



2024

# ELECTROMAGNETIC FIELDS

What the experts say?

## 2024

### Spain's Scientific Advisory Committee on Radio Frequencies (CCARS) / March 2024

The seventh report of Spain's Scientific Advisory Committee on Radio Frequencies reviews the scientific evidence published in the years 2020, 2021, and 2022. The report concludes that "the current scientific evidence suggests that, under the established exposure limits, RF-EMFs do not present a significant risk to human health." > [More info](#)



## 2023

### Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) / April 2023

The European Commission and its Scientific Committee on Health, Environmental and Emerging Risks (SCHEER) published its final "Opinion on the need of a revision of the annexes in the Council Recommendation 1999/519/EC and Directive 2013/35/EU, in view of the latest scientific evidence available with regard to radiofrequency (100kHz - 300GHz)". In this document, the SCHEER calls for a revision based on new technical data and emerging applications that have become available. The SCHEER highlights that "no moderate or strong evidence could identify potential adverse health effects at exposure levels below the current recommendation". > [More info](#)



## 2022

### National Cancer Institute / May 2022

The National Cancer Institute reviewed numerous epidemiologic studies and comprehensive reviews of the scientific literature that have evaluated possible associations between exposure to non-ionizing EMFs and risk of cancer. It concludes that there is "no mechanism by which ELF-EMFs or radiofrequency radiation could cause cancer has been identified. Unlike high-energy (ionizing) radiation, EMFs in the non-ionizing part of the electromagnetic spectrum cannot damage DNA or cells directly." > [More info](#)



## 2021

### Public Health of England / August 2021

The UK Health Security Agency updated its guidance on "Mobile phone base stations: radio waves and health," supporting the view that health effects are unlikely to occur if exposures are below international guideline levels. > [More info](#)



### GSMA / October 2021

"Exposure Guidelines: Explaining the 2020 RF-EMF exposure guidelines published by the International Commission on Non-Ionizing Radiation Protection (ICNIRP)" report explains the key features of the updated international guidelines for exposure to radiofrequency electromagnetic fields (RF-EMFs) developed by the ICNIRP. The report highlights that "in the updated guidelines ICNIRP concludes that the only substantiated adverse health effects caused by RF-EMF exposure above 10 MHz are due to temperature elevation". > [More info](#)



## 2020

### Spain's Scientific Advisory Committee on Radio Frequencies (CCARS) / October 2020

CCARS publishes "2019 Radio Frequency and Health Report" where concludes that "current evidence from in vitro, in vivo and epidemiological studies does not indicate an association with the use of mobile phones and the development of tumors in the most exposed organs". > [More info](#)



## Public Health of England / September 2020

England's updated Guide to Base Station Radio Waves and Health for ICNIRP 2020 states that "the restriction values in the new guidelines are very similar to the previous ones, especially at frequencies below 6 GHz, where current mobile communications systems operate". It also refers to the measurements regarding of 5G base stations published last April by the British regulator Ofcom, whose conclusions were the highest level of 5G signals was specifically 0.039% of the maximum established in the international guidelines. > [More info](#)



## French Inter-ministerial Inspectorate of Social Affairs (IGAS) / September 2020

In a report on 5G, IGAS published its conclusions: "In view of the large number of studies published since the 1950s in France and throughout the world on the health effects of radio frequencies, according to the consensus of national and international health bodies, no harmful short-term effects, i.e. harmful thermal effects on tissues, have been found below the exposure limit values recommended by the ICNIRP, either for the general public or for workers". Its recommendations include better communication, increased research and monitoring of exposure. > [More info](#)



## Dutch Health Council / September 2020

The Council recommends to the Dutch Parliament to "monitor exposure to 5G and conduct further research. It has not been proven and nor is it likely to be harmful, but from a scientific viewpoint, it cannot be completely ruled out". > [More info](#)



## Radiation and Nuclear Safety Authority in Finland (STUK) / May 2020

The Radiation and Nuclear Safety Authority of Finland reports that “the limit values protect us from the health effects of short and long-term exposure” and that “there is no reason to suspect, on the basis of current knowledge, that millimetre waves to be implemented later would have harmful health effects on exposures below the limit values”. > [More info](#)



