

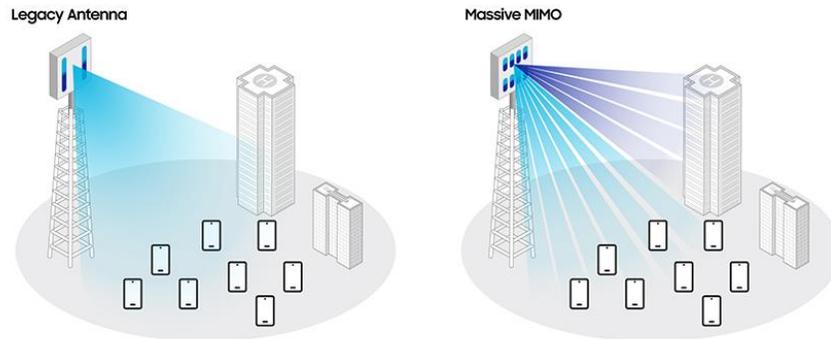
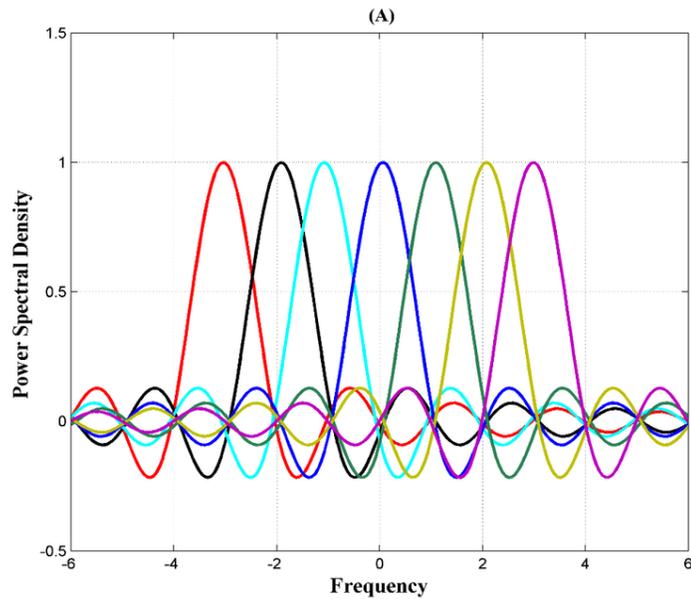
DOES 5G POSES HEALTH RISK TO HUMAN LIFE ?

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Zététique

Overview of 5G technology

Is a new cellular network communication standard based in a OFDM (orthogonal frequency division multiplexing) and MIMO (multiple input multiple output).



Taken from: <https://www.5gamericas.org/samsung-shares-massive-mimo-roadmap-in-new-whitepaper/>

Taken from: https://www.researchgate.net/figure/Multi-carriers-of-OFDM-signal-20_fig2_321278034

Initial review findings

Widely divergent opinions in a quick search in IEEE and googlescholar.

First question that arises is how to know if a journal is trusted enough to be used as a reference?

Preliminary analysis

A unique doubtful source could be “filtered”



5G: Understanding Health Risks

Professor Tom Butler

What does science have to say about the health risks of 5G Technology?

The World Health Organization (WHO) classifies non-ionizing radiofrequency radiation (RFR) as a possible human carcinogen. It is, therefore, incredible that not a single, peer-reviewed, scientific study has been carried out on the health risks associated with 5G technologies that emit low frequency (700MHz), high frequency (3.4-3.8 GHz, centimetre (CM)) or extremely high frequency millimeter (MM) (26 GHz and above) RFR. Neither the telecommunications industry, nor the World Health Organization (WHO), nor the International Commission on Non-ionizing Radiation Protection (ICNIRP),

headache, irritability, fatigue, concentration difficulties, depression, dizziness, tinnitus, burning and flushed skin, digestive disturbance, tremor, cardiac irregularities,

- *adverse impacts on the neural, circulatory, immune, endocrine, and skeletal systems.”*

What is the scientific consensus on health risks?

