

APPENDICES:

For further education of constituents and councillors.

These are also available on this website: <https://stop5g.co.uk/template-letters/>

- 1. 5G technology: hazards and background**
- 2. Frequently Asked Questions**
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1.0 SUMMARY OF 5G TECHNOLOGY ISSUES AND BACKGROUND

- 5G wireless radiation is microwave radiation, also classed as radio frequency (RF) or electromagnetic (EM) radiation. Its transmission frequencies range from low band (approx 700MHz) to Millimetre Wave (approx 24-28GHz and higher is planned). 60GHz is already in use for WiGig.

The term 5G covers both the augmentation of 4G within the same sub 3.8Ghz spectrum, and also the proposed mmWave small cell systems that operate in bands from 6-90GHz. Any polarised waveform trigger biological stress, but the mmWave can be particularly harmful, and the increase in overall radiation is unacceptable.

RFR signals are highly pulsed and variable. This can cause cellular DNA damage, as a result of oxidative stress, and the breakdown of other cellular mechanisms and homeostasis. This is a factor in cancer in humans and other species. Living organisms will constantly work to restore balance to their systems but this is devitalising and comes at a price, especially when dealing with a long term chronic assault.

The 20 year old safety guidelines were updated in 2020, but are still based on a methodology defined in 1996, and are recommended by a discredited committee, ICNIRP, and also by Public Health England who are advised by ICNIRP. They are flawed as they only take into account biological effects at a very high dose (56 V/m), and for short duration. The effects are also incorrectly attributed to heating – cancer is not caused by heat. This goes back to the Schwann heating fallacy from the 1950's.

<https://bioinitiative.org/rf-color-charts/>

- A 2013 **European Commission** document warned that relevant EMF exposures (not just 'over- exposures') might cause the following symptoms (**QUESTION** which document? I can't find it FYI)

- Hearing clicking, buzzing or hissing noises
- Increased body temperature of only a few degrees leading to mental confusion, fatigue, headache and other symptoms of heat stress.
- Localised heating or 'hot spots' in muscles or internal organs
- Skin pain and burns.
- Cataracts which can take weeks or months to develop.
- A temporary lowering of sperm count
- Increased risk of miscarriage in early pregnancy.
- Interference with active implanted or body worn medical devices. Passive medical implants that are metallic may serve as absorbing antennas resulting in local increases in RF exposure of tissues and possible injury.

- In 2018, a European Commission Scientific Committee on Health, Environment and Emerging Risks, **SCHEER**, warned "The lack of clear evidence to inform the development of exposure guidelines to 5G technology leaves open the possibility of unintended biological consequences."

- May 2011 **IARC** (International Agency for Research on Cancer) classifies radiofrequency electromagnetic fields as possibly carcinogenic to humans

https://www.iarc.fr/wp-content/uploads/2018/07/pr208_E.pdf

- Leading researcher Joel Moskowitz "**We Have No Reason to Believe 5G Is Safe**"

<https://blogs.scientificamerican.com/observations/we-have-no-reason-to-believe-5g-is-safe/>

- The rush towards this immature technology, without proof of safety under long term exposure, is baffling.

SECURITY

The director of European communications security watchdog, ENISA, warned that 5G had not been designed with security in mind, making it impossible to have efficient security. IT professionals are now advising people to use wired internet connections because they are faster as well as being more secure.

PRIVACY

Leading privacy campaigners, Privacy International, had firm reservations on 5G.

Campaign group BigBrotherWatch outlined how UK police have been using indiscriminate facial recognition without due legal basis or scrutiny – and have highlighted how 98% of facial ‘matches’ by the Met Police have actually identified the wrong people! Investigative IT website The Register highlighted how 5G was being developed for this in the UK (using public funds) and China.

There may also be a threat to public security through dependence on technology for 5G from Huawei, a company legally obliged to help the undemocratic Chinese government in intelligence gathering if asked.

Steve Purser, a director of European communications security watchdog, ENISA, warned that the 5G technology had not been designed with security in mind, making it impossible to have “efficient security”.

FREEDOM

The threat to our personal freedom and data security is already being seen in the debate about whether to approve tracking apps for the purposes of Covid-19.

Channel 4 news Friday 27th March 2020: *"This is where we as humanity decide - do we choose personal freedom?"*

Regarding our humanity and the sovereignty of nature, see this UK report. Do we really aspire to such dystopia and disconnection, is there even a problem to fix?

UK Agricultural Productivity Working Group

<https://www.fdf.org.uk/publicgeneral/APWG-report-feb20.pdf>

Page 32: In order to harness the full potential of precision technology, robotics and autonomous systems, 5G coverage across the whole of the UK is a must. The robotics case study (Case Study 5) of this report emphasises the need for this level of coverage. The APWG endorses the work of 5Gruralfirst.

AFFORDABILITY

The government wants new 5G wireless technology rolled out to the whole country before **2027**. This will have a massive effect on everybody's lives and we were not asked if this was what we wanted when big decisions were made.

Industry websites observe that commercial demand isn't really there and regard it as hyped 'jam tomorrow' technology. In 2017, the UK government appeared to agree, admitting "...the business case for the investment required for the deployment of 5G is not yet established...." Several reservations have been expressed on the justification and value for taxpayers' money in promoting 5G if demand isn't really there. (Next Generation Mobile Technologies: A 5G Strategy for the UK, p8/9)

- Industry Committee review for the case for 5G: business case - weak, safety - very poor, privacy - weak.

Next Generation Mobile Technologies: A 5G Strategy for the UK

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/597421/07.03.17_5G_strategy_-_for_publication.pdf

- This paper highlights the hype surrounding 5G; the poor business case, the need for scientific research on parts of the 5G set up; and the need to take "a long view" on 5G.

IN-DEPTH ANALYSIS Requested by the ITRE committee: 5G Deployment State of Play in Europe, USA and Asia.

[https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/631060/IPOL_IDA\(2019\)631060_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/631060/IPOL_IDA(2019)631060_EN.pdf)

2.0 FREQUENTLY ASKED QUESTIONS

2.01 What can we do as a Council?

- You can lobby to apply safety criteria that exceed ICNIRP guidelines in this case, as you do in many other instances as a council.
- RF EMRs are shown to be a biological hazard, and therefore **ALL** the scientific studies and evidence must be considered when evaluating Harm that could be caused to the Environment and Public.

The harmful biological effects of EMR are fully established and cannot be defined at any exposure level to be sufficiently safe in a public setting. The harm caused is a zero-threshold process. It is unlawful and unethical to install infrastructure that causes harm.

- **You can:** lobby to prevent further upgrades until there is safe technology – to protect your wide remit for Duty of Care. Particularly it is not too late to halt mmWave 5G.
- **You can:** refuse test beds in your area
- **You can:** if you are a Borough or District Council you can make a Public Declaration, and call a moratorium on any further installation of harmful tech and that you will prioritise wired broadband
- **You can:** question the NPPF para 116 since its directive directly conflicts with your other legal obligations.
- **You can:** reply to government Telecoms consultations demanding tighter regulation of the levels of radiating power from wireless telecom facilities (WTFs), exposure levels, and monitoring of hot spots from multiple sources.

Currently the OfCom consultation is open for response in 2020.

<https://www.ofcom.org.uk/consultations-and-statements/category-1/limiting-exposure-to-emf>

- **You can:** issue a "Non-Compliance Report" against ISO Standards: ISO 9001 (Quality) or the equivalent TL 9000, ISO 14001 (Environment) and ISO 18001 (Health and Safety). See 2.13

2.02 The NPPF para 116 requires us not to consider health impacts when assessing new applications.

• Para 116 **does not** state that the local council cannot take health concerns into account. It merely states that it cannot set **health safeguards** different from the ICNIRP. ICNIRP's guidelines may provide for a certain safe level of exposure, but it says nothing about the harm which is being done to residents at levels below these limits.

• From the information enclosed you will see that there is harm to residents at levels below ICNIRP's guidelines. Health IS a planning consideration and if residents are telling you that they are sick from radiation sickness or fear such sickness, this is relevant information which you can take account of and raise an objection or refuse planning permission on that basis. You do not need to set different exposure levels but **you can** reject the efficacy of those advised, to protect environmental and public health.

• The NPPF also states that authorities must use the best available evidence when carrying out assessments. (see also 3.3.1)

2.03 There is still a debate about the science though.

There is only a manufactured debate. There is sufficient knowledge gathered over the last 80 years about the fact of, and reasons for, damage to living systems caused by RFR. The mechanisms and causes of damage are also well known now. See *appendix 4.0, 5.0*.