## Health Physics - ICNIRP Supplement / May 2020

This edition of the journal Health Physics is devoted to the latest publications of ICNIRP: “The guidelines are established using a conservative approach, which means that compliance with the recommended exposure limits will provide a very high level of protection against adverse health effects ... The ICNIRP’s guidance is based on a detailed evaluation of the scientific evidence. Scientifically justified adverse health effects are identified and exposure limits are developed to prevent them. For the estimation of exposure limits, the ICNIRP generally assumes the worst-case scenarios and considers uncertainties in the scientific evidence”. > [More info](#)



## The International Commission On Non Ionizing Radiation Protection (ICNIRP) / March 2020

The final ICNIRP guidelines, based on the best science currently available’ and periodically revised and updated, state that: “Adherence to these levels is intended to protect people from all substantiated harmful effects of radiofrequency EMF exposure”. There are many conservative elements in the guidelines so the “limits would remain protective even if exceeded by a substantial margin” and, therefore: “There is no evidence that additional precautionary measures will result in a benefit to the health of the population”.

> [FAQ](#), > [differences between the 2020 and 1998 guidelines](#) and > [responses to the public consultation](#). > [More info](#)



## World Health Organization (WHO) / February 2020

A World Health Organization (WHO) brief FAQ on 5G mobile networks and health concludes that provided “overall exposure remains below international guidelines, no consequences for public health are anticipated.” The existing question and answer on cell phones and base stations was also updated. The WHO notes that both the ICNIRP and IEEE ICES guidelines cover the 5G frequencies. > [More info](#)



## The Food and Drug Administration (FDA) / February 2020

The Food and Drug Administration (FDA) published a review (2008-2018) of animal and epidemiological studies of radio signals and cancer concluding that ‘to date, there is no consistent or credible scientific evidence of health problems caused by the exposure to radio frequency energy emitted by cell phones.’ > [More info](#)



## Spain’s Scientific Advisory Committee on Radio Frequencies (CCARS) / February 2020

CCARS presents information on 5G and health, noting that exposure levels are unlikely to change significantly and that 5G will comply with exposure limits. They say that exposure below the limits “established by ICNIRP does not carry known health risks. To date and re-viewing the existing scientific evidence, exposure to radio frequencies below the exposure limits established by the ICNIRP does not carry known health risks”. > [More info](#)



## 2019

### Swedish Radiation Safety Authority / June 2019

The 13th report by the Swedish Radiation Safety Authority's (SSM) Scientific Council on Electromagnetic Fields concludes that "no new causal relationship between EMF exposure and health risks have been established" and there is no reason to change reference levels or recommendations. .

The report recommends "more research covering the novel frequency domains, used for 5G. We also encourage researchers to start forward-looking epidemiological studies, i.e. cohort studies, in this area." > [More info](#)



## 2018

### The Scientific Council on Electromagnetic Fields from Sweden (SSM) / May 2018

The twelfth report concludes that "no new health risks have been identified". The results of studies of cell phones and brain cancer are "not entirely consistent but mainly point towards a lack of association". > [More info](#)



### The French Agency for Food, Environmental and Occupational Health & Safety (ANSES) / March 2018

The report concludes that there is no "causal link" between EHS and EMF exposure, however, the symptoms are real and more research is needed. ANSES also recommends that health authorities consider better training for health professionals and treatment recommendations. > [More info](#)



## 2017

### Swedish Public Health Agency / November 2017

The Environmental Health Report 2017 concludes that although “the percentage of the population that is exposed to weak radio frequency fields has increased substantially since the 1990’s, primarily due to increasing use of mobile telephones, there radio frequency field exposure below current reference values is related to health risks”. In any case, as indicated, since wireless technology is relatively new, the investigation should continue.

