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Subject: Letter of Comment on Smart Meter Report

I have been invited by colleagues to submit my Commentary on CCST Report and Recommendations for Smart Meters using RF. My comments are based on the information summarized in the Bioinitiative Report and the Seletun Reports, as well as the other reports in the recent scientific literature, The broader context for my commentary are the consequences of our past failures in environmental epidemiology to heed early warnings from other many population wide exposures in yesteryear, notably lead.

Personal Background: I am a medical epidemiologist who has assessed source-exposure-effect relationships for many chemical and physical agents over the past 40 years. This work has included work on lead, asbestos and smoking, pesticides, solvents, air pollution, and mixed exposures and ionizing radiation. Since the late 1980's I served as Head of the Unit of Occupational and Environmental Medicine in Hebrew University-Hadassah School of Public Health and Community Medicine in

Jerusalem Israel. I have also been involved in issues having to do with the medical ethics in public health, and served for several years as Chairman of the Ethics and Philosophy Committee of the International Society for Environmental Epidemiology and I am a member of the Collegium Ramazzini. I have published more than 100 scientific papers in the peer reviewed literature. Since the 1980's, I have had the opportunity to assess the case for a cause effect relationship with many workers with past cancer and past severe exposures to RF/MW, often after short latent periods. I have also supervised projects assessing community exposures to RF/MW and ELF in Jerusalem. I have reported on cases of brain cancer in individuals with latency periods of less than 10 years and am currently writing an investigation of a cluster of cancer in workers with extremely high occupational exposures to RF. I helped draft the Benevento and Seletun statements. In recent years, I have been particularly active assessing the use and scope of the Precautionary Principle in examining the anticipated risks from alternative technologies.

1. Smart grid networks, if using RF, will generate 24/7 round the clock ubiquitous involuntary indoor exposures to RF – in the everyday background environment of everyone in California in human habitats. The background exposures produced by these grids will be substantially greater than those from point source WI-FI routers, microwave ovens and cell phones. These whole body exposures, though perhaps below levels of current regulatory standards, (INCRIP-WHO, and IEEE), will exceed cumulative time weighted exposures producing the above outcomes, based on the literature.

2. Based on the evidence in peer reviewed studies on the effects on these endpoints and the exposure projections in Sage Associates' landmark report (see Sage, http://sagereports.com/smart-meter-rf/docs/Table7-8ElectricMeters_R1000_TA1-90Final.pdf) this project exposes large percentages of the general population to highly alarming involuntary exposure risk scenarios, taking into account an array of modifying factors e.g. background exposures, distance, reflection, and factors influencing access to exposure areas.

3. Since the publication of the Benevento Resolution and the BioInitiative Report, the body of evidence concerning health risks from exposures to RF continues to accumulate. In particular from cell phone use. Cell phone use involves the delivery of a high concentration of non-ionizing radiation to the skull and brain for relatively brief periods of time over a 24 hour period as result of voluntary decisions by users—a situation far less aggressive to the general population than involuntary exposure from the proposed Smart Meters. Models for predicting penetration into the whole body are now available, based on those developed by Gandhi and by Kuster. These models draw attention in particular to the risks from exposure to the young.

4. The exposures from Smart Meters are the equivalent of exposure of the entire population—the young, the old, the newborn, the unborn, and the sick, to environmental tobacco smoke, even if most members of the population do not smoke.

5. There is a huge body of evidence to refute the claim the so-called “hot muffin theory” that there are no effects from sub-thermal exposures to NIR, and specifically RF/MW (Benevento Statement, BioInitative Report, London Report) The effects pertain to ROS- Reactive Oxygen Species, cellular changes, effects on DNA, and neurobehavioral effects-- e.g. deficits in memory, mood changes, fatigue, headache, as well as electro hypersensitivity and cancer, and effects on those with electronic medical implants. It is important to note that there are also concerns about the production of dirty electricity, itself a risk factor for many of these outcomes (Milham).

