



2nd Memorandum (22/10/19) by the Cyprus Medical Association (CyMA) and the Cyprus National Committee on Environment and Children's Health (CNCECH) on the 5G discussion

- based on the Nicosia Declaration 2017

2nd Memorandum (22/10/19) on 5G on the discussion:

“Public Health Risks from the use of the 5G network”

**submitted on October 22, 2019 to the Chairmen
and Members of the Standing Committees on
Health Affairs and the Environment of the Cyprus
Parliament, by the Cyprus Medical Association
(CyMA) and the Cyprus National Committee on
Environment and Children's Health (CNCECH):**

This is an English version of the №2 Memorandum text. This №2 Memorandum is a follow up of the Memorandum № 1 of September 26th 2019, aiming to provide scientifically substantiated answers to the questions raised by the Honorable members

of the Parliament meeting. It should be emphasized that personal assumptions made on Health issues by Dr. N. Constantinou without himself having any relevant expertise on the subject, are unacceptable, unsubstantiated and dangerously misleading (Dr. Metsis' memoir submitted to the parliament and parties involved is very clear for Dr Constantinou's unacceptable assumptions). Further documentation of our position on the issue is provided in the Bibliography submitted with the 1st Memorandum on September 19th 2019.

Characteristics of Electromagnetic Radiation Radiofrequency (EMF/RF)

EMF/RF has less energy than the visible light, the ionizing, ultraviolet and infrared radiations. However, due to the fact that it transmits information, unlike all the above types of radiations, it does not have a fixed waveform. It is polarized (*Panagopoulos DJ et al.: Polarization: a key difference between man-made and natural electromagnetic fields. Sci Rep. 2015; 5: 14914-1 – 14914-10), Review M.Pall 2018*) and characterized by pulses with high intensity peaks. Also, in contrast to the visible light, it can penetrate the body and the brain. Pulse and polarity are the key properties that make it highly bioactive and having the potential under certain circumstances to cause not only tissue heating, but also biological effects, by affecting the electrophysiology of the body. Because of its double-helical shape, DNA acts as a fractal antenna, and interactions with external electromagnetic fields become inevitable and multiple. It is therefore self-evident that any comparison of harm to that of the visible light on the basis of energy alone (*as N. Constantinou claimed*) is scientifically wrong and misleading.

5G will not replace the currently used 3G and 4G technology, but it will coexist / cooperate with it. It will utilize the current frequencies, as well as additional very high frequencies of submillimeter waves, to achieve excellent internet speeds with minimal latency time. Therefore, when discussing potential health implications of 5G, we must take into account both the already existing strong documentation on the health adverse effects of 3G-4G technologies and the very little-studied potential additional effects of 5G.

Documentation on the health effects of EMF/RF

Scientific documentation of the potential health impacts of EMF/RF is constantly expanding and is already sufficiently strong, justifying and at the same time urging for the immediate application of the Precautionary Principle (*relevant bibliography has been submitted with the Memorandum No1 of the 19th of September 2019*). Extensive reference to the harmful effects of EMF/RF is also made in the "Resolution 1815" (2011) of the Council of Europe, which adopted the recommendations of its pertinent scientific body, the ITRE Committee (*European Parliament's Committee on Industry, Research and Energy*):

«the Parliamentary Assembly of the Council of Europe adopted Resolution 1815 (2011) in which it considered that there was sufficient proof of the potentially harmful effects of electromagnetic fields (EMF) on the environment and human health. In this document, the Council proposed that its member states take measures concerning the use of mobile phones and Wi-Fi networks and specifically asked for a ban on such devices in schools».

The existing documentation overrides arbitrary and unsubstantiated assumptions such as that: "EMF/RF can only cause tissue heating and therefore is safe". Since the current limits are based on those assumptions, they are, NOT SAFETY LIMITS. They only refer a) to a few minutes of exposure and not 24h/365 days/y exposure of the 21st century, and b) to thermal effects, completely ignoring biological effects, found to be triggered at lower level, by 100,000 times – up to 10⁶ times lower, including possible carcinogenicity (*WHO/IARC 2011*). The current limits INCRIP are so high and they certainly meet the growing needs of the increase of the exposure which will result from the implementation of 5G and the Internet of Things (IoT) (*Report to European Parliament 2019*). *The increase in the exposure has been admitted by Mr Komodromos, Director of the Electronics and Communication, responsible for 5G deployment, at the meeting of 26/9/19 at the Parliament.*

Based on the scientific documentation, under the existing conditions of permanent and chronic exposure, the biological effects, are reasonably expected to evolve into adverse health effects and cause diseases (*Bioinitiative report 2012/14*).