The analysis has been produced for the Public Health Agency of Sweden by the Institute for Environmental Medicine at the Karolinska Institute. > [More info](#)



### Spain’s Scientific Advisory Committee on Radio Frequencies (CCARS) / May 2017

This report reviews the scientific results of the last three years and concludes that “the critical analysis of the evidence supports that there are no technical or sanitary reasons that justify the arbitrary and discretionary imposition of more demanding exposure limits than those recommended by the WHO-ICNIRP and the European Union”, while the application of more restrictive limits “would imply increasing the number of antennas with the consequent visual, social and economic impact”. “The levels of exposure of the population to the RF of Wi-Fi devices, which are well studied in realistic operating conditions, are much lower than those recommended by the agencies and scientific committees (WHO-ICNIRP, FCC and the IEEE)”. > [More info](#)



## 2016

### Ministry of Posts and Telecommunications (Japan) / September 2016

In 1997, the MPT [Ministry of Posts and Telecommunications] decided to organize the Committee to Promote Research on the Possible Biological Effects of EMFs (CPR-EMF) in order to organize a national research program to consolidate the scientific basis for the RRRPG [Radio Radiation Protection Guideline]. This year a paper has been published which summarizes the review work of this Committee. The main conclusion after analysis of Human, Epidemiology, Animals and In Vitro studies is:

“ The results of these studies consistently showed no hazardous effect of RF-EMF within the exposure levels of internationally accepted guidelines...”



## The French Health Authority (ANSES) / June 2016

The French Health Authority (ANSES) values in a report the scientific literature related to children, the RF EMF exposure and potential health effects.

In line with what the Food and Drug Administration (FDA) and The Health Council of the Netherlands have recently published, it concludes that the weight of scientific evidence does not show evidence of adverse effects from use of mobile phones in children and teenagers. > [More info](#)



## Swedish Radiation Safety Authority (SSM) / May 2016

The latest report of the Scientific Council on Electromagnetic Fields (EMFs) for the Swedish Radiation Safety Authority includes an overview of how scientific evidence has changed since the reports began in 2002 and finds that the evidence that mobile phones or wireless networks could pose a health risk to humans or the environment has become increasingly weaker. However, the Scientific Council notes that some questions have not been answered satisfactorily and thus need more research, so there is a need to continue monitoring and reporting on new scientific findings.

Regarding the radiofrequency (RF) fields produced by mobile phones the report states: "Altogether it provides no or at most little indications for a risk for up to approximately 15 years of mobile phone use. No empirical data are available for longer use; however, cancer rates in Sweden and other countries do not show any increase that might be attributed to the massive mobile phone use that started in the beginning of this century." > [More info](#)



2015

## Sweden's Scientific Council on EMF / June 2015

Sweden's Scientific Council on EMF, appointed by the Swedish Radiation Safety Authority (Strålsäkerhetsmyndigheten, SSM), has published its annual report on EMF and health. According to the SSM press release, "The scientific support for mobile phones causing cancer is weak. However, it is too early to draw completely definitive conclusions for those who have used mobile phones for over 15 years." "It is also too early to draw firm conclusions regarding risk of brain tumours in children and adolescents, but the available literature to date does not indicate an increased risk," they say. On the subject of mobile phone exposure and sleep EEG in human volunteer studies, the Council states, "The observed effects...are weak and do not seem to translate into behavioural or other health effects."

With regard to electromagnetic hypersensitivity, the Council finds, "While the symptoms experienced by patients with EHS are real and some individuals suffer severely, studies so far have not provided evidence that exposure to electromagnetic fields is a causal factor." Regarding far-field sources, the Council concludes, "In line with previous studies, new studies on adult and childhood cancer with improved exposure assessment do not indicate any health risks for the general public related to exposure from radiofrequency electromagnetic fields from far-field sources, such as base stations and radio and TV transmitters. There is no new evidence indicating a causal link to exposure from far-field sources such as mobile phone base stations or wireless local data networks in schools or at home." > [More info](#)