It is significant that the vast majority of independent original experimental and epidemiological research studies and scientific review papers identify the health effects documented above (cf. Belpomme et al. 2018; Belyaev et al. 2016; Miller et al., 2018; for examples of the latter). In addition, following its own extensive empirical research on 2-3G radiation, which identifies clear evidence that RFR is carcinogenic (Lin, 2019), the US National Institute of Environmental Health Sciences' National Toxicology Program (NTP) is investigating whether 5G poses similar risks to human health (National Toxicology Program, 2018b). Inter

A crowdfunding legal case attempting to stop the rollout of 5G has been blocked by a judge.

But the group behind it, which has raised more than £160,000, has said it will continue its battle to try to obtain a judicial review.

The lawyers behind the case, including human rights barrister Michael Mansfield QC, have been involved together in other crowdfunded cases, so far without successful outcomes for their clients.

The case raises questions about the nature of crowdfunded legal action as well as the debate over 5G, which mainstream scientists believe poses no greater risk to health than other wireless technologies.

Overall doing this kind of filtering was assessed difficult.

Preliminary analysis

It comes as to be seen that two different positions are given of 5G health effects.

A rather superficial study suggests that engineering papers placed 5G as safe, while medical papers called for further studies or inconclusive results.

5G Favorable studies

15th (IEEE) International Conference on Industrial and Information Systems (ICIIS) 2020

Debunking the Fabricated Myths Around 5G

In the light of discussions carried out above, it is safe to conclude that 5G is a technological advancement for good. 5G services require antenna towers installment because buildings, trees or hills may block the high-frequency 5G signals because the signals do not penetrate. 5G has been placed as being as carcinogenic for human beings as pickled vegetables, that tells a lot about the adverse effects of 5G radiation of human health! The penetration of radiation in human body with increase in frequency is minimal; hence biological changes are next to impossible to occur.

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Health Risks Associated With 5G Exposure: A View From the Communications Engineering Perspective

We have performed an in-depth analysis of the health risks associated with 5G exposure by adopting the perspective of 5G communications engineering. Initially, we have concentrated on the health effects, by analyzing the central allegations of diseases linked to 5G exposure and by investigating the false claims and hoaxes. Besides, we have applied key concepts of communications engineering to review recent animal-based studies, demonstrating that the claimed health effects about the carcinogenicity of RF radiation can not be applied to 5G gNBs and 5G UE. Moreover, we have examined the population-based studies relevant to 5G, showing that their methodologies have to be deeply revised when considering 5G communications.

5G Favorable studies

The Covid-19 Pandemic and 5G Cellular Telecommunication Systems

While many of these investigations with mm-wave exposures reported biological responses, there is inconsistency in the dependence of biological effects and mm-wave intensity used for exposure. The number of reported in vitro and in vivo laboratory investigations were also modest and diverse, considering the wide 5G mm-wave frequency domain. The jury on biological effects or health impact is still out on 5G. Moreover, there is a lack of ongoing controlled laboratory investigations. **Simply put, the existing scientific data is inadequate for any reliable assessment or conclusion with confidence.**

5G Technology: Which Risks From the Health Perspective?

In this chapter, we discussed five main allegations regarding the potential health effects due to the EMFs generated by 5G radio base stations. **By reviewing the relevant scientific documentations, we could not find evidences of carcinogenicity associated with an EMF exposure below the limits set by the applicable Italian laws.** In addition, we clarified that an increase in the number of 5G radio base stations would only allow to steadily decrease the power (and consequently the EMFs) generated by each base station, while preserving the received signal strength (hence quality of communication) over the territory. In all cases, given the current regulations on EMF limits and the presence of pre-5G sites, we do not expect that 5G will bring to a huge proliferation of new radio base stations.

