



MTHR

Mobile Telecommunications and Health Research

Report on the MTHR Programme



MTHR programme

- September 2007 report
 - research investigated whether health or other effects can result from mobile phones or base stations: exposures below guidelines
 - high quality achieved
 - report includes results obtained in other countries & recommends further research
- Extension of the programme - MTHR2



Overview of MTHR

- Funded jointly by Government and Industry
- £8.8 M (£7.4 M plus “adjunct” funds of £1.4 M)
- 28 projects funded
- First projects started in Dec 2001
- 23 completed -mostly published in peer-reviewed journals.



Programme Management

- Management
 1. identification of areas of research to be done
 2. call for proposals
 3. selection of proposals
 4. management of research and finance
 5. dissemination of results
- Funded by Government and Industry - both have vested interests
- Managed by Independent Committee
 - mostly University scientists
 - funders: no rôle or influence on management (firewall)
 - secretariat: Dept of Health,



Report

1. Cancers of Brain and Nervous System
2. Brain Function
3. Electrical Hypersensitivity
4. Biological Mechanisms
5. Base stations
6. Risk Communication
7. Mobile Phones and Driving



1. Cancers of the Brain and Nervous System

Position in 2001: very few studies had been made to look for an association between risk of cancers of brain and nervous system and mobile phone use

MTHR funded:

- 2 epidemiological (case-control) studies of brain cancers and acoustic neuromas (part of international *Interphone* study)
 - found no association between incidence and exposures of less than 10 years
 - results are less clear for people who have used phones for more than 10 years; partly because their numbers are much smaller
 - cannot rule out possibility of an association
 - also cancer symptoms normally take more than 10 years to appear from time of exposure to whatever caused them
- A pilot epidemiological cohort study
 - valuable assistance in the design of a major study



2. Brain Function

Position in 2001: 2 studies had suggested phone signals affected cognitive function eg response times

MTHR funded:

- Largest programme of brain function studies on volunteers undertaken anywhere
 - numbers of volunteers and number of different studies
- 5 volunteer studies using GSM phones - 2 also used TETRA handsets; examined possible reactions to wide range of cognitive and physiological functions.
 - no evidence for any reaction to phone signals
- Volunteer study using GSM and 3G base stations
 - no evidence for any reaction to base station signals



3. Electrical Hypersensitivity

Position in 2001: few systematic studies on phones and base stations; some conflicting reports. No study of prevalence in UK

MTHR funded:

- Largest programme of electrical hypersensitivity from phones and base stations undertaken anywhere:
- Study of prevalence in UK
 - 1 to 4% of people reported that they are electrically hypersensitive
 - proportion of women reporting this was twice that of men
- However, 2 volunteer studies using GSM mobile phones both found
 - no evidence for association between symptoms and phone signals
- Volunteer study using GSM and 3G base station signals found
 - no evidence for association between symptoms and base station signals



4. Biological Mechanisms

Position in 2001: evidence that RF signals expressed (activated) genes in nematode worms and also caused “calcium efflux”: could the pulsing of RF signals enhance their interaction with tissue?

MTHR funded:

- Extension to original work on nematode worms including very detailed dosimetry and modelling of exposures.
 - RF raised sample temperature by 0.2C - sufficient to explain the effects originally attributed to a non-thermal mechanism.
- Study to see whether calcium concentration in a wide range of cells is affected by RF signals.
 - not yet published
 - study funded by a Home Office programme found no effects
- Pulsing of RF only likely to affect interaction if tissue can demodulate the signals to produce low frequency currents. A very sensitive study to look for this is underway.



5. Base Stations

Position in 2001: no reliable studies of either short term or long term health effects. Little information on exposures from microcell and picocell base stations

MTHR funded:

- Volunteer study to look for short term effects: see hypersensitivity.
- Epidemiological study of young children (ongoing)
- Technical assessment of a new personal exposure meter which may make it possible to obtain reliable information on exposure. Epidemiological study of adults is presently not feasible since such information is not available.
- A study of power densities from microcell and picocell base stations.
 - measurements made near 20 base stations show power densities generally greater than from macrocell base stations for distances along the ground of less than 50 m. Greatest measured = 8.6% of ICNIRP guidelines



6. Risk Communication

Position in 2001: no independent systematic studies of risk communication regarding mobile telecommunications

MTHR funded:

- Study to assess public understanding of scientific uncertainty and reactions to government advice on mobile phones and base stations
 - few had seen the DoH leaflets (15% phone & 10% base station leaflets)
 - poor appreciation of precautionary advice
 - other strategies needed to inform public: no clear advice on what these should be



7. Mobile Phones and Driving

Position in 2001: well known that phone use while driving (both hands on or hands free) impairs performance and increases risk of accident.

MTHR funded:

- Volunteer study to assess the relative hazards of using a phone
 - measures of performance impairment: no worse than those of other distractions: conversations with passengers, adjustment of controls etc. (NB these are less likely to occur in potentially risky situations)
 - suggestions that phone use draws on greater cognitive resources than other distractions



MTHR1 Summary

- No evidence for short term effects from handsets
- No evidence for short term effects from base stations (GSM and 3G)
- No evidence that the unpleasant symptoms attributed by electrically hypersensitive people are caused by signals from handsets or base stations.
- Epidemiological studies of brain tumours
 - no association between incidence and exposures of less than 10 years
 - cannot rule out possibility of association for exposures of more than 10 years
- Replication studies of biological effects reported earlier
 - gene expression - no effects seen
 - Ca efflux - not yet published (no effects seen in Home Office study)



MTHR1 Remaining Studies

- Children's cancer and base stations
- Adult leukaemia and mobile phone use
- Non-linear and demodulation mechanisms
- Calcium efflux



Conclusions

- MTHR1, plus work elsewhere, has answered many questions but not all:
 - Epidemiological studies leave some uncertainty. Latency of cancers is more than 10 years: more than most people's exposure.
 - Very little work done on children. May be more sensitive than adults to other effects (pollution, UV, ionising radiation).
- **Both are WHO priority areas**



MTHR2

- Extension to MTHR programme
- Similar structure to MTHR1:
 - joint funding from government and industry of £5 million so far
 - independent management committee



MTHR2

1. A UK component for an international cohort study of mobile phone users
 - advantage of cohort study is it rules out bias
 - can also study many diseases: brain tumours neuro-degenerative diseases (Parkinson's, Alzheimer's ..) etc.
 - study involves around 200,000 people
 - Denmark, Finland, Sweden and UK



MTHR2

2. Epidemiological studies to look for associations between RF exposure and childhood diseases.
3. Volunteer studies of electrical hypersensitivity in relation to TETRA radios and base stations (under way)



MTHR2-June 2008 update

- Call for outline proposals November 2007
- Evaluation Jan 2008
- UK part of COSMOS - started March 2008
- Study of children being considered

www.mthr.org.uk