## Health Canada (HC) published its revision of Safety Code 6 (SC6)

Health Canada (HC) published its revision of Safety Code 6 (SC6), the country's RF safety guidelines. According to an HC news release, "The updated Safety Code includes slightly more restrictive reference levels in some frequency ranges to ensure even larger safety margins to protect all Canadians, including newborn infants and children." SC6 "makes Canada's limits among the most rigorous science-based limits in the world," it states. "Royal Society of Canada has agreed on the basis of current scientific data, that no adverse health effects will occur from exposure to RF fields at the levels permitted by Safety Code 6." "Canada's limits are consistent with the science-based standards used in other parts of the world, including the United States, the European Union, Japan, Australia and New Zealand." > [More info](#)

## The European Commissions Scientific Committee on Emerging & Newly Identified Health Risks (SCENIHR)

The EC's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) has released its opinion on potential health effects of exposure to EMF. Among the opinion's findings is that "overall, the epidemiological studies on mobile phone RF EMF exposure do not show an increased risk of brain tumours."

In addition, a newly released fact sheet on EMF – based on the new SCENIHR opinion and aimed at members of the public – summarizes, "The results of current scientific research show that there are no evident adverse health effects if EMF exposure remains below the levels set by current standards." > [More info](#)



## 2014

### Electromagnetic Fields Committee of the Health Council of the Netherlands (SSM) / September 2014

In a new review, the Electromagnetic Fields Committee of the Health Council of the Netherlands concludes that there are “no indications for cancer in experimental animals after exposure to radiofrequency electromagnetic fields.”

The Committee concludes from their review that “it is highly unlikely” that RF EMF can lead to cancer in animals. They recommend that no further animal studies on this topic be pursued until the results of the large-scale US National Toxicology Program research are known. > [More info](#)



### GSMA / July 2014

In its report “LTE: Technology and Health”, the association representing mobile operators globally describes the main features of the LTE technology and addresses some of the questions about exposure to radio signals from LTE antennas and devices.

According to GSMA, “based on the current state of scientific knowledge expert bodies consistently conclude that the international standards provide health protection for all persons and are relevant to all mobile technologies, including LTE”. And the association adds that new safe exposure limits are not necessary. > [More info](#)



### Swedish Radiation Safety Authority (SSM) / June 2014

In its annual Report on EMF and Health, the Swedish Radiation Safety Authority from Sweden concludes: “New research does not suggest any health risks of using mobile phones or wireless computer networks.”

Regarding the possible relation between mobile phone use and brain tumor development, says that for a period exceeding 15 years for children and teenagers, “the available literature to date does not indicate an increased risk.” > [More info](#)



## Coureau et al., Occupational & Environment Medicine (France) / May 2014

The CERENAT case-control study "Mobile phone use and brain tumours" indicates that "no association with brain tumours was observed when comparing regular mobile phone users with non-users... However, the positive association was statistically significant in the heaviest users when considering life-long cumulative duration...and number of calls for gliomas...

In relation to the last idea, GSMA comments that the study contained a very small number of brain tumours cases in the highest lifetime phone use category and the researchers said their results could have been influenced by recall bias. > [More info](#)



## Royal Society of Canada / March 2014

Experts from the Royal Society of Canada (RSC) following the revision of its standards (Code 6A) conclude in their report "the balance of evidence at this time does not indicate negative health effects from exposure to RF energy below the limits recommended in the Safety Code." > [More info](#)



## Spain's Scientific Advisory Committee on Radio Frequencies (CCARS) / March 2014

In its biennial report, the CCARS has published that epidemiological and clinical studies continue to provide the most information through reports and analyses supplied by different international committees and agencies. The data continues to support the argument that there is no evidence of a causal relationship between exposure to radiofrequency (RF) electromagnetic fields (EMF) and the appearance of tumours. There is general consensus – a position that the CCARS shares – that research into the basic mechanisms should be encouraged.

In situations of alarm, it recommends that the relevant authorities react quickly, providing objective, comprehensible, transparent and independent information. It also recommends defining R&D&I plans based on the effects of radiofrequency electromagnetic fields that allow interaction mechanisms to be established between these electromagnetic fields and biological systems as well as increasing knowledge about the causes and symptoms of electromagnetic hypersensitivity syndrome. > [More info](#)



## UK's Mobile Telecommunications Health Research Programme (MTHR) / February 2014

After 11 years of research about the possible effects of exposure to radiofrequency (RF) electromagnetic fields (EMF) from mobile phones on health, the Mobile Telecommunications Health Research Programme (MTHR) in the UK has published its final report. The main conclusion is that there is no evidence of biological or adverse health effects.