<https://www.emf-portal.org/en>

2.04 But sunlight doesn't harm us in this way so why should 'non-ionising' waves?

Sunlight is naturally un-polarised and consists of a complete packet of informational and organizational fields. Man-made EMR (electromagnetic radiation) is not. We have also evolved in an environment where background levels below THz were practically zero.

The alterations caused to biological mechanisms are seen to be detrimental to proper cell function and cause a cascade of functional and therefore health issues. Explained in the first paragraph of this paper:

<http://www.es-uk.info/wp-content/uploads/2018/06/Panagopoulos-et-al-Polarization-Scientific-Reports-2015.pdf>

For one example of how the effects of man-made pulsed EMR have been understood refer to this patent which resolved an issue faced by the US army in the Iraq war where their soldiers were being harmed by WiFi equipment in their helmets:

Diagram of Biological Trigger mechanism related to US patent 5544665A.

<https://patents.google.com/patent/US5544665>
<https://patentimages.storage.googleapis.com/3a/71/94/caecee24c9f79/US5544665.pdf>

2.05 It is normal for a risk-benefit analysis to be done in many daily tasks, and in this case the risks seem way smaller than the benefits the tech offers

- The analysis needs to be made from a fully informed position, you will find if you weigh up all the evidence for biological harm, from 1000's of studies, that harm is caused at exposure levels down to at least 0.05 V/m, and compare that to the fact that the environmental levels and those within buildings from WiFi also exceed this low level by 100s of times.

- The effects are multifarious, have long latency and affect different people in many different ways, the one size fits all approach is to have zero to minimal exposure. We all without exception are affected by this radiation, but we all have different tolerances. Electro Sensitive people are like the canaries in the coalmine, they feel what is happening, and also their needs should not be ignored.

- It is normal for a risk-benefit analysis to be done and to use the ALARA principle to define exposure levels. The problem is that the current situation takes no account at all of the real risks, a re-balance is urgently needed.

- It is crucial that we focus on safer alternatives such as conventional or new plastic fibre-optic broadband.

- Public Health England** now recommends that we reduce our exposure to mobile phones, 'due to uncertainties in the science', because they are not safe. When something is not safe then the hazard must be recognised in all situations, we cannot make general prescriptions that fall short of removal of the hazard, or mitigation to levels that have meet with a general consensus of agreement. This cannot be claimed where up to 70% of independent studies show that low level NIR is harmful.

<https://www.gov.uk/government/publications/radio-waves-reducing-exposure/radio-waves-reducing-exposure-from-mobile-phones>

2.06 ICNIRP and PHE say the available scientific evidence (for non-thermal biological effects) is not sufficiently robust or compelling

This begs the question, "what does constitute robust, consistent or compelling" evidence? Especially when the US federal govt spends \$25m on a 10-year study that finds clear evidence at below thermal of a link with cancer? [NTP study] What kind of research would ICNIRP accept that would move them away from their obsession with heating???

It is also notable that two former ICNIRP members, Dr Andrew Miller and Dr Lin both think that NTP, and Ramazzini Institute studies are compelling, and have called for the WHO to consider re-classifying RF radiation as a Class 1 carcinogen.

2.07 “The ICNIRP guideline exposure levels are what PHE say are safe and are what we must rely on, so as a Council we cannot set different criteria.”

Section 2A of the Public Health Act provides the legal basis on which PHE currently issues information and advice as part of its general duty to protect the general public from disease and other dangers to health. **The Guidance is not maintained and revised by PHE for the explicit purpose of any other body undertaking any other statutory function.** If in any other context regard is had to the Guidance, that is entirely a matter for the discretion of the relevant body and it must determine what weight to place on the Guidance given the clear indication as to the sources from which the advice and recommendations in the Guidance are derived. **Equally, that body must determine what other evidence from your clients or other members of the public or interested parties to consider in making any decision."**

- Public Health England solicitors state: *If it be alleged that a public body now or in the future acted unlawfully in placing reliance on the guidance, that cannot retrospectively taint the guidance with illegality".* 8 August 2019

The above statement from the solicitors to PHE unequivocally asserts that **public bodies** should balance PHE's guidance **with other sources of evidence** i.e. that they should indeed question that guidance.

- ICNIRP, on whom PHE solely rely, also have a legal disclaimer regarding their Guidelines on their website:

"The ICNIRP undertakes all reasonable measures to ensure the reliability of information presented on the website, but does not guarantee the correctness, reliability, or completeness of the information and views published. The content of our website is provided to you for information only. We do not assume any responsibility for any damage, including direct or indirect loss suffered by users or third parties in connection with the use of our website and/or the information it contains, including for the use or the interpretation of any technical data, recommendations, or specifications available on our website"

- The ICNIRP guidelines (2002) require you to make a balanced judgement regarding health effects.

Page 9 Nature of Health Effects: *"People being protected: Different groups in a population may have differences in their ability to tolerate a particular NIR exposure. ... Exposure to NIR may cause different biological effects, with a variety of consequences for a human being. Biological effects may be without any known adverse or beneficial consequences, other effects may result in pathological conditions (diseases), while still other biological effects have beneficial consequences for a person. Annoyance or discomfort may not be pathological per se but, if substantiated, can affect the physical and mental well-being of a person and the resultant effect should be considered as a potential health hazard.Because adverse consequences of NIR exposure can vary across the entire range from trivial to life threatening, a balanced judgement is required before deciding on exposure guidance."*

Safe RF exposure levels: organizations reflexively quote ICNIRP guidelines to justify all RF exposure (mirrored by Public Health England). These guides are irrelevant to long term public exposure, the ICNIRP advised maximum exposure levels are peak **56 V/m**, but were defined for totally different conditions, only thermal effects, and in 1998. Whereas international long-term biological guidelines, based on scientific evidence and to protect health, include: Seletun 2010, Bioinitiative 2012, EUROPAEM 2016 and IGNIR 2018.

- ICNIRP guidelines are only for short term exposure to a mobile phone for 6-30 mins, and are therefore completely inadequate considering the variety of emissions we're exposed to today.
- International long-term biological guidelines: 0.006-0.2 V/m (0.1-100 $\mu\text{W}/\text{m}^2$)
- In many public areas and streets in the UK the levels are now around 3 V/m on a constant basis, this is not acceptable and contravenes your statutory Duty of Care.

In a letter dated July 2002 from the **US Environmental Protection Agency**, to the President of the EMR network. The EPA stated that *"the FCCs current exposure guidelines do not apply to chronic non-thermal exposure situations. They are considered protective of effects arising from a thermal mechanism, but **NOT** from all possible mechanisms. **Therefore the generalization by many that the guidelines protect human beings from harm by any or all mechanisms is not justified."***

Most authorities now reject the UK government's heating-only claim and argue for adopting biological limits. The USSR adopted biological limits in 1958 and an increasing number of countries have done so since, most recently India in 2013. Since 2008 the majority of involved scientists have accepted non-thermal effects. In 2009 the EU parliament voted that current heating-only limits were "obsolete" and new biological

limits were needed. In 2011 the Council of Europe warned governments against WiFi in schools. The international **BioInitiative Report** of 2012 by 29 experts proposed new biological limits, as did the **Seletun** panel in 2010. The UK government has not yet accepted this majority scientific viewpoint based on the weight of established evidence. *See Appendix 2-4*

The Council of Europe passed the draft Resolution 1815 in which they voted unanimously to ban Wi-Fi and mobile phones in schools and that on 27th May 2011 the **Parliamentary Assembly** of the Council of Europe called on Member States to reduce exposure to radiofrequency electromagnetic fields, asking for particular attention to be given to children and young people, who are most at risk, and called for restrictions on the use of wireless technologies (Wi-Fi) in schools with a clearly stated recommendation for fully-wired networks to be used.

The **Institute of Electrical and Electronics Engineers** (IEEE) which helped to set existing exposure limits decades ago acknowledges these are not protective and the public should take precautionary measures now while public policy catches up to the science.

<https://ieeexplore.ieee.org/document/9016183>

Long term effects/non-thermal effects: ICNIRP guidelines contain inadequacies regarding long term effects, and with regard to effects seen at low exposures below those which are referenced in the guidelines criteria for thermal effects.

Carpenter DO, Hardell L, Moskowitz JM, Oberfeld G. *The EMF Call for truly protective limits for exposure to electromagnetic fields (100 kHz to 300 GHz)*.

The authors, academic and public-health physicians, argue that ICNIRP's limits are "unscientific, obsolete and do not represent an objective evaluation"; they "only protect against acute thermal effects from very short and intense exposure", not against "harmful effects from low-intensity and long-term exposure, such as cancer, reproductive harm, or effects on the nervous system."

