

**MAINE CDC EXECUTIVE SUMMARY OF  
REVIEW OF HEALTH ISSUES RELATED TO  
SMART METERS  
November 8, 2010**

**Background**

On October 25<sup>th</sup>, 2010 a complaint was filed with the Maine Public Utilities Commission (PUC) focusing on concerns related to health, safety (malfunctioning, shorting out, and igniting), and security (vulnerability to hacking) of smart meters, also known as advanced metering infrastructure. The complaint requests several steps related to the stated health concerns, including asking the PUC for:

- A moratorium on the installation of smart meters, repeaters, nodes, antennas, and related wireless equipment in Maine in order for there to be a “thorough, independent and transparent investigation of the health, safety and security impacts relative to the CMP ‘Smart Meter Initiative’”;
- A consideration of “scientific, peer-reviewed studies on the safety of Smart Meter mesh networks and the pulsing radiofrequency signals to which the utility seeks to expose Maine families”;
- An “opt-out” from smart meters, including for those with electro-sensitivities and other qualifying medical conditions;
- A requirement that CMP accommodate those who “opt out” by ensuring mesh networks and pulsing radiofrequencies “do not permeate their residences at unacceptable and/or unhealthy levels” and to consider creating “safe zones”; and
- An opportunity to hear from national and international experts.

**Maine CDC Approach**

Since the end of September, Maine CDC has received and reviewed numerous emails and other communications on the issue of smart meters. During October and early November Dr. Mills reviewed numerous materials sent to her by both opponent and proponents of smart meters. She assembled several Maine CDC staff to review these materials. These staff, comprising a “Maine CDC Smart Meters Team” include: Jay Hyland, Andy Smith, ScD, Molly Schwenn, MD, Lauren Ball, DO, MPH, and Nancy Beardsley. Brief descriptions of their credentials are included at the end of this document.

After reviewing the large amount of materials sent to us, the Maine CDC team decided to increasingly focus our reviews on health studies and assessments by government agencies and some affiliated private and academic organizations, including the:

- World Health Organization (WHO),
- U.S. Federal Communications Commission (FCC),
- National Cancer Institute (NCI) in the National Institutes of Health (NIH),
- Health Canada (Canada’s public health agency),
- Health Protection Agency of the United Kingdom (U.K.’s public health agency),
- International Commission on Non-Ionizing Radiation Protection (ICNRP),
- Institute of Electrical and Electronics Engineers (IEEE),

- University of Ottawa’s McLaughlin Centre for Population Health Risk Assessment,
- Ontario Agency for Health Protection and Promotion,
- Swedish Radiation Protection Authority, and
- Australian Radiation Protection and Nuclear Safety Agency.

A compilation of the summaries of these agencies’ studies and assessments is included in the attached document “Smart Meter Review of Government Resources 11 08 10” (referred to as “review document”). These agency reviews focus on the health effects of the radiofrequency (RF) band of non-ionizing radiation, ie frequencies on the EMF (electromagnetic field) spectrum below those of visible light and X-rays, and higher than those of power lines.

### **Public Statements**

Additionally, Dr. Mills received several press calls the past few weeks. Her speaking points with all of them are as follows:

- We (Maine CDC) received information from opponents of smart meters starting the end of September. We received information from CMP about a week later. We are reviewing both sets of information as well as reviewing some peer-reviewed literature and other materials on the matter. We have not had time yet to fully vet these materials, especially because of their volume.
- However, thus far, it appears from the information we have collected and vetted, that smart meters emit non-ionizing radiation, and not the kind that is found in X-Rays (which over-exposure from can change the structure and function of cells).
- It also appears that smart meters emit (non-ionizing) radiation that has a similar frequency and power as that of wireless routers, which many homes now have. And, that smart meters are used at the most about 10% of the time. So, smart meters appear to be similar to having a wireless router on the side of a house that we understand operates about 10% of the time. The frequencies and power of smart meters are also in the range of those found in cordless phones and cell phones. Therefore, there does not seem to be an analogy to having a cell phone tower on the side of one’s house, as is reported by some of the emails we have received.
- Some of the same arguments we heard last winter in relation to cell phone use are similar to what we’ve seen presented with smart meters.
- Although we are commenting on possible health issues related to smart meters, this does not mean we are weighing in on whether or not people should have a choice in having them on their homes. We are also not analyzing the security or safety issues raised by some opponents, as these are not within our areas of expertise.

