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3 March 2013

to  
The Danish Parliament's Health and Prevention Committee,  
(Folketingets Sundheds- og Forebyggelsesudvalg),  
Christiansborg,  
1240 Copenhagen

**Audience, 19 mars 2013:**

**The increasing aggravation of the health status of the population with particular focus on neurological/neuropsychological injuries as a result of electromagnetic radiation.**

Exposure to electromagnetic fields (EMF), especially from radio frequency (microwave frequency) radiation (RFR/MWR) from mobile phones and mast transmitters (GSM, 3G, 4G) wireless (DECT) phones, wireless laptops, tablets, e-readers, wireless networks (Wi-Fi, WLAN, Wi-Max, TETRA, etc.) wireless meters ("smart meters") for measuring electricity, water and heating consumption as well as a wide range of other wireless technology, is threatening public health. In 2011, The World Health Organisation (IARC) updated its warning about the risks to the individual, the environment and professional life, of cancer as a result of radiation from this technology. The radiation represents not only a risk for developing cancer, but also other diseases. The health and functional capacity of current and future generations is in jeopardy.

In addition to individual suffering, it will entail enormous economic costs to society. As responsible psychologists with insight into the problem, we are very concerned and anticipate that the damage inflicted on health by the radiation will have an explosive effect on the welfare state. The fact that the National Board of Health denies the potential public health disaster which we are facing and overrides the precautionary ALARA principle means that, in the words of the EEA's director Jacqueline McGlade, it is "failing in its duty to protect the Danish people" (1).

Non-ionizing EMF / RF radiation, like nuclear radiation, cannot be seen, heard, smelt, tasted or felt. The radiation can not be sensed by humans, who therefore have great

difficulty in understanding that they are being subjected to a harmful environmental contamination. Consequently, they are unable to see the link between their physical and psychological symptoms and radiation.

None the less, all of us without exception - pregnant women and fetuses, infants, children, adults, the elderly and the sick - are being irradiated with (huge)non-thermal wave intensities. The ICNIRP Safety Standards, which Denmark follows, do not give us any protection. (2)

Year in and year out, 7 days a week, 24 hours a day, even when we sleep, we are all exposed non-stop to RF radiation which is insidiously laying the foundation for disease. The intensity of the irradiation is on a yearly increase which has now reached astronomical levels, and which has never ever before existed on our planet, radiation which we as biological creatures are not adapted to.

The radiation penetrates everything: buildings, walls, ceilings, floors, windows, the metal bodywork of cars, buses and trains and through human bodies, where it is absorbed. Here it interferes with atomic, molecular and cellular processes, including the body's own electrical field, cell communications, and DNA. This results in non-thermal adverse effects on virtually every biological level (i.e. damage which has nothing to do with the heating of body tissue).

Several thousands of scientific reports made by independent researchers, who are themselves not involved in any conflicts of interest, have without any doubt demonstrated that these adverse effects are very serious. The injuries include damage to DNA, as well as to the immunological, reproductive and nervous/ neurological systems, and to cognition and development (2).

As psychologists, we base our starting point in our profession. We therefore refer only to some of the neurological / neuro-psychological / behavioural injuries which EMFs / EMR causes, and which have been documented both in vitro and in vivo, by case-studies, double-blind studies and epidemiological studies. Here is a selection of references:

1 Negative impact of changes in neurotransmitters: serotonin, acetylcholine, and GABA (3), glutamate (4), adrenaline (epinephrine), noradrenaline (norepinephrine), dopamine and the neuromodulator PEA (5). ADHD sufferers have, inter alia, injuries in their noradrenergic and dopaminergic systems. Ritalin acts directly on the PEA.

2 Children who are irradiated as fetuses due to maternal use of mobile phones during pregnancy have a 54% greater risk of experiencing the developmental injuries (concentration disorders, hyperactivity, behavioural disorders) which characterize ADHD. When children themselves also use mobile phones during the first seven years of life, the figure rises to 80%. This study has been carried out on 13,000

Danish children (6). A replicated study on twice as many Danish children show the same statistically significant results with a slightly lower percentage: a 50% greater risk of children developing behavioural disorders if the mother used a mobile phone during pregnancy and the children themselves had used a mobile phone (7).