This report responds to one of the recommendations of the UK's Independent Expert Group in 2001 (Stewart Report). The project was jointly funded by the government and industry, with total funding of £13.6 million. Over these years, it has produced more than 50 scientific publications, which are listed in the report. > [More info](#)



## The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) / January 2014

Agency (ARPANSA) publishes its first technical report on RF measurements of Electromagnetic Fields emitted by Smart Meter equipment. The main conclusion they come to is: "The RF electromagnetic energy transmitted in a single pulse from a Smart Meter is similar to the signal from a car remote control to unlock a car door and much less than the energy transmitted to send a single GSM SMS. The measurements do not provide any indication that emissions from Smart Meters could produce symptoms in people who have not been affected by other wireless technologies such as mobile phone terminals. In fact, the levels are so low and the transmission times so short that they make the occurrence of effects quite unlikely." > [More info](#)



## Nordic radiation safety authorities on RF EMFs / January 2014

The Nordic authorities Nordic Radiation Safety Authorities. Sundhedsstyrelsen (Danish Health and Medicines Authority), STUK (Finland), Strålsäkerhetsmyndigheten (Swedish Radiation Safety Authority), Statens strålevern (Norwegian Radiation Protection Authority), and Geislavarnir Ríkisins (Icelandic Radiation Safety Authority. BAFU) have published a joint statement on the safety of exposure to radiofrequency electromagnetic fields from mobile phones, base stations and wireless networks. The main conclusions are: "A review of all the scientific studies published to date does not reveal that there are adverse health effects from exposure to radiofrequency electromagnetic fields below the limits adopted in the Nordic countries. However, there are few epidemiological studies on long-term exposure to radio waves from mobile phones, especially studies on children and adolescents." They recommend reducing exposure by using a hands-free device, sending text messages and speaking in areas with good coverage. > [More info](#)



## 2013

### The Swiss Federal Office for the Environment. Bundesamt für Umwelt (BAFU) / November, 2013

In the update to its report on Electromagnetic Fields and Health published in 2007, the Swiss Federal Office for the Environment concludes: "no scientifically-proven adverse health effects are observed from exposure to electromagnetic fields below the levels specified by ICNIRP. However, it is currently not possible to analyse possible long-term effects."

> [More info](#)



### French Agency for Food, Environment and Occupational Health & Safety (ANSES) / October 2013

In its bibliographical review, the French Health Agency (ANSES) does not find arguments which suggest the need to change the ICNIRP exposure limits. In the current context of a society in the midst of technological development and research projects whose results have yet to be released, it recommends limiting the exposure to radiofrequencies, in particular those of mobile telephones, especially in the case of children and intensive users (not prohibiting their use). It also notes the development of studies with electro-sensitive people which will provide data that will make it possible to take them into account. > [More info](#)



### Electromagnetic Fields Committee of the Health Council of the Netherlands. De Gezondheidsraad / June 2013

The Dutch Health Council: Comparative analysis of the results of the epidemiological studies carried out since 2000 concludes that there is no clear, consistent evidence which would indicate an increase in the risk of suffering brain tumours or tumours in other areas of the head associated with the use of the mobile phone. > [More info](#)



## Swedish Radiation Safety Authority. Strålkäkerhetsmyndigheten (SSM) / May 2013

The Swedish Radiation Safety Authority (SSM) concludes that the recent evidence from the latest scientific publications does not suggest a link between the use of the mobile telephones and the development of brain tumours. The main recommendation made by the Swedish agency is that, as a precaution, the hands-free kit should be used, and the handset should be kept away from the body during mobile telephone calls. > [More info](#)



## International Agency for Research on cancer (IARC) / May 2013

The International Agency for Research on Cancer (IARC) publishes a monograph about the carcinogenicity of RF in humans. This monograph includes the scientific evidence by the IARC expert group, which established that radio frequency electromagnetic fields of mobile phones are carcinogenic type 2B. > [More info](#)



## 2012

## Norwegian Public Health Institute. Folkehelseinstituttet / September 2012

In its report, the Committee of Experts of the Norwegian Public Health Institute concludes that there is no scientific evidence that low-level exposure to electromagnetic fields from mobile telephones causes adverse effects for health.

