Canada

1. Research Activities

**Health Canada**
- Health Canada carries out internally-funded studies to assess the biological effects of electromagnetic fields (EMFs) and public exposures to EMF emitting devices. In the area of exposure assessment, Health Canada has recently carried out laboratory tests on the most common brands of compact fluorescent lamps (CFLs) to acquire technical data on EMF and UV emissions from them. The tests were performed in response to media reports and public concerns that radiation from some CFL bulbs may contribute to “dirty electricity” and cause such health problems as headaches, fatigue, dizziness, eye strain, nausea and skin irritations. The findings have been published and made available online:


  Health Canada has also developed a cylindrical waveguide system for exposing unrestrained mice to radiofrequency (RF) electromagnetic energy at 1.9 GHz. Variations in specific absorption rate for mice weighing between 20 and 30 g due to posture and position in the cage during their exposure have been evaluated. The results have been submitted for journal publication and were presented at the 32nd Bioelectromagnetics Society Annual Meeting, Seoul, Korea, June 14-18, 2010, and at the AP-S International Symposium and CNC/USNC/URSI Radio Science Meeting, Toronto, July 11-17, 2010. The exposure system has been successfully used for carrying out a laboratory study with live animals. The study aimed at investigating subtle gene expression changes from RF energy (as emitted by cell phones) in a variety of biologically relevant brain regions. Results from this study are not yet available.

  For more information, contact Dr. Art Thansandote at <art_thansandote@hc-sc.gc.ca>.

**University of Ottawa**
- University of Ottawa’s McLaughlin Centre for Population Health Risk Assessment was a collaborating centre for the large-scale epidemiological study on mobile phones (Interphone study), coordinated by the International Agency for Research on Cancer. At present, the university is participating in the MOBI-KIDS international study investigating a relationship between communication technologies, including mobile phones and environmental factors, and brain cancer in young people.

  For more information, contact Dr. Daniel Krewski at <dkrewski@uottawa.ca>. 
University of Western Ontario

University of Western Ontario’s Lawson Health Research Institute (LHRI) has carried out research in the area of behavioral and biological exposure to magnetic fields. Over the past five years, their activities have involved the investigation of 60 Hz magnetic field (MF) exposures up to 3.0 milliTesla (mT) in humans. Their results showed some effects on human movement, psychological tests, and brain activity measured using functional Magnetic Resonance Imaging. Beyond the scientific importance, these results highlight the consequences of MF exposure from an environmental and occupational health point of view. However, these results are too subtle to demonstrate a reliable threshold value as defined in the guidelines. This stresses the need for new studies testing higher MF exposure levels as well. In a new project beginning this year, LHRI is focusing on the effect of 60 and 50 Hz MF up to 50 mT on: 1) magnetophosphenes and associated brain electrical activity; 2) physiological brain activity; 3) finger tremor; and 4) and standing balance. In addition, LHRI scientists will use mathematical modeling of brain activity to propose mechanisms of action supporting their experimental results. This complex project will establish, at a typical electrical power frequency, a threshold of MF exposure that will consistently produce an objective effect, characterize the brain structures involved in that effect, and validate the theoretical mechanisms of action that produce the effect. These results will assist future guidelines updates protecting the public and workers' safety, and will produce fundamental implications for future therapeutic applications utilizing any positive effects of MF exposure.

For more information, contact Dr. Frank Prato at <frank.prato@lawsonimaging.ca>.

Recent publications in the EMF-health area by scientists at the above organizations:


2. Standards

2.1 Health Canada has updated its human exposure guidelines to radiofrequency electromagnetic energy. The current version of these exposure guidelines is specified in a document entitled: *Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz - Safety Code 6 (2009)*. This code is accompanied by the *Technical Guide for Interpretation and Compliance Assessment of Health Canada's Radiofrequency Exposure Guidelines*, to assist users in understanding and assessing the safety of electromagnetic exposures in working and living environments. The current version of the Code reflects the scientific literature published up to August 2009 and replaces the previous version published in 1999. To obtain copies of *Safety Code 6 (2009)* and the *Technical Guide*, please contact: publications@hc-sc.gc.ca

2.2 Industry Canada, the Canadian regulator for cellular and broadcast industries, has recently updated the following regulatory document:

Radio Standards Specification 102, Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands), Issue 4, March 2010. This document sets out the requirements and measurement techniques used to evaluate radio frequency (RF) exposure compliance of radiocommunication apparatus designed to be used within the vicinity of the human body. The document is available online (www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01904.html).