3 The opening of the blood-brain barrier with the permeability of large molecules (albumin, virus, toxins), which consequently leads to extensive brain damage in the cerebral cortex, hippocampus and basal ganglia in experimental animals (8, 9, 10, 11). The opening of the blood-brain barrier with increased levels of S100B in the blood of people with electromagnetic hypersensitivity (EHS sufferers) (12).

4 Calcium efflux from brain cells of humans and animals. Calcium is essential to many bodily functions including the nervous system, where it, among other things, contributes to the release of neurotransmitters. A change in levels of calcium leads to changes in neural functions (13).

5 Structural alterations in brain cells. The degeneration of myelin, rapidly growing glial cells, degeneration of and abnormal brain cells in the hypothalamus, hippocampus and cerebral cortex of animals following RF exposure (3). An increased number of anti-myelin proteins in the blood of electromagnetic-hypersensitive people (EHS sufferers) during exposure to EMFs (12).

6 Brain cells are most vulnerable to electromagnetic fields / radiation and most likely to experience DNA damage, altered cell function and cell death. The support tissue of the brain, glial cells, develops cancer as a result of RF radiation from mobile telephones (14, 15, 16, 17).

7 Changes in brain metabolism of neurotransmitters and cell membranes and changes in energy metabolism that reduce the transport system of mitochondrial electrons(18).

8 Changes in the brain's blood flow, as measured by the brain scans (19) of electro-hypersensitive people (EHS sufferers), especially in the brain's limbic areas (hippocampus) (12).

9 Altered brain activity after 50 minutes of mobile telephone use. PET scans show an increased consumption of glucose on the side of the brain (orbitofrontal cortex and the temporal lobe) where the handset was held (20).

10 Impaired spatial orientation capacity and memory loss in mice exposed to radiation from a GSM 900 MHz mobile phone (21).

11 Reduced melatonin synthesis. Melatonin is vital for sleep, circadian rhythms and combats oxidative stress. (Melatonin is the strongest antioxidant in existence). Melatonin is formed by the pineal gland in the brain and is present in all body cells. Melatonin deficiency is seen in breast cancer, Alzheimer's (22) and in those suffering from electro-hypersensitivity (EHS sufferers) (12)

12 Stimulation of the peripheral nervous system with RF - EMF affects electrical activity in the central nervous system (the thalamus). Termed "evoked potentials" (2). Affects the neural auditory system (hearing) (3). Proven electrodermal (EDA) reaction from sound stimulation and a change in the Visual Evoked Potentials (VEP) of electro-hypersensitive people (EMF sufferers) (27).

13 The formation of stress proteins (24). Change in the synthesis of 143 proteins, in three areas of the brain (cerebellum, hippocampus and frontal lobes) as an expression of oxidative stress. The key role is played by stress proteins (25). The secretion of stress proteins HSP 27 and HSP 70 in the blood of people with electrohypersensitivity (EHS sufferers) as a result of EMF exposure (12). The formation of free radicals, and oxidative and nitrosative stress both intracellular and intercellular. An increased yield in peroxynitrite (ONNO) from a reaction of nitrogen monoxide (NOO) with superoxide (O<sub>2</sub>) (61).

14 General stress response. Changes in the autonomic nervous system. Changes in the autonomic nervous system of people with electrohypersensitivity (EHS sufferers) measured with an iriscorder (23). An increase in heart rate (HR) (23, 26, 27), heart rate variability (HRV), (26, 27, 28) and in the electrical activity of the heart as a result of ELF-EMF exposure as measured by ECG (28, 29) and in the skin's electrical potential and microcirculation in the capillaries of people with electromagnetic hypersensitivity (EHS sufferers) (29).

15 A significant change and reduced activity in the cerebral cortex (dorsolateral prefrontal cortex) as measured by Transcranial Magnetic Stimulation during EMF exposure resulting in cognitive and neurological changes, abnormalities in assessment capabilities (30, 31), attention, memory and perception (22) of people with electromagnetic hypersensitivity (EHS sufferers). (32).

