from a wide variety of sources including radio and TV transmitters, satellites, pagers and radar. Often signals from a distant base station can give a higher exposure than those from a local base station as the antennas tend to be directed towards the horizon. Total exposures, however, need to comply with guidelines – not just exposures from a particular source.

The Stewart Report recommended that permitted development rights for the erection of all base station sites should be revoked and that the siting of all base stations should be subject to the normal planning process. As a result, new guidance was issued, on planning policy for telecommunications, to local authorities throughout the UK. The aim of the new guidance was to provide for more discussions between operators and

local authorities on development proposals for telecommunications equipment and to minimise visual intrusion.

To address concerns about the siting of base stations near schools, the then Department for Education and Employment (DEE) issued information about the conclusions and recommendations in the Stewart Report to local authorities and schools through “Spectrum” magazine and the Teachernet website.

### ***Advice to Industry***

#### *Specific Absorption Rate (SAR) values for phones*

The quantity used to describe absorption of radio waves in the head is the Specific Absorption Rate (SAR). The IEGMP recommended that the industry should make available to consumers, information on the SAR from phones, once a standard method of testing became available. This would enable individuals to choose to use a phone with a low exposure if they so wished. From October 2001, information on the SAR for new phones was made available by the main manufacturers and this is now available for all phones of members of Mobile Manufacturers Forum (MMF).

#### *Sensitive Groups*

The IEGMP also expressed concern that there may be sensitive groups in the population. In particular, it was felt that:

“...children may be more vulnerable because of their developing nervous system, the greater absorption of energy in the tissues of the head and a longer lifetime of exposure.” (Stewart Report, paragraph 1.53)

Therefore the Stewart Report recommended, in line with the precautionary approach, that the mobile phone industry should refrain from promoting the use of mobile phones by children. The report also recommended that children should use mobile phones for essential purposes only, keeping all calls short, since talking for long periods prolongs exposure and should be discouraged.

### ***Research Priorities***

The IEGMP identified a number of areas where more research was desirable. It was also recommended that research should be supervised by “a demonstrably independent panel” and funded jointly by the mobile phone companies and the public sector. A considerable quotient of research-time has been set-aside for the assessment of exposures from picocell and microcell base stations. The need for a further review of research relevant to concerns about human health and exposure to RF was identified by the IEGMP. It recommended that this should be carried out within three years of publication of its report. The government requested that the NRPB undertake this review and the Board of NRPB asked its Advisory Group on Non-Ionizing Radiation (AGNIR), chaired by Sir Richard Doll, to carry this out. The findings of the Review were published in January 2004 and are summarized in Appendix 4.

### ***Advice to NRPB***

The Stewart Report issued advice to the NRPB on how it might better prioritize its work in relation to public concerns about non-ionizing radiation (NIR). Since

publication of the Stewart Report, the Board of NRPB has set up a new Advisory Group on Radiation, Risk and Society, under the chairmanship of Sir Kenneth Calman, which is examining how the NRPB might tackle issues of public concern. It has redesigned its website to facilitate accessibility and has developed content for the site directed at providing information for the general public. NRPB is also providing “plain English” text on key issues for a number of reports it publishes on the website. More effort has been put into giving advice to the public on concerns about NIR, further base station surveys have been carried out and the NRPB’s research programme has been extended relevant to health concerns related to exposures to EMfs. The NRPB have estimated that they receive approximately 12,000 queries per year concerning sources of and exposures to NIR.

### ***Recent Developments***

A number of other national bodies have prepared reports on mobile phones and health. A report by an Expert Panel of the Royal Society of Canada concerning a review of the potential health risks of radiofrequency radiation fields from wireless telecommunication devices has been issued (Royal Society of Canada, 1999), and this was referred to in the Stewart Report. The Department of Health in France (Zimirou et al, 2001) and the Health Council of the Netherlands (2000 and 2001) have issued similar reports. In the UK, the British Medical Association (BMA) has issued a report on mobile phones and health (BMA, 2001) published on the BMA website. The conclusions in these and other recent reports are very similar to those of the IEGMP in relation to possible health effects from exposure to RF radiation from both mobile phones and base stations, although the Health Council of the Netherlands did not see a reason to recommend that mobile telephone use by children be limited as far as possible.