

Planned Studies of EHS in the UK

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Telecommunications and Health
Research Programme (MTHR)

UK Research on Mobile Telecommunications

- MTHR programme -£8.9 M (12 MEUR)
- Started in Jan 2001
- Managed by an independent committee of scientists.
- Received around 150 proposals
- 29 have been funded.
- TETRA research also funded by Government-£10M (14 MEUR).

MTHR and Government Programmes

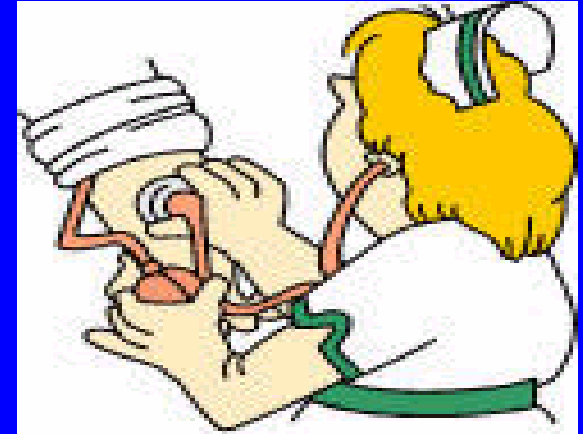
- Epidemiology (5+1*)
- Human volunteer Studies (8+2*)
- Mechanistic (3+1*)
- Exposure and dosimetry (12)
- Psycho/Social Studies (1)

* funded and managed by Government

Provocation Studies

- Mobile Phones

- Blood pressure (GSM and TETRA)
- Cognitive function (GSM)
- Cognitive function (TETRA*)
- Electrical activity of the brain (TETRA)
- *Symptoms* and labyrinthine function (GSM)
- *Symptoms* and neuroendocrine function (GSM)
- *Symptoms* (TETRA)
- *Symptoms* (TETRA*)
- Conversations in cars



- Base stations

- *Symptoms* (GSM and UMTS)

- Commissioned standard handset and base station exposure systems

“Symptoms”

This includes the wide range of symptoms and sensations that have been reported such as nausea, headaches, dizziness, fatigue, warmth etc etc

Provocation Studies of Symptoms: Phones

- Koivisto et al (2001)-GSM. *No association with exposure*
 - 96 non-EHS volunteers
 - reported symptoms/sensations
 - also did cognitive tests (Koivisto et al 2000)
- Hietanen et al (2002)-analogue and GSM. *No association with exposure*
 - 20 EHS volunteers
 - reported symptoms/sensations
 - physiological data monitored
 - Issues? No controls, 3 or 4 sessions in 1 day, 1/2 volunteers had chronic illness.

MTHR Provocation Studies of Symptoms: Phones

- All studies use one of 2 standard exposure systems developed for MTHR -one for GSM 900, the other for TETRA.
- Provides either pulsed or CW RF, or sham.
- Double-blind controls. Care taken that blinding is not compromised by differences in surface temperature, noise etc.
- Pulsed RF exposure intended to be “typical” for a phone. SAR=1.6 Wkg⁻¹



Symptoms and labyrinthine function (GSM phones)

- Luxon et al, National Hospital for Neurology and Neurosurgery, London; Nov 2002- July 2004. (Luxon is Prof of Audiological Medicine at University College, London).
- 20 EHS and 20 non-EHS volunteers, Each attends 2 sessions.
- Stimulation of the labyrinthine receptors in inner ear can lead to disorientation, nausea, headache etc.
- To see if RF stimulates inner ear, hearing and balance tests before and after 30 minutes exposure (otoacoustic emission, video-oculography etc).
- After each test, volunteers asked if they think the phone is emitting.

Symptoms and neuroendocrine function (GSM phones)

- Wessely et al, King's College, London; April 2003-March 2006. (Wesseley is Professor of Epidemiological and Liaison Psychiatry).
- 60 EHS and 60 non-EHS volunteers. Each attends 3 sessions separated by at least 2 days.
- Questionnaires to define phone usage, symptoms, if any, and health. Assess psychological predictors of symptom reporting
- Heart rate and Critical Flicker Fusion threshold measured before 60 minute exposure. 4 blood samples taken at times throughout exposure to determine hormone concentrations.
- Volunteers asked whether phone is on and to report symptoms

Symptoms (TETRA phones).

- Wessely et al, King's College, London; July 2005 – June 2008 (Wesseley is Professor of Epidemiological and Liaison Psychiatry).
- 60 EHS and 60 non-EHS volunteers (all police officers). Each attends 3 sessions separated by at least 2 days
- Questionnaires as in GSM study
- Physiological measurements as in GSM study

Symptoms (TETRA phones).

- Burgess et al, Imperial College, London; Jan 2005-
(Dr Burgess is in the Division of Neurosciences and Psychological Medicine)
- 60 EHS and 100 non-EHS volunteers (all police officers)
- Equal numbers of large and small users of TETRA
- 10 four-minute auditory discrimination sessions followed by self-rating of level of alertness.
- TETRA exposure for half the sessions (random allocation)
- EEG, ECG and behavioural response monitored throughout.

Provocation Studies of Symptoms: Base stations

- Zwamborn et al (2003=TNO study). *Some association with UMTS exposure for both EHS and non-EHS volunteers.*
 - 36 EHS and 36 non-EHS volunteers. Each attends 4 sessions. Chronically ill excluded.
 - GSM(900), GSM(1800), UMTS or sham
 - 1Vm^{-1} (4mWm^{-2})
 - reported symptoms/sensations
 - cognitive tests
 - no physiological tests made
- Exact replication of TNO study is underway in Switzerland

MTHR study of Symptoms: (GSM and UMTS base stations)

- Fox et al, University of Essex; Jan 2004 - Dec 2005
(Fox is Professor of Psychology)
- 132 EHS and 132 non-EHS volunteers (chronically ill excluded). Each attends 4 sessions at least a week apart.
- Questionnaires to identify EHS sufferers.
- Report symptoms in both open and blind exposures and in blind, whether phone is on or off.
- Further tests to see whether results affected by mental load
- physiological response monitored

MTHR Studies of Symptoms: base station exposure system

- Volunteer exposed to simulated base station emission, either
 - (a) GSM at 10 mWm^{-2} (5 mWm^{-2} at 900 and 5 mWm^{-2} at 1800 MHz) or
 - (b) UMTS at 10 mWm^{-2} or
 - (c) Sham (power density = 0)
- Double-blind controls
- Exposure takes place in a screened room after a waiting time in a second screened room.

Summary

- The MTHR programme includes 5 provocation studies of symptoms (nausea, headaches etc).
- All studies involve EHS and non-EHS volunteers and a double-blind exposure system.
- 4 studies use a GSM or TETRA phone; SAR value of 1.6 Wkg^{-1}
- 1 study uses a GSM or UMTS base station exposure system, power density of 10 mWm^{-2}
- Studies all in progress or about to start. One should finish shortly.