BIOEFFECTS ARE CLEARLY ESTABLISHED

Bioeffects are clearly established and occur at very low levels of exposure to electromagnetic fields and radiofrequency radiation. Bioeffects can occur in the first few minutes at levels associated with cell and cordless phone use. Bioeffects can also occur from just minutes of exposure to mobile phone masts (cell towers), WI-FI, and wireless utility 'smart' meters that produce whole-body exposure. Chronic base station level exposures can result in illness.

BIOEFFECTS WITH CHRONIC EXPOSURES CAN REASONABLY BE PRESUMED TO RESULT IN ADVERSE HEALTH EFFECTS

Many of these bioeffects can reasonably be presumed to result in adverse effects if the exposures are prolonged or chronic. This is because they interfere with normal body processes (disrupt homeostasis), prevent the body from healing damaged DNA, produce immune system imbalances, metabolic disruption and lower resilience to disease across multiple pathways. Essential body processes can eventually be disabled by incessant external stresses (from system-wide electrophysiological interference) and lead to pervasive impairment of metabolic and wide electrophysiological interference) and lead to pervasive impairment of metabolic and reproductive functions.

Indicative examples of impacts and related documentation are provided below. Based on extensive, peer-reviewed literature, the assumption that since radiation does not cause ionization, it cannot affect DNA is not correct. The destruction of DNA by EMF/RF

has been laboratory-proven since 1999 and this was further confirmed in 2005 by the famous Comet assay performed on human (fibroblast) cells and animal cells (*Diem E et al., Mutat Res. 2005; 583 (2): 178-83*). It was documented that the DNA damage after 24-hour exposure to 1800 MHz at SAR 1.3 W / kg (INCRP limit / Cyprus 2 W/kg) was equivalent to the one which would be caused by 5000 chest radiographs. A review of 100 peer-reviewed studies and the latest bibliography from 2018-2019 (*Review Yakymenko I. et al. 2015, M Pall 2018, Lai 2019*) shows that 93% of the studies have shown that DNA is destroyed by EMF/RF, (with brain DNA being highly vulnerable) and affected mainly through the mechanism of free radicals and oxidative stress caused by the radiation. **Oxidative stress is considered to be the primary mechanism of biological impact and destruction of DNA. EMF/RF, even at low intensity is an oxidizing agent with high potential for pathogenicity for cancer and for other diseases.**

The cause of central nervous system cancer constitutes one of the most highly substantiated and critical/irreversible effect. In 2011 the IARC/WHO classified 30KHz – 300GHz radiation (emitted by Wi-Fi, mobile data, masts, mobile phones, wireless connections, tablets, baby monitors, etc) as potentially carcinogenic 2B, in the same group as exhaust gas and the insecticides Parathion and DDT. The statement made that a “possibly carcinogenic 2B” radiation is harmless is at least scientifically unacceptable if not deliberately misleading. If EMF/RF was harmless, IARC would have placed it either in category 3 (“Uncertain as to carcinogenicity in humans”: *There is no evidence at present that it causes cancer in humans*), or category 4 (“Probably not carcinogenic to humans”: *There is strong evidence that it does not cause cancer in humans*).

Today, more recent research and documentation show that EMF/RF is probably a 1st class carcinogen (*Carlberg, M. et al, 2017; Hardell L et al. 2013, 2017; Miller A. et al, (2017 & 2018)*). Due to that, in April 2019 IARC he has included it on the list of “High priorities for re-evaluation due to new mechanistic evidence/bioassays” (www.thelancet.com/oncology/Vol_20_June_2019). Research studies also linked radiation to increased incidence of Thyroid cancer (*Carlberg M et al: Increasing incidence of thyroid cancer in the Nordic countries with a focus on Swedish data, 2016; BMC Cancer (2016) 16: 426*). Other research indicate possible action of EMF/RF as a “cancer promoter”, (*Tillmann T et al. 2010, Carlberg M, Hardell L 2014, Lerchl A et al., 2015*).