6. Models of carcinogenicity or exposures to toxic and physical agents and cancer postulate that we cannot be certain there is a threshold (based on the DNA single hit model). These models also postulate roughly linear dose response relationships and recognize groups and age windows for special risks—e.g. foetuses, newborns, persons who are immunocompromised and those with sensitivities on the basis of mechanisms which are still poorly understood. For populations, it is probable that similar dose response models for exposure-risk relationships apply even though mechanisms involve resonance models of intensity and frequency.

7. It is fair to say that we are no longer talking about mere precaution of uncertain risk, but about prevention of highly probable and known risks. Based on the accumulating evidence, it is now fairly certain that there will be widespread adverse public health impacts. What remains uncertain is how many will be affected, and whether there are time weighted intensity of exposure thresholds, below which there will be absence of risk.

8. The most plausible scenario is that there will be 'small' increases in individual risk for the incidence of occurrence (e.g. cancer) or incidence and severity (e.g. neurobehavioral effects), applied to the entire population from these networks/ large population wide increases in absolute numbers of people with adverse outcomes. The epidemiologist Geoffrey Rose articulated the principle that small increases in so-called sub-threshold exposures result in many more individuals with illness in the entire population than high exposures delivered to small numbers of people. *This principle applies to the scenario of population-wide effects from exposures to RF from networks of Smart Meters and concerns about dirty electricity*.

9. Were these population-wide exposures to smart meters to be part of a project carried out in a medical setting, to test the risks and benefits of a new technology on human health and well being, it would be rejected by a Medical Institutional Review Board on ethical grounds as an unethical exercise in human experimentation.

10. The risks we are assessing today from exposure to RFMW and dirty electricity from Smart Meters placed everywhere recalls the story of population-wide exposure to lead in gasoline – a subject concerning which I have much direct personal experience. In the 1970s, a mere 35 yrs ago, we were arguing as to whether or not an everyday blood lead level of 30ug/dl was a health risk. By 1979, that threshold dropped to 20ug/dl and thereafter through the 1980s to 10ug/dl for children, and now we are not certain whether there is a threshold below which there are no discernable adverse neurobehavioral effects, especially for *in utero* and newborn exposures. We now know, in retrospect, that the entire urban population, notably children, were receiving exposures which were impairing their IQ, emotional well being, and long term growth and development. These findings led to the elimination of lead from gasoline. In retrospect, we were not heeding the early warnings regarding an impending population-wide hazard with disastrous effects. I suggest that in the case of population-wide exposure to RF, the situation is similar, with one exception: The warnings may no longer be early.

11. Population-wide exposure to man-made NIR represents a scenario relatively new in the history of biology. It is difficult to assess risks from these new exposures and their frequencies and wave patterns using experience based on exposure to background naturally occurring NIR. Instead, we are required to rely on experimental studies and epidemiology of exposure-effect relationships, using endpoints such as effects on stem cells, leaks from the blood brain barrier, as well neurological, cardiac and cancer endpoints. In addition, there are additional vulnerabilities to the eyes and to the testes.

12. I warn that we may be on the cusp of a similar scenario here with regard to community wide exposures to RF/MW and dirty electricity from Smart Meters — with one exception: there are safe alternatives.

13. The Precautionary Principle, in its various formulations, specifies that where there is uncertainty concerning the possibility of health risks from a new technology, the costs of doing nothing to prevent the exposure (e.g. a false negative) may be greater than a false positive (taking preventive action). I add that in applying the Precautionary Principle, we are required to weigh the risks and benefits from 3 options: doing nothing (i.e. no Smart Meters), and doing something (Smart Meters with RF) or a different kind of Meters using fiberoptics. We recognize that doing

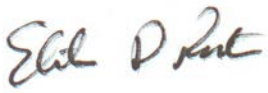
nothing carries itself certain risk having to do with the operations of the electrical ssgrid system.

But alternative technology- smart meters powered by fiber optics, which are without known risk, ***can be used to achieve the same objective.***

14. There is no excuse for avoiding this investment with a permanent enduring protection for the public in avoiding and not introducing fiber optics. For reasons just stated, it will be bad ethics and bad technology and, possibly wanton negligence, recklessness and incompetence to wilfully forego the last option.

