

Cynulliad Cenedlaethol Cymru / National Assembly for Wales

Pwyllgor yr Economi, Seilwaith a Sgiliau / Economy, Infrastructure and Skills
Committee

Seilwaith digidol Cymru / Digital infrastructure in Wales

Ymateb gan C Prosser / Evidence from C Prosser

The Clerk
Economy, Infrastructure and Skills Committee
National Assembly for Wales

Submission to Economy, infrastructure and skills committee inquiry into digital infrastructure. Is Wales Connected?

In relation to the above inquiry, I would like to bring to the committee's attention the growing scientific evidence with regard to the adverse health effects of the radiation used by mobile phones and Wi-Fi.

My interest in this subject is based on personal experience. I live in Wales and a close family member has suffered extreme negative health reactions after exposure to Wi-Fi frequencies. I have seen first hand how this 'allergy' can have a detrimental effect on day to day living and the social exclusion it causes. Thankfully, Wales currently has low coverage in some places. By making adjustments to day-to-day life and spending time in areas with no Wi-Fi or mobile coverage this person has been able recover his health and lead a normal (if socially restricted) life. However further roll out of digital infrastructure masts and Wi-Max could compromise future health, leaving no place to 'go' for the body to recover. This in turn could have a negative affect on employment and income.

The current debate is complex, combining physics, biochemistry and epidemiology. I have attempted to simplify the science so that committee members gain an understanding of the key areas of this subject and are therefore able to make informed decisions.

Background

The electromagnetic spectrum is made up of natural and manmade frequencies. The lowest part of the spectrum begins at electrical power, extends through radio frequencies (which includes microwaves), through visible light to the higher frequencies of x-rays, radioactive and cosmic rays. The electromagnetic spectrum is divided into ionising and non-ionising radiation. (Visual images of the layout of the electromagnetic spectrum can be easily sourced on Google).

Ionising radiation has sufficient energy to free electrons from atoms or molecules. It has the potential to cause illness and cancers by causing damage to DNA. These are the higher frequencies of the spectrum (e.g. x-rays). Strict regulatory guidelines are in place for use of this type of radiation and are not of concern in this submission.

Non-ionising radiation does not carry enough energy to completely remove an electron from an atom or molecule. Traditional scientific thinking states that non-ionising radiation can only harm humans if it is powerful enough to cause heating of biological tissue (so called thermal effects). However, there is now considerable scientific evidence showing biological effects at non-thermal levels.

Mobile phones, mobile phone masts, Wi-Max, Wi-Fi, WLAN and Bluetooth all use **non-ionising** radiation, also known as radio-frequency (RF) radiation. For ease of explanation I will consistently use the term RF radiation when referring to that used by mobile phones and Wi-Fi.

According to neuroscientist Professor Olle Johansson of the Karolinska Institute in Stockholm, artificial RF radiation in the environment is 10 billion times higher than it was the 1960s.

Adverse health effects from exposure to RF radiation were first noted in the 1950's in radar station workers. The condition was labelled "microwave syndrome". Symptoms included headaches, fatigue, mental and cognitive impairment, depression, anxiety, heart and muscle pain and breathing difficulties. Similar symptoms are now being reported in a wider section of the population. It is commonly known as electrohypersensitivity (EHS). Professor of Environmental Studies at Trent University Canada, Dr Magda Havas suggests that 5% of the population have severe symptoms and that 35% suffer mild to moderate symptoms, in most cases removing the irritant (i.e. RF radiation) sees improvement in symptoms.

Over the last 20 years, thousands of peer-reviewed studies have been conducted on potential adverse health effects by independent and industry scientists. A 2012 evaluation of some of these studies by Henry Lai, Professor of Bioengineering at the University of Washington, indicated approximately 70% of non-industry funded studies identified biological effects compared to only 30% of industry studies.¹ The consensus of scientists whose studies show adverse effects is that biological changes are happening at a cellular level causing impaired immune function and a whole host of other health problems.

In the UK, Public Health England (and therefore Wales too) bases its current advice on the safety of RF radiation on the 2012 report by the Advisory Group on Non-Ionising Radiation (AGNIR). Their advice states there is 'no consistent evidence' of harm to date.

Key points

May 2011: The International Agency for Research on Cancer (IARC) of the World Health Organisation categorised RF radiation as a potential 'Group 2B carcinogen'. (This classification was not even mentioned in the 2012 AGNIR report.)