The documentation on the effects on brain and nervous system development (*Deshmukh, P. et al., 2015; Tang, J. et al., 2015*) and other neuropsychological and learning/cognitive adverse effects (*de Caires Jr LC et al., 2014, Deshmukh PS et al., 2015, Li HJ et al., 2015*), especially on fetus and child has reached the level of more than 70% of absolute documentation (*Lai 2019*). Behavioral problems caused to children as a result of fetal and postnatal exposure of the child (*Divan et al. 2010, 2012, Birks L et al. 2017*), early onset of dementia and Alzheimer’s (*Review M. Pall 2018*), addiction and dependency (*WHO 2018*), are also all well documented. EMF/RF also causes perforation of the blood-brain barrier that protects the brain (*Nittby H. et al., 2009*), thereby increasing the penetration and consequently the effects of other toxic agents on the brain.

The effects on the reproductive system, the potential cause of decline in fertility and the impact on semen quality and quantity, are documented in 18 reviews of reliable studies (*Review M. Pall, 2018, Houston, BJ, et al., 2016; Adams, J., 2014, De luliis GN et al., 2009*). In another review and post-analysis of 10 studies (sperm samples from 1492

males) showed sperm damage due to cell phone use (*Adams JA et al., 2014*). A study of 2028 college students (2013-15) showed correlation of the alteration to semen related parameters with the use of mobile phones (*Zhang G. et al., 2016*). 21 out of 27 studies examining the effects of EMF/RF on the male reproductive system revealed harmful effects (*Houston BJ et al, Reproduction 2016*).

The damaging effect of Wi-Fi has also been well documented. Wi-Fi affects in particular DNA, the genital system, the brain, etc. (*Resolution of the Council of Europe 2011, Martha Herbert, 2016, Pall, M., 2018 Environmental Research 164 (2018) 405-416, Review of 100 studies by Wilke I: umwelt · medizin · gesellschaft 2018 Feb 31 (1)*). In addition to the caused continuous passive exposure **24 hours / 7 days / all year round**, the greatest exposure occurs at the time/point of use (down-or up-loading), with the direct exposure being very high for the user. In addition, there is high passive exposure of whoever is nearby. Both active and passive exposure are even higher with the use of mobile data 3G/4G. Four (4) hours of continuous exposure to a computer connected to Wi-Fi, led to alteration of sperm motility and quality (*Avendano C, et al., 2012*). These are the scientific rationale of the Council of Europe (since 2011), Medical Associations and other International bodies (*Reykjavik appeal 2017, Nicosia Declaration 2017*) warn about risks and urge to avoid them. The use of wired internet connection that is safe but also faster, is recommended in particular for schools, homes and pediatric units.

Fetus and child are those that are most directly and over time more severely and more dramatically affected (*Carlo V. et al., in Bionitiative 2012 sect 19 on fetal and neonatal Effects of EMF*). As developing organisms, they are more sensitive, their systems are in constant development and various defense mechanisms may still be weak (*WHO 2010 & 2014*).

The main reasons why children have high vulnerability are:

- They have a higher density of embryonic stem cells that are more sensitive to multiple frequencies and cannot adapt to chronic exposures (*Belyaev 2012*)
- Sensitivity to RF-induced epigenetic changes (changes in gene expression) is higher (*Davis and Lowell, 2008*), which can alter embryonic development, in particular neurological development (*Sage, C. et al. 2017*).
- The faster cell division combined with EMF/RF caused increased DNA damage and reduced ability to repair it, strongly suggests that children may be particularly susceptible to cancer and to brain growth retardation which may also be related to autism (*Martin Pall, USA, 2018*).
- In addition, due to smaller and thinner cranial bones and a larger dielectric constant and conductivity, it was found that absorption is greater, and the penetration of radiation deeper than to adult's brain i.e. 10-fold in the brain bone marrow (*Ghandi et al. IEEE Trans, Microwave Theory & Techniques, Vol. 44 (10), pp. 1884-1897, 1996, IARC Monograph 102, 2011*).

