

Drowning in a Sea of Microwaves: “To Be or not to Be Wireless”. The Unspoken Wi-fi Health Hazards...

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To be “wireless” has replaced “wired-up” for being connected and cool. Wi-fi is now in hotels, airport departure lounges, universities, schools, homes, and entire cities. You cannot get away from it. We shall all be submerged in a sea of microwaves, whether we choose to go wireless or not.

Soon, all one can do is to lock oneself away in a shielded room, an electro-smog-proof yellow submarine. And for the estimated 1.5 – 3 percent of populations worldwide that are “electromagnetic hypersensitive” [1], that may well be the only option open. Unlike cigarette smoke, passive involuntary exposure to electromagnetic radiation cannot be avoided easily.

What is wi-fi?



and used for mobile computing devices such as laptops, but is now increasingly used for more services including the internet and connection to consumer electronics such as TV, DVD player and digital camera [2]. A user can connect to the internet via an enabled device, such as a personal computer, when in range of an ‘access point’ (AP).

A region covered by one or more APs is called a ‘hotspot’. Hotspots can range from a single room to many square miles of overlapping hotspots. Wi-fi can also be used to create a mesh network, and allow devices to connect directly with each other in peer-to-peer (ad-hoc network) mode, as in consumer electronics and gaming applications.

A typical wi-fi consists of one or more APs and one or more clients. An AP broadcasts its SSID (Service Set Identifier, or network name) in small (short-duration) packets, called beacons, every 100 ms. Wi-fi networks operate in the unlicensed 2.4 and 5 GHz microwave bands, with an 11 Mbps (Megabytes per second) or 54 Mbps data transmission rate, or both (dual band), and clients can choose which service to use.

Wi-fi has the advantage that it operates without cables, and is built into most modern laptops, and rapidly expanding into other devices as prices continue to drop. It operates on a global set of standards, so it can work in different countries. However, the operational limitations are not consistent around the

world and power consumption is fairly high. Wi-fi is not secure, and worries about health risks of microwaves from mobile phones are growing (see main text).

Wireless explosion out of control

There are now more than 250 000 public hotspots for wi-fi worldwide [2]. Wi-fi is available in millions of homes, corporations, and university campuses. According to one estimate, wi-fi use has increased 74 percent in Europe and 75 percent in the UK between the first and second half of 2006 [3].

Birmingham is to have Britain's first city wide wireless communication by early 2007, and Manchester is planning the largest European wi-fi zone covering 400 square miles. Norwich and Milton Keynes already have wi-fi, and Brighton is set to follow [4].

Most worrying of all, wi-fi has been installed in up to 80 percent of secondary schools in the UK and more than half of the primary schools [5], exposing the most vulnerable populations to microwave irradiation.

The increasing popularity of wi-fi comes on the heels of the explosive growth in wireless mobile telephones, and amid heightened concerns over the health hazards of saturating levels of electromagnetic radiation [6] (Cancer Risks from Microwaves Confirmed , SiS 34).

Microwaves at current exposure levels are linked to brain damage, DNA damage, brain tumours, cancers, microwave sickness, impairment of cognitive functions, impairment of reproduction and fertility, affecting humans, rodents, birds, and bees (Box 2).

Health hazards of microwave radiation

- Rats exposed to microwave radiation from mobile phones for two hours showed signs of brain damage due to leakage of the blood brain barrier that persisted 50 days later [7] (Mobile Phones & Brain Damage , SiS 24).
- DNA breaks and chromosomal abnormalities were found in animal and human cells exposed to low levels of microwaves [8] (Confirmed: Mobile Phones Break DNA & Scramble Genomes , SiS 25)
- Risk of cancers – breast, prostate, bowel, skin (melanoma), lung and blood – trebled with microwave exposure in the Southern German town of Naila 5 to 10 years after the mobile phone transmitter was installed [6].
- Risk of cancers quadrupled in area exposed to microwave radiation in Netanya, an female cancers 10.5 fold compared with the general population in Israel [6].
- Risk of acoustic neuroma and glioma increased 2 to 3 fold on 10 years or more of mobile phone use [6].
- Mobile phone use correlates strongly with chronic illnesses [9]; Sweden has had a seven-fold increase in the long-term ill since 1981.
- Men who used mobile phones more than 4 hours a day had lower sperm count and poorer quality sperm compared to those who did not use mobile phones [10].
- A study in Greece showed that mice exposed to mobile phone microwaves at 1.68 m W/m² became completely sterile after five generations, while those exposed to 10.53 mW/m² became completely sterile after three generations [11]
- Reproduction and breeding success of sparrows and white storks

are reduced near mobile phone transmitters, and exposure to microwaves in the laboratory caused high mortality rates in chick embryos [12] (Mobile Phones and Vanishing Birds , SiS 34).

