



February 16, 2017

To: MP Bill Casey, Chair Parliamentary Standing Committee on Health (HESA)

On October 6th, 2016 the Honourable Jane Philpott, Minister of Health, presented, pursuant to the House of Commons Standing Order 109, the Government's response to the Thirteenth Report of the Standing Committee on Health (HESA) report entitled, "*Radiofrequency Electromagnetic Radiation and the Health of Canadians*" tabled in the House of Commons on June 15, 2016.

Below is C4ST's preliminary reply to that response. This document outlines how profoundly the response falls short of the goals and intent of the recommendations, and how it fails to address the main points made in the recommendations and the evidence presented by the international experts¹ called as HESA witnesses. These are preliminary comments. An in-depth reply will follow at a later time.

The Government response has:

1. – dismissed the large body of credible evidence that there are harmful biological effects at levels below Safety Code 6 (2015). The statement "It is Health Canada's position that there are no established adverse health effects at levels below the limits outlined in Safety Code 6" is ill-founded and is not based on the body of science based evidence publically available. By clinging to the outmoded scientific belief that there can only be harmful biological effects when there is warming from microwave/radiofrequency radiation from wireless devices,² Health Canada, with Minister Philpott's oversight, is failing to protect the health of Canadians.
2. – refused to invest the resources to understand electromagnetic hypersensitivity (EHS) better, consequently turning its back on Canadians being made ill by wireless radiation. Estimates are that at least 3% of Canadians are affected, some debilitated, by EHS. This compares to 2% of the population who are estimated to have a peanut allergy.³ The loss to our economy, burden to the health care system and heartbreak are enormous.
3. – neglected to take even preliminary steps to protect Canadians by issuing the proper warnings to use wireless devices more safely and by not working with Innovation, Science and Economic

¹ [HESA international expert witnesses](#)

² www.hc-sc.gc.ca/ewh-semt/consult/2014/safety_code_6-code_securite_6/final_finale-eng.php See Section 2. MAXIMUM EXPOSURE LIMITS, paragraph 2 - first sentence

³ <http://www.theglobeandmail.com/life/parenting/for-schools-and-parents-what-is-the-right-approach-to-food-allergies/article16618717/>

Development Canada (regulator for wireless devices) to direct the wireless industry to make more visible the safety instructions that come with devices such as cell phones and baby monitors.⁴

4. – obfuscated the truth about how Canada's microwave/radiofrequency safety guidelines compare to other countries. We do not have “among the safest guidelines in the world”. China, Italy, Russia and Switzerland have standards that are 100 times lower (safer).

5. – failed to meet the international scientific standards for systematic literature review essential for a basis for making evidence based public health decisions.

We look forward to receiving answers to our questions clarifying the disconcerting points in the Government response and in working with the Parliamentary Health Committee to hold the government more accountable to protect the health of Canadians.

Sincerely,

Frank Clegg

C4ST

Canadians for Safe Technology - Preliminary rebuttal and questions for clarification

A fundamental flaw in Health Canada's statements about safety limits, protection of vulnerable populations, children, etc. is that the "design" of Safety Code 6 does not include ANY of the many non-heating effects of microwave/radiofrequency emitted from common wireless devices such as cell phones, smart meters and Wi-Fi routers. Health Canada maintains that if it does not heat tissue, it does not harm tissue.⁵ The hundreds of well-designed, credible studies from respected institutions documenting adverse effects are dismissed by Health Canada without valid substantiation to Canadians.

We use the following format in this document: portions from Minister of Health Jane Philpott's response on behalf of the Government appear within borders and C4ST comments and questions to Health Canada appear below the framed government responses.

Bill Casey, MP Chair Standing Committee on Health House of Commons Ottawa, Ontario K1A 0A6

Dear Mr. Casey:

⁴ <http://ehtrust.org/key-issues/cell-phoneswireless/fine-print-warnings/>

⁵ http://www.hc-sc.gc.ca/ewh-semt/consult/2014/safety_code_6-code_securite_6/final_finale-eng.php

See Section 2. MAXIMUM EXPOSURE LIMITS, paragraph 2 - first sentence

Pursuant to the House of Commons Standing Order 109, I am pleased to respond, on behalf of the Government of Canada, to the Thirteenth Report of the Standing Committee on Health, entitled, “*Radiofrequency Electromagnetic Radiation and the Health of Canadians*” tabled in the House of Commons on June 15, 2016.