May 2011: The Council of Europe adopted Resolution 1815 which issues a warning about the potential dangers of electromagnetic fields and RF radiation: "Despite calls for the precautionary principle and despite all recommendations, declarations and a number of statutory and legislative advances, there is still a lack of reaction to known or emerging environmental and health risks and virtually systematic delays in adopting and implementing effective preventive measures". It also points out that "Waiting for high levels of scientific and clinical proof before taking action to prevent well-known risks can lead to very high health and economic costs, as was the case with asbestos, leaded petrol and tobacco."

May 2015: International EMF Scientist Appeal to the United Nations. 223 international scientists from 41 nations submitted an appeal to the United Nations and the World Health Organisation requesting the adoption of more protective exposure guidelines for electromagnetic fields.² The Appeal (2015) identifies the following health impacts: "increased cancer risk, cellular stress, free radical formation, increased permeability of the blood brain barrier, and genetic damage. Other potential effects include learning and memory deficits,

¹ www.bioinitiative.org

² www.emfscientist.org

neurologic/neurotransmitter disorders, reproductive effects, and negative impacts on general wellbeing. Moreover, there is growing evidence of harmful effects on plant and animal life."

July 2016: National Toxicology Program (NTP). A \$25million US federal funded study released its preliminary findings. It provides the strongest evidence to date that exposure to mobile phone type radiation is associated with the formation of two rare cancers in the brains and hearts of rats. The findings are due for peer-review and publication in 2017. However, the researchers felt the results were so important that they released them prior to publication.

December 2016: A critical study of the 2012 report by AGNIR was published in *Reviews in Environmental Health*: Sarah J. Starkey, "Inaccurate official assessment of radiofrequency safety by the Advisory Group on Non-ionising Radiation". The study identifies "incorrect and misleading statements, omissions and conflict of interest" within the AGNIR study, which make its conclusions unsuitable for health risk assessment. It concludes that the AGNIR report can no longer be held up as a thorough review of the science by an independent group of experts.³ This AGNIR 2012 report is used by Public Health England (and Wales) in setting guidelines on the safety of RF radiation.

Recommendations

As this submission has shown, there is now considerable evidence of adverse health effects of RF radiation at non-thermal levels, especially at mobile phone and Wi-Fi frequencies.

The committee needs to consider the impact of any policy changes in this area and the potential long-term effects on both economic and health sectors in Wales. The following are considerations that require further investigation:

1. Public health guidelines and legislation.
2. World Health Organisation (WHO) categorisation moving to a Class 2A 'probable' carcinogen.
3. Consumer behaviour changes.
4. Public perception of health implications.
5. Recognition of electrohypersensitivity (EHS) as an environmentally induced medical condition.
6. Cost implications of mobile phone and wireless infrastructure following changes in safety legislation.
7. Review of public liability insurance policies for 'Electromagnetic exclusions'.
8. Potential for personal injury claims.

The committee needs to consider adopting the following strategy:

Mobile Phone communications

1. Planning restrictions remain in place for the process of siting base stations
2. Pursue a policy of mast sharing to minimise base stations
3. Impact review of population reporting symptoms of electrohypersensitivity

³ www.degruyter.com/view/j/reveh.2016.31.issue-4/reveh-2016-0060/reveh-2016-0060.xml?format=INT

4. No further mobile coverage in areas of outstanding natural beauty, national parks and rural areas, especially for non-essential applications such as 3G and above. Instead, promote further fibre-optic roll out to homes and businesses
5. Open dialogue with operators on ways to improve the safety of frequencies and emissions from base stations

Digital Connectivity

1. Focus on fibre-optic infrastructure for further digital connectivity.
2. Encourage businesses to use fibre-optic, Ethernet (hard wired internet) and landline connections for communication

Fibre Optics

Fibre-optic technology uses light to carry information within a bundle of glass threads in cables. Fibre-optic technology has the following advantages over mobile technology:

- High data transfer over greater distances.
- Data moves fast and efficiently and has better signal quality.
- Virtually unaffected by outdoor atmospheric conditions
- Difficult to hack
- No RF/electromagnetic radiation is emitted from the cables.

The Well-Being of Future Generations Act means that Wales must adopt policies compatible with the promotion of the health and well-being of the population. Focus on long-term rather than short-term gains should take priority. Elizabeth Kelley, the director of EMFscientist.org, states, "Solutions must be found that place the highest priority on protecting people and the planet over the powerful economic forces driving new technologies without thought for biology." She also states, "We can have both innovation and public safety, if there is political will."

C Prosser

30 November 2016