I thank the Commission for the opportunity to submit my comments.

Elihu D Richter MD, MPH (Assoc Professor)



References:

1. BioInitiative Working Group, Cindy Sage and David O. Carpenter, Editors. BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF). www.bioinitiative.org. August 31, 2007.

2. Pathophysiology Journal, Special Issue 16: Volumes 1 and 2, 2009. Elsevier Press. *There are chapters on low-intensity radiofrequency and wireless radiation health effects based on scientific literature from the realms of genotoxicity, genomics and proteomics, neurology, blood-brain barrier effects, stress (heat shock) proteins, immunology and inflammatory diseases, cancer and public health consequences of ignoring warnings given global proliferation of wireless exposures at billions of times greater levels than earth and humans evolved with.*

3. WHO Research Agenda, 2010. WHO research agenda for radiofrequency fields, © World Health Organization 2010

4. REFLEX, 2004. Risk Evaluation of Potential Environmental Hazards from Low Frequency Electromagnetic Field Exposure Using Sensitive *in vitro* Methods.

5. Markova E, Malmgren LOG, Belyaev IY. 2009. Microwaves from mobile phones inhibit 53PB1 focus formation in human stem cells stronger than in differentiated cells: Possible mechanistic link to cancer risk. *Environmental Health Perspectives* On-line. 22 October 2009. doi:10.1289/ehp.0900781

6. Belyaev IY, Markovà E, Hillert L, Malmgren LO, Persson BR. 2009. Microwaves from UMTS/GSM mobile phones induce long-lasting inhibition of 53BP1/gamma-H2AX DNA repair foci in human lymphocytes. *Bioelectromagnetics* 30: 129-141

7. Sage C, Carpenter D.O. 2009. Public Health Implications of Wireless Technologies. *Pathophysiology* 16: 233–246.

8. Capri M, Scarcella E, Fumelli C, Bianchi E, Salvioli S, Mesirca P, Agostini C, Antolini A, Schiavoni A, Castellani G, Bersani F, Franceschi C. 2004. In vitro exposure of human lymphocytes to 900 MHz CW and GSM modulated radiofrequency: studies of proliferation, apoptosis and mitochondrial membrane potential. *Radiation Research* 162: 211-218.

9. Nittby H, Grafstrom G, Eberhardt JL, Malmgren L, Brun A, Persson BRR, Salford LG. 2008. Radiofrequency and Extremely Low-Frequency Electromagnetic Field Effects on the Blood-Brain Barrier. *Electromagnetic*

Biology and Medicine 27:103–126.

10. Velizarov S, Raskmark P, Kwee S. 1999. The effects of radiofrequency fields on cell proliferation are non-thermal, *Bioelectrochem Bioenerg* 1999; 48: 177-180

11. Wolke S, Neibig U, Elsner R, Gollnick F, Meyer R. 1996. Calcium homeostasis of isolated heart muscle cells exposed to pulsed high-frequency electromagnetic fields, *Bioelectromagnetics* 17:144-153

12. Zwamborn APM, Vossen SHJA, van Leersum BJAM, Ouwens MA, Mäkel WN. 2003. Effects of global communication system radio-frequency fields on well-being and cognitive functions of human subjects with and without subjective complaints, *TNO-report FEL-03-C148*; 148:1-89

13. Sage Associates, 2011. *Assessment of Radiofrequency Microwave Radiation Emissions from Smart Meters*. http://sagereports.com/smart-meter-rf/

14. Grandjean P, Bellinger D, Bergman A, Cordier S, Davey-Smith G, Eskenazi B, Gee D, Gray K, Hanson M, van den Hazel P, Heindel JJ, Heinzow B, Hertz-Picciotto I, Hu H, Huang T, Jensen TK, Landrigan PJ, McMillen C, Murata K, Ritz Schoeters G, Skakkebaek NE, Skerfving S, Weihe P. 2007. The Faroes Statement: Human Health Effects of Developmental Exposure to Chemicals in Our Environment, Nordic Pharmacological Society. *Basic & Clinical Pharmacology & Toxicology* 102:73–75

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