

WiFi & Health

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- *Early 20th Century:* **Chemical Revolution**
 - DDT
 - CFCs
 - PCBs

- *Second half of 20th Century:* **Electromagnetic Revolution**
 - New frequencies for TV broadcasting
 - Radar
 - Mobile telephones
 - WiFi

About WiFi

- Term comes from “Wireless Fidelity”
- Uses similar frequencies and technology to cell phones

Benefits

- Eliminates the need for cabling, reducing cost, and enabling a connection anywhere

Disadvantages

- Surrounds us with yet one more layer of microwave radiation

Safety Code 6

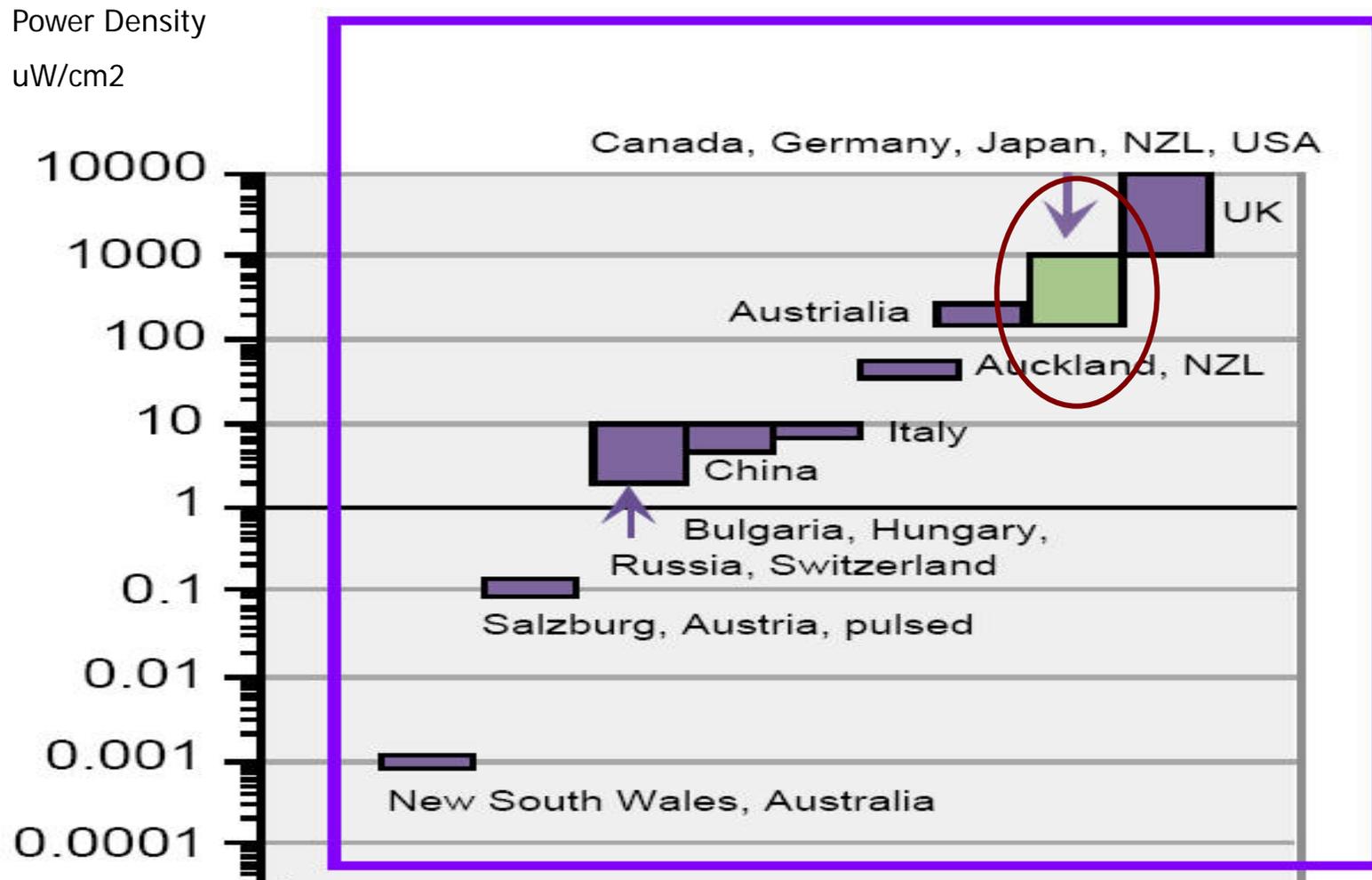
- Canada's official document specifying the requirements for the safe use of radiation emitting devices, including WiFi
- As long as the radiation emitted doesn't raise the body temperature by 1 degree celsius in six minutes, it's considered safe