16 An altered picture of the brain's right temporal lobe and angular gyrus of the right parietal lobe as measured by the MRI scanning of people with electromagnetic hypersensitivity (EHS sufferers) (32).

17 Changes in sleep quality (19, 33, 34) and the sleep patterns of people with electrohypersensitivity (EHS sufferers) as measured by polysomnography (32).

18 Subjective symptoms from the nervous system: eg headache, nausea, light-headedness, tiredness and a sensation of total exhaustion, pressure in the ears, tinnitus, cardiac symptoms, shortness of breath, memory and concentration difficulties, and other cognitive disorders, insomnia and other sleep disorders, stress and depression in people with electrohypersensitivity (EHS sufferers) when exposed to EMF (ELF and RF), (26, 35, 36,37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49).

In recent years, there has been an explosion in neurological ill health (morbidity) among the Danish population.

Many Danes have developed:

**Brain Cancer**, which is rising sharply. The cancer statistics for 2011 show that brain tumours from 2001-2010, including the most aggressive glioblastomas that cannot be treated, had increased by 40% in men and by 29% in women. The latest cancer statistics from 2013 from the National Serum Institut show an even greater increase in brain tumours in Denmark from 2003-2012 with 41.2% in men, and quite dramatically at 46.1% in women (50).

**Multiple Somatic Symptoms** are rising sharply. 300,000 Danes suffer from these Central Nervous System / Autonomic Nervous System / cognitive / neuropsychological symptoms that are largely similar to the symptoms of those with electromagnetic

hypersensitivity / (EHS) / EMF-syndrome / Electromagnetic Field Intolerance (EFI) - also known by American and Russian scientists since the 1950s as "The Microwave Syndrome" or "Radiowave Sickness" (2, 12, 23, 35, 38, 45, 46, 48, 51, 52). This includes symptoms such as:

Headache, fainting, chronic fatigue and exhaustion, insomnia and other sleep disorders, aching muscles, joint and nerve pain, a sensation of inner burning, inner trembling and anxiety, numbness, skin and mucous membrane symptoms, shortness of breath, sinus infections, gastrointestinal symptoms, tingling / tinnitus, hearing loss and vision problems, heart beat with rhythm disturbances, concentration, memory and attention disorders, stress, anxiety and depression.

International groups of doctors and scientists point out that the symptoms are often mistakenly perceived as psychosomatic symptoms (2, 12, 32, 37, 45, 46, 48, 51, 58, 62, 63, 64). Unfortunately this is most often the case in Denmark, where certain psychiatrists misinform doctors and the general public that the sick are suffering from a psychosomatic disease which they term "a (psychosomatic) functional disorder" or "Bodily Distress Syndrome (BDS)"(64).

We must put a stop to these faulty diagnoses!

**Stress** is rising sharply. Between 300,000 and 500,000 Danes suffer from stress with virtually the same symptoms. 430,000 of all Danes, ie, 10-12% have symptoms of severe stress.

35,000 Danes report sick each day due to stress. According to the updated figure from "Arbejds miljø og Helbred" ("The Working Environment and Health"), Feb. 2013, 15% of all working Danes felt stress "often" or "all the time" during the previous two weeks. 500,000 (1.5 million) feel burnout on the job. 52% stated that the work itself was the main source of stress. Stress costs Denmark 14 billion kroner (crowns) a year in the form of absenteeism, premature death and expenditure for health care.

It is imperative that we put an end to the myth that stress is caused exclusively by psychosocial factors, and recognise that electromagnetic fields / radiation directly affects not only the body's general stress response system (autonomic nervous system / neurotransmitters), but has also a direct stress impact on the brain (through the opening of the blood-brain barrier and through worsened blood circulation) and cellular stress response (the production of stress proteins, free radicals, oxidative and nitrosative stress, damage to cell membranes, mitochondria and cell nucleus DNA).

**Depression** is rising sharply. 200,000 Danes have received this diagnosis with many of the described symptoms. Stress, triggers over more than half of all cases of depression

and anxiety. It is predicted that stress and depression will be the most significant cause of disease by 2020.

Bipolar disorder, a symptom of depression, is rising sharply. Current diagnoses show 40,000 people with the condition - a figure that is increasing steadily.