<https://www.emfcall.org/the-emf-call/>

2.08 Anti 5G colleagues would like to have it both ways, but it is wrong. On one hand they claim that the 5G was not tested for its health impact on humans. Meaning, there are no studies available to prove its safety. But then, they claim that 5G is dangerous and proven to damage human health (Pall, Firstenberg, Davis et al.) Which is true ?

The industry are lying, they have done tests, but state that they plan to do no further tests. The industry agent who testified before Congress in Feb 2019 said that they had done no tests, and none were being planned, so he was half truthful. For one there was Jerry Phillips' cellular study, commissioned by Motorola, 1997. They also deny that there is reputable or sufficient evidence of harm. This is also a lie.

There are 1000's of military and non-industry studies since 1888. (See Appendix 4.0)

What 5G frequencies do they mean when referring to 5G? Those well below 6 GHz, that were used already and are known to possibly/probably affect health, though the proof of health damage is still elusive? Or are they talking about 26 GHz and 28 GHz and other frequencies over the 30 GHz (mmWaves) that were not studied?

The proof of health effects is not elusive, there are 1000's of peer reviewed papers - enough to establish harm and the need to minimise exposure and cause liability if not. The biological trigger is known to occur at ANY frequency and at any dose, with an unpredictable result each time since the transfer from physical to biological effects is non linear. So, there is harm from any 'G'.

5G is both sub 6GHz which is much of the existing spectrum being used, and cm and mmWave above 6GHz which is probably even more damaging considering the wavelength is closer to a physical match with our biological features.

All of this increase in exposure is a step too far in aggregate considering the unacceptably high levels already present in our homes and high streets.

4G-5G Microwave Radiation imposes serious Privacy, Security, Health, Safety and Environmental problems that must immediately be remedied.

3.0 GOVERNMENTS AND ORGANIZATIONS TAKING A STAND

- **Eleven councils in the UK have already called for a moratorium:**

Frome, Totnes, Kingsbridge, Wells, Glastonbury, Winchester, Shepton Mallet, Totnes, Wellington, Coombe Martin and Lampeter

<https://stop5g.co.uk/councils-invoking-precautionary-principle/>

- Since 27th March there has been a noted and sudden increase in Petition signatures on change.org reaching 103,000 signatures

- 37 UK petitions against 5G have been started in April 2020. **Total UK signatures over 145,000**

- **The International scientists appeal**

Scientists call for Protection from Non-ionizing Electromagnetic Field Exposure

<https://emfscientist.org>

- A call for a **Judicial Review** has just been launched taking legal action against the Secretary of State of the Department of Health and Social Care and Public Health England.

<https://actionagainst5g.org>

GOVERNMENTS AND ORGANIZATIONS THAT BAN OR WARN AGAINST WIRELESS TECHNOLOGY

<https://stop5g.co.uk/governments-organisations-taking-stand/>

GOVERNMENTS FACING LEGAL ACTION OVER 5G AND WIRELESS TECHNOLOGY

<https://www.radiationresearch.org/category/legal/>

<https://ehtrust.org/international-actions-to-halt-and-delay-5g/>

May 2020: Robert F. Kennedy, Jr. and Dafna Tachover, Director of 5G and Wireless Harms Project of Children's Health Defense (CHD), signed onto the UK EM Radiation Research Trust (RRT) letter calling on UK Prime Minister **Boris Johnson** and political leaders to protect the public from the proven harms of wireless radiation and 5G.

The Open Letter of Complaint was written in response to an article published by First News in their children's online newspaper titled "There is no 5G Conspiracy", claiming 5G is absolutely safe. RRT, which is a trusted and leading UK group dedicated to education about wireless radiation health effects, has been receiving emails and phone calls from parents, school children and teachers asking RRT to respond to the article.

[*RFK, Jr. Joins EM Radiation Research Trust in Calling Upon UK Prime Minister to Halt 5G Deployment • Children's Health Defense*](#)

4.0 a PRIMARY STUDIES THAT HAVE FOUND DIRECT BIOLOGICAL EFFECTS

- 60-70% of independent studies show bio-effects from RF microwave radiation (and around 90% from oxidative stress). A conservative 60% of 23,218 is 13,930 studies.

A study by Rahmani et al in 2011 found that out of a total of 919 studies that they looked at on RF microwave radiation effects on humans, animals, plants and insects, **65%** showed impact, 21% were inconclusive and 14% showed no impact.

In June 2019 [Powerwatch.org.uk](https://www.powerwatch.org.uk) had looked at 1674 studies and found that **61.47%** found effects, 15.89% found no effects, and 22.64% contained important findings but were inconclusive.

- The **US National Toxicology Programme** study which was published in 2018 provided 'sufficient animal evidence' for RF as a carcinogen. If the disruption of Voltage Gated Calcium Channel signalling (see M.Pall et al.) and oxidative stress are also counted as highly likely mechanisms that cause stress and disruption, then RF is already a certain human carcinogen, according to the criteria used by **IARC**, even before it is formally classified as such.

The **WHO** classified man made RFR as a Class2B possible carcinogen in 2011 on the basis of 3 key studies, since then there are 1000's more. It is currently pending consideration as a Class1, which has been called for also by two former members of the ICNIRP panel. This makes one wonder whether any person of authority can risk compulsorily exposing the public whose well-being is their legal responsibility to a certain human carcinogen. Do they have the **competence** to make such a call?

- Harmful effects of RF-EMF exposure have been indicated by a number of controlled studies. More than **230 scientists** from 41 countries have expressed their "serious concerns" regarding the ubiquitous and increasing exposure to EMF generated by electric and wireless devices, already **existing before additional 5G rollout**. They refer to the fact that "numerous recent scientific publications have shown that EMF affects living organisms at levels well below most international and national guidelines".

- Effects include: increased cancer risk, cellular stress, increase in harmful free radicals, genetic damages, structural and functional changes of the reproductive system, learning and memory deficits, neurological disorders and general negative wellbeing in general on humans. Damage goes well beyond the human race: there is growing evidence of harmful effects to birds, insects, microbes, animals and plants.

- The EUROPA EM-EMF Guideline 2016 states that "**there is strong evidence** that long-term exposure to certain EMF's is a risk factor for such diseases as certain cancers, Alzheimer's disease and male infertility. Common EHS (electromagnetic hypersensitivity) symptoms include headaches, concentration difficulties, sleep problems, depression, lack of energy, fatigue and flu-like symptoms."

US National Toxicology Programme study

<https://www.niehs.nih.gov/news/newsroom/releases/2018/november1/index.cfm>

Ramazzini Study Belpoggi F. et al., (2018). "Report of final results regarding brain and heart tumours in Sprague-Dawley rats exposed from prenatal life until natural death to mobile phone radiofrequency field representative of a 1.8 GHz GSM base station environmental emission. Environmental Research 165:496-503.

<https://www.ncbi.nlm.nih.gov/pubmed/29530389>

Bio-initiative Report 2012 (updated 2017) – A Rationale for Biologically-based Public Exposure Standards for Electromagnetic Fields (ELF and RF) **1480 pages**, 29 authors, 10 countries.

<https://bioinitiative.org>

On MW radiation: Danish Legal opinion on the 5G roll out. Jensen, F.C. (2019) 'LEGAL OPINION on whether it would be in contravention of human rights and environmental law to establish the 5G-system in Denmark' See Section 1.0.

<https://midsafetech.files.wordpress.com/2019/07/5g-danish-legal-opinion-jensen-2019.pdf>

US patent 5544665A Protection of living systems from adverse effects of electric, magnetic and electromagnetic fields

<https://patents.google.com/patent/US5544665>

World Health Organization, radiofrequency radiation and health; Hardell, I. 2017

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5504984/>

5G: Great risk for EU, U.S. and International Health Compelling Evidence for Eight Distinct Types of Great Harm Caused by Electromagnetic Field (EMF) Exposures and the Mechanism that Causes Them; Pall. M. 2018

<https://ehtrust.org/wp-content/uploads/5g-emf-hazards-dr-martin-l.-pall-eu-emf2018-6-11us3.pdf>

Cell phone radio waves have insufficient energy to damage DNA and cause serious illness - an enduring fallacy; Henshaw 2019

<https://ehtrust.org/wp-content/uploads/Henshaw-2019-Non-ionising-radiation-quantum-energy-fallacy-11th-April.pdf>

DATABASES OF STUDIES:

