

# Electromagnetic radiation including G5 frequencies, health effects summary and policy recommendations

Stein Y.<sup>1,\*</sup>

1 Physician and researcher of health effects of electromagnetic radiation. Affiliation: Department of Anesthesiology and Critical Care Medicine, Hebrew University – Hadassah Medical Center, Jerusalem, Israel

\*corresponding author: e-mail: yael.stein1@mail.huji.ac.il

## Extended Abstract

5G millimeter wave technology offers advantages: "smart" homes, "smart" cities and autonomic automobiles. The price: a rise of 30-100% in exposure to electromagnetic radiation near citizens' homes and higher exposure levels inside homes. Scientists have declared current exposure levels not relevant to protect against health effects.<sup>1</sup> Pregnant women, babies and children should be protected from chronic exposure of public source in the private home against their will. Electrohypersensitive individuals would be forced to leave their homes and become refugees.<sup>2</sup> In Brussels as well as other cities, 5G has been halted due to health concerns.<sup>3</sup>

**Background:** Reportedly, exposure to electromagnetic radiation (EMR) in frequencies above 1 Gigahertz has risen 10<sup>18</sup> times background environmental levels.<sup>4</sup> It is the largest and fastest growing anthropomorphic environmental pollutant, affecting billions. Allowable exposure levels from 1996 rely on physics theory that low-level nonionizing EMR can cause nothing but thermal effects.<sup>5</sup> But thousands of studies demonstrate biological effects on cells and tissues exposed to low non-thermal levels of EMR.<sup>6</sup> Studies from the 1950-60s in radar technicians in former USSR reported health effects: headache, hematologic problems, fertility problems, decline in libido and neural effects – named "Microwave Sickness".<sup>7</sup> EMR has been categorized as a possible human carcinogen by IARC.<sup>8,9</sup> Data trends indicate a rise the incidence of brain cancer even though researchers are still in disagreement.<sup>10,11</sup> Economic interests might affect some of the studies and their conclusions. Recent studies in humans demonstrate: acute exposure to non-thermal levels of EMR affects brain metabolism,<sup>12</sup> brain electric function<sup>14</sup> and the immune system.<sup>13</sup> Studies have shown effects of chronic exposure to EMR on DNA by enhancement of oxidative stress response<sup>15,16</sup> and effects in nerve tissue, on myelin.<sup>17</sup> Two recently published large animal studies performed by the US- National Toxicology Program<sup>18</sup> and by the Ramazzini institute reported statistically significant rise in tumors in animals exposed chronically to non-thermal levels of EMR.<sup>19</sup> Studies on G5 millimeter wave frequencies: Experiments conducted between 1970-75 in former USSR on animals exposed to non-thermal levels of millimeter waves for only 15 minutes a day

demonstrated detectable changes in both the central and peripheral nervous system, changes in permeability of blood vessels, changes in the reflex response of the nervous system (stronger response from a lower trigger) and changes in the hematopoietic and lymphatic systems.<sup>20</sup> Studies from the Hebrew University in Jerusalem and from Japan demonstrate that human sweat ducts respond to millimeter waves and concentrate the energy inside the skin, despite the belief that G5 frequencies cannot penetrate the skin.<sup>21, 22 23</sup>

**Policy recommendations:** Safer alternatives exist: broad band internet via fiber-optic infrastructure, and wired "smart" meters. "More antennas – less radiation" is not true because an extreme rise in usage is predicted, therefore exposure will certainly rise, not fall. The decision to authorize 5G frequencies by the US FCC<sup>24</sup> relies only on thermal 1996 guidelines and did not take non-thermal biological effects or public health precautionary measures into account.<sup>25</sup> Extensive public exposure keeping with thermal allowable levels is expected to have adverse health effects and is therefore unsafe. The public have a basic human right to be safe inside their homes from public source exposure. An individual "opt-out" option must be made available. Allowable exposure levels should be lowered according to biologic effects.<sup>26</sup> The public should be warned about adverse effects of G5 frequencies, and unbiased researched should be funded by government agencies or dedicated trust funds.

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