**ADHD and other behavioural disorders** are rising sharply. Around 25,000 children have been diagnosed with ADHD, and the number is increasing. In 2008, 10,700 children received medical treatment for ADHD, and the figure is rising steadily. A growing number of adults are also being diagnosed with ADHD, currently 10,000 people. Experts say that this is a massive underdiagnosis, and that upwards of 80, 000 adults are suffering from ADHD. Over the course of a decade the number of children, young people and adults with ADHD medication has increased from 2,100-31,000, of which half are adults.

**Alzheimer's and other dementias** are rising sharply. 90,000 Danes have this diagnosis, a figure that is steadily increasing. It is claimed that an increase in average life-expectancy in Denmark is the reason for this increase, but the researchers have also found signs of Alzheimer's in infants. Research shows that electromagnetic fields / radiation damages cells in, amongst others, the brain areas in the hippocampus and in the temporal lobes which in turn reduces the brain's production of the neurotransmitter acetylcholine and melatonin, alterations that can cause Alzheimer's.

**IN OTHER WORDS, ONE AND A QUARTER MILLION DANES ARE SUFFERING FROM NEUROLOGICAL DISEASES.**

Exactly how many of all these diseases have been caused by radiation, or if exposure to EMFs is a contributing factor to the symptomatology, but is being diagnosed as mental disease by medical practitioners or psychiatry, we obviously do not know. But we can be assured that the number is huge. International figures on the upgrading of self-reported EMF health problems and disease (EHS / EHS) varies. There are no Danish figures. The Bioinitiative Report states between 3-10% of the population (2). This is equivalent to 150,000-500,000 Danes. Based on UK figures, Bevington estimates that 3-5% of citizens understand that their symptoms are due to exposure to EMF. However, the number of people who do not understand that EMF is the cause of their symptoms / disease, is much higher. Bevington estimates that 3% of the UK population are suffering from severe symptoms, 35% are reckoned to have moderate problems, up to 50% have milder problems (52). The unknown amount can, therefore, be enormous.

Regarding injuries in children's neurobiological development, according to new statistics from the US, one in six children is suffering from brain injury: ADHD, ADD, autism spectrum disorders, behavioural disorders. For children diagnosed with ADHD in Denmark, the figure given is 25,000. The number of ADHD cases diagnosed over 18 years in Denmark has increased from 3,572 in 2006 to 10,000 in 2010. Researchers estimate that up to 80,000 adults are suffering from ADHD. Regarding autism, the disease occurs in one out of every 80 children in the United States. 10 years ago the figure was one in 500, whilst 20 years ago the figure was one in 1 000. For an only child, this generates huge problems for the family, but it is also a gigantic problem for society when the child grows up and becomes disabled as an adult (53).

Regarding young people aged 15-17 years, Russian authorities state that the increase in cases of central-neurodevelopmental disorder has increased by 82% since 2009, and this increase must be related to the use of mobile telephones (54). There is no reason to believe that the situation is any different in Denmark, not even when the authorities try to counterargue with the suggestion that: "We have become better at diagnosing". Therefore, it can no longer be denied that the increase in brain disease is simply an epidemic.

In the newspaper "Politiken" ("Politics"), January 24, 2013, the SF health-chairman Özlem Cekic is quoted as saying that the 240,000 Danes currently on happy pills, and the 4,000 children on Ritalin, as well as the ever-increasing number of people using antipsychotic medication are being subjected to an over-treatment. However, in our opinion, it is not the treatment itself which is the cause of the problem, but rather a massive psychiatric misdiagnosis which has resulted in increasing psychopharmacological processing. Many of these people are not mentally ill in the strict sense of the word, i.e. their disease and symptoms should not be related to psychosocial and genetical causal factors, but instead to exposure to EMFs from a combination of low- and high frequency fields (EFs), magnetic fields (MFs) and electromagnetic fields (EMFs) emitting from the different signaling patterns and intensities of technological devices - often referred to as "electrosmog".