The Government would like to thank both past and present members of the Committee for their work in preparing this report and welcomes their interest in evaluating the potential health effects of radiofrequency electromagnetic radiation, including cell phones and Wi-Fi.

Protecting the health of Canadians and their environment is a core function of the Government. A number of actions directed at increasing awareness and responding to Canadians' concerns related to potential negative health effects from electromagnetic energy have already been initiated.

As can be seen in the attached Government Response, the Government is committed to using the best available science to inform its decision making. The Government will continue to monitor the international scientific literature and support awareness on exposure to electromagnetic radiofrequencies while promoting information sharing amongst all levels of government. As described in the Response, action will also be taken on additional recommendations provided by the Committee.

The Honourable Jane Philpott, M.P.
Minister of Health

**GOVERNMENT RESPONSE TO THE REPORT OF THE
STANDING COMMITTEE ON HEALTH ENTITLED**

Radiofrequency Electromagnetic Radiation and the Health of Canadians

The Government of Canada has carefully considered the Thirteenth Report of the Standing Committee on Health (the Committee) entitled *Radiofrequency Electromagnetic Radiation and the Health of Canadians*.

Canada is recognized worldwide for the rigour with which it gathers, assesses, and incorporates scientific information into its decision making and standards.

In the case of electromagnetic radiation Health Canada carefully tracks developments in the scientific literature, in particular studies in relation to adverse health impacts. Health Canada uses a “weight of evidence” approach in evaluating scientific studies, which takes into account both the quantity and quality of studies, and gives more weight to studies which have been reproduced and which meet the highest standards of rigor and control.

The process used for risk assessment by Health Canada in the area of health impact of radiofrequency-electromagnetic fields (RF-EMF) is an exception to this. Dr. D. Moher⁶ and Dr. M. Sears⁷, (experts in the discipline of the systematic review of scientific evidence) provided direct feedback to Health Canada in a meeting in Sept., 2014, that Health Canada fails most major criteria in the process to evaluate the

⁶ <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3737035/>

⁷ <http://www.preventcancernow.ca/main/about-us/who-we-are>

scientific evidence for RF-EMF.⁸ It appears that Health Canada does not have the skills⁹, or the software necessary to track, review and analyze the large number of peer-reviewed, published papers relevant to this topic. Dr. Sears provided direct testimony to the HESA 2015 committee outlining these concerns.¹⁰

QUESTION: What actions were taken from the recommendations made at this meeting?

After being pressed by HESA 2015 hearing committee members, Health Canada admitted that 36 of the studies submitted by C4ST were of "sufficient quality for inclusion in the Risk Assessment" in the following categories:

- Cancer is linked in 6 studies,
- Brain/nervous system impacts in 13,
- Biochemical disruption in 16 and
- Development and/or learning behaviour impacts in 7.¹¹

The Weight of Evidence (WOE) concept and its associated methods should be fully described when used.¹² This two-step process involves 1. Systematic assembly, examination, data extraction and quality assessment of all of the evidence; and 2. Transparent grading and weighing of this evidence. Since Health Canada has failed to execute step one, step two is impossible.

QUESTIONS: What are the inclusion and exclusion criteria? When will Health Canada publish its WOE criteria? What studies are included and why? What studies are excluded and why? The standard for high quality systematic review is to include all evidence, then to allocate less weight to evidence that is considered less reliable or broadly applicable.¹³

Canada also recognizes the importance of leveraging scientific expertise from around the world and as such, works closely with organizations like the World Health Organization (WHO), which includes the International Agency for Research on Cancer (IARC). Canada's approach ensures the protection of the health and safety of Canadians, including our most vulnerable. Some researchers and advocates question the safety of radiofrequency (RF) energy and the approach applied by Health Canada in assessing the scientific evidence related to developing human exposure limits. While some studies have reported health effects below Canadian and international safety limits the totality of the scientific evidence does not support the link between radiofrequency electromagnetic fields (RF EMF) and health effects.

