

Dear Contributor,

Thank you for participating in the public consultation of the ICNIRP draft guidelines.

Please note that it is important that ICNIRP understands exactly the points that you are making. To facilitate our task and avoid misunderstandings, please:

- be concise
- be precise
- provide supporting evidence (reference to publication, etc.) if available and helpful.

**How to complete the comments table:**

Please use 1 row per comment. If required, please add extra rows to the table.

This response document asks you to provide your ‘comment’, your ‘proposed change’, and the ‘context’ to this comment and proposed change. What is meant by these is the following:

**Comment :** A brief statement describing the issue that you have identified (and that you would like ICNIRP to take into account in the final version of the guidelines).

**Proposed Change:** A brief statement describing how you would like the document changed to account for this issue.

**Context:** A brief statement identifying relevant documents in support of your comment and proposed change.

**Please, provide your details below as per the online form and the provision of the privacy policy**

Last name, first name: Bevington, Michael	Email address: michael@es-uk.info	Affiliation (if relevant): Electrosensitivity UK
If you are providing these comments officially <b>on behalf</b> of an organization/company, please name this here: Electrosensitivity UK		
<input checked="" type="checkbox"/> I hereby agree that, for the purpose of transparency, <b>my identity (last and first names, affiliation and organization where relevant) will be displayed</b> on the ICNIRP website after the consultation phase along with my comments. <input type="checkbox"/> I want my comments to be displayed anonymously.		

	Document (Guidelines, App A, App B)	Line Number #	Type of comment (General/ Technical/ Editorial)	Comment. Proposed change. Context.
1	Guidelines	6	General	<p>The Guidelines are for Heating and Short-term effects only. This should be clearly stated in the title so that they are not confused with existing international Guidelines for Biological and Long-term and Short-term effects.</p> <p><i>„GUIDELINES BASED ON HEATING AND SHORT-TERM EFFECTS FOR LIMITING EXPOSURE TO TIME-VARYING ELECTRIC...“</i></p> <p>It should be clearly stated in the title that these Guidelines are for Heating and Short-term effects, so that they are not confused with existing international Guidelines for Biological and Long-term and Short-term effects (e.g. Bioinitiative 2012, EUROPAEM 2016).</p>
2	Guidelines	14	General	<p>It should be clearly stated that these guidelines are not „for the protection of humans“ but only „for the protection from heating and short-term effects in some humans“ so that they are not confused with existing international Guidelines for Biological and Long-term and Short-term effects. The ICNIRP also needs to state at the start of the guidelines that it has already declared that people whom it recognises are not protected by these guidelines should choose guidelines which are protective and protect against the many established biological and long-term health effects and not just heating and short-term effects.</p> <p><i>„The guidelines described here are for the protection from heating and short-term effects in some humans exposed to radiofrequency electromagnetic fields (EMFs) in the range 100 kHz to 300 GHz (hereafter ‚radiofrequency‘). The ICNIRP recognises that these guidelines are not protective of biological and long-term adverse health effects, especially cancers, cardiovascular and neurological harm, including Electromagnetic Hypersensitivity, and fertility damage, all of which have been known since the 1930s onwards in the published scientific literature. The ICNIRP has already stated in 2002 that some members of the general population are vulnerable to exposure levels below these guidelines and recognises that such people need to choose international biological and long-term guidelines such as Bioinitiative 2012 or EUROPAEM 2016.“</i></p> <p>1.</p> <p>It is essential that it is explained that these guidelines are based on Schwan’s invalidated hypothesis of 1953, rejected by the majority of scientists and almost half the regulators and governments around the world, that the only adverse health effects of radio frequency EMFs are the result of raising the body temperature by one degree in six minutes. Since it is possible to raise the body temperature by one degree within six minutes (or 30 minutes, averaged) through exercise or sitting in strong sunlight, but without the established health harm from pulsed RF EMFs such as cancer promotion or co-promotion, cardiovascular and neurological harm, including Electromagnetic Hypersensitivity, and fertility damage, all of which have been known since the 1930s onwards in the published scientific literature, it should be clearly stated that these guidelines are not „for the protection of humans“ but only „for the protection from heating and short-term effects in some humans“.</p> <p>2.</p>

