

# RFR (2G, 3G, 4G, 5G AND WIFI)

## FACTS AND THEORIES

*The media has various 'conspiracy' theories about Radio Frequency Radiation (2G, 3G, 4G, 5G and Wifi). The following are some relevant facts.*

### **FACT 1: Known dangers from 2G, 3G, 4G and Wifi; no long-term tests on 5G**

Parts of the media promote the theory that RFR including 5G is proven safe.

► In fact, there have been no long-term safety tests on specifically 5G radiation as regards general health and people with electrosensitivity, and therefore no robust studies proving its safety.

However, established evidence shows that 2G, 3G, 4G and Wifi Radio Frequency Radiation can have harmful effects, and 5G already uses 4G and Wifi radiation. Safety tests for 5G would need to be long-term to include cancer as well as other electrosensitivity symptoms. Cancers can take years to develop.

### **FACT 2: No universal consent to 5G as a public health experiment**

Eric van Rongen, vice-chair of the ICNIRP, stated about 5G in 2019:

*"It [5G] is not set up as a public health experiment but of course you can consider it as such. It will be necessary to gain more information about the exposure and any health problems that might come from an effect of that exposure."*<sup>1</sup>

► In fact, the Nuremberg Code of 1947 on health experiments states:

*"The voluntary consent of the human subject is absolutely essential."*

It seems highly likely that the 1.2% of the population (over 800,000 people in the UK) whose health is already severely affected by Radio Frequency Radiation do not give their voluntary consent to this 5G additional radiation experiment, if they are aware of it.

### **FACT 3: Appropriate safety guidelines are long-term, not ICNIRP's short-term**

Rodney Croft, chair of the ICNIRP, stated in 2020 that:

*"international regulations 'restrict 5G exposures to levels' that cannot cause harm."*<sup>2</sup>

► In fact, the current ICNIRP guidelines used by the UK are based on Schwan's 1953 invalidated theory that the only adverse effect of Radio Frequency Radiation is short-term, with measurements averaged over 6 or 30 minutes.

Long-term electrosensitivity effects have been established since experiments with electricity from Leyden jars in 1745, and many countries have adopted long-term safety guidelines, such as the USSR in 1935. Electrosensitivity symptoms such as cancers, associated with RFR since 1953, are usually long-term effects, not short-term.

- Background safe levels of RFR are 0.00002 V/m (Volts per metre) (peak)
- International long-term guidelines are 0.02 V/m
- The current short-term ICNIRP guidelines allow 130 V/m.

**FACT 4: Appropriate safety guidelines are non-thermal, not ICNIRP's thermal**

Some media promote the theory that heating is the only adverse effect, as in the current ICNIRP guidelines used by the UK, and that, therefore, tests of UK 5G base stations found radiation levels "at 'tiny fractions' of safe [ICNIRP] limits".<sup>3</sup>

► In fact, the current ICNIRP guidelines are based on Schwan's 1953 heating theory, but this theory has long been invalidated. In 1930 it was shown that the primary effects of RFR are non-thermal, with heating secondary.

All electrosensitivity effects, which were established in 1932 among radio workers and known since 1745 when electricity from Leyden jars was first used, are non-thermal.

These include cancers, associated with RFR since 1953.

RFR was classified by the World Health Organisation's IARC in 2011 as a 2B human carcinogen based on cancers caused by non-thermal mobile phone use.

- Background safe levels of RFR are 0.00001  $\mu\text{W}/\text{m}^2$  (microWatts per metre squared)
- International long-term guidelines are 1  $\mu\text{W}/\text{m}^2$
- The current short-term ICNIRP guidelines allow 40,000,000  $\mu\text{W}/\text{m}^2$

**FACT 5: Confusion between Electrosensitivity and Electrophobia**

Some of the media promotes the theory that Electrosensitivity is the same as Electrophobia. The World Health Organization in 2004 renamed Electrosensitivity as Idiopathic Environmental Intolerance attributed to Electromagnetic Fields (IEI-EMF), but suggested it was not a physical but a psychological condition based on a nocebo effect.

► In fact, this theory conflates two separate conditions:

- **Electrosensitivity, a physical biological intolerance.**

Electrosensitivity has been established as a physical condition since the 1740s. It was proved by subjects with 100% accuracy in blinded provocation studies from 1991, accepted under ICD-10 as EI-Allergy in 2000, specifically listed as a functional impairment in Sweden in 2000 and followed by Canada and the USA, and recognised by courts worldwide, including the UK, from 2012.

- **Electrophobia, a psychological nocebo effect.**

Electrophobia has been established since 1903, first as radiophobia and then renamed as Electrophobia in 1989. It requires prior cognitive conditioning.

Only about 1% of people with Electrosensitivity also have Electrophobia.

Scientific evidence shows that the two conditions are different:

- The blind, unaware and children without prior cognitive conditioning can have Electrosensitivity but cannot have Electrophobia.
- Electrosensitivity has been shown to relate to a wide range of objective biomarkers, such as in ultrasonic cerebral tomosphygmography for cerebral blood perfusion changes, brain injuries evident in 3d fMRI scans, melatonin and histamine levels, and genetic haplotypes.

In contrast, none of these biomarkers has been shown to apply to Electrophobia.

**FACT 6: Non-ionising radiation, as well as ionising radiation, can cause biological effects and lead, directly or indirectly, to cancer**

Some parts of the media promote the theory that, because non-ionising radiation does not displace electrons like ionising radiation, non-ionising radiation does not cause biological effects, including electrosensitivity and its symptoms like cancer.