This does not mean, of course, that none of those affected may need treatment with Psychotropic drugs / psychotherapy, since the exposure can cause severe stress, depression and anxiety, and development problems, which may require medical / psychological treatment. However, the crux of the matter is that this is not a problem that can be solved by psychiatry. On the contrary, somatic doctors including those involved in occupational and environmental medicine, general practitioners, neurologists et al., must be properly informed about EMF-related health problems, which often fall within the so-called stress-related health problems, so they can get started with setting differential diagnoses and so investigate and treat the disease properly. At the same

time, we need political negotiations to make decisions about health protection through prevention, in order to safeguard against even more citizens falling ill in the future.

The alarm has been raised worldwide about the harmful consequences of radiation and the Danish health authorities have been informed about the warnings and proposed plans for action from the European Parliament (55), the EEA's (56), the European Council (51), WHO (IARC) 57, and medical and research groups (2, 58, 59). Many countries including France, Italy, Belgium, Spain, England, Poland, Austria, Switzerland, Israel, USA, Canada, Chile, Russia, China, etc. have already introduced varying degrees of protective measures.

Here at home, however, The Board of Health misinforms doctors, the Folketing (Parliament) and the general public by saying that you should not take seriously the specifically extensive research which documents the injuries caused by EMFs (60). At the same time Sundhedsstyrelsen (The Board of Health) sanctions that Danes damaged by radiation are to be diagnosed as mentally ill and to receive psychiatric and psychological treatment. This is particularly irresponsible, because the sick are thereby denied the correct medical health examinations based on the study of bodily pathophysiology (blood, urine, samples and scanning). Thus the EHS sufferers are not properly diagnosed as suffering from EHS / EMF-syndrome / EFI and so they are denied the proper treatment, which is first and foremost shielding against further irradiation.

And this means that you politicians in Sundheds- og Forebyggelseudvalget (The Health and Prevention Committee) are continuing to participate in a senseless deployment of wireless technology right in the midst of schools, orphanages, children's day care and hospitals without taking any account of the precautionary principle and facts about EMF-related health problems. This will undoubtedly result in even more people falling ill.

We will investigate these problems further in our audience with The Health and Prevention Committee. It is urgent and of the utmost importance that immediate political measures are taken to create legislation which safeguards the population in general, especially pregnant women, children, the young, the sick, the elderly and those with electromagnetic hypersensitivity (EHS injured).

We urge you to read the following documents as soon as possible.

1) BioInitiative report, from 2012. e.g. "Summary for the Public and conclusions".  
[http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec01\\_2012\\_summary\\_for\\_public.pdf](http://www.bioinitiative.org/report/wp-content/uploads/pdfs/sec01_2012_summary_for_public.pdf)

2) Guideline of the Austrian Medical Association for the diagnosis and treatment of EMF related health problems and illnesses (EMF syndrome). Consensus Paper of The Austrian Medical Association's EMF Working Group, 3 March 2012.

<http://freiburger-appell-2012.info/media/EMF%20Guideline%20OAK-AG%20%202012%2003%2003.pdf>

3) European Council Resolution 1815 (from 2011) "The potential dangers of electromagnetic fields and their effect on the environment"

<http://assembly.coe.int/mainf.asp?link=/documents/adoptedtext/ta11/eres1815.htm>

4) ARTACs description of electro-hypersensitivity (2009). (French and English)

[http://www.artac.info/fic\\_bdd/pdf\\_fr\\_fichier/declaration23mars2009\\_12961432440.pdf](http://www.artac.info/fic_bdd/pdf_fr_fichier/declaration23mars2009_12961432440.pdf)

or (French) (2010)

[http://www.artac.info/fic\\_bdd/pdf\\_fr\\_fichier/electrosensibiliterecherche\\_12961423640.pdf](http://www.artac.info/fic_bdd/pdf_fr_fichier/electrosensibiliterecherche_12961423640.pdf)

Yours sincerely,

Eva Theilgaard Jacobsen and Susanne Bølling

**Enc:**

**APPENDIX 1: Bibliography**

**APPENDIX 2: Overview of abbreviations and explanations**

*English translation by Sharon Ingram from the Danish-Swedish translation by Jan Hanes*

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## Appendix 2: Overview of abbreviations and explanations used in the text