If Health Canada means that ALL of the evidence must be in agreement that RF-EMF is dangerous, then this will never happen. The term "totality of the scientific evidence" represents an unprecedented high bar for proof, suggesting that unanimity is necessary. This apparent requirement for all research to be

⁸(US National Toxicology Program framework) <https://ntp.niehs.nih.gov/pubhealth/hat/noms/index-2.html>

⁹<http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7892702&File=0> time 17:11

¹⁰<http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7892702> time 16:44

¹¹http://www.c4st.org/images/documents/hesa/Health_Canada_Response_to_C4ST_References_of_140_Missing_Studies.pdf

¹² Douglas L. Weed, 2005. "Weight of Evidence: A Review of Concept and Methods" PMID, DOI: 10.1111/j.1539-6924.2005.00699.x. <https://www.ncbi.nlm.nih.gov/pubmed/16506981>

¹³ US National Toxicology Program. Handbook for Conducting a Literature -Based Health Assessment Using HAT Approach for Systematic Review and Evidence Integration https://ntp.niehs.nih.gov/ntp/ohat/pubs/handbookjan2015_508.pdf

consistent causes more confusion and concern regarding Health Canada's scientific processes and decision-making.

If the term "totality" means examining and assessing all of the evidence, then this has clearly not been done by Health Canada. The analysis by C4ST of the literature examined by Health Canada, the Royal Society of Canada, and the authoritative agency reviews they cite, highlights only 140 of the studies omitted by both.¹⁴

None of the authoritative reviews that Health Canada cites include key studies such as those of Dr. Hardell or Dr. Belpomme.¹⁵ The details of the controversy surrounding the reports and even the shortfalls of the World Health Organization EMF (WHO EMF) Project will be described below.

The Government of Canada agrees to continue to support scientific research and encourages researchers interested in studying the possible health effects of the RF EMF exposure and adverse health effects to make use of opportunities available as outlined below. Additional research helps to increase scientific evidence in this area, to better respond to public concerns and to improve risk communications. To encourage worldwide coordination of scientific efforts on this issue the WHO has published a "Research Agenda for Radiofrequency Fields", which identifies scientific research priorities related to RF EMF health effects impacts.

The Government's Response to the Committee's recommendations is grouped into three broad themes: the need for further research and investigation into possible links between RF electromagnetic frequency exposure and cancer; the need for greater understanding and management of electro-hypersensitivity (EHS); and the need to protect our most vulnerable while enhancing stakeholder engagement and information sharing. The Committee's recommendations are listed at the end of the Government Response for ease of reference.

Further Research and Investigation into Possible Links Between EMF RF Exposure and Cancer (Recommendations 1, 10, and 11)

Recommendation 1

That the Government of Canada, in collaboration with the health departments of the provinces and territories, examine existing cancer data collection methods to improve the collection of information relating to wireless device use and cancer.

Recommendation 10

That Health Canada conduct a comprehensive review of all existing literature relating to radiofrequency fields and carcinogenicity based on international best practices.

Recommendation 11

That the Government of Canada, through the Canadian Institutes of Health Research, consider funding research into the link between radiofrequency fields and potential health effects such as cancer, genetic damage, infertility, impairment to development and behaviour, harmful effects to eyes and on the brain, cardiovascular, biological and biochemical effects.

To date, thousands of scientific studies have been carried out globally to evaluate the safety of RF EMF. The results from these and ongoing studies have informed the development of Canadian and international human

¹⁴[C4ST list of omitted studies](#)

¹⁵<https://www.ncbi.nlm.nih.gov/pubmed/26613326>

exposure limits. Human exposure limits to RF EMF have existed in Canada and internationally for over 30 years.

Health Canada's Safety Code 6 guidelines were first established in 1979 and have not had any major revisions since then.

These exposure limits have taken into account the latest scientific information on established health effects of RF EMF and have incorporated large safety margins for the avoidance of such health effects.

