

CHILDREN AND HEALTH RISKS OF WIRELESS COMMUNICATION NETWORKS

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Who I am... education and work

- Two doctorates and docentship in biochemistry
- Independent expert; actively advising and lecturing
 - 2014 – e.g. Norway, South Africa, USA, India, Australia
 - 2015 – e.g. Switzerland, USA, Serbia, Turkey, Australia
- 22 years (1992-2013) at STUK – Radiation and Nuclear Safety Authority
 - 2003-2007 as Head of Radiation Biology Laboratory
 - 2000-2013 as Research Professor
- Assistant Professor at Harvard Medical School, USA; 1997-1999
- Guangbiao Prof. at Zhejiang Univ., Hangzhou, China; 2006-2009
- Visiting Prof. at Swinburne Univ. Technology, Melbourne, Australia; 2012/13

Who I am... expert experience

- 18 years of experimental work on EMF and health
- Testified
 - Canadian Parliament's House of Commons' hearing on cell phones and health, in 2015
 - before Minister of Health and Family Welfare of India, in 2014
 - US Senate Appropriations Committee hearing on cell phones and health, in 2009
- Member of 2011 IARC Working Group for classification of the carcinogenicity of cell phone radiation
- Advised e.g.: Parliament of Finland; National Academies, USA; World Health Organization; Bundesamt für Strahlenschutz, Germany; International Commission on Non-Ionizing Radiation Protection (ICNIRP); Swiss National Foundation; The Netherlands Organization for Health Research and Development;

Possible health effects

- Brain cancer and cancer in other locations
- Leakage of the blood-brain barrier and brain function
- Fertility – sperm quality
- Fetus exposure in womb
- Sensitive sub-population
- Children and ill people, e.g. with compromised immune system

IARC evaluation in 2011

- 30 experts divided into four sub-groups
 - Dosimetry
 - Epidemiology
 - Animal studies
 - Mechanistic laboratory *in vitro* studies
- Decisions by a consensus or by a simple majority
- The vast majority of 30 experts voted for the classification of cell phone radiation as a possible carcinogen (Group 2B)

IARC 2011: Epidemiology

- Interphone & Hardell studies
 - no reliable exposure data based on person's memory
 - risk increase in long-term avid users
- Children – only CEFALO
 - exposures for 2-4 years
 - has no statistical power to detect small risk
- Bruce Armstrong, Australia
- Maria Blettner, Germany
- Elisabeth Cardis, Spain
- Lennart Hardell, Sweden
- Peter Inskip, USA
- David Richardson, USA
- Martin Roosli, Switzerland
- Jonathan Sammet, USA
- Malcolm Sim, Australia
- Jack Siemiatycki, Canada, Chair

...after IARC: Epidemiology

- Trend-data - Little et al. 2012: slow rise of brain cancer cases in USA
 - trend is similar to Interphone “prediction” but not Hardell “prediction”
- Danish Cohort update study 2011 – no effect
 - no exposure data but just the *length of phone subscription* with service provider
- Million Women study 2014 - no effect but exposure data inadequate
 - use of cell phone: ‘*never*’, ‘*less than once a day*’, ‘*every day*’
- CERENAT study from France 2014 – effect as in Interphone and Hardell
 - no reliable exposure data based on person’s memory

All epidemiology studies have completely unreliable exposure data

- All epidemiology studies have completely unreliable exposure data
- Length of calls or length of phone subscription with service provider or saying whether you ever or never used cell phone, does not inform about the real exposure of the cell phone user.
- Using the above "exposure data", persons with very different radiation exposures are placed in the same exposed group for statistical evaluation. This dilutes results!
- Ongoing cohort study COSMOS collects exposure data as length of calls!
- There is a way to collect real exposure data by using apps installed on currently used smart phones

Game changers after 2011 IARC

strengthening the evidence for carcinogenicity of cell phone radiation

- Epidemiology – CERENAT study
 - Coureau G, et al. Mobile phone use and brain tumours in the CERENAT case-control study. *Occup Environ Med.* 2014; 71: 514-522
- Animal studies – Lerchl's group replication of Tillman et al study
 - Lerchl A, et al. Tumor promotion by exposure to radiofrequency electromagnetic fields below exposure limits for humans. *BBRC* 2015; 459: 585-590
- Dosimetry – reevaluation of in vitro dosimetry by Schmid & Kuster
 - Schmid G & Kuster N. The discrepancy between maximum in vitro exposure levels and realistic conservative exposure levels of mobile phones operating at 900/1800 MHz. *Bioelectromagnetics.* 2015; 36:133-148

In my opinion, the currently available scientific evidence is sufficient to upgrade the carcinogenicity of cell phone radiation from the possible carcinogen (Group 2B) to the probable carcinogen (Group 2A)

Reasons for invoking the Precautionary Principle

Scientific information is insufficient, inconclusive, or uncertain

- IARC classification as possible carcinogen (Group 2B)

There are indications that the possible effects on human health may be potentially dangerous

- epidemiological studies from Interphone, Hardell and CERENAT show an increased risk of brain cancer in long-term avid users

Inconsistent with the chosen level of protection

- epidemiological studies, showing increased risk in long-term avid users, were generated in populations using regular cell phones, meeting current safety standards = current safety standards are insufficient to protect users

The impact of implementing the Precautionary Principle

- **Precaution** does not equal **Prevention** of use
- Strong opposition from telecom industry
 - Technology providers can be made responsible to prove their product is safe
 - Requirement of making more efficient (less radiation emissions) technology
 - Limiting current rampant and uncontrolled deployment of wireless networks
- Will create new knowledge through research
- Will create new jobs in research and technology

Smart phones - changed exposure patterns

- Emits radiation not only when speaking but also when connected to internet
- Exposure from phone kept in pocket does not comply with safety standards
- Data traffic extends and relocates exposures away from head to other parts of the body

Wi-fi exposures

- Lack of research on wi-fi
- No scientific data to answer health risk question
- *Per analogiam*: wi-fi radiation similar to cell phone
- Schools should have only wired internet connections

WHO EMF Project is front for ICNIRP opinions

- ICNIRP members play a lead role in preparation of the WHO's Environmental Health Criteria on RF-EMF (e.g. cell phone radiation) that will determine the future of the wireless technologies
- ICNIRP members sit on numerous national committees = opinions dominant in national safety agencies
- ICNIRP, the self-appointing NGO, has no accountability at all – nobody controls its activities (not for Col disclosures, not for erroneous decisions)
- Can "private club", ICNIRP, be fully trusted with the EHC task that is certainly lobbied by the telecom?

Conclusions

- IARC classification of cell phone radiation as a possible carcinogen is a sufficient reason for **invoking Precautionary Principle**
- Claims that the current **safety standards** protect all users are **not supported by the scientific evidence**
- Users should be informed about the current scientific uncertainty and advised to limit exposures whenever possible and feasible and strongly **discouraged from keeping cell phones close to body** (in pockets) **especially when data traffic is active**
- Deployment of **wi-fi in schools should be avoided** and preference given to wired internet connections