				<p>These guidelines are inconsistent with the ICNIRP's stated general approach published in 2002 that there are members of the general population for whom these heating and short-term guidelines are not protective and that these members of the general population need non-thermal and long-term guidelines, such as Bioinitiative 2012 and EUROPAEM 2016.</p> <p>3.</p> <p>The chair of the ICNIRP in 2016 stated that everyone has the right to choose whether to follow the ICNIRP heating and short-term guidelines, or the international biological and long- and short-term guidelines such as Bioinitiative 2012 and EUROPAEM 2016. This free choice should be made clear in the introduction to these heating and short-term guidelines.</p>
3	Guidelines	18	General	<p>These guidelines are not based on „the best science currently available“.</p> <p><i>„These guidelines are based on a selection of the science currently available which does not claim to be comprehensive, and it is recognized ...“</i></p> <p>The ICNIRP guidelines, as explained above point 1, are based on a fundamental mistake made by Schwan in 1953 that the only adverse health effect from RF EMFs is heating the body by one degree in six minutes. Since the vast majority of international scientists have long rejected this viewpoint and many governments, regulators and courts have adopted non-thermal approaches, and since the ICNIRP has recognised since 2002 that some members of the general population are adversely affected at levels of exposure under ICNIRP's thermal guidelines, it is blatantly wrong and totally unscientific to claim that they are based on the „best“ science available.</p> <p>Many leading scientists have shown that in fact these ICNIRP guidelines are not based on the „best“ science, but are based on an interpretation of selected studies suiting the heating hypothesis, thus denying the convincing and consistent outcome of the majority studies now available. The majority studies confirm what has been established since the 1930s, that RF can have biological and long-term adverse health effects.</p> <p>On average some 80% of studies agree in showing adverse effects at non-thermal levels for outcomes like infertility, neurological and cardiovascular effects. These guidelines do not recognise this fact and are misleading in adopting the minority viewpoint.</p> <p>These adverse effects from non-thermal levels of exposures have also been well established over several decades from studies on geomagnetic effects, usually at much lower levels of exposure than man-made radiation. This should be clearly acknowledged in the main guidelines as well as in the supporting documentation.</p> <p>These guidelines would not pass a balanced peer-review panel. By stating that they are based on the „best“ science available, when they are clearly not, no competent peer-review panel could allow an unsubstantiated claim like this.</p>
4	Guidelines	24	General	<p>The ICNIRP has already stated in 2002 that their heating and short-term guidelines do not provide protection „for all people“.</p> <p><i>„for some people“</i></p> <p>The ICNIRP's statement in 2002 that their heating and short-term guidelines do not provide protection „for all people“ is inconsistent with the claim in line 24.</p>