Health Canada has imposed an unreasonable, unworkable standard for health effects to be "established." The cited large safety margins are predicated upon status quo exposures that are demonstrably harmful according to the most recent epidemiological and animal toxicology research.

All of the strongest (case-control) epidemiological studies published since the WHO-International Agency for Research on Cancer (IARC) panel meeting in 2011 have found some positive results, linking mobile phone use to brain tumours. This updated information is absent from the Health Canada response.

One of the scientific advancements that Health Canada scientists have not been acknowledging is that of the many significant effects that can occur due to non-heating (non-thermal) at below Safety Code 6 levels. A recent example is the highly credible study conducted by the National Toxicology Program, National Institute of Environmental Health Science (NTP/NIEHS) Program. The NTP/NIEHS released the first results of its \$25m study in May 2016 that found a statistically significant association between cell phone radiation and cancer in rats. "*The occurrences of two tumor types in male Harlan Sprague Dawley rats exposed to RFR [radiofrequency radiation], malignant gliomas in the brain and schwannomas of the heart were considered of particular interest....*"¹⁶ This study found that cancer occurred at non-thermal levels.¹⁷ Between 70% and 80% of the people who reviewed the results felt there was a significant association.¹⁸ These cancers are the same types that are documented in epidemiological studies on heavy cell phone users.^{19 20 21}

QUESTION: Health Canada asserts that it continually updates its information. Why are only older results referenced, and modern research studies not mentioned? Please make the up to date reference list publicly available.

QUESTION: What is Health Canada's response to the aforementioned US National Toxicology Program (NTP) study?

QUESTION: When will Health Canada publish its summary of the recent scientific evidence?

¹⁶ Wyde, M., Cesta, M., Blystone, C., Elmore, S., Foster, P., Hooth, M., ... Bucher, J. (2016). *Report of Partial findings from the National Toxicology Program Carcinogenesis Studies of Cell Phone Radiofrequency Radiation in Hsd: Sprague Dawley® SD rats (Whole Body Exposure)* (No. biorxiv;055699v1). Retrieved from <http://biorxiv.org/lookup/doi/10.1101/055699>

¹⁷ <http://biorxiv.org/content/early/2016/05/26/055699>

¹⁸ <http://www.wsj.com/articles/u-s-cellphone-study-fans-cancer-worries-1464393051>

¹⁹ <https://academic.oup.com/ije/article/39/3/675/631387/Brain-tumour-risk-in-relation-to-mobile-telephone>

²⁰ [http://www.pathophysiologyjournal.com/article/S0928-4680\(14\)00064-9/abstract](http://www.pathophysiologyjournal.com/article/S0928-4680(14)00064-9/abstract)

²¹ <https://www.ncbi.nlm.nih.gov/pubmed/24816517>

Health Canada's recommended human exposure limits are outlined in a document entitled "Safety Code 6 Limits of human exposure to radiofrequency electromagnetic fields in the frequency range 3 kHz to 300 GHz" (Safety Code 6). While the human exposure limits in Safety Code 6 were initially developed for, and applied by, federally-regulated employers, some of the exposure limits in the Code have since been referenced by other federal departments and non-federal jurisdictions. In particular, Innovation, Science and Economic Development Canada (ISED) requires compliance with Safety Code 6 as part of its technical standards for radio apparatus.

Furthermore, compliance with the relevant Safety Code 6 limits, by all operators of antennas, is required through licensing requirements under the *Radiocommunications Act*. The exposure limits in Safety Code 6 have been updated periodically since they were first developed in 1979, with updates occurring in 1991, 1999, 2009 and, most recently, in 2015.

In recent years, the issue of a possible association between mobile phone use and brain cancer has been a topic of public and scientific concern. To address this issue, in 2011 the International Agency for Research on Cancer convened an Expert Panel to review the scientific evidence pertaining to the possible cancer causing ability of RF EMF. A Health Canada scientist was among the experts conducting the review. Upon considering the available evidence, the IARC Expert Panel classified radiofrequency EMF as "possibly carcinogenic to humans" (Class 2B), based on an increased risk for glioma (a type of brain cancer) associated with long-term heavy cell phone use in some studies, for some statistical comparisons. However, the vast majority of studies have not found similar results. The IARC classification of RF energy reflects the fact that this limited evidence exists and cannot rule out RF energy as a possible risk factor for cancer.