3. Public Information

Public information in the area of EMFs and health has recently been updated on the Health Canada and Industry Canada websites:
3.1 Wireless Device Safety

Safety of Cell Phones and Cell Phone Towers
www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/cell-eng.php

Health Canada - Video and text transcript on Wi-Fi

Health Canada - Frequently Asked Questions about Wi-Fi

Health Canada - It's Your Health: Safety of Wi-Fi Equipment
www.hc-sc.gc.ca/hl-vs/iyh-vsv/prod/wifi-eng.php

Health Canada Statement on Radiofrequency Energy and Wi-Fi Equipment

Fact sheet on wireless device safety

Frequently Asked Questions (FAQ) on Radiofrequency (RF) Energy and Health
www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf08792.html

Wireless communication and health
www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf09591.html

3.2 ELF Fiends and Power Lines

It's Your Health: Electric and Magnetic Fields at Extremely Low Frequencies
www.hc-sc.gc.ca/hl-vs/iyh-vsv/environ/magnet-eng.php

Federal-Provincial-Territorial Radiation Protection Committee – Canada,
Response statement to public concerns regarding electric and magnetic fields (EMFs) from
electrical power transmission and distribution lines.

3.3 Compact Fluorescent Lamps

It's Your Health: The Safety of Compact Fluorescent Lamps

4. Public Concerns

Possible health risks from exposure to electromagnetic fields (EMFs) in living and school
environments, arising from electrical power lines and cellular base stations (cell towers)
located nearby, continue to be an issue of public concerns in Canada. Recently, concerns
have been raised about the possibility that wireless technologies, specifically Wi-Fi
equipment, could cause health problems for school children. These concerns appear to
arise from frequent media reports and some Internet websites which contain controversial or
contradictory statements regarding EMF-health issues. Also, several outspoken advocates are
demanding the application of precautionary measures to EMF exposure. In this regard, the BioInitiative Report, selected publications and a number of articles from the Internet are often cited by these advocates and concerned individuals. The concerns result in widespread public opposition to the proposed construction of high-voltage power lines and cell towers. In many cases, the opposition is influenced by aesthetics and property devaluation. In regard to Wi-Fi health concerns, parents in many municipalities across Canada demand schools turn off or remove Wi-Fi systems as it is believed that they cause a number of symptoms among students, including headaches, nausea, an inability to concentrate, and heart irregularities.

Recent media coverage on wireless technologies has resulted in numerous enquiries to Health Canada regarding their potential health risks. In March 2010, a petition was submitted by a group of concerned citizens requesting the Canadian House of Commons to protect the population from microwave radiation from wireless technologies. The House Standing Committee on Health met on April 27th and 29th and October 28th, 2010 and conducted hearings from interested parties representing the public, private and non-governmental sectors on the effects of microwaves on human health. On December 2, 2010, the committee issued a 34-page report that contains a number of recommendations regarding radiofrequency health policy, among them that Health Canada and Industry Canada develop a public risk awareness program, and that Health Canada develop a process to receive and respond to reports of adverse reactions to wireless devices. The report is available online at:


The committee requested the federal government to table a comprehensive response to the report within 120 days. However, since the parliament was dissolved in March 2011, the government is no longer required to provide the response.

A number of the inquiries were also submitted as environmental petitions to the Office of Auditor General of Canada (OAG). Official replies from responsible government departments are then posted on the OAG website. Recent environmental petitions include the following:

- Follow-up petition on the alleged misinterpretation of exclusion list conditions under the Canadian Environmental Assessment Act related to the construction of a communications tower in Pontiac, Quebec (Petition No. 301B).
  www.oag-bvg.gc.ca/internet/English/pet_301B_e_35210.html

- Alleged misinterpretation of exclusion list conditions under the Canadian Environmental Assessment Act related to the construction of a communications tower in Pontiac, Quebec (Petition No. 301).
  www.oag-bvg.gc.ca/internet/English/pet_301_e_34274.html

- Federal government’s management of the impact of pesticides and toxic chemicals on the health of Canadians (Petition No. 297).
  www.oag-bvg.gc.ca/internet/English/pet_297_e_34272.html

Compiled by Art Thansandote
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