► In fact, it has been known since the 18<sup>th</sup> century that non-ionising radiation can cause adverse biological effects at non-thermal levels. Sunlight is mainly non-ionising radiation yet it can cause cancer. Extremely low frequency fields, with much less energy than sunlight, have been known since 1979 to be capable of causing cancer.

- Since 1954 it has been established that all humans are electrosensitive at a subconscious level to geomagnetic events. Brainwaves are entrained to natural EMFs.
- Since 1745, when electricity from Leyden jars was first used, it has been known that some humans are more electrically sensitive than others at a conscious level. Up to 79% of the population (53 million in the UK) can be sensitive with adverse effects, as shown by surveys of symptoms like disturbed sleep or cancers among people living closer to a phone mast compared with further away.
- The use of electricity, from 1745 with Leyden jars, has also shown that some humans can become very sensitive to electric fields at a conscious level and develop hypersensitivity. This includes the 1.2% (over 800,000 in the UK) severely affected.
- Probably 99% of cancer deaths are caused by non-ionising agents and only 1% by ionising radiation.
- The many non-ionising EMF and RFR mechanisms and pathways established over the last 70 years include: radical pairs, spin resonance and coherence, ion forced-oscillation, polarisation, subtle energy fields, retinal sensors responding to a single light photon, magnetic field bystander effects, frequency 'windows', genomic instability, epigenetic effects, gene expression, voltage-gated ion channels, cryptochromes, magnetite and iron, the vagal nerve, demyelination, histamine degranulation, melatonin reduction, Hsp70, free radicals, nitric oxide, reactive oxygen species, oxidative stress, inflammation, antioxidants, lymphocytes, cerebral blood perfusion, DNA repair genes and genetic haplotypes.  
All of these can lead to established non-ionising EMF effects which include cancers, electrosensitivity, infertility, and cardiovascular and neurological harm.

### **FACT 7: EMFs and RFR can affect the immune system**

Eric van Rongen, vice-chair of the ICNIRP, stated in 2020 that

*"it's physically impossible for 5G to weaken your immune system to make you more susceptible to infection."*<sup>4</sup>

► In fact, people with chronic inflammation or disease can be more vulnerable to the effects of EMFs, as known for over a century. It has been shown since 1960 that EMFs can affect parts of the immune system. In diseased animals exposed to millimetre RFR, a 1977 study found antibodies reduced by 33% and mortality increased by up to 40%.

In addition, parts of the media deny that epidemics can relate to electromagnetic fields.

► In fact, many people are unaware that since the 18<sup>th</sup> century some scientists have linked the incidence of some epidemics with the occurrence of sunspots and atmospheric electromagnetic fields, but this is a complex area of evolving interdisciplinary science.

### **Technical differences between 2G/3G/4G and 5G**

- **Beam-forming:**  
5G uses beam-forming and pulsed modulations, similar to radar. These cause a high intensity of radiation in a small area, especially where beams happen to

coincide, cross or reflect. 5G also uses MIMO. The ICNIRP raised its limits to allow for these.

- **More transmitters:**

5G needs more transmitters sited on lamp posts and walls outside flats, houses and bedrooms and above roads and pavements, close to where people live and work.

- **Higher frequency:**

5G will use higher frequency GHz (millimetre) waves in the future. RFR at 60 GHz is absorbed by oxygen. RFR is also attenuated by water.

### EMFs, RFR and 5G Legal Actions

There are many legal challenges against EMFs, RFR and 5G worldwide, with two major ones in the UK.

- **UK High Court Case against EMFs and 5G**

Solicitor Jessica Learmond-Criqui of LCS Practice Ltd and barrister Tim Buley QC of Landmark Chambers.

Website: <https://www.5gemfreview2020.com/>

Funding: <https://www.crowdjustice.com/case/5g-judicial-review-2020/>

- **Legal Action Against 5G**

A legal team led by the civil liberty and human rights barrister Michael Mansfield QC.

Website: <https://actionagainst5g.org/>

Funding: <https://www.crowdjustice.com/case/legalactionagainst5g/>

### EMFs, RFR and 5G Appeals

Many scientists who are experts on the dangers of EMFs and radio frequency radiation (RFR) are appealing to governments to review EMF and RFR safety guidelines and halt the 5G rollout.

- International EMF Scientist Appeal <https://www.emfscientist.org/>
- The EMF Call <https://www.emfcall.org/>
- The 5G Appeal <https://www.5gappeal.eu/>
- Stop 5G In Earth and in Space International Appeal <https://www.5gspaceappeal.org/>

For further information see the ES-UK website under:

[Resources](#) and [Research](#)

M Bevington,  
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<sup>1</sup> Margi Murphy: "Mobile safety standards relaxed ahead of 5G networks" (Daily Telegraph, March 9 2019).

<sup>2</sup> APF Australia: "No evidence that 5G radiation is harmful to human health, experts say" (AFP April 24 2020)

<sup>3</sup> Anon.: "UK's 5G network well within safety limits, Ofcom tests find" (BBC News, February 24 2020)

<sup>4</sup> 'As told to Elle Hardy': "I'm the scientist who sets the global guidelines on 5G safety. Take it from me: 5G doesn't cause cancer or spread COVID-19" (Business Insider, June 23 2020)