

Radio-frequency electro-magnetic fields (RF-EMF) and the 5G network

More information about RF-EMF and 5G and the evidence relating to any public health concerns.

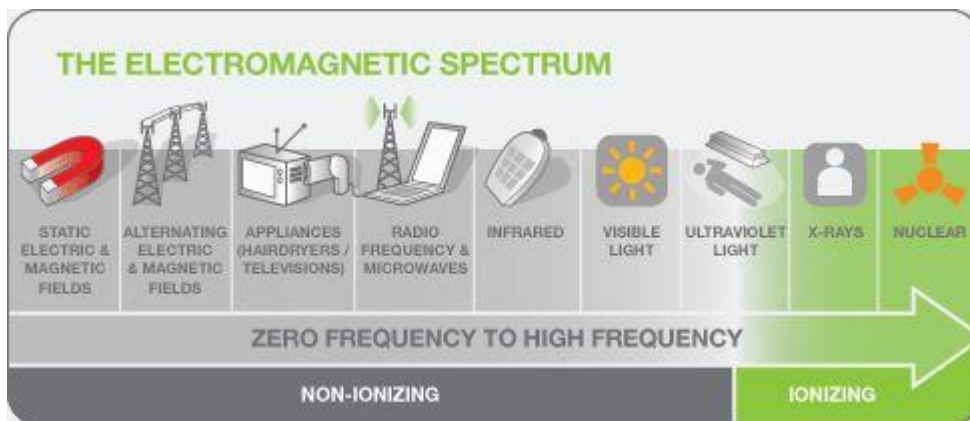
What are radio-frequency electro-magnetic fields (RF-EMF)?

RF-EMF is part of the overall electromagnetic spectrum which ranges from static electricity and magnetic fields through to visible light, X-rays and nuclear radiation.

RF-EMF is in the middle part of the spectrum and is used for radio communications, mobile phone networks, mobile base stations and mobile phones.

It is used to deliver technologies including 3G, 4G and 5G, Wi-Fi and Bluetooth.

You can see the full electromagnetic spectrum, and where RF-EMF fits in the middle of that spectrum, in the picture below.



Non-ionizing radiation does not carry enough energy to break molecular bonds. Ionizing radiation carries enough energy to break bonds between molecules and ionize atoms

Is RF-EMF harmful to health?

The impact of RF-EMF on health has been monitored by health regulators around the world over many years. The World Health Organisation (WHO) set up the [WHO EMF Project](#) to assess the evidence on health and environmental impacts of EMF (including RF) exposure.

After assessing the evidence the WHO said: *current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields. However, some gaps in knowledge about biological effects exist and need further research.*

National governments and health protection agencies around the world have also periodically reviewed the evidence for effects on health and the environment. Their findings have been in line with those of the World Health Organisation.

How is the level of exposure to RF-EMF regulated?

An independent body, The [International Commission on Non-ionising Radiation Protection](#) (ICNIRP), publishes guidelines on safe exposure limits. These limits are based on all available scientific evidence.

The ICNIRP exposure guidelines are followed for all installations on the Island.

The Guidelines are dated 1998 as this is when they were first established and published. However, they were fully reviewed in 2009 (at which time the evidence did not support any change in the exposure threshold) and they are currently undergoing further review.

What is 5G?

As the name suggests, 5G is the 5th generation of mobile networks.

It is being designed to meet the large growth in data and the connectivity required by modern applications and the 'internet of things', such as smart homes, smart cars, smart phones and much more.

At first it will work with existing 4G networks, with stand-alone networks developing as use and coverage grows.

5G is being rolled out around the world. The first 5G network in the UK went live on 30th May 2019.

Is 5G different to the RF-EMF used by current mobile and telecommunications applications? Will it have different impacts on health?

5G is part of the same spectrum as the RF-EMF currently used in telecommunications.

In the Isle of Man 5G will utilise frequencies similar to those already in use by existing networks.

The research on health effects of RF-EMF also applies to 5G. 5G will be regulated to comply with the ICNIRP guidelines. 5G does not mean that we will be exposed to a new type of radiation, or to higher or stronger levels of RF-EMF.

Some people believe they experience adverse effects on their health from exposure to RF-EMF. Doesn't this prove that RF-EMF harms health?

The World Health Authority has researched this issue extensively and concluded: *Some members of the public have attributed a diffuse collection of symptoms to low levels of exposure to electromagnetic fields at home. Reported symptoms include headaches, anxiety, suicide and depression, nausea, fatigue and loss of libido.*

To date, scientific evidence does not support a link between these symptoms and exposure to electromagnetic fields. At least some of these health problems may be caused by noise or other factors in the environment, or by anxiety related to the presence of new technologies.

How can I find out more?

- The World Health Organisation EMF International Project is a major source of quality assured appraisal of the evidence for the health impacts of RF-EMF. It is available here <https://www.who.int/peh-emf/project/en/>

But there are other sources of robust scientific information too. Many national governments and health protection agencies have carried out their own reviews, independent of each other and of the World Health Organisation.

- **UK:** <https://www.gov.uk/government/publications/radiofrequency-electromagnetic-fields-health-effects>
 - **Australia:** <https://www.arpana.gov.au/understanding-radiation/radiation-sources/more-radiation-sources/electricity>
 - **New Zealand:** <https://www.health.govt.nz/publication/electric-and-magnetic-fields-and-your-health>
 - **Canada:** <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09583.html>
 - **US:** <https://www.fcc.gov/general/radio-frequency-safety-0>
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- Further information on radio waves and health in the UK is available here: <https://www.gov.uk/government/publications/mobile-phone-base-stations-radio-waves-and-health/mobile-phone-base-stations-radio-waves-and-health>.
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- A full database of all scientific research data, which allows you to search details of more than 28,000 publications covering individual scientific studies on the effects of electromagnetic fields, is available here: <https://www.emf-portal.org/en>