5	Guidelines	24	General	<p>It is invalid to state „against known adverse health effects“ since at present, under similar guidelines, there are already many thousands of people suffering „known adverse health effects“ which have been established by the convincing and consistent weight of evidence in the scientific literature.</p> <p><i>„against some known adverse health effects“</i></p> <p>To claim what is patently untrue according to the scientific literature over many decades is misleading and unscientific.</p>
6	Guidelines	43	General	<p>These guidelines are not „for safe personal exposure“. If such guidelines were safe, then there would not be thousands of people harmed by current EMF levels.</p> <p><i>„for personal exposure which prevent acute adverse effects from a temperature rise in the body“</i></p> <p>As explained above, it is scientifically invalid to claim that EMF exposure which causes established harm is safe.</p>
7	Guidelines	432	General	<p>As shown above, it is invalid based on the scientific evidence to claim „do not cause any known health effect“ since thousands of people are adversely effected by the levels permitted under the ICNIRP guidelines.</p> <p><i>„do not cause some known health effects“</i></p> <p>To be scientifically valid the claim made here should be scientifically accurate and be limited to „some“ not „any“ known health effect.</p>
8	Appendix B	95-102	General	<p>These three sentences in lines 95-102 are scientifically and factually inaccurate. They are based on a confusion between Electrophobia or the nocebo effect, established in the scientific literature in the 1980s, and the physiological reactions to EMF exposures established from the 1930s onwards. There have been numerous studies confirming both separate conditions. To equate them is invalid scientifically and undermines the scientific basis of these guidelines.</p> <p><i>„A small portion of the population experiences a negative psychological reaction to the presence of observed wireless devices. This is known as Electrophobia or Idiopathic Environmental Intolerance psychologically attributed to EMF (IEI-psychological-EMF) and was first described in the literature in the 1980s. Some double-blind experimental studies have failed to identify a relation between radiofrequency EMF exposure and non-specific symptoms in this Electrophobia or IEI-psychological-EMF population, as well as in healthy population samples. Some interpretations of these human experimental studies assumed that ‚belief about exposure‘ (e.g. the so-called ‚nocebo‘ effect) , and not the exposure itself, is the relevant symptom determinant for Electrophobia or IEI-psychological-EMF. Another small portion of the population experiences specific physiological symptoms, conscious and/or subconscious, in the presence of various types of RF EMF exposure. This has been described in the scientific literature since the 1930s and is known as Electrical Sensitivity or Intolerance, or Electromagnetic Hypersensitivity (EHS). This condition is now established and diagnosed by a growing number of physicans and in specialist centres worldwide by means of multi-system objective tests, including blood-flow perfusion, changes to endocrine, hormone and protein expression, ROS and VGCC effects, and fMRI scans, along with temporal correlation of exposure and specific symptoms, and the evidence of absence of specific symptoms in the absence of exposure. About 1% of people with EHS also suffer from Electrophobia or IEI-psychological-EMF.“</i></p> <p>1.</p>

