

Healthy communications?

Andy Heard, Database Manager at the Airwave Health Monitoring Programme, outlines the scope of the Study...

Airwave is the radio communications service being rolled-out across the police forces in England, Scotland and Wales. It's a modern digital technology based on the TETRA standard and offers many advantages over the old analogue system.

Although TETRA shares many similarities with the GSM (conventional mobile) standard, the handsets do operate at different frequencies, power levels and protocols. In particular, the pulsing frequency of TETRA handsets (17.6 Hz) is similar to the 16Hz frequency at which certain 'contradictory' results have been obtained when examining the biological effects of pulsed RF emissions. While no obvious health effect has been suggested, a report from the Independent Expert Group on Mobile Phones (IEGMP), reporting in 2000, recommended a precautionary approach, and the need for further research into the possible short- and long-term health impact of such technology.

Following on from this, the Home Office, who are driving the roll-out of Airwave, took advice from the National Radiological Protection Board (NRPB), which resulted in a report, published in July 2001. It concluded that: "Although areas of uncertainty remain about the biological effects of low level RF radiation in general and about modulated signals in particular, current evidence suggests that it is unlikely that the unique features of the TETRA system pose a hazard to health."

This was deemed sufficient reassurance to roll-out the Airwave system nationwide, whilst sponsoring research that will address remaining areas of uncertainty.

Previous studies

Earlier studies have investigated mobile phones and health. So far, results have provided no persuasive evidence of any adverse health effect, but these studies tended to suffer from a lack of detailed information on exposure of the cohort during the study, or low numbers of participants. This results in insufficient statistical power to detect possible health effects, especially of rare events.

That said, a long-term study of US Airforce male personnel did report a small but marginally significant statistical

association between brain tumour risk and exposure to RF/microwave radiation. However, no human epidemiological or occupational study has yet explored possible short- or long-term health risks associated with exposure to TETRA.

Current study

The Airwave Health Programme is now under way at Imperial College London, having completed its pilot phase during 2005. It will draw from a potential cohort of 140,000 police personnel and we expect to recruit at least 40% of these into the Study. Airwave usage data for each individual will be available to the Programme, giving us unprecedented information on personal exposure levels.

Health outcome data will be assessed from individuals' medical records and general sickness as reported to their police force.

We ask about current health complaints from a questionnaire completed when they volunteer for the study, and another questionnaire will be taken after five years. The results of the questionnaire so far have proved to be interesting. For example, asking whether participants 'have any concerns about your health or safety regarding use of Airwave radios', only 38% of 4,428 pilot participants answered no, 40% answered yes, with the remaining 22% undecided.

Health screening

Perhaps the most powerful aspect of the Programme, and one that benefits not only the long-term research but also the volunteers personally and immediately, is the free health screen offered to all volunteers. Carried out locally by occupational health nurses trained by Imperial College, it includes not just the standard health assessment tests such as height, weight and blood pressure, but also a blood test and more specialised screening tools such as an ECG (heart trace). Screening will be offered to every relevant police officer and staff in England, Wales and Scotland over the next seven years.

Screening has proven to be very popular, with about three-quarters of volunteers opting in. The incentive is

the detailed and confidential feedback of results provided to individuals and their GP. We explain the significance of each measurement and the reference range of values that exist in the healthy background population. This is not intended to substitute for the skill of a trained clinician, and we make it clear that, if anything in their results causes a participant any concern, their GP should always be consulted. Nevertheless, we have found that this form of 'full disclosure' has proven to be very popular with participants and, for the research, it provides crucial data that can allow us to estimate individuals' predisposition to certain types of mortality and other health disorders.

Blood and urine samples taken at the health screening are being stored long term, securely and confidentially, in deep freezers, and a new state-of-the-art biorepository is being built for the remaining years. By maintaining this valuable resource of samples, we hope to improve our understanding of the genesis and progress of diseases occurring in the cohort.

Neuro-cognitive study

We are also investigating symptoms reported by Airwave users whilst using the radio or shortly afterwards. For example, many report headaches that they attribute directly to using the radio. There are several parts to this study:

- Volunteers will complete a questionnaire designed to assess stress levels and mood;
- We will measure memory performance and power of concentration;
- An Airwave handset will be positioned at the side of the volunteer's head, as if it was in use making a call. Sometimes it will be 'on' and at other times 'off', but neither the researcher nor the volunteers will know which. Volunteers will perform tasks that measure levels of attention and we will record their EEG (brain wave trace).

Volunteers will be either symptomatic users of Airwave, non-symptomatics who make high occupational use of Airwave, or non-symptomatics who use the system only a little.

At the end of the study, we should be able to assess whether cognitive performance is affected by exposure to actual signal (as opposed to sham) from an Airwave terminal and whether the amount of prior exposure to Airwave influences those results. We plan to complete this work by mid-2007.

Progress to date

Initial feedback from the police has been very positive, with take-up of circa 40%. We are rolling-out one force at a time, with a short-term plan determined partly by level of local interest. We plan to have covered all mainland

police forces by 2013. Lancashire and part of the West Midlands force were chosen for the pilot phase of the Programme because of their early adoption of Airwave and keen interest in the study, and the success enjoyed in these forces has given us confidence in our methods to roll-out nationwide.

Final results

After five years, we will assess whether the data collected demonstrates significant health effects and provide an interim report. The neuro-cognitive study expects to complete and publish during 2007, and the final Programme report is due in 2018.

By its nature, some of the data that we are collecting are classified because it comes from operational police systems, and the need to collect health information on participants imposes further restrictions. This will not detract from the scientific value of the study to the wider community because published data will be aggregated to a level that protects all confidences. All our results will be subject to peer review and published in publicly available journals.

In the meantime, our website – <http://www.police-health.org.uk/> – aims to keep interested parties up-to-date with progress of the study and the results when they become available.

Related research

There is much ongoing research on the possible health effects of mobile radio communications. The Link Mobile Telecommunications and Health Research Programme – <http://www.mthr.org.uk/> – has been set up to co-ordinate and sponsor research, and it is funding research on the effect of Airwave on the UK police forces.

A study being run by colleagues at Kings College London will test whether using Airwave radios can cause short-term health effects such as headaches, fatigue and burning sensations. Set to run until 2008, it is also testing whether some officers are particularly sensitive to these effects. It is currently appealing for police officers interested in taking part to get in touch: contact James Rubin – g.rubin@iop.kcl.ac.uk – for details.

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