<https://www.telecompowergrab.org/science.html>

<http://www.es-uk.info/research/>

<https://www.5gcrisis.com/scientific-studies>

<https://www.emf-portal.org/en/article/overview/mobile-communications-5g>

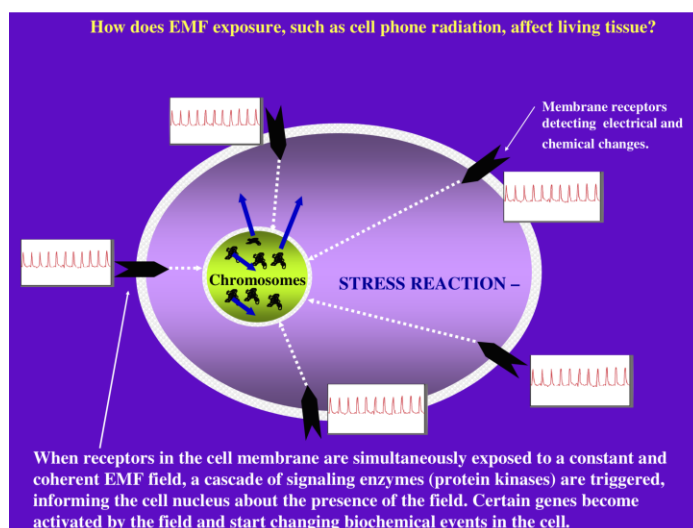
https://ehtrust.org/scientific-research-on-5g-and-health/?fbclid=IwAR2A3KQb_PBpxBp_f4Sooq91ltyL7X9W3iPGex2KS9b-j7TTSYSAOKjqES4

<https://ehtrust.org/science/peer-reviewed-research-studies-on-wi-fi/>

Diagram of Biological Trigger mechanism related to US patent 5544665A.

This solution was used by US military to resolve wireless RFR harm to troops. The alterations caused to biological mechanisms are seen to be detrimental to proper cell function and cause a cascade of functional and therefore health issues. See Studies cited in the appendix 4b.

<http://www.es-uk.info/wp-content/uploads/2018/06/Panagopoulos-et-al-Polarization-Scientific-Reports-2015.pdf>



4.0 b MAJOR SUMMARY PAPERS AND STATEMENTS

On the Clear Evidence – Prof Tom Butler

https://e9a5d5c6.stackpathcdn.com/wp-content/uploads/2019/02/On-the-Clear-Evidence-of-the-Risks-to-Children-from-Smartphone-and-WiFi-Radio-Frequency-Radiation_Final.pdf

Ronald N. Kostoff et al. - Adverse health effects of wireless technology under real-life conditions

<https://www.sciencedirect.com/science/article/abs/pii/S037842742030028X>

Ronald N. Kostoff – 1000pp. Largest Unethical Medical Experiment in Human History

Summary of the Problem, and references to 5,300 reports on Medline, multiple peer reviewed studies on dangers of wireless radiation.

https://smartech.gatech.edu/bitstream/handle/1853/62452/LARGEST_UNETHICAL_MEDICAL_EXPERIMENT_FINAL.pdf?sequence=4&isAllowed=y

Martin Pall statement on 5G health risk

<https://www.radiationresearch.org/wp-content/uploads/2018/06/EU-EMF2018-6-11US3.pdf>

EM Radiation Research Trust puts UK government on notice regarding 5G amidst profound world-wide health concerns

<https://www.radiationresearch.org/wp-content/uploads/2019/10/The-EM-Radiation-Research-Trust-puts-UK-government-on-notice-regarding-5G-amidst-profound-world-wide-health-concerns-3.pdf>

5G appeal <http://www.5gappeal.eu/>

The following military reports all citing biological effects:

Declassified military research Papers on millimetre radio waves from the 70s and 80s. These clearly demonstrate biological effects at relatively low power densities. With the advent of 5G we will all become part of the millimetre wave experiment, we've already been subjected to microwave experiments with 2.45 GHz 4G. Effects of this has been a rapid rise in autoimmune disease and cancer as well as neuro degenerative disorders ADHD and Alzheimer's

•NMRI 1972 report comprising over 2300 research studies

<https://www.emfresearch.com/us-nmri-studies/>

•1981 Aeromedical Review. Assessment of possible hazards associated with applications of mm Wave systems W.Hurt, D.Erwin

<https://apps.dtic.mil/dtic/tr/fulltext/u2/a112014.pdf>

•De-classified CIA 1977 report

<https://mdsafetech.files.wordpress.com/2019/02/biological-effects-of-millimeter-wavelengths.-zalyubovskaya-declassif-by-cia-1977-biol-eff-mm-waves.pdf>

•The Defence Intelligence Agency 1976 Report

<https://thefullertoninformer.com/declassified-the-1976-defense-intelligence-agency-report-on-microwaves/>

Which states up front:

"If the more advanced nations of the West are strict in the enforcement of the stringent exposure standards, there could be unfavourable effects on industrial output and military functions. The Eurasian Communist countries would, on the other hand, give lip service to strict standards, but allow their military to operate without restriction and thereby gain the advantage in electronic warfare techniques and the development of antipersonnel applications."

•A report by the **National Radiological Protection Board (NRPB)** Advisory Group on Non-ionising Radiation (AGNIR) gives advice on possible health effects of Terrestrial Trunked Radio (TETRA). It was prepared, at the request of government, after the IEGMP recommended in May 2020 that ' as a precautionary measure,

amplitude modulation around 16 hertz should be avoided, if possible, in future developments in signal coding’.

The TETRA system is used for commercial applications, by emergency services in the UK, and in a number of other countries that use a network of base stations to serve terminals, that are either vehicle mounted or in the form of separate handsets. Its operation results in power modulation of some of the radiofrequency signal at a pulse frequency of 17.6 hertz.

It is recognised that calcium plays an important role in many biological processes, especially in the function of nerve cells. Moreover, as the IEGMP pointed out, there is evidence that radiofrequency fields, amplitude-modulated at about 16 hertz, may influence the leakage of calcium ions from tissues.

<https://www.gov.uk/government/publications/terrestrial-trunked-radio-tetra-health-effects-from-exposure>

Prof Tom Butler exposes the risks to children from RF wireless radiation at school and in the home.

<https://www.radiationresearch.org/articles/on-the-clear-evidence-of-the-risks-to-children-from-non-ionizing-radio-frequency-radiation-the-case-of-digital-technologies-in-the-home-classroom-and-society/>

WHO called to account – Olga Sheean

<https://www.emfoff.com/wp-content/uploads/2018/02/WHO-setting-the-standard-for-a-wireless-world-of-harm.pdf>

No Safe Place – Olga Sheean

<https://www.emfoff.com/wp-content/uploads/2018/02/NO-SAFE-PLACE-Letter-to-Gregor-Robertson-240716.pdf>

Dimitris J. Panagopoulos – Cellular/DNA pulsed nature of the wave is damaging from **all** Electromagnetic signals.

https://www.researchgate.net/publication/331661949_Comparing_DNA_Damage_Induced_by_Mobile_Telephony_and_Other_Types_of_Man-Made_Electromagnetic_Fields

Dr Martin Pall Journal of Molecular and Cellular August 2013 Medicine “Electromagnetic fields act *via* activation of voltage-gated calcium channels to produce beneficial or adverse effects”

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3780531/>

Dr Martin Pall “Wi Fi is an important threat to human health” Science Direct

<https://www.sciencedirect.com/science/article/pii/S0013935118300355#bibliog0005>

Oxford University showed a 50-60% decline in sperm counts among Western males

<https://www.frontiersin.org/articles/10.3389/fpubh.2019.00223/full>

Levine. H. 2017 Temporal trends in sperm count: a systematic review and meta-regression analysis

<https://academic.oup.com/humupd/article/23/6/646/4035689>

Dr Anthony Miller. 2019 Risks to Health and Well-Being From Radio-Frequency Radiation Emitted by Cell Phones and Other Wireless Devices

<https://www.frontiersin.org/articles/10.3389/fpubh.2019.00223/full>

Dr Andrew Goldsworthy – wifi in schools

<http://electromagneticman.co.uk/index.php/research/77-wifi-in-schools-by-dr-andrew-goldsworthy>

Alexandrov BS et al.: “DNA Breathing Dynamics in the Presence of a Terahertz Field” (Phys.Lett A, 2010)

<https://www.sciencedirect.com/science/article/abs/pii/S0375960110000125>

P. Ben-Ishai: “Potential Risks to from Future Sub-MM Comm. Systems” EHT, Feb. 15 2017. 32 min.

<http://www.es-uk.info/wp-content/uploads/2019/07/5G-Radiation-Health-Injuries.pdf>

Arthur Firstenberg: “5G From Blankets to Bullets” (Cellular Phone Task Force, January 17 2019)

<https://scientists4wiredtech.com/what-are-4g-5g/5g-wavelengths-from-blankets-to-bullets/>

Professor M Pall: "5G: Great risk for EU, U.S. and International Health"(May 2018, 90 pages)
<https://www.radiationresearch.org/research/dr-martin-palls-latest-compilation-of-emf-medical-research-literature/>