### **Brief Summary of Maine CDC's Findings**

Our review of these national and international government or government-affiliated assessments indicate a broad consensus that studies to date give no consistent or convincing evidence of a causal relation between RF exposure in the range of frequencies and power used by smart meters and adverse health effects.

We found little information in these assessments that spoke directly about the safety of RF exposure from smart meters. There is, however, much discussion about the safety of mobile phones. Mobile phone use represents an RF exposure qualitatively similar to smart meters in range of frequency, but because the power is higher and typical use results in exposure closer to the body, the resulting exposure to RF appears to be quantitatively much greater than that from smart meters. Thus, it appears to us that the lack of any consistent and convincing evidence of a causal relation between RF exposure from mobile phones and adverse health effects would indicate even less concern for potential health effects from use of smart meters.

### **Cell Phones**

The most comprehensive study to date on cell phones and cancer concerns, called the Interphone study, is an international pooled analysis of data gathered from 13 participating countries that was released in May of 2010 in the *International Journal of Epidemiology* (see relevant excerpts from this study in the accompanying review document).

Interphone researchers reported that overall, cell phone users have no increased risk for two of the most common types of brain tumor - glioma and meningioma. In addition, they found no evidence of increasing risk with progressively increasing number of calls, longer call time, or years since beginning cell phone use. For the small proportion of study participants who reported spending the most total time on cell phone calls, there was some increased risk of glioma, but the researchers and a number of reviewers considered this finding inconclusive because of the limitations resulting from biases and errors in the study. The researchers and most reviewers have noted the lack of data for mobile phone use over time periods longer than 15 years or data on exposure during childhood years, and thus recommend further research of mobile phone use and brain cancer risk.

We also are aware of a very recently published study (this month, November, 2010, see accompanying review document) by the National Cancer Institute (NCI) in the National Institutes of Health looking at brain cancer incidence in the U.S. The NCI study examined trends in brain cancer between 1992 and 2006, a time during which mobile phone subscribers in the U.S. increased from 50 million to nearly 250 million. The investigators concluded, "these incidence data do not provide support to the view that cellular phone use causes brain cancer."

### **Electromagnetic Hypersensitivity**

Several of the national and international assessments included in the accompanying review document discuss electromagnetic hypersensitivity or EHS. The assessments report that a number of studies have been conducted in which EHS individuals were exposed to EMF similar to those that they attributed to the cause of their symptoms, with the aim to elicit symptoms under controlled laboratory conditions. The assessments further state that the majority of studies indicated that EHS individuals cannot detect EMF exposure any more accurately than non-EHS individuals, and that well controlled and conducted double-blind studies have shown that symptoms were not correlated with EMF exposure.

### **Other Health-Related Issues**

Some of the concerns expressed in the complaint filed with PUC related to mesh networks are addressed in the accompanying document labeled “Smart Meter FCC Letter August 2010”. This letter from the FCC explains that multiple meters in the same geographical area can only communicate to a controller one at a time, therefore “eliminating the potential for exposure to multiple signals at the same time.” The letter goes on to address some concerns related to interference with medical devices.

In the accompanying review document, we have included relevant excerpts from the President’s Cancer Panel 2008-2009 report and a link to the entire document. We do not see a “global call for the ‘precautionary principle’” related to cell phones, smart meters, or similar technologies as is iterated in the complaint filed with PUC.

Dr. Mills has also been in contact with her colleagues from other states, including New Mexico (since it is cited in the complaint filed with PUC), and has asked the Complainant for the names of any government health official who is concerned about health effects related to smart meter technologies. At this time, Dr. Mills cannot find any state health department or official representing the health department who is taking action or is of the opinion the health department should take action to stop the conversion to smart meters.