Safety Code 6

- Problems:
 - Based on short term thermal effects
 - Does not consider accumulative and non-thermal biological effects
 - An ancient document that has not been updated since 1999
 - Unacceptable in as rapidly expanding a field as wireless communication

Safety Code 6 compared to guidelines from other countries

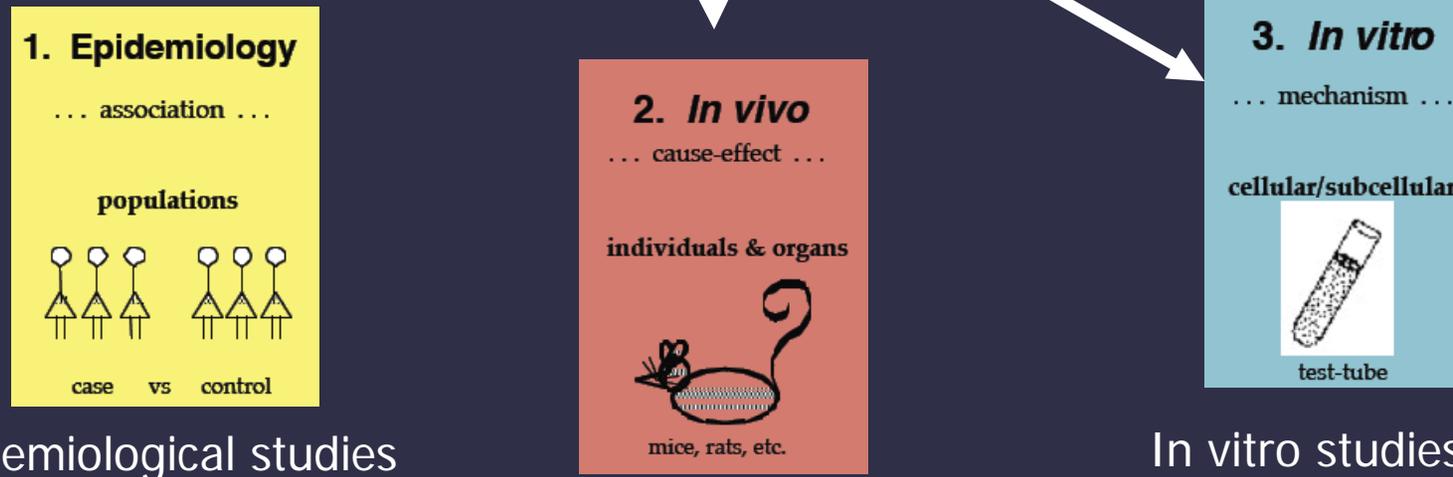
Guidelines for various countries



Are radio frequencies at levels
below Safety Code 6 harmful
to health?

Yes

Scientific Evidence



Epidemiological studies

In vivo studies

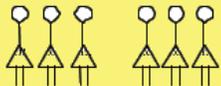
In vitro studies

- WiFi too new for many studies
- A need to rely on studies dealing with exposure to similar types of radiofrequency radiation
- Closest case studies are those looking at exposure to cell phone antennae

1. Epidemiology

... association ...

populations



case vs control

Epidemiological Studies

- Exposed-Unexposed Studies:
 - Examines two similar groups of people - one exposed to a risk factor, the other not - and compares the frequency of disease between the two groups.

The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer

- Conducted by five doctors in Germany
- Found significantly more cancer cases among people who had lived within **400 meters (m) of a cellular transmitter site during the past 10 years**
- Patients fell ill on average 8 years earlier
- Living near the transmitter increased the relative risk of getting cancer by 3-fold

Eger, H. et al. 2004. The Influence of Being Physically Near to a Cell Phone Transmission Mast on the Incidence of Cancer. Umwelt·Medizin·Gesellschaft 17,4 2004, as: 'Einfluss der räumlichen Nähe von Mobilfunksendeanlagen auf die Krebsinzidenz'.

Study of the health of people living in the vicinity of mobile phone base stations

Santini, R., Santini, P., Danze, J., LeRuz, R., Seigne, M.

- From the peer-reviewed journal: Pathologie Biologie, 2002, Vol. 50, pp. 369-373
- Surveyed 530 people (270 men; 260 women) living or not in the vicinity of phone base stations on 18 non-specific health symptoms:
 - Headaches
 - Sleep disruptions
 - Depression
 - Memory loss
 - Dizziness
 - Irritability
 - Tiredness
 - Nausea
 - Visual disturbances
 - Loss of appetite
 - Trouble concentrating
 - Etc.