Professor M Pall: "Dr. Martin Pall To The NIH: "The 5G Rollout Is Absolutely Insane"" (Aug. 2018, 9 min.)
<https://www.emfsa.co.za/videos/dr-martin-pall-to-the-nih-the-5g-rollout-is-absolutely-insane/>

Professor M Pall: "'Totally insane': Telecomm Industry ignores 5G dangers" (RT Am., Mar. 6 2019, 6 min)
<https://es-ireland.com/5g-5th-generation-greater-dangers/>

Belpomme D, Hardell L, Belyaev I, Burgio E, Carpenter DO, 2018: Thermal and non-thermal health effects of low-intensity non-ionising radiation. Environmental Pollution 242: 643–58.
<https://ecfsapi.fcc.gov/file/12103008105187/nonionizing%20radiation%20international%20perspective%20Belpomme%20Hardell%20Carpenter%202018.pdf>

Belyaev I, Dean A, Eger H, et al, 2016. EUROPAEM EMF guideline 2016 for the prevention, diagnosis and treatment of EMF-related health problems and illnesses. Reviews on Environmental Health 31: 363–97. [Proposes, with evidence, alternatives to ICNIRP limits]

https://www.degruyter.com/view/journals/reveh/31/3/article-p363.xml?tab_body=pdf-69320

Di Ciaula A, 2018. Towards 5G communication systems: are there health implications? International Journal of Hygiene and Environmental Health 221: 367–75.

<https://www.ncbi.nlm.nih.gov/pubmed/29402696>

4.0 c ENVIRONMENTAL DAMAGE

Environmental harm caused by the creation, distribution, installation, operation and disposal of 5G technology is inestimable.

- The amount of power required to operate the systems and manage the data is more than the aviation industry uses.
- Microwaves by their very nature create warming, and so the unbridled radiation of the atmosphere contradicts all calls to reduce 'global warming'.
- The mining of materials including lithium for batteries and back up power is very harmful.
- The harm to nature from the polarised radiation is also already well documented.

Planetary electromagnetic pollution: it is time to assess its impact

[https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(18\)30221-3/fulltext](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(18)30221-3/fulltext)

The impacts of artificial Electromagnetic Radiation on wildlife

http://www.eklipse-mechanism.eu/documents/15803/0/EMR-KnowledgeOverviewReport_FINAL_27042018.pdf/1326791c-f39f-453c-8115-0d1c9d0ec942

Russell CL, 2018. 5 G wireless telecommunications expansion: public health and environmental implications. Environmental Research 165: 484–95.

<https://www.sciencedirect.com/science/article/abs/pii/S0013935118300161>

UK press articles from 2006 to 2010

<https://www.independent.co.uk/environment/nature/electronic-smog-is-disrupting-nature-on-a-massive-scale-921711.html>

<https://www.independent.co.uk/environment/nature/are-mobile-phones-wiping-out-our-bees-5332810.html>

<https://www.independent.co.uk/environment/green-living/germany-warns-citizens-to-avoid-using-wi-fi-5329224.html>

https://www.naturalscience.org/wp-content/uploads/2015/01/kompetenzinitiative-ev_study_bees-birds-and-mankind_04-08_english.pdf

TREES

University of Surrey white paper

<https://www.surrey.ac.uk/sites/default/files/2018-03/white-paper-rural-5G-vision.pdf>

<https://phys.org/news/2010-11-dutch-wi-fi-possibly-trees.html>

Waldmann-Selsam, de la Puente, Balmori,

<https://www.ncbi.nlm.nih.gov/pubmed/27552133>

INSECTS/ AMPHIBIANS / BIRDS

Mobile phone-induced honeybee worker piping Daniel Favre

https://www.researchgate.net/publication/225679194_Mobile_phone-induced_honeybee_worker_piping?%20fbclid=IwAR0aRCXU3kTAYar_IQcJfqEsfvL4xlfV962ThNFaelyT_bjZM4lWBLhnKI

Mobile phone mast effects on common frog (*Rana temporaria*) tadpoles: the city turned into a laboratory.

<https://www.ncbi.nlm.nih.gov/pubmed/20560769>

Radio-Frequency Electromagnetic Field Exposure of Western Honey Bees (2020, Thielens, Scientific Reports)

<https://www.ncbi.nlm.nih.gov/pubmed/31949179>

Changes in honeybee behaviour and biology under the influence of cellphone radiations (Kumar, Current Science, vol. 98, no 10, 2010)

<http://media.withtbank.com/a49823b5aa.pdf>

"We have compared the performance of honeybees in cell phone radiation exposed and unexposed colonies. A significant ($p < 0.05$) decline in colony strength and in the egg laying rate of the queen was observed. The behaviour of exposed foragers was negatively influenced by the exposure, there was neither honey nor pollen in the colony at the end of the experiment."

A possible effect of Electromagnetic Radiation from Mobile Phone Base Stations on the Number of Breeding House Sparrows (*Passer domesticus*)

<https://www.ncbi.nlm.nih.gov/pubmed/17454083> (Bauwens, Electromagnetic Biology and Medicine, 2007)

Electromagnetic Fields Act Similarly in Plants as in Animals: Probable Activation of Calcium Channels via Their Voltage Sensor (2016, Pall M., Current Chemical Biology, Volume 10, Issue 1)

https://www.researchgate.net/publication/305691437_Electromagnetic_Fields_Act_Similarly_in_Plants_as_in_Animals_Probable_Activation_of_Calcium_Channels_via_Their_Voltage_Se

REPORTS OF DYING AND DISAPPEARING INSECTS AND WILDLIFE

Documenting the worldwide starvation of insects caused by microwave radiation, and the consequent starvation of birds, bats and frogs for lack of insects to eat:

Allan Hardman writes from Mexico:

"I am, like you, astounded by the silence. I also remember driving down the Central Valley of California from college to my parents' house in the '60's and stopping often to scrape and clean my windshield. That problem has now been solved -- kill the bugs! And the birds who ate them."

Andrea Mercer writes from Colorado:

"I moved to Minnesota in 2006 in the summer. I would see bats flying through the streets and swarms of insects of many species in densities I had never experienced living in Oregon. Year after year they would disappear. Minnesota was saying it was white nose syndrome blaming that on the disappearance of bats. But it was more to me. The bats didn't have food... I found deformed dragonflies that couldn't fly in Minnesota."

Rangaswami Ramakrishnan writes from India:

"In India we had sparrows which we used to call Indian Sparrows, with brown wings, and we used to see lots of them making nice noises and the whole variety is now missing in cities. There are still a few left in the villages... All due to 4G."

Eva Goedhart writes from Los Angeles:

"It kills me watching the bees die everywhere I go. There are so many of them on tennis courts and in one spot in our backyard. I can't figure out why I always see dead bees in the same spot. It makes total sense that they're starving! We pick the bees up, bring them inside, put few drops of water and honey next to them and they eat! Sometimes they're able to fly away!"

"I'm 50 years old and I grew up in Poland and remember a totally different world. Frogs, toads, hedgehogs, tons of insects. Now I live in Los Angeles and it's a true horror watching the towers popping up everywhere. Everything is slowly dying."

Karen Eichstadt writes from South Africa:

"I remember those days where the wind screens would be smeared with insects. That almost never happens anymore. We are like the frogs in the pot of water and don't even notice the temperature rising."

Sam Samson writes from Scotland:

"I'm 71 and remember the myriad of insect and bird life. Yesterday I found a bat unable to get to roost, I tried to place it in a dry safe place, very unusual in winter."

Warren Friedman writes from South Africa:

"I've been blaming EMF's for the decline in insects for over twenty years. I miss the birds and bats."

Jeanne Aymé-Martin writes from France:

"I do understand why you are so bewildered because I am too. We are very much concerned about the survival of a so low number of bees, insects, and bats in our garden and in nature in general."

Francisco Gabiola Guerra writes from Belgium:

"When I go on holidays to the town in Spain where I was born, in the past in summer you heard all the time crickets in the fields, there were butterflies in the fields, you heard birds all the time, when you went to the fields there were honey bees everywhere. Today none of that is present."

Antonia Holthuizen writes from the Netherlands:

"I live next to the woods. In May 2016, when I came to live here, there were always so many frogs on my driveway. I could hardly avoid them with my bike, there were that many. But in the last two years, I may be glad to see one, maybe two. One dragged itself to my doorstep. I talked to him, but didn't know how to help him. Next time I will pick him up and bring him to the woods where I, myself, can't feel the radiation anymore, and see if this might help him."

