

FACT-CHECK 5G & HEALTH

IN BRIEF

- Electromagnetic fields have already been considered a potential health risk with previous generations of mobile radio communication. In 2011, the International Agency for Research on Cancer (IARC) classified mobile phone radiation as “possibly carcinogenic”. To this day, experts continue to discuss this topic with much controversy.
- 5G, the latest generation of mobile phone networks, promises to transmit larger amounts of data with lower latency. Industry 4.0, augmented reality games or the Internet of things rely on such higher performance.
- The assessment of risks and gaps of knowledge enables precautionary regulation and a prudent approach to 5G.

WHAT IS IT ABOUT?

Mobile radio communication enables the wireless transmission of data via high-frequency electromagnetic radiation. It has been in use in mobile telephony for over 20 years. In order to enable increasingly faster transmission of data, the technology used for this purpose is continuously being refined. Today, we are talking about a first (analogue), a second (GSM), a third (UMTS), and a fourth (LTE) generation of mobile radio communication.

In the course of digitalisation, faster data transmission and lower latency have become the focus for Industry 4.0, digital gaming or the Internet of things. It is these promises that have been fuelling the development of a fifth generation of mobile communication.

5G is based on existing technologies. Innovations include a different transmission system (MIMO: use of multiple-input and multiple-output antennas), directional signal transmission or reception (beamforming), and the use of other frequency ranges. The rollout of 5G is currently underway throughout Europe, including Austria. It is undertaken in various stages. How and for what purpose 5G will ultimately be used is not yet clear, but still developing. Large companies in the automotive industry in Germany, for example, are planning to use 5G at specific production sites to improve the networking of individual industrial robots in production. A nationwide 5G network is also being called for to allow for other applications; however, at present, there are only speculations as to what these could entail. An Internet of things could digitally connect household appliances; lower latency enables new applications in the context of augmented reality games.



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The automotive industry already believes in 5G.

At the same time, resistance is forming within the population and amongst some health experts. Possible health risks and uncertainties pertaining to high-frequency electromagnetic fields of mobile networks of all generations fuel an ongoing controversy. Whereas the risk of tissue heating has been recognised by all experts, and is to be limited to a maximum of 1 °C according to set safety limits, a unanimous risk assessment concerning non-thermal effects is still pending.

BASIC DATA

Project title:	5G-Mobilfunk und Gesundheit
Project team:	ITA: Kastenhofer, K., Mesbahi, Z., Schaber, F., Nentwich, M.; AIT: Wasserbacher, D., Weber, M.
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KEY RESULTS

14 internationally recognised scientific committees have reached the following agreement on non-thermal health risks of electromagnetic fields of mobile radio communication:

For established generations of mobile radio communication there is consensus that scientifically easily detectable (acute, short-term and frequent) health effects can be excluded if limits on exposure levels are met. There is also a consensus regarding the existence of gaps of knowledge, necessitating further research.



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Experts are divided, the population is worried.

However, there is no consensus amongst experts on a large number of risk hypotheses that are difficult to investigate. These range from impaired quality of sleep to neuronal disorders and cancer, particularly in the area of the head due to greater exposure. The International Agency for Research on Cancer (IARC) thus classified mobile phone radiation in 2011 as “possibly carcinogenic”. The discussion about the health risks of 5G is currently focusing on high frequency ranges in the millimetre wave range (26 GHz and above) that may be used in the future. In particular, there is a call for more research into risk hypotheses with regard to the eyes and the skin as well as small and very small structures (sweat glands, microorganisms). Experts unanimously acknowledge that targeted, high-quality research on 5G health risks is still lacking. It is therefore imperative to have in place more accurate definitions of who will be exposed to mobile phone radiation, how people will be exposed to it, and to what extent.

WHAT TO DO?

Public debate is often limited to the question of whether health risks have already been sufficiently demonstrated to allow for a change of current exposure level limits or to declare a 5G moratorium. There are, however, ways of responsibly addressing risks and uncertainties, even with limited knowledge:

- Application of the protective principle of “prudent avoidance”: i.e. only the lowest, reasonably achievable exposure levels should be aimed for when setting safety limits for exposure levels.
- Formulation of specific guidelines for the construction of transmission equipment, the technical design of terminal equipment and basic supply infrastructure.
- Targeted information on technical details of all planned steps of expansion as well as actual and feasible areas and modes of application and thus on realistic future exposure scenarios.
- Promotion of independent, national and international research at the highest level.
- New ways and places of uncertainty and risk information and dialogue in view of a great need for exchange between the various stakeholders.
- Evaluation of the existing risk governance system with regard to the institutional separation of evidence assessment, formulation of recommendations, political action and supervision.

FURTHER READING

Kastenhofer, K., Mesbahi, Z., Schaber, F. und Nentwich, M., 2020, 5G-Mobilfunk und Gesundheit; Endbericht, im Auftrag des Österreichischen Parlaments, Nr. ITA-AIT-11, Wien: Institut für Technikfolgen-Abschätzung (ITA) und AIT Austrian Institute of Technology
epub.oeaw.ac.at/ita/ita-projektberichte/ITA-AIT-11.pdf

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