<b>ALARA:</b>	<b>The Precautionary Principle:</b> As Low As Reasonably achievable.
<b>ADD:</b>	<b>Attention Deficit Disorder</b>
<b>ADHD:</b>	<b>Attention Deficit Hyperactivity Disorder</b> Neurologically- induced developmental disability characterised by behavioural symptomatology, including excessive hyperactivity, impulsivity, attention disorders and disturbed social behavior.
<b>DECT:</b>	<b>Digital Enhanced Cordless Telephone</b> A digital cordless telephone, which operates at about 1900 MHz. Most DECT telephones are constantly emitting radiation - even when one is not actually speaking on them.
<b>EEA:</b>	<b>European Environmental Agency</b> The European Environment Office. Located in Copenhagen.
<b>EF:</b>	<b>Electric Fields</b> See EMF / EMR.
<b>EFI:</b>	<b>Electromagnetic Fields Intolerance, see EHS</b>
<b>EHS:</b>	<b>Electro Hyper Sensitivity</b> Also referred to as EMF syndrome and electromagnetic fields Intolerance (EFI). Formerly called Microwave Syndrome and Radiowave Sickness. A neurological-immunological illness with multiple symptoms triggered by EMF.
<b>ELF:</b>	<b>Extreme Low Frequency</b> Extremely low frequencies. Low-frequency fields. Located between 0 - 1000 Hz on the frequency spectrum.
<b>EMF:</b>	<b>Electromagnetic Fields.</b>
<b>EMR:</b>	<b>Electromagnetic Radiation.</b> Electromagnetic fields (EMF) / Electromagnetic radiation (EMR) are physical energy fields / rays / waves created around electrically charged objects. An electromagnetic field is a combination of an electrical (EF) and magnetic field (MF), both of which radiate from an electrically charged source. The EMF / radiation emits from the source in an undulating wave motion or as small packets of energy = photons. Electric fields and magnetic fields are separate when occurring at low frequencies, but combined when occurring in high frequency radio and microwave-frequency based radiation. An electromagnetic field stretches out infinitely in space and affects other electrically charged objects in the environment. One experiences its force and is affected by it. The

human body is also an electromagnetically charged system, which is affected by electromagnetic fields / radiation in the environment.

**EEG:** **Electro Encephalography**  
Medical examination of brain activity.

**ECG:** **Electro Cardiography**  
Medical examination of the heart's electrical activity.

**The Precautionary Principle** **The Precautionary Principle ALARA:** (As Low As Reasonably Achievable) is the basic principle behind the EU's environment policy (The Lisbon treaty § 191), which Denmark, according to the terms of the EU treaty, is obliged to implement. In addition, the UN Rio Declaration of 1992, Article 15 has embraced the precautionary principle.

The EU Commission states its use:

*"The precautionary principle enables rapid response in the face of a possible danger to human, animal or plant health, or to protect the environment... According to the Commission the precautionary principle may be invoked when a phenomenon, product or process may have a dangerous effect, identified by a scientific and objective evaluation, if this evaluation does not allow the risk to be determined with sufficient certainty".*

<http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1423827901181&uri=URISERV:I32042>

Regarding exposure to EMF / EMR, The Council of Europe Resolution number 1815, 2011 uses The precautionary principle:

*"The precautionary principle should be applied when scientific evaluation does not allow the risk to be determined with sufficient certainty. Given the context of growing exposure of the population, in particular that of vulnerable groups such as young people and children, there could be extremely high human and economic costs if early warnings are neglected.... Waiting for high levels of scientific and clinical proof before taking action to prevent well-known risks can lead to very high health and economic costs, as was the case with asbestos, leaded petrol and tobacco".*

**(from: "The potential dangers of electromagnetic fields and their effect on the environment")**

<http://assembly.coe.int/mainf.asp?link=/documents/adoptedtext/ta11/eres1815.htm>

To date, The Danish Board of Health has ignored Denmark's obligations to implement ALARA with respect to electromagnetic radiation.

**GSM:** **Global System for Mobile Communication**  
A digital mobile telephone system which is available in two versions: GSM 900 MHz and 1800 MHz.