The list of publications reviewed by IARC, numbering close to 1,000, covered the RF-EMF cancer literature up to 2010 and early 2011.

The strongest pragmatic epidemiological study design for rare diseases such as brain tumors is the case-control study. The IARC "*possible* carcinogen" designation was based primarily on the 13 country-wide INTERPHONE study²², as well as a series of studies led by Dr. Lennart Hardell.²³ Since then, in 2014, the well-designed CERENAT French study supported those findings.²⁴ The international CEFALO study of children and adolescents indicated increased glioma risk with increased time of subscription, with significantly increased odds among the longest subscribers, and a significant trend.²⁵

Dr. Hardell's team's research has been identified as a cornerstone of IARC's decision to designate RF-EMF a *possible* carcinogen. Recently Dr. Hardell co-authored a paper calling for RF-EMF radiation from wireless phones to be classified as Group 1, *carcinogenic to humans*.²⁶ Tobacco is in Group 1.

QUESTION: What is the "vast" majority of studies to which Health Canada is referring?

Health Canada supports the IARC Class 2B designation and agrees the evidence of a possible link between RF EMF and cancer risk is far from conclusive and that more research is needed to clarify this "possible" link. Given the uncertainty associated with long-term heavy use of cell phones Health Canada issued precautionary advice, consistent with IARC's advice, to cell phone users informing them of practical ways they can reduce their exposure to RF EMF from cell phones.

²² See Appendix 2. <https://academic.oup.com/ije/article/39/3/675/631387/Brain-tumour-risk-in-relation-to-mobile-telephone>

²³ <https://www.ncbi.nlm.nih.gov/pubmed/21331446>

²⁴ <https://www.ncbi.nlm.nih.gov/pubmed/24816517>

²⁵ Aydin et al. "Mobile Phone Use and Brain Tumors in Children and Adolescents: A Multicenter Case-Control Study." *JNCI: Journal of the National Cancer Institute* 103, no. 16 (August 17, 2011): 1264–76. doi:10.1093/jnci/djr244. <https://academic.oup.com/jnci/article-lookup/doi/10.1093/jnci/djr244>

²⁶ <https://www.ncbi.nlm.nih.gov/pubmed/24192496>

In testimony before the Parliamentary Health Committee, Health Canada admitted there is no effort to communicate this information proactively to the Canadian public.²⁷

In 2011, IARC classified all RF energy as a Class 2B, *possible* carcinogen. Since that time, there have been dozens of peer-reviewed studies published that show direct health effects from RF radiation at levels below Safety Code 6. C4ST has identified, and submitted to Health Canada, 60 studies published in 2015 and 2016 that show harm.²⁸ The above mentioned \$25m US National Toxicology Program study challenges the core assumptions of Health Canada's Safety Code 6.

Brain tumours are now the leading cancer in American adolescents, and incidence is rising in young adults according to this largest most comprehensive analysis of these age groups to date.²⁹

"The astounding increases reported in this study³⁰, especially in young people, mirror what I am seeing in my clinic," responded Dr. Jacob Easaw, (formerly) from the Tom Baker Cancer Centre in Calgary.

QUESTION: If Health Canada believes in the class 2B designation, why is it not proactively offering advice to Canadians instead of burying its advice on its website?

QUESTION: It is now four months since this Government response was presented. What steps has Health Canada taken to provide more precautionary messaging?

As the Government of Canada recognizes more research is needed, scientists interested in this issue are encouraged to make use of current Government funding programs for health research. The Government of Canada funds scientific research on health related questions primarily through the Canadian Institutes for Health Research (CIHR). Canadian scientists from eligible research institutions receive support from CIHR through both targeted and investigator-initiated funding programs. Through its investigator-initiated funding programs, CIHR supports research in areas related to electromagnetic frequencies and health. Examples of this research include work led by researchers at Western University in London, Ontario who have led two major, multidisciplinary research investigations into the impact of low- and high-level, time-varying electromagnetic fields (EMFs) on brain activity and physical behaviour.