5G Favorable studies

Health Effects of 5G Base Station Exposure: A Systematic Review

- Most of the studies in literature using 2G/3G/4G showed no effects and no consistency in how exposure to these signals affected the cognitive, physiological parameters, well-being, and EEG of the volunteers.
- There is an absence of studies reporting the effects of 5G (700 MHz, 3.5 GHz, or 28 GHz) BS signals on adults in terms of cognitive performance, well-being, or physiological markers (heart rate, blood pressure, and body temperature).

Doubts for 5G in the literature

Health Council of the Netherlands and evaluation of the fifth generation, 5G, for wireless communication and cancer risks

In conclusion regarding cancer, current scientific evidence clearly demonstrates an increased risk for glioma and acoustic neuroma for use of mobile and/or cordless phones. In this review other tumor types and health endpoints are not discussed. The increased risk for brain and head tumors is based on human cancer epidemiology studies and is supported by similar tumor types found in animal studies. In fact, these animal studies confirmed the earlier results in case-control studies on increased tumor risk for use of wireless phones (both mobile and cordless phones). Mechanistic aspects on carcinogenesis come from laboratory findings on, *e.g.*, the increase of reactive oxygen species[5] and DNA damage[4].

Towards 5G communication systems: Are there health implications?

Evidences about the biological properties of RF-EMF are progressively accumulating and, although they are in some case still preliminary or controversial, clearly point to the existence of multi-level interactions between high-frequency EMF and biological systems, and to the possibility of oncologic and non-oncologic (mainly reproductive, metabolic, neurologic, microbiologic) effects.

Doubts for 5G in the literature

5G wireless deployment and health risks: Time for a medical discussion in Australia and New Zealand

declare moratoria on 5G deployment and to begin investigations. In contrast, there is no medically-oriented professional discussion on this public health topic in Australia and New Zealand, where 5G deployment is being expedited. 5G is untested for safety on humans and other species and the limited existing evidence raises major concerns that need to be addressed. The vast body of research literature on biological/health effects of 'wireless radiation' (radiofrequency EMR)^{3,4} indicates a range of health-related issues associated with different types of wireless technologies (1G-4G, WiFi, Bluetooth, Radar, radio/TV transmission, scanning and surveillance systems). These are used in a wide range of personal devices in common use (mobile/ cordless phones, computers, baby monitors, games consoles etc) without users being aware of the health risks. Furthermore, serious safety concerns arise from the extra complexity of 5G.

Adverse health effects of 5G mobile networking technology under real-life conditions

Wireless radiation offers the promise of improved remote sensing, improved communications and data transfer, and improved connectivity. Unfortunately, there is a large body of data from laboratory and epidemiological studies showing that previous and present generations of wireless networking technology have significant adverse health impacts. Much of this data was obtained under conditions not reflective of real-life. When real-life considerations are added, such as 1) including the information content of signals along with 2) the carrier frequencies, and 3) including other toxic stimuli in combination with

the wireless radiation, the adverse effects associated with wireless radiation are increased substantially. Superimposing 5G radiation on an already imbedded toxic wireless radiation environment will exacerbate the adverse health effects shown to exist. Far more research and testing of potential 5G health effects under real-life conditions is required before further rollout can be justified.

World Health Organization take on 5G

What are the potential health risks from 5G?

To date, and after much research performed, no adverse health effect has been causally linked with exposure to wireless technologies. Health-related conclusions are drawn from studies performed across the entire radio spectrum but, so far, only a few studies have been carried out at the frequencies to be used by 5G.

What can be concluded

Lack of consensus, not a specific opinion will be taken regarding this issue, however a possible explanation as to why the lack of consensus can be explained as:

- Two different fields are being confronted in a same subject, there is lack of a standardization of analysis, meaning that each fields has different standards for quantabilizing data.
- Terminology that might not be reciprocal or completely understood in each field, opening a field for controversy.
- Both positions argued incorrect data analysis and treatment without really deepening this question. A correct peer-reviewed analysis should interrogate further this alleged faults.

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