### **Conclusion**

**In conclusion, our review of these agency assessments and studies do not indicate any consistent or convincing evidence to support a concern for health effects related to the use of radiofrequency in the range of frequencies and power used by smart meters. They also do not indicate an association of EMF exposure and symptoms that have been described as electromagnetic sensitivity.**

It should be noted, however, that our review is subject to several limitations related to the complaint filed with PUC.

First, our review focused primarily on assessments and studies conducted by agencies we typically rely on for such work, such as government (U.S. and international governments) or government affiliated institutions. We were unable to review the entire body of literature on the subject of non-ionizing radiation and health because this would be a

massive undertaking for a small public health agency. We therefore are making the assumption that these agency reviews have considered all credible published findings.

Second, the Maine CDC staff involved with this review have not spent their entire careers nor work fulltime in the topic area of health effects of RF radiation.

Third, some of the focus of the complaint filed with the PUC is on safety and security issues, both of which are topics we do not have expertise to analyze.

If further health analysis is desired, we recommend consultation with credible non-biased experts in the fields of non-ionizing radiation pathophysiology, non-ionizing radiation dosimetry, and epidemiology of non-ionizing radiation health effects. The ICNIRP (<http://www.icnirp.net/what.htm>), FCC, RF-COM at the University of Ottawa (<http://www.rfcom.ca/about/index.shtml>), and other agencies listed above may provide potential resources for experts on the health issues related to smart meters.

**Comparisons of Common Sources of Non-Ionizing Radiation**

<b>Item</b>	<b>Frequency in GHz</b>	<b>Power (max) in Watts</b>	<b>Power (average) Watts</b>
<b>Smart meter</b>	2.4	1	0.100
<b>G router</b>	2.4	1	depends on use
<b>N router</b>	2.4 or 5.0	1	depends on use
<b>Cordless Phone</b>	2.4	0.25	0.010
<b>Cell Phone</b>	1.9	3	depends on use
<b>FM Radio Tower</b>	0.1	100,000	100,000
<b>Cell Phone Tower</b>	0.8 to 1.99	48,000	depends on use/loc

GHz = 10<sup>9</sup> Hz

**Maine CDC Smart Meters Team**

**Lauren Ball** has a D.O. from the Philadelphia College of Osteopathic Medicine, a Masters of Public Health with a focus on epidemiology and community health from Temple University, a Preventive Medicine Residency from the U.S. CDC, service with the National Center for Environmental Health section of the Epidemic Intelligence Service at the U.S. CDC, and currently serves as the Deputy State Epidemiologist at Maine CDC.

**Nancy Beardsley** has a degree in geology and has worked in the environmental health field for over 20 years, including working at Maine DEP, directing Maine’s Drinking Water Program for 7 years, and directing Maine CDC’s Environmental Health Division for the last 3 years.

**Jay Hyland** has worked in the Maine Radiation Control Program for 22 years (1988), including 13 years as the director. He has a B.S. degree in Engineering Physics with a minor in Chemical Engineering from the University of Maine, and is a Professional Environmental Engineer

**Dora Anne Mills** has an M.D. from the University of Vermont College of Medicine, a Masters in Public Health from the Harvard School of Public Health, a residency in pediatrics at the Children's Hospital of Los Angeles, and has served as Maine's Public Health Director since 1996.

**Molly Schwenn** has an M.D. from Stanford University Medical School, did coursework in biostatistics and epidemiology from the Harvard School of Public Health, was a postdoctoral fellow in Radiobiology, is a pediatrician (residency at Massachusetts General Hospital), a pediatric oncologist (fellowship at Dana-Farber Cancer Institute), and has a masters in cancer biology. For the last 7 years she has headed Maine CDC's Cancer Registry.

**Andy Smith** has a doctorate (ScD) and masters (SM) from Harvard School of Public Health in Toxicology and Environmental Health, and has served as Maine's Toxicologist and the Director of Environmental and Occupational Health Programs since 1996.