Through CIHR, the Government of Canada is also working with its partners to avoid unnecessary duplication of effort and to coordinate research on an international level. For example, CIHR has partnered with the Canadian Wireless Telecommunications Association to fund Canadian participation in the MOBI-Kids study. This research, led through the University of Ottawa in collaboration with the British Columbia Cancer Agency and Cancer Care Ontario, is an international, multi-centric, case-controlled study which aims to assess the potential associations between use of communication devices and other environmental risk factors with brain tumors in children and youth. Information on the MOBI-KIDS programme can be found at <http://www.crealradiation.com/index.php/en/mobi-kids-home>.

²⁷ <http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7892702&File=0> time 16:10

²⁸ [References and extracts of over 60 scientific studies published in 2015 and up to April 2016 reporting potential harm at or below Safety Code 6 \(2015\)](#)

²⁹ Ostrom, Q.T., et al. (2016). American Brain Tumor Association Adolescent and Young Adult Primary Brain and Central Nervous System Tumors Diagnosed in the United States in 2008-2012. <https://www.ncbi.nlm.nih.gov/pubmed/26705298>

Neuro-Oncology 18.Suppl. 1. i1-50. First Author Affiliation: Case Comprehensive Cancer Center, Case Western Reserve University School of Medicine, Cleveland, OH USA; Central Brain Tumor Registry of the United States, Hinsdale, IL USA.

³⁰ Quote from Prevent Cancer Now: <http://www.preventcancer.ca/main/wclds>

The Government of Canada is also involved in supporting research efforts on EMF outside of CIHR.

- Health Canada continues to monitor the scientific literature and has conducted its own research on the biological effects of RF energy. This research has increased the scientific knowledge regarding the intensity of RF energy in our environment, the possible biological/health effects of RF energy and has helped to establish the human exposure threshold where potentially adverse health effects may occur. This important information, along with other Canadian and international studies, form the basis for establishing safety standards for RF energy that protects the health of Canadians. Information on Health Canada research in this area is available on the Health Canada website: <http://www.hc-sc.gc.ca/ewh-semt/radiation/cons/radiofreq/research-recherche-eng.php>.

All of the studies used to set Safety Code 6 limits are based on heating.

- The Natural Sciences and Engineering Research Council of Canada (NSERC) also supports research on EMF. Since 2002, the NSERC Industrial Research Chair in Risk Science has conducted a broad program of research and training in risk science, particularly with respect to the assessment and management of population health risks associated with technological developments. NSERC is supporting work underway at Laurentian University in Sudbury on the effects of EMF on specific biological signals. This research project aims to determine whether certain EMF can inhibit cancer cell growth.

Comprehensive reviews of the scientific literature relating to RF fields have been carried out by scientists and expert panels under the auspices of highly recognized international bodies including the European Union's Scientific Committee on Emerging and Newly Identified Health Risks and the International Committee on Non-Ionizing Radiation Protection.

The International Commission on Non-ionizing Radiation Protection (ICNIRP) is a closed group, registered as a society in Germany. Its impartiality has been challenged by many, including Dr. Dariusz Leszczynski, invited speaker to the 2015 HESA committee.³¹

The shortcomings of the European Union's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) has been detailed in the Comment Letter: *Rebutting the validity of findings of SCENIHR's Final Opinion on Potential Health Effects of Electromagnetic Fields (EMF)*³²

Although the WHO states it will review all of the relevant literature, this is not the case. Details on exclusion of key studies are provided below.

The approach, commonly referred to as a scientific monograph, is generally conducted by international bodies requiring the participation of many scientific experts (40+) and many years of effort. Recent similar efforts have taken place by IARC as well as the WHO. Health Canada has been taking part in the International EMF Project, coordinated by the WHO. The goals of this project are to verify reported biological effects from exposure to EMFs and to characterize any associated health risks to humans. The WHO is committed to conduct a formal risk assessment of all studied health outcomes from RF field exposure by 2017.

³