**Hz:** **Hertz**

Cycles / oscillations / waves per second. The unit of measurement of the vibration scale for electromagnetic radiation is  
1 Hz is one cycle per second,  
1 million cycles per second is 1 MHz (Megahertz),  
1 milliard cycles per second is 1 GHz (Gigahertz),  
1 THz - Terahertz(Tz) is one billion cycles per second (visible light).

- ICNIRP:** **International Commission on Non-Ionizing Radiation Protection**  
A private association, located in Munich, Germany, with close ties to the Telecommunications Industry. They set thermal (heating) limits for electromagnetic fields and radiation, which does not take account of non-thermal damage and effects. Nevertheless, Denmark's National Health Board adheres to these irrelevant standards.
- IARC:** **International Agency for Research on Cancer**  
An expert panel within the WHO, which evaluates the risk of cancer from a wide range of substances.  
In 2011 IARC upgraded the cancer risk from RF-EMF on the individual, in the environment and professionally from cell phones, cordless phones, cell towers, wireless network, etc. to a cancer risk factor Class 2B (the same category as lead, dioxin and DDT). In 2001, IARC upgraded the cancer risk from low-frequency EMF (EF and MF), from high-voltage lines, electricity, transformers etc.
- Non-thermal injuries:** **Refers to exposure to levels of EMF / EMR, where no heating of tissues may occur**, but where there nevertheless occur a whole range of biophysical and adverse effects on living organisms, based on other biophysical mechanisms apart from heating and temperature increases.
- In-vitro:** **in vitro means "in glass", i.e. reagent glass**  
and refers to studies of cells and tissues in the laboratory environment outside organisms e.g. of blood, urine or cells.
- In-vivo:** **in vivo means "in life"**  
and refers to studies of living organisms, animal experiments and tests on humans.
- MF:** **Magnetic Fields.** See EMF / EMR
- MHz:** **Megahertz**  
The unit of measurement for frequencies  
The unit of measurement for frequencies is 10 to the power of 6, i.e. millions of hertz = oscillations/ waves per second.
- MRI scan:** **Magnetic Resonance Imaging scan**  
A medical examination, where a large number of measurements are taken and processed into detailed computer images.

<b>Microwaves:</b>	<b>300 MHz - 1 THz</b> The upper range of the radiowave spectrum.
<b>PEA:</b>	<b>Phenyletylamin</b> An essential amino acid, which is a parent neuromodulator with control of catecholamine synthesis (the catecholamine system consists of the neurotransmitters adrenalin, norepinephrine, and dopamine). PEA is reduced upon exposure to EMR. In ADHD PEA is severely reduced. Treatment of ADHD with Ritalin (Methylphenidat) normalizes the irrigation of PEA in the urine.
<b>PET:</b>	<b>Positron Emission Topography</b> A type of scanning used in medical examinations.
<b>RF:</b>	<b>Radio frequencies</b> The part of the electromagnetic spectrum that extends from 30 000 cycles per second to THz (Terahertz) (visible light). Microwaves which have the frequency of 300MHz are called radio waves. Microwaves emit from all kinds of wireless networks, phones, masts, radar.
<b>Ritalin:</b>	<b>Product Name</b> Comprises the central stimulant substance metylphenidat. Used in the treatment of ADHD.
<b>TETRA</b>	<b>Terrestrial Trunked Radio</b> Amplitude modulated wireless communication system. Used by the emergency services. Alarm service. Operates between 400-470 MHz.
<b>UMTS</b>	<b>Universal Mobile Telephony System</b> 3rd generation mobile technology. Operates between 1920 - 2170 MHz.
<b>LTE:</b>	<b>The 4th generation of mobile telephony</b> 3GPP = 3rd Generation Partnership Project LTE = Long Term Evolution. Operates at 2600 MHz
<b>Wi-Fi:</b>	<b>Wireless Fidelity</b> Wireless broadband networks. Operates between 2400 - 2500 MHz.
<b>Wi-Max:</b>	<b>Worldwide Interoperability for Microwave Access</b> Far-reaching wireless broadband networks. Operates between 3400 - 3600 MHz.
<b>WLAN:</b>	<b>Wireless Local Area Network</b> Short-propelled wireless broadband connection.
<b>WHO:</b>	<b>World Health Organisation</b>

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