- Bees fail to return to their hives when cordless phone base-stations were installed, raising strong suspicion that microwave radiation may be responsible for the colony collapse disorder now devastating beekeepers and farmers in the United States and Europe [13] (Mobile Phones and Vanishing Bees , SiS 34).
- Up to 3.5 percent of people suffer a range of symptoms including headache, nausea, lack of concentration, depression and allergy, known collectively as microwave sickness syndrome when in proximity of mobile phone transmitters.

Sir William Stewart, Chair of the [UK] Health Protection Agency and former chief scientific adviser to the Government, has issued the most authoritative warning on mobile phones in successive reports and public statements to the press [7], which have been ignored by the government. He is becoming worried about the rapid spread of wi-fi, and is privately pressing for an official investigation into the risks. He is not alone among government scientists to be concerned. Dr. Ian Gibson, former Chair of the Commons Science and Technology Committee, called on the Department of Health to conduct an enquiry into potential health risks of wireless computer networks [14]. Gibson is an honorary Professor and former Dean of the School of Biological Sciences at the University of East Anglia.

Growing backlash against wi-fi



Meanwhile the backlash against wi-fi installations is growing. Teachers are leading the calls for more research into wireless communication networks in Britain, fearing it may become the “asbestos of the 21 century” [4]. The Professional Association of Teachers with 35 000 members wrote to Education Secretary Alan Johnson expressing deep concern.

One of its members, Michael Bevington, became ill after the wi-fi network was installed at Stowe School in Buckinghamshire where he has taught for 28 years. He suffered from nausea, headaches and a lack of concentration, symptoms typical of microwave sickness (Box 3).

The German Union for Education and Science had already advised its members to resist the roll out of wLAN in its schools in March 2006 [15].

Microwave sickness recognized

There have been numerous reports from physicians that mobile phone base stations are associated with a number of health symptoms in people living nearby: headaches, fatigue, sleep disorders, memory impairments, collectively known as microwave sickness syndrome, or electro-hypersensitivity. These have been documented in several recent studies.

A French study found that people living within 100 m of a cell phone transmitter station suffered from irritability, depression and dizziness, while those living within 200 m of the station suffered from tiredness [16]. In Austria, researchers detected a correlation between electromagnetic field strength and cardiovascular symptoms in people living near mobile phone base stations [17]. A study in Spain confirmed that microwave radiation was linked to a host of symptoms: headache, nausea, loss of appetite, unwellness, sleep disturbance, depression, lack of concentration and dizziness [18].

In order to counteract the criticism that the symptoms were 'psychosomatic' in origin, scientists in the University of Vienna carried out a new study covering urban and rural areas in Austria, involving 365 subjects in 10 locations [19]. Two network providers were each asked to identify about five base stations within both regions that have been operating for at least two years and there had been no protests against the base station from residents. These stations also have no other base station nearby, and transmission are mostly only in the 900 MHz band.

The results showed that microwave exposure from the mobile phone base stations is orders of magnitude below current guideline levels in Austria, which is 4.1 mW/m^2 . But people still suffered from headache and difficulty in concentrating.

According to the World Health Organisation (WHO) conference on hypersensitivity to electromagnetic fields (October 2004, Prague, Czech Republic), 1.5 to 3 percent of the population currently suffers from the condition. (The WHO otherwise denies that electromagnetic radiation has any health impacts [20].)

A number of schools in Britain had dismantled their wireless networks after lobbying from worried parents; others are under pressure to do the same [21]. Lakehead University in Ontario, Canada, with 7 400 students has removed wi-fi because of what its Vice-Chancellor, Dr. Fred Gilbert, calls "the weight of evidence demonstrating behavioural effects and physiological impacts at the tissue, cellular and cell level."

Dr. Ger Oberfeld of the Public Health Department in Salzburg Austria, had written an open letter addressed to "Governor/Head Teacher/ Concerned Parent" worldwide in December 2005, giving them the official advice from his Department not to use WLAN or cordless phones in schools and kindergardens [22]. In September 2006, more than 30 scientists from all over the world signed the Benevento Resolution issued by the International Commission on Electromagnetic Safety, stating, "there is evidence for adverse health effects, including cancer and EHS (electro-hypersensitivity) from microwave radiation at current exposure levels and that a precautionary approach should be adopted [23].

Precaution/defensive measures

Evidence is emerging that the health hazards associated with wireless microwave are at least comparable to, if not worse than, those associated with cigarette smoking. Unlike cigarette smoking, passive exposure to microwaves is hard to avoid if wi-fi becomes ubiquitous. Now that smoking bans are in place all over the world, there is no reason not to do the same with wi-fi.

All wi-fi networks in public places should be dismantled, especially in schools and universities, and a ban imposed. For the same reasons, citywide networks should not be installed. Lounges, coffee bars, restaurants and hotels with wi-fi networks should carry

warning signs.

The use of cell phones should be reduced to a minimum, especially for populations at risk, such as children. There should be mandatory adoption of cellphones and microcells with ALARA (as low as reasonably achievable) levels of radiation, together with hand-off and earphone technologies.

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