Conclusion

- People living within 300m of base stations showed an increase in symptoms as compared with people living >300m or not exposed to base stations
- The study concludes “From these results, and in applying the precautionary principle, it is advisable that mobile phone base stations not be sited closer than 300m to populations” (p.2)

Increased incidence of cancer near a cell-phone transmitter station

Ronni Wolf, MD & Danny Wolf, MD

- Published in the *International Journal of Cancer Prevention, Vol 1, No 2, April 2004*
- Participants: 622 people living 3-7 years in the vicinity of a cell-phone transmitter station
- **Four-fold increase in cancer** cases in the population living near the transmitter
- **Ten-fold cancer increase** for women
- Measured power density was an average of **200 times** below the levels allowed by Safety Code 6 in Canada

Mobile Telecommunications and Health: A Review

- Commissioned in 2000 by Cellular industry giant *T-Mobile*
- Conducted by an independent research institute: ECOLOG Institute
- Reviewed 220 peer-reviewed and published papers which dealt with the health risks from mobile telecommunications

What the report said

- Cancer

- “Given the results of the present epidemiological studies, it can be concluded that electromagnetic fields with frequencies in the mobile telecommunications range **do play a role in the development of cancer**”
(p.33)

- Infertility

- Birth defects

- Loss of memory and cognitive function

- Immune system disruptions

- Permeability of the blood-brain barrier
- Stress reactions
- Decreased melatonin production leading to poor sleep

Report's Conclusion

- Radiation exposure limits should be cut to 1/1,000th of those in force
- Caution should be exercised in siting masts, particularly where children are affected



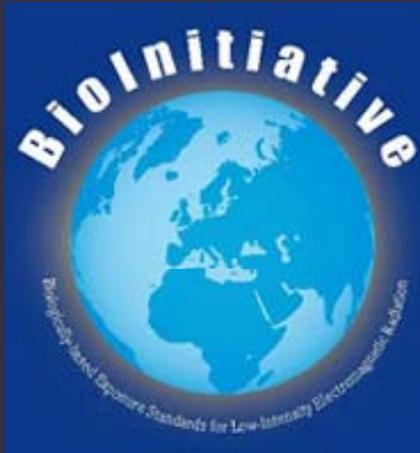
Children

- Because of their growing bodies and rapidly multiplying cells, children may be 10 times more vulnerable to health effects from exposure to microwave radiation than adults
(US Environmental Protection Agency)
- The county of Palm Beach, FL, the state of California, the Vancouver School Board and the countries of New Zealand and Greece have all prohibited cellular antennas near schools due to safety concerns

Electrohypersensitivity (EHS)

- Symptoms include: cognitive dysfunction, balance, dizziness & vertigo; facial flushing, skin rash; chest pressure, rapid heart rate, depression, anxiety, irritability, frustration, temper; fatigue, poor sleep; body aches, headaches; ringing in the ears and are consistent with chronic fatigue and fibromyalgia.
- Defined as:
" . . . a phenomenon where individuals experience adverse health effects while using or being in the vicinity of devices emanating electric, magnetic, or electromagnetic fields (EMFs). . . EHS is a real and sometimes a debilitating problem... Their exposures are generally several orders of magnitude under the limits in internationally accepted standards. "

- Recognized by the World Health Organization (WHO) and Canadian Human Rights Commission
- Approximately 3% of the population are severely affected and another 35% are moderately affected
- WiFi will worsen the symptoms of individuals already affected by EHS and may increase the number of new cases

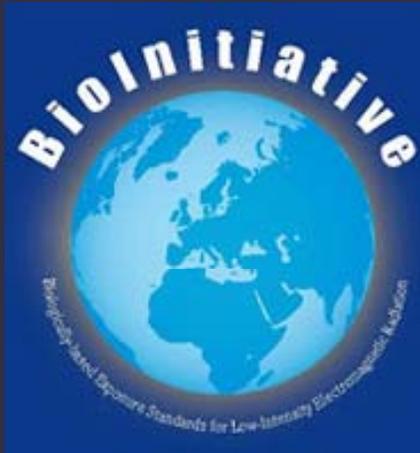


Bio Initiative Report

August 2007

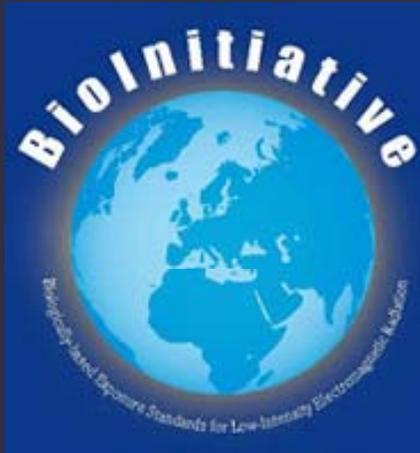
- Written by 14 (fourteen) scientists, public health and public policy experts to assess scientific evidence on health impacts from electromagnetic radiation below current public exposure limits
- Looked at over 2000 peer-reviewed and published studies