			<p>The psychological condition of Electrophobia or IEI-not-EMF, or the nocebo effect, has been shown in the scientific literature to be different from the physiological condition of EHS with specific conscious symptoms and many subconscious physiological changes in the body. The ICNIRP guidelines should not be making such an elementary mistake.</p> <p>2.</p> <p>The specific symptoms caused by Electrical Intolerance or Sensitivity are the same as for EHS according to the literature from the 1930s onwards. This has been shown in numerous studies, including some on base stations and exposure to mobile phones, Wifi etc.</p> <p>3.</p> <p>These specific symptoms caused by electrical intolerance or sensitivity and EHS are the same as for those from geomagnetic events, according to the literature from the 1960s onwards.</p> <p>4.</p> <p>These specific symptoms caused by electrical intolerance or sensitivity and EHS are the same as for those from electromagnetic warfare and military usage (eg Golomb B 2018).</p> <p>5.</p> <p>These specific symptoms caused by electrical intolerance or sensitivity and EHS can be the result of variant DNA which has been shown by DNA sequencing (eg De Luca C et al 2011, De Luca C et al 2014). It is increasingly shown for conditions which involve variations in myelin.</p> <p>6.</p> <p>These subconscious and conscious specific symptoms caused by electrical intolerance or sensitivity and EHS can be measured objectively with a number of biological markers (eg Buchner K et al 2011, Belpomme D et al 2015, Belyaev I et al 2016).</p> <p>7.</p> <p>Use of fMRI can show objective abnormal brain patterns in people with EHS (Heuser G et al 2017).</p> <p>8.</p> <p>The conditions of real physiological ES and EHS has been given international ICD recognition since 2000. It has been recognised in a growing number of courts of law, employment and pension tribunals and occupational health advisors, and it is specifically included under some government disability regulations. The specific symptoms of real physiological ES and EHS are listed under health warnings on a number of RF wireless devices and are becoming common knowledge among much of society.</p> <p>8.</p> <p>The separate condition of Electrophobia or IEI-psychological-EMF, or the nocebo effect, requires prior cognitive conditioning. This is not the case for real physiological EHS which can affect unaware adults, children and animals, none of whom have experienced prior cognitive conditioning (eg Lamech F 2014, Dieudonne M 2016).</p> <p>9.</p> <p>Because, as the WHO has stated, EHS is individual to the person concerned like all environmental biological reactions, all tests must be conducted and recorded individually. The process of averaging test results and the failure to screen subjects beforehand for whether they actually have EHS obviously mean that the results will fail to find the small portion of the general population who have</p>
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				<p>EHS. Where individual EMF exposures are correlated with specific EHS symptoms for the relevant signals to which an individual is sensitive, then it is possible to confirm the existence of EHS by this type of test (eg Rea W et al 1991, Havas M 2006, Havas M et al 2010, Buchner K et al 2011, McCarty D et al 2011, Tuengler A et al 2013, Belpomme D et al 2015, Bogers R et al 2018, Irigaray P et al 2018, etc)</p> <p>10.</p> <p>My list of March 2018 provides over 2,000 studies and references relevant to both Electromagnetic Sensitivity and Electromagnetic Hypersensitivity available at: <a href="http://www.es-uk.info/wp-content/uploads/2018/05/Selected%20ES%20and%20EHS%20studies.pdf">http://www.es-uk.info/wp-content/uploads/2018/05/Selected%20ES%20and%20EHS%20studies.pdf</a></p> <p>These include references to numerous studies from the 1930s-1970s which established convincingly and consistently a wide range of physiological and adverse health outcomes from exposure to RF EMFs.</p> <p>CONCLUSION:</p> <p>The claims in the draft ICNIRP guidelines in lines 95-102 are not based on scientific facts and need to be rewritten. The ICNIRP guidelines should take into account the established science which has shown convincingly and consistently by weight of evidence that some people do experience specific physiological adverse health from exposure to RF EMF. The guidelines should not confuse this real physiological condition with a psychological condition which has been shown convincingly and consistently to have different aetiological processes.</p>
9	Appendix B	408-476	General	<p>The draft guidelines do not seem to acknowledge the established concerns in the scientific literature about their failure to protect human health. The reference section should include these studies and the text should explain the ICNIRP response to these studies, which are both consistent and convincing in being based on the viewpoint of the large majority of international scientists.</p> <ul style="list-style-type: none"> <li>• Bailey WH ET AL.: “Accounting for human variability and sensitivity in setting standards for electromagnetic fields” <i>Health Phys.</i> (2007) <a href="#">PMID: 17495668</a>.</li> <li>• Bandara P et al.: “Letter to the Editor [Wifi exposure in Australian schools]” <i>Rad Prot Dosimetry</i> (2017) <a href="https://doi.org/10.1093/rpd/ncx108">doi.org/10.1093/rpd/ncx108</a>. <a href="#">Article</a>.</li> <li>• Bandara P et al.: “Cardiovascular disease: Time to identify emerging environmental risk factors” <i>Eur J Prev Cardiol.</i> (2017) <a href="#">PMID: 28969497</a>. <a href="#">Article</a>.</li> <li>• Bortkiewicz A et al.: [Biological effects and health risks of electromagnetic fields at levels classified by ICNIRP as admissible among occupationally exposed workers: a study of the Nofer Institute of Occupational Medicine, Lodz] <i>Med Pr.</i> (2003) <a href="#">PMID: 14669585</a>.</li> <li>• Fernández C et al.: “Absorption of wireless radiation in the child versus adult brain and eye from cell phone conversation or virtual reality” <i>Environ Res.</i> (2018) <a href="#">PMID: 29884550</a>.</li> <li>• Frey AH: “Is a toxicology model appropriate as a guide for biological research with electromagnetic fields?” <i>J Bioelect.</i> (1990) <a href="#">Article</a>.</li> </ul>

