



Australian Government
National Health and Medical Research Council



UNIVERSITY
OF WOLLONGONG
AUSTRALIA



Australian Centre for
Electromagnetic Bioeffects
Research



5G Community Concerns



ACEBR: Background



- National Health and Medical Research Council of Australia (NHRMC) Centre of Research Excellence



- Research agenda addressing high priority aspects of the non-ionising electromagnetic energy health debate

- Research areas:

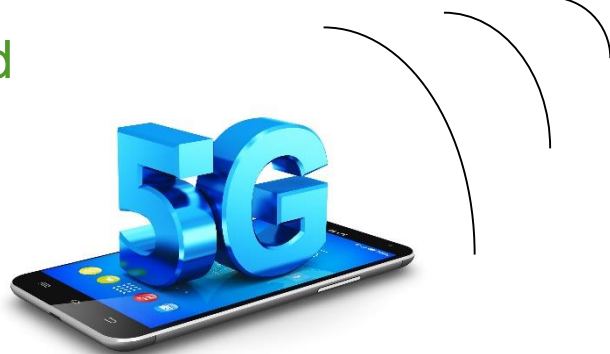
- Human Studies
- Animal Studies
- Cellular Studies
- Dosimetry
- Risk Communication



Mobile Phones and Health:

What is the Issue?

- Increasing mobile phone use → increase in concern and demand for scientific research
- Particular focus on potential effects of radiofrequency electromagnetic energy on the human brain
 - *Possibility of biological effects below current exposure limits/guidelines*
- The ongoing rollout of 5G has led to renewed concern and media attention, particularly around possible health effects
- Should we be concerned?



Mobile Phones and Health: Common Questions and Concerns



- **Concern:** *“There is lots of information and research out there that says that mobile phone radiofrequency electromagnetic energy is harmful”*
- **Response:**
 - Yes there is, and you can find anything on the internet today that supports your own beliefs or agendas
 - However, when it comes to science and research there is a huge variability in quality
 - This means that there are many false reports, or many individual reports that lack verification
 - Very important that independent organisations, such as the World Health Organisation, review all of the science, in order to put research and risks into context

Mobile Phones and Health: Common Questions and Concerns



- **Concern:** “*What do we know about mobile phones and cancer?*”
- **Response:**
 - One of the main concerns about mobile phones is whether the use of this technology causes cancer
 - The International Agency for Research on Cancer classified radiofrequency fields as ‘*possibly carcinogenic*’
 - What this really means is that there’s not enough evidence to show that it’s *not* carcinogenic
 - Despite reports of effects, no reports of effects on cancer have been substantiated

Mobile Phones and Health:

Common Questions and Concerns



- **Concern:** *“That the higher frequencies and larger number of antennas used in 5G will mean higher exposures”*
- **Response:**
 - Higher frequencies actually mean that the radiofrequency electromagnetic energy doesn’t penetrate as deeply – so less is actually absorbed deeper in the body than previous generations of mobile phones
 - Similarly, while more antennas may be required to service areas where demand for the new service is high, users are closer to the mobile phone base station and therefore their devices can operate at a reduced power, reducing their exposure from their personal device

Mobile Phones and Health:

Common Questions and Concerns



- **Concern:** *“There is very little, or no research, on 5G”*
- **Response:**
 - Extensive research on electromagnetic energy does exist, including specifically on mobile phone applications
 - The reality is that we know the mechanisms of how electromagnetic energy interacts with the body
 - The only effect we see is a small temperature rise
 - This has not been shown to have an impact on health
 - Is far smaller than temperature changes such as those associated with our daily circadian rhythm, physical exercise, etc.
 - No health effects have been established

Mobile Phones and Health: Common Questions and Concerns



- **Concern:** *“What about those who claim to be sensitive or allergic to electromagnetic energy”?*
- **Response:**
 - Electromagnetic hypersensitivity (or EHS) is a self-diagnosed disorder that has no medical or scientific basis
 - The symptoms are very real, but there is no evidence that these are caused by exposure to electromagnetic energy
 - Research has consistently failed to find any association between exposure and reported symptoms, or health more generally
 - One possibility is that EHS is caused by a person’s expectations or belief that electromagnetic energy is harmful (also known as a nocebo effect)

Mobile Phones and Health: Summary



- An important feature of the higher frequencies used by 5G is that they do not travel as far from the source than the lower frequencies currently used
 - This results in more superficial exposures which are mostly absorbed by the skin rather than deeper tissues or organs
- Current national (ARPANSA) and international (ICNIRP) exposure guidelines include the newer frequencies that will be used in 5G technologies
- There are no established health effects within these safety limits