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5G networks in European Countries: appeal for a standstill in the respect of the precautionary principle

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The document by the European Commission "*5G for Europe: An Action Plan*" (September 2016) aimed to describe "*an action plan for timely and coordinated deployment of 5G networks in Europe through a partnership between the Commission, Member States, and Industry*". This document was targeted to introduce early the new 5G networks by 2018 and, subsequently, to a "*commercial large scale introduction by the end of 2020 at the latest*".

Following this document, several member States are planning in these months, at a national level, preliminary "5G experimentations" by private phone operators, aimed at testing the network at frequencies over 6 GHz, before the final introduction of the typical 5G frequencies (over 30 GHz, millimeter waves).

A document by the Italian Communication Authority (AGCOM, March 28, 2017) stated that "*the 5G networks will serve an elevated number of devices and will connect, according to the prevalent hypothesis based on ongoing standardization developments,* ***about 1 million devices per Km2****. This device density will cause* ***an increase of the traffic*** *and the need to install small cells in order to allow adequate connectivity performances, with subsequent* ***increment of the density of the installed antennas***".

In Italy, as an example, the "5G experimentation" will involve, in three different geographical areas (north, center, south), about 4 million of uninformed and unaware citizens. The residents will be exposed, during this "experimentation" to frequencies and with a device

density never employed before on a large scale.

Although typical radiofrequency electromagnetic fields (RF-EMF) exposure levels are usually below current regulatory limits in European countries[1, 2], the real health impact of the advancement and spreading in communication technology is still under debate[3]. Several studies have documented the ability of RF-EMF to induce oxidative stress[4, 5] (mainly by an increased production of reactive oxygen species)[6-12], and oxidative DNA base damage [13]. Of note, biological effects have also been recorded at exposure levels below the regulatory limits, leading to growing doubts about the real safety of the currently employed ICNIRP standards[14-16].

Previous evidences led the IARC in the year 2011 to classify the RF-EMF as possibly carcinogenic to humans (Group 2B). After the year 2011, more recent studies strengthen the link between RF-EMF and cancer onset [17-22] and highlighted new possible health risks mainly in terms of reproductive [23-25], neurologic [26-31] and metabolic diseases [32-35].

Furthermore, specific preliminary evidence showed the exposure to frequencies over 30GHz could alter gene expression[16, 36-39], increase the temperature of the skin [40], stimulate cell proliferation[41-43], alter the functions of cell membrane [44, 45] and neuro-muscular systems[46-52], and are able to modulate the synthesis of proteins involved in inflammatory and immunologic processes[53], with possible systemic effects.

Further studies are certainly needed in order to better and fully explore the biological effects caused by the exposure to these specific RF-EMF frequencies accompanied by high exposure density. The available evidence, however, is sufficient to justify the possibility of health effects (in particular on the more vulnerable subjects, as children and pregnant women) secondary to a technological “experimentation” conceived with commercial aims.

We believe it should be unethical to ignore the available evidence waiting a possible “*a posteriori*” demonstration of health damages in the presence of a present and potentially manageable risk for public health.

Thus, in the respect of the precautionary principle and of the WHO principle “health in all policies”, we believe suitable the request of a standstill for the “5G experimentations” throughout Europe until an adequate and active involvement of public institutions operating in the field of environmental health (health ministry, environmental ministry, national environmental and health agencies) will be effectively planned.

This involvement should be aimed to correctly and preliminarily perform risk analyses and environmental health monitoring plans, possibly suggesting alternative or adequate measures to reduce the level of risk in the exposed population.

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