"Last year I also saw bumblebees stumbling across my lawn. I let one crawl over my hand, what a beautiful creature, wonderful. But I couldn't help them. They died. It became a bumblebee cemetery. Later I realised that they would die exactly there where I myself also suffered from the two masts, hidden in the church tower in the village."

Connie Drummond writes from the UK:

"Insects have gone, small birds are not in the trees and we are left with a few kestrels and kites who, too, are starving and just circling the skies desperate for grub like vultures."

Patricia Ormsby writes from Japan:

"5G got switched on in late February. Five days ago I noticed that the black kites (Milvus migrans) that used to roost around our vegetable field, that left our field when smart meters were installed but moved on to fields further away with no smart meters, have now fled those fields entirely. Totally empty sky, but lots and lots of ground birds in those fields. What kites still remain have moved to the forests. Each time I have gone out I have seen one or two kites attempt to fly out over the fields and then give up."

Angela Foulds writes from Australia:

"In Melbourne millimetre wave trials across 25% of the city just began. This morning, on my walk with a neighbour we were mortified to see dead bees and insects on the ground throughout our hour long walk, all the way to a nature park and all along the streets back home."

4.0 d RECENT EPIDEMIOLOGIC NEURO STUDIES – INFRASTRUCTURAL RADIATION

Mobile Phone Base Station Tower Settings Adjacent to School Buildings: Impact on Students' Cognitive Health. *American Journal of Men's Health.*

Meo, S. A., Almahmoud, M., Alsultan, Q., Alotaibi, N., Alnajashi, I., & Hajjar, W. M. (2018)

High exposure to RF-EMF produced by mobile phone base station towers was associated with delayed fine and gross motor skills, spatial working memory, and attention in school adolescents compared to students who were exposed to low RF-EMF.

Neurobehavioral effects among inhabitants around mobile phone base stations Abdel-Rassoul et al, *Neurotoxicology*, 2007

This study found that living nearby mobile phone base stations (cell antennas) increased the risk for neuropsychiatric problems such as headaches, memory problems, dizziness, tremors, depression, sleep problems and some changes in the performance of neurobehavioral functions.

Health effects of living near mobile phone base transceiver station (BTS) antennae: a report from Isfahan, Iran. Shahbazi-Gahrouei et al, *Electromagnetic Biology Medicine*, 2013.

This cross-sectional study found the symptoms of nausea, headache, dizziness, irritability, discomfort, nervousness, depression, sleep disturbance, memory loss and lowering of libido were statistically increased in people living closer than 300 m from cell antennas as compared to those living farther away. The study concludes that "antennas should not be sited closer than 300 m to people to minimize exposure.

Bortkiewicz et al, 2004 (Poland), Subjective symptoms reported by people living in the vicinity of cellular phone base stations: review, Med Pr.2004;55(4):345-51.

- Residents close to mobile phone masts reported: more incidences of circulatory problems, sleep disturbances, irritability, depression, blurred vision and concentration difficulties the nearer they lived to the mast.
- The performed studies showed the relationship between the incidence of individual symptoms, the level of exposure, and the distance between a residential area and a base station.
-

Wolf R and Wolf D, Increased Incidence of Cancer Near a Cell-phone Transmitter Station, *International Journal of Cancer Prevention*, (Israel) VOLUME 1, NUMBER 2, APRIL 2004

- A significant higher rate of cancer (300% increase) among all residents living within 300m radius of a mobile phone mast for between three and seven years was detected.
- 900% cancer increase among women alone
- In the area of exposure (area A) eight cases of different kinds of cancer were diagnosed in a period of only one year.
This rate of cancers was compared both with the rate of 31 cases per 10,000 per year in the general population and the 2/1222 rate recorded in the nearby clinic (area B). The study indicates an association between increased incidence of cancer and living in proximity to a cell-phone transmitter station.

Investigation on the health of people living near mobile telephone relay stations: Incidence according to distance and sex Santini et al, 2002, *Pathol Bio*

People living near mobile phone masts reported more symptoms of headache, sleep disturbance, discomfort, irritability, depression, memory loss and concentration problems the closer they lived to the installation. Study authors recommend that the minimal distance of people from cellular phone base stations should not be < 300 m.

Navarro EA, Segura J, Portoles M, Gomez-Perretta C, The Microwave Syndrome: A preliminary Study. 2003 (Spain) *Electromagnetic Biology and Medicine*, Volume 22, Issue 2, (2003): 161 – 169

6. Statistically significant positive exposure-response associations between RFR intensity and fatigue, irritability, headaches, nausea, loss of appetite, sleeping disorder, depressive tendency, feeling of discomfort, difficulty in concentration, loss of memory, visual disorder, dizziness and cardiovascular problems.

Oberfeld, A.E. Navarro, M. Portoles, C. Maestu, C. Gomez-Perretta, The microwave syndrome: further aspects of a Spanish study

A health survey was carried out in La Ñora, Murcia, Spain, in the vicinity of two GSM 900/1800 MHz cellular phone base stations. The adjusted (sex, age, distance) logistic regression model showed statistically significant positive exposure-response associations between the E-field and the following variables: fatigue, irritability, headaches, nausea, loss of appetite, sleeping disorder, depressive tendency, feeling of discomfort, difficulty in concentration, loss of memory, visual disorder, dizziness and cardiovascular problems.

Significant Decrease of Clinical Symptoms after Mobile Phone Base Station Removal – An Intervention Study) Tetsuharu Shinjyo and Akemi Shinjyo, 2014 Umwelt-Medizin-Gesellschaft, 27(4), S. 294-301.

Japanese study Showed Statistically Significant Adverse Health Effects from electromagnetic radiation from mobile phone base stations. Residents of a condominium building that had cell tower antennas on the rooftop were examined before and after cell tower antennas were removed. In 1998, 800MHz cell antennas were installed, then later in 2008 a second set of antennas (2GHz) were installed. Medical exams and interviews were conducted before and after the antennas were removed in 2009 on 107 residents of the building who had no prior knowledge about possible effects. These results lead researchers to question the construction of mobile phone base stations on top of buildings such as condominiums or houses.

Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations Hutter HP et al, (May 2006), Occup Environ Med. 2006 May;63(5):307-13

Found a significant relationship between some cognitive symptoms and measured power density in 365 subjects;
highest for headaches. Perceptual speed increased, while accuracy decreased insignificantly with increasing exposure levels.

HORMONAL EFFECTS:

Changes of Neurochemically Important Transmitters under the influence of modulated RF fields – A Long Term Study under Real Life Conditions (Germany), Bucher and Eger, 2011

German study showing elevated levels of stress hormones (adrenaline, noradrenaline), and lowered dopamine and PEA levels in urine in area residents during 1st 6 months of cell tower installation. Even after 1.5 years, the levels did not return to normal.

How does long term exposure to base stations and mobile phones affect human hormone profiles?
Eskander EF et al, (2011), Clin Biochem

11. RFR exposures significantly impacted ACTH, cortisol, thyroid hormones, prolactin for females, and testosterone levels for males.

GENETIC EFFECTS:

A cross-sectional case control study on genetic damage in individuals residing in the vicinity of a mobile phone base station. Ghandi et al, 2014 (India):

This cross-sectional case control study on genetic damage in individuals living near cell towers found genetic damage parameters of DNA were significantly elevated. The authors state, "The genetic damage evident in the participants of this study needs to be addressed against future disease-risk, which in addition to neurodegenerative disorders, may lead to cancer."

Effect of GSTM1 and GSTT1 Polymorphisms on Genetic Damage in Humans Populations Exposed to Radiation from Mobile Towers. Gulati S, Yadav A, Kumar N, Kanupriya, Aggarwal NK, Kumar R, Gupta R., Arch Environ Contam Toxicol. 2015 Aug 5. [Epub ahead of print]

In our study, 116 persons exposed to radiation from mobile towers and 106 control subjects were genotyped for polymorphisms in the GSTM1 and GSTT1 genes by multiplex polymerase chain reaction method. DNA damage in peripheral blood lymphocytes was determined using alkaline comet assay in terms of tail moment (TM) value and micronucleus assay in buccal cells (BMN). Our results indicated that TM value and BMN frequency were higher in an exposed population compared with a control group and the difference is

significant. In our study, we found that different health symptoms, such as depression, memory status, insomnia, and hair loss, were significantly associated with exposure to EMR. Damaging effects of nonionizing radiation result from the generation of reactive oxygen species (ROS) and subsequent radical formation and from direct damage to cellular macromolecules including DNA.