			<ul style="list-style-type: none"> <li>• Frey AH: “Biological function as influenced by low power modulated RF energy” <i>IEEE Trans Microwave Theory and Techniques</i>. (1971) <a href="#">Article</a>.</li> <li>• Grigoriev Y: “Methodology of Standards Development for EMF RF in Russia and by International Commissions: Distinctions in Approaches” in Markov M (ed.) (2017) <i>Dosimetry in Bioelectromagnetics</i> (2017) ISBN: 978-1498774130. <a href="#">Article</a>.</li> <li>• Grigoriev YuG: “From Electromagnetic Smog to Electromagnetic Chaos. To Evaluating the Hazards of Mobile Communication for Health of the Population” <i>Med Radiol Radiat Safety</i>. (2018) <a href="#">Abstract</a>.</li> <li>• Hardell L et al.: “Biological effects from electromagnetic field exposure and public exposure standards” <i>Biomed Pharmacother</i>. (2008) <a href="#">PMID: 18242044</a>.</li> <li>• Hardell L: “World Health Organization, radiofrequency radiation and health – a hard nut to crack (Review)” <i>Int J Oncology</i>. (2017) <a href="#">PMID: 28656257</a>. <a href="#">PMC5504984</a>.</li> <li>• Hasan GM et al.: “Effect of electromagnetic radiations on neurodegenerative diseases- technological revolution as a curse in disguise” <i>CNS Neurol Disord Drug Targets</i>. (2014) <a href="#">PMID: 25345513</a>.</li> <li>• Hensinger P et al.: “Wireless communication technologies: New study findings confirm risks of nonionizing radiation” <i>umwelt-medizin-gesellschaft</i>. (2016) <a href="#">Article</a>.</li> <li>• Iakimenko IL et al.: [Metabolic changes in cells under electromagnetic radiation of mobile communication systems] <i>Ukr Biokhim Zh (1999)</i>. (2011) <a href="#">PMID: 21851043</a>.</li> <li>• Johansson O: “Disturbance of the immune system by electromagnetic fields - A potentially underlying cause for cellular damage and tissue repair reduction which could lead to disease and impairment” <i>Pathophysiology</i>. (2009) <a href="#">PMID: 19398310</a>.</li> <li>• Koh WJ et al.: “Non-ionizing EMF hazard in the 21th century” <i>IEEE Xplore</i>. (2018) <a href="#">Abstract</a>.</li> <li>• Lan JQ et al.: “On the effects of glasses on the SAR in human head resulting from wireless eyewear devices at phone call state” <i>Prog Biophys Mol Biol</i>. (2018) <a href="#">PMID: 29428220</a>.</li> <li>• Leszczynski D ET AL.: “Mobile phone radiation health risk controversy: the reliability and sufficiency of science behind the safety standards” <i>Health Res Policy Syst</i>. (2010) <a href="#">PMID: 20205835</a>. <a href="#">Article</a>.</li> <li>• Lin JC: “Clear Evidence of Cell Phone RF Radiation Cancer Risk” <i>IEEE Microwave Mag</i>. (2018) <a href="#">Abstract</a>.</li> <li>• Marino AA et al.: “Trigeminal neurons detect cellphone radiation: Thermal or nonthermal is not the question” <i>Electromagn Biol Med</i>. (2017) <a href="#">PMID: 27419655</a>.</li> <li>• Markov M et al.: “Protect children from EMF” <i>Electromagn Biol Med</i>. (2015) <a href="#">PMID: 26444201</a>.</li> </ul>
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			<ul style="list-style-type: none"> <li>• Markovà E et al.: “Microwaves from GSM mobile telephones affect 53BP1 and gamma-H2AX foci in human lymphocytes from hypersensitive and healthy persons” <i>Environ Health Perspect.</i> (2005) <a href="#">PMID: 16140623</a>. <a href="#">PMC1280397</a>.</li> <li>• Pall ML: “Scientific evidence contradicts findings and assumptions of Canadian Safety Panel 6: microwaves act through voltage-gated calcium channel activation to induce biological impacts at non-thermal levels, supporting a paradigm shift for microwave/lower frequency electromagnetic field action” <i>Rev Environ Health.