The main recommendation of this group of experts is to emphasise the need to establish channels for good information and communication on this subject. > [More info](#)



## Swedish Council for Working Life and Social Research (FAS) / August 2012

At the request of the FAS, the Swedish group of scientific experts in radiofrequencies has carried out an analysis of the last ten years of research.

Among other conclusions, on the one hand they do not find evidence which makes it possible to establish a link between the symptoms of electromagnetic hypersensitivity and exposure to electromagnetic fields. On the other hand, the results obtained in studies carried out on patients with brain tumours who have used mobile telephones do not show any kind of causal relationship. > [More info](#)



## Advisory Group on Non-ionising Radiation (AGNIR) / April 2012

A new report by the Health Protection Agency's independent Advisory Group on Non-ionising Radiation (AGNIR) has concluded that there is still no convincing evidence that mobile phone technologies cause adverse effects on human health. The report, which updates AGNIR's previous review in 2003, considers the scientific evidence on exposure to radiofrequency (RF) electromagnetic fields, which are produced by mobile phone technologies and other wireless devices, such as Wi-Fi, as well as television and radio transmitters. > [More info](#)



## 2011

### Health Council of Netherland / October 2011

A new advisory report released by the Electromagnetic Fields Committee of the Health Council of the Netherlands concludes, "no evidence has been found that exposure to [RF EMF] has a negative influence on the development and functioning of children's brains, not even if this exposure is frequent." However, the Committee says that a lack of data leaves them unable to draw conclusions about possible long-term effects. > [More info](#)



## World Health Organization / June 2011

In the new version of Fact Sheet 193 titled "Electromagnetic fields and public health: mobile phones", WHO includes the classification by the International Agency for Research on Cancer ( [IARC](#) ) of the electromagnetic fields as possibly carcinogenic to humans. Besides WHO indicates that "to date, no adverse health effects have been established as being caused by mobile phone use". And adds that "studies are ongoing to more fully assess potential long-term effects of mobile phone use". > [More info](#)



## The Scientific Advisory Committee on Radiofrequency and Health (CCARS) / February 2011

The Advisory Committee's annual report states that "as a number of prestigious organisations have outlined recently, there are no scientific reasons that justify a reduction in current mobile phone electromagnetic exposure limits, either for the general public or as a result of occupational contact". > [More info](#)



## 2010

## World Health Organization (WHO) / May 2010

Its Fact Sheet № 193 "Electromagnetic Fields and Public Health: Mobile Phones" concludes that "to date, no adverse health effects have been established for mobile phone use".

This Fact Sheet includes the results of the international epidemiological research project INTERPHONE: "(...) no increase in brain cancer has been observed as a result of the use of mobile phones. Faced with the possibility of increased risk of brain tumours from long-term maximum level exposure, research should continue". > [More info](#)



## 2009

### International Commission on Non-Ionizing Radiation Protection (ICNIRP) / August 2009

The ICNIRP's position after the bibliographical review published in July 2009 is as follows: "Scientific literature since 1998 indicates that there is no evidence that requires any changes to exposure limits to mobile phone electromagnetic fields". > [More info](#)



### International Commission on Non-Ionizing Radiation Protection (ICNIRP) / July 2009

The Commission's Scientific Review of epidemiological research reached the following conclusion: "Results show no evidence consistent with a causal relationship between exposure to radiofrequencies (RF) and adverse effects on health". > [More info](#)



### The European Commission's Scientific Committee on Emerging & Newly Identified Health Risks (SCENIHR) / January 2009

The balance of the results from epidemiological research indicates that "the use of mobile phones over a period of at least 10 years does not increase the risk of cancer". > [More info](#)