5.0 CRITIQUES OF EXPOSURE GUIDELINES, AND CALLS TO ACCOUNT

5.01 Alarming, NO known telecoms industry studies or research have been conducted on the adverse effects of Radio Frequency - Electro Magnetic Fields (RF-EMF) from 5G technology. Many military studies have been undertaken since 1950s however, see **Navy Medical Research Institute** Military Microwave Report

https://www.magdahavas.com/wp-content/uploads/2011/06/Glaser_1972_shortened.pdf

5.02 PHE (Public Health England), WHO (World Health Organisation), ICNIRP (International Commission on Non-Ionizing Radiation Protection) and other such bodies are all quoting outdated research and all have legal disclaimers relieving them of any liability for the information on their websites. PHE are a government body, and the government have a vested interest in 5G and its infrastructure. This constitutes a conflict of interest for PHE.

5.03 As recently as 13th January 2020 an Appeal Court in Turin refused to accept evidence from ICNIRP in a ruling on the cause of a brain tumour because of conflicts of interest (link). The Court did not consider ICNIRP to be a reliable witness.

5.04 Other countries unilaterally set public exposure guidelines up to 100x lower than the ICNIRP ones.

<https://slt.co/Downloads/Education/RF-ExposureGuidelines-International.pdf>

Late Lessons from Early Warnings: Towards realism and precaution with EMF? Gee. D. 2009

<https://www.sciencedirect.com/science/article/abs/pii/S092846800900008X>

ICNIRP Guidelines: Unscientific and Not Protective Michael Bevington (2019)

<http://www.es-uk.info/wp-content/uploads/2020/02/03.11-ICNIRP-Guidelines-Unscientific-and-Not-Protective.pdf>

IARC / WHO class2B

https://www.iarc.fr/wp-content/uploads/2018/07/pr208_E.pdf

ICNIRP's opinion and guidelines are unscientific and protect industry, not public health

<https://www.emfcall.org/the-emf-call/>

Carpenter DO, Hardell L, Moskowitz JM, Oberfeld G.

Evidence to parliament Dr Sarah Starkey

[https://cdn.website-](https://cdn.website-editor.net/2479f24c54de4c7598d60987e3d81157/files/uploaded/Early_Years_Inquiry_EY10062.pdf)

[editor.net/2479f24c54de4c7598d60987e3d81157/files/uploaded/Early_Years_Inquiry_EY10062.pdf](https://cdn.website-editor.net/2479f24c54de4c7598d60987e3d81157/files/uploaded/Early_Years_Inquiry_EY10062.pdf)

Starkey S. Inaccurate official assessment of radiofrequency safety by the Advisory Group on Non-Ionising Radiation. *Reviews on Environmental Health* 2016; 31: 493–503.

<https://www.ncbi.nlm.nih.gov/pubmed/27902455>

Hardell, L. (2017) 'World Health Organization, radio frequency radiation and health - a hard nut to crack (Review)', *International Journal of Oncology* 51: 405-413, 2017 (DOI: 10.3892/ijo.2017.4046).

<https://www.ncbi.nlm.nih.gov/pubmed/28656257>

Hardell, L. (2020) Appeals that matter or not on a moratorium on the deployment of the fifth generation, 5G, for microwave radiation

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7016513/>

On MW radiation: Danish Legal opinion on the 5G roll out. Jensen, F.C. (2019) 'LEGAL OPINION on whether it would be in contravention of human rights and environmental law to establish the 5G-system in Denmark'

<https://midsafetech.files.wordpress.com/2019/07/5g-danish-legal-opinion-jensen-2019.pdf>

IARC CLASSIFICATION UPGRADE RECOMMENDATION

<https://multerland.wordpress.com/2020/01/27/former-icnirp-member-advocates-that-wireless-must-get-a-more-stringent-cancer-risk-class/>

ITRE report unpredictable signals not tested for real life

[https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/631060/IPOL_IDA\(2019\)631060_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/631060/IPOL_IDA(2019)631060_EN.pdf)

Nasim, I. and Kim, S. (2017) 'Human Exposure to RF Fields in 5G Downlink', IEEE International Communications Conference (Georgia Southern University) (arXiv.1711.03683).

ICNIRP warning

<https://web.archive.org/web/20191114060540/https://www.icnirp.org/en/frequencies/high-frequency/>

"To avoid hazards to health and prevent adverse interaction with high frequency fields (i.e. to prevent whole-body heat stress and excessive localized heating), ICNIRP recommends limiting the exposure to HF so that the threshold at which these interactions become detrimental is never reached.

Dr Martin Pall Response to ICNIRP guidelines

http://www.5gappeal.eu/wp-content/uploads/2018/10/icnirp_2018_pall.pdf

Michael Bevington of ES-UK exposes serious flaws in the WHO and ICNIRP's claims on health, 5G and RF wireless radiation. 9pp

<http://www.es-uk.info/wp-content/uploads/2019/10/03.6-Serious-flaws-in-the-WHO-ICNIRP-claims-on-5G-and-RF-wireless-radiation.pdf>

Michael Bevington of ES-UK rebuts ICNIRP's claims on mobile phone safety. 3pp

<http://www.es-uk.info/wp-content/uploads/2019/10/03.8-Critique-of-ICNIRPs-defence-of-Mobile-Phones.pdf>

Lack of Safety Testing 5G– Senator Blumenthal

<https://www.jrseco.com/u-s-senator-blumenthal-raises-concerns-on-5g-wireless-technologys-potential-health-risks/>

ITRE report unpredictable signals not tested for real life

[https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/631060/IPOL_IDA\(2019\)631060_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2019/631060/IPOL_IDA(2019)631060_EN.pdf)

Nasim, I. and Kim, S. (2017) '**Human Exposure to RF Fields in 5G Downlink**', IEEE International Communications Conference (Georgia Southern University) (arXiv.1711.03683)

<https://arxiv.org/abs/1711.03683>

6.0 LIABILITY ISSUES AND LEGAL DUTIES OF THE COUNCIL

6.01 Council Constitutions generally require all decisions of the Council to be made in accordance with the following principles:

- (a) taking into account **all relevant** considerations and ignoring all irrelevant considerations (i.e. the 'Wednesbury' principle)
- (b) compliance with the **European Convention on Human Rights (ECHR)**
- (c) The **ICNIRP guidelines (2002)** require you to make a balanced judgement regarding health effects. (see 3.3.1)
- (d) by restricting yourselves to the **PHE** guidelines you are failing to consult "other sources" and are also failing to consider the best available scientific evidence, contrary to **NPPF** guidance.

6.02 s.11 of The Health & Social Care Act 2012 defines a duty to protect public health, specifically including "(3) Subsection (4,a) the protection of the public from ionising or non-ionising radiation. "

Furthermore, each local authority must take 'such steps as it considers appropriate for improving the health of the people in its area'.

6.03 The Universal Declaration of Human Rights. Article 3 embodies a fundamental human right. "... the right to freedom from bodily harm is second only to the right to life and is equally based on the right which all people have a level of basic respect and dignity as human beings," (Hoffman & Rowe 2010).

6.04 Public Health Act 1936. Nuisance and inevitable injury. In most situations there is no cause for inevitable injury where alternatives are available. Parliament does not permit such infringement and so it must be avoided.

6.05 A local authority also has obligations as an employer to its workers under the health and safety at work legislation, particularly **The Control of Electromagnetic Fields at Work Regulations 2016 (CEMFAW)**.

Council workers work in public places and will be working where there is 5G radiation. This will be particularly likely in town centres and other high footfall locations that will see a higher concentration of small cells on street furniture.

6.06 HSE at Work Act 1974. "places duties on people in control of premises (landlords, tenants etc), both to ensure that people can use the premises without risks to their health or safety and to control exposure to electromagnetic radiation, and any "noxious or offensive substances" from being released into the atmosphere and that a suitable and sufficient risk assessment must be conducted "before you do work which presents a risk of injury or ill health."

6.07 Although as a radio frequency (RF) emission, 5G radiation is nominally classed as 'non- ionising', it has been shown to be indirectly ionising in effect through a separate biochemical pathway. Arguably therefore **Directive 2013/59/Euratom** would apply as it is not limited to radiation from nuclear sources and explicitly covers 'non-directly ionising radiation'. The Directive sets limits for occupational exposure including the age limit for occupational exposure being set to 18 years, and the limit for an unborn child is 'preferably zero'.

6.08 To ignore the needs of EHS (electrosensitivity) sufferers or expectant mothers in the context of 5G would constitute a breach of the public equality duty under **s.149 of the Equality Act**.

6.09 The use of the **Precautionary Principle** is enshrined in European law that will continue past Brexit. The European Environment Agency has recommended its use based on past experience, including failure to act on hazards. The Council of Europe, a wider body than the EU, ditto. In the context of 5G technology, this would prescribe a moratorium (halt) on the rollout unless and until it was objectively proven safe.