The Nicosia Declaration and 5G

The Nicosia Declaration 2017 is a common position paper by the Cyprus Medical Association (CyMA), the Vienna/Austrian Medical Chamber, and the Cyprus National Committee on the Environment and Children's Health (CNCECH) and is now under revision to address 5G.

The Nicosia Declaration aims to provide responsible science-based information to promote policies and measures for effective Public Health protection. It is considered as an urgent necessity because of the following reasons:

1. Universal and continuous exposure of the whole population to EMF/RF. **The exposure of children, even infants and fetuses, geometrically expands, increases, it is multiple and uninterrupted, at vulnerable stages of their development from embryonic to adolescent stages, and affects the entire population.**
2. The existing and constantly emerging scientific documentation on the health effects to children and the fetus, indicate health effects that may be serious and irreversible. Documentation is strong enough to **support Preventative measures and to establish preventive activities and rules for reasonable technology usage.**
3. Existing limits (*ICNIP, EC Rec. 1999/519*) concern only short-term exposure and only thermal effects, ignoring long-term exposure, biological effects including possible carcinogenicity.
4. **New devices emerge without prior and post marketing health related safety control** especially in relation to the potential long-term health effects on children. They simply invoke compliance with existing limits which do not imply safety. At the same time, wireless technology is being promoted in schools without taking into account the health/cognitive implications and ignoring the option for a secure wired connection (ethernet).
5. **The society is not well informed** about the dangers and may have erroneous perceptions of safety.
6. **Good Practices for the Safe Use of Technology and Reduction of the Exposure do exist.**

The 2017 Declaration as a Framework of Principles / Findings and Recommendations also relates to 5G, because it falls within the frequency spectrum covered by the Declaration. Declaration was not specifically refer to 5G, due to the lack of sufficient scientific documentation of the additional biological effects of 5G. The main problem with 5G is the very limited number of biomedical related studies. (*Ref EMF Interanational Symposium Mainz Germany October 2019, Discussions and presentations by D.Davis, D. Leszczynski, opinion on 5G 2019*),

More specifically, the following are missing or are very limited:

1. toxicological studies in animals
2. studies of the effect of 5G on human physiology
3. studies of possible effects of chronic exposure
4. synergy studies of microwaves with toxic chemical agents
5. studies of the effects of micro-millimeter waves on the skin (the largest organ of the human body) and on the physiological functions governed by it (such as immune function).
6. Studies on the effects on the eye and the physiology of the eye, which is particularly susceptible to heat.

Based on the above limitations, any assumption that 5G is safe is arbitrary, scientifically unsupported and misleading. The hasty implementation of 5G might be dangerous. The contribution of wireless technology to technological development is undisputed. However, time should be given to consider the implications and redefine where wireless communication is needed and where not, for which applications, and where fiber optics and wired internet can be used (for safer and faster internet), as well as hardwired telephony. Any technological development must be done in a prudent way, while weighing and limiting potential risks and safeguard to mental and physical health.

The following specific Recommendations made in the 1st Memorandum of September 19th 2019 are essential:

A) All necessary data (related to exposure and impact assessment studies, ways of reliable control etc), must be submitted and disclosed prior to 5G deployment,

B) Legislative measures are needed, aiming to reduce children's exposure as follows:

1. **the application of 5G free zones for playgrounds, schools, hospitals,**
2. **the prohibition of wireless technology in schools for children up to 15 years of age and the application of special exposure biological criteria to evaluate children's exposure**

C) The Parliament asked to safeguard "the Right to Know" and to call on the Ministries of Health and Education and Culture to support through a multifaceted science based campaign, the responsible information on the potential impact on Health and good practices for safe- rational use of Technology (*detailed in Memorandum No 1 of 19/9/19*).

It is evident that existing documentation leaves no room for negligence and holds us accountable to children and to younger generations. It obliges us **to apply the Prevention, Precaution and the ALARA Principles, i.e. of the smallest possible exposure**, since the exposure level to children in particular is already well above levels which can be considered as biologically acceptable.

The Nicosia Declaration 2017

Bibliography

solution 1815" (2011) of the
Council of Europe

[More about Electromagnetic
Radiation](#)

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