Report available online at: www.bioinitiative.org



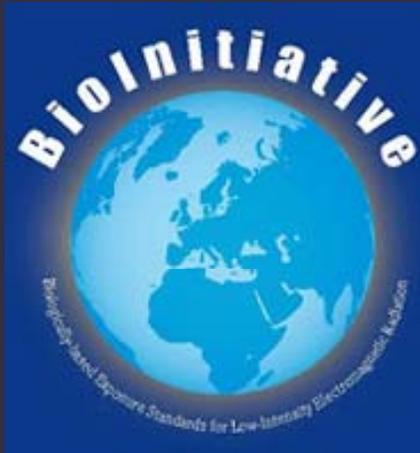
Bio Initiative Report Conclusions

“RF can cause **inflammatory reactions**, **allergy reactions** and change normal **immune function** at levels allowed by current public safety standards.”



Bio Initiative Report Conclusions

“...bioeffects and health impacts can and do occur at exquisitely low exposure levels that can be thousands of times below public safety limits.”



Bio Initiative Report Conclusions

“The scientific evidence is substantial enough to warrant preventative actions for RF.”

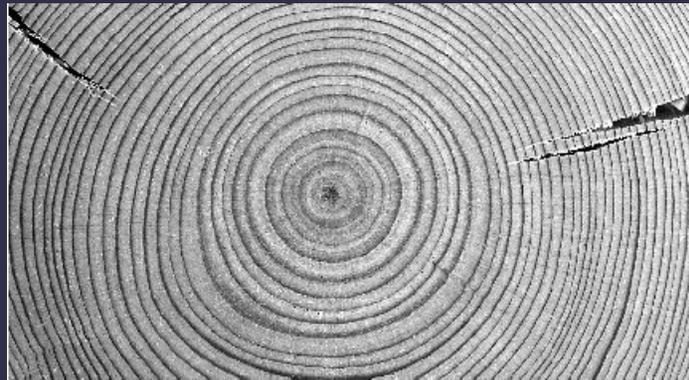
Studies dealing with plants and animals....

- Back to Safety Code 6
 - Allows 1000uW/cm²
- The following studies all show effects at MUCH lower levels

2.7 million times below SC 6

Smaller tree growth rings

-Balodis, 1996



Growth rings are a sign of health – thick growth rings mean good growing conditions while thin rings indicate poor growing conditions.

2.7 million times below SC 6

Premature aging of pine needles

-Selga, 1996



50 million times below SC 6

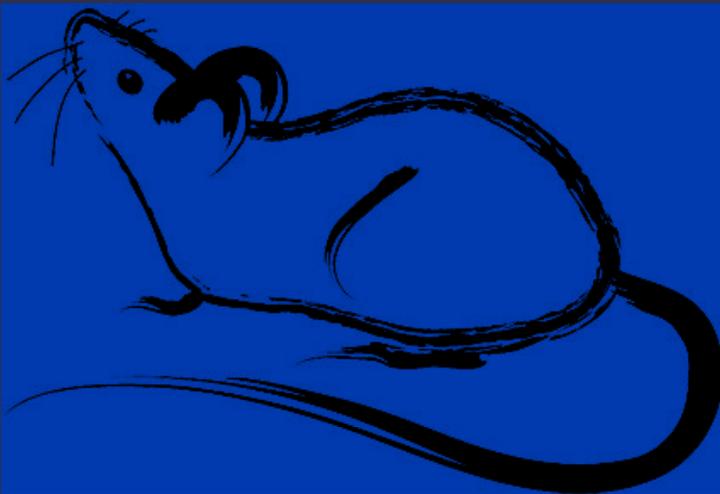
Effect on cell growth in yeast

-Grundler, 1992

100 million times below SC 6

Conditioned "avoidance" reflex in rats

-Kositsky, 2001



1000 million times below SC 6

Effects on immune system in mice

-Bundyuk 1994



2000 million times below SC 6

Stimulation of ovulation in
chickens

-Kondra, 1970

Conclusion

- The people living in Thorold are already exposed to several sources of radiation: cell phone antennas, broadcast antennas, and essential services such as police, fire, and ambulance communication
- Schmonn tower at Brock University transmits over 75 different signals
- Adding yet one more type of exposure (WiFi) may contribute to many individuals becoming sick

Recommendation

- Given the existing scientific literature surrounding exposure to RF, Thorold should follow the precautionary principle:

Where an activity raises threats of harm to the environment or human health, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.

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