The PP is defined as follows: "When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm."

Appropriate: actions taken now to avoid plausible and potentially more serious threats to health from EMF are likely to be seen as prudent and wise ...” Professor Jacqueline McGlade, Executive Director of the European Environment Agency (2003-2013) (EEA 2007).

Qualification: when using the Precautionary Approach, that the science pertaining to dm, cm and mm microwave radiation is established with cause-and-effect relationship - especially such radiation that is pulse-modulated for data carriage, and particularly where deployed in close proximity to sensitive locations like homes, schools and healthcare facilities; in unending duration and with an extremely high-level complexity of multiple, simultaneously interacting signals; and involuntarily upon the entire population including vulnerable human subgroups, and highly vulnerable nonhuman species.

Appropriate: to invoke the **Prevention Principle** which in the same EU Treaty is also in place to deal with known, largely uncontested, scientifically based evidence of harm (eg smoking/lung cancer, post 1964). Where the evidence of harm, in this case from EMR, is established by the majority of independent peer reviewed studies (see 5.10), the **Prevention Principle** must lawfully be applied by minimizing risks including exposure wherever it is possible by using a hardwired system.

6.10 Danish attorney-at-law Christian F. Jensen has reviewed aspects of compliance with **environmental and human rights law**. The European Convention on Human Rights, as given force by the UK Human Rights Act, upholds the right to respect for private and family life

<https://midsafetech.files.wordpress.com/2019/07/5g-danish-legal-opinion-jensen-2019.pdf>

There are dozens of key studies in this report showing damage to the ecosystem that is caused by EMF. If you ignore those and proceed with 5G then you will damage the ecosystem and thus break both the **Environmental Protection Laws** and **NPPF guidance** to use the best available science.

6.11 The council should check its **liability cover** as insurance companies will not insure against harm caused by electromagnetic fields (EMFs). The ICNIRP and PHE guidelines do not provide safety assurances which can be relied upon for liability purposes.

Swiss Re in their Emerging Risks Report (May 2019)

<https://www.swissre.com/institute/research/sonar/sonar2019/SONAR2019-off-the-leash.html>

"To allow for a functional network coverage and increased capacity overall, more antennas will be needed, including acceptance of higher levels of electromagnetic radiation. In some jurisdictions, the rise of threshold values will require legal adaptation. Existing concerns regarding potential negative health effects from electromagnetic fields (EMFs) are only likely to increase. An uptick in liability claims could be a potential long-term consequence... Other concerns are focused on cyber exposures, which increase with the wider scope of 5G wireless attack surfaces. Traditionally IoT devices have poor security features. Moreover, hackers can also exploit 5G speed and volume, meaning that more data can be stolen much quicker."

6.12 Nuremberg Code: to carry out compulsory mass exposure to pulsed microwave radiation without the fully informed consent of the people affected is in contravention of the Nuremberg code. Former ICNIRP Chairman Eric Van Rongen is on record admitting that the continuous exposure of the population to ever increasing levels of RF radiation without relevant safety standards could indeed be called an experiment on humanity. Where there is known harm to a vulnerable group of people then to proceed regardless with exposing them 24/7 to the harmful agent is in breach of this Code of ethics.

6.13 ISO compliance: A Non Compliance Report may be issued against ISO Standards: ISO 9001 (Quality) or the equivalent TL 9000, ISO 14001 (Environment) and ISO 18001 (Health and Safety) where these standards are named in any contract the Council has with companies supplying wireless equipment.

- The NCR can request an examination of the evidence for harmful effects of EMR, as outlined in the Appendices, and a report on risk analysis and mitigation could then be secured from suppliers of wireless and 5G equipment.
- The NCR is issued to ensure that EMR emitting equipment, installations and services are used only after the **Precautionary Principle** has been applied to ensure that all risks to human health and environmental impacts of EMR emitting technologies are addressed during ‘test-to-pilot’ stages and prior to subsequent deployments.

- Due to predictable harm, these risks warrant the adoption of the precautionary principle, and its application to risk assessments re: human health, the health of other living organisms, and to the wider environment, to assure the suitability of all EMR emitting equipment before use.
- Service providers are contractually obliged to comply with ISO standards. This is a way Councils Liability and Duty of Care responsibilities can be addressed.
- The NCR, if issued, raises vital questions concerning the functionality of ICNIRP guidelines used by Public Health England (PHE) to avert the risks that EMR emitting equipment poses to human health and welfare.

6.14 You must not proliferate statutory nuisances in breach of the **Environmental Protection Act 1990** by virtue of s. 79(d) and (e)

S. 79(d) identifies a pollutant at “any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance;”. Section 79(e) identifies it as “any accumulation or deposit which is prejudicial to health or a nuisance”.

Electromagnetic frequencies used by 5G are an “effluvia” and an “accumulation” and so caught by these words, are a nuisance and so caught by the Act. Your failure to prevent this environmental pollution has endangered the population in breach of this Act.

6.15 You are bound by your **Public Sector Equality Duty under s. 149 of the Equality Act.**

Equality Impact Assessments must be undertaken before permitting the installation of infrastructure. You cannot rely solely on the ICNIRP’s exposure guidelines, which are not safe for persons who are electro-hypersensitive or who have become disabled because of such radiation.

7.0 VIDEO PRESENTATIONS

Boris Johnston speech to the United Nations General Assembly – 17 minutes

<https://youtu.be/XaN-MbGV4dY>

Official Government transcript of the speech

<https://www.gov.uk/government/speeches/pm-speech-to-the-un-general-assembly-24-september-2019>

Former president Microsoft Canada, Frank Clegg on 5G, Wireless Tech and Safety - 10 minutes

<https://www.youtube.com/watch?v=DIV39-KOzh0>

Brigadier-General, The Threat of 5G - 9 minutes

<https://www.youtube.com/watch?v=AGkU7HmAAAc&t=222s>

Dr Martin L Pall about 5G, EMF, ICNIRP - 18 minutes

<https://youtu.be/QSkHBdVaPtI>

Wireless wake-up call, **Jeromy Johnson**, TEDxBerkeley – 17 minutes

<https://youtu.be/FONEaPTu9oI>

Why Wi-Fi Is So Harmful to Our Health, **Dafna Tachover** – 5 minutes

https://youtu.be/_qg0H63GLkU

"We Are The Evidence" Testimony to the FCC Disability Committee on Wireless Radiation Harms – 5 minutes

https://youtu.be/_qg0H63GLkU

Martha Herbert, Harvard Pediatric Neurologist on Electromagnetic Radiation, Autism and Brain Development May 2016 – 6 minutes

<https://youtu.be/BiybO08af58>

Dr Devra Davis Lecture - The truth about mobile phone and wireless radiation – Abridged 7 minutes

<https://youtu.be/yYDmlq-nTn4>

Dr Devra Davis Lecture - The truth about mobile phone and wireless radiation – full lecture 61 minutes

<https://youtu.be/BwyDCHf5iCY>

BBC Panorama WiFi Warning Signal featuring Sir William Stewart – 30 minutes

https://youtu.be/_k5gnA-PeXc

Dr Erica Mallery-Blythe Post interview - Electromagnetic radiation & 5G – 5 minutes

<https://www.youtube.com/watch?v=gTPt1Mu3x6Q>

Microwave warfare expert Jerry Flynn on 5G and EMF's – 70 minutes.

https://www.youtube.com/watch?v=6N_KHxDnfgQ

Generation Zapped – multi award winning documentary 2014 – 52 minutes

<https://youtu.be/Ozf4Vwg7qYA>

Resonance Beings of Frequency – 88 minutes

<https://youtu.be/FttrOK1ec4Q>

A Child Testifies to Microwave Illness from Wifi in Schools – 5 minutes

<https://youtu.be/oQugpEcxLDY>

The 5G Trojan Horse (Documentary) – 73 minutes

https://youtu.be/xJ07BhcM5_4

8.0 KEY INFORMATIVE WEBSITES

Aachen University EMF portal – archive of 1000's of studies
<https://www.emf-portal.org/en>

Physicians for Safe Technology
<https://mdsafetech.org>

Environmental Health Trust
<https://ehtrust.org/>

Powerwatch UK
<https://www.powerwatch.org.uk>

Radiation Research Trust
<https://www.radiationresearch.org>

Physicians' Health Initiative for Radiation and Environment
<http://phiremedical.org>

ES-UK
<http://www.es-uk.info/information/>

EMF scientist appeal and resource
<https://www.emfscientist.org>

Safe Schools Information Technology Alliance
<https://ssita.org.uk>

Fibre Action for Safer Telecoms Technology
<https://www.fastt.org.uk>

Electromagnetic Radiation Safety
<https://www.saferemr.com>