</i> (2015) <a href="#">PMID: 25879308</a>.</li> <li>• Panagopoulos DJ et al.: “Evaluation of specific absorption rate as a dosimetric quantity for electromagnetic fields bioeffects” <i>PLoS One.</i>(2013) <a href="#">PMID: 23750202</a>.</li> <li>• Paul B et al.: “Mobile phones: time to rethink and limit usage” <i>Indian J Public Health.</i> (2015) <a href="#">PMID: 25758729</a>. <a href="#">Article</a>.</li> <li>• Redmayne M: “International policy and advisory response regarding children's exposure to radio frequency electromagnetic fields (RF-EMF)” <i>Electromagn Biol Med.</i> (2015) <a href="#">PMID: 26091083</a>.</li> <li>• Rubtsova N et al.: “Intensity-time dependence dosing criterion in the EMF exposure guidelines in Russia” <i>Electromagn Biol Med.</i> (2018) <a href="#">PMID: 29493302</a>.</li> <li>• Sage C et al.: “Comments on SCENIHR: Opinion on potential health effects of exposure to electromagnetic fields, Bioelectromagnetics 36:480-484 (2015)” <i>Bioelectromagnetics.</i> (2015) <a href="#">PMID: 26688202</a>. <a href="#">RG</a>.</li> <li>• Sagioglou NE et al: “Apoptotic cell death during Drosophila oogenesis is differentially increased by electromagnetic radiation depending on modulation, intensity and duration of exposure” <i>Electromagn Biol Med.</i> (2016) <a href="#">PMID: 25333897</a>.</li> <li>• Sarkar S et al.: “Effect of low power microwave on the mouse genome: a direct DNA analysis” <i>Mutat Res.</i> (1994) <a href="#">PMID: 7506381</a>.</li> <li>• Starkey SJ: “Inaccurate official assessment of radiofrequency safety by the Advisory Group on Non-ionising Radiation” <i>Rev Environ Health.</i> (2016) <a href="#">PMID: 27902455</a>. <a href="#">Article</a>.</li> <li>• Steneck NH et al.: “The origins of U.S. safety standards for microwave radiation” <i>Science.</i> (1980) <a href="#">PMID: 6990492</a>.</li> <li>• Syaza SKF et al.: “Non-ionizing radiation as threat in daily life” <i>J. Fundam. Appl. Sci.</i> (2017) <a href="#">Article</a>.</li> <li>• Webster PC: “Federal Wi-Fi safety report is deeply flawed, say experts” <i>CMAJ.</i>(2014) <a href="#">PMID: 24756628</a>. <a href="#">Article</a>.</li> <li>• Yakymenko I et al.: “Long-term exposure to microwave radiation provokes cancer growth: evidences from radars and mobile communication systems” <i>Exp Oncol.</i> (2011) <a href="#">PMID: 21716201</a>.</li> </ul>
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				Explain the context of your comment.
10	Appendix B	408-476	General	<p>The draft guidelines do not seem to acknowledge the specific concerns in the scientific literature about their failure to protect the health of the wildlife and all living systems on earth. The reference section should include these studies and the text should explain the ICNIRP response to these studies.</p> <ul style="list-style-type: none"> <li>• Engels S et al.: “Anthropogenic electromagnetic noise disrupts magnetic compass orientation orientation in a migratory bird” <i>Nature</i>. (2014) <a href="#">PMID: 24805233</a>.</li> <li>• Manta AK et al.: “Mobile-phone radiation-induced perturbation of gene-expression profiling, redox equilibrium and sporadic-apoptosis control in the ovary of <i>Drosophila melanogaster</i>” <i>Fly (Austin)</i>. (2017) <a href="#">PMID: 27960592</a>. <a href="#">PMC5406167</a>.</li> <li>• Margaritis LH et al: “<i>Drosophila</i> oogenesis as a bio-marker responding to EMF sources” <i>Electromagn Biol Med</i>. (2014) <a href="#">PMID: 23915130</a>.</li> </ul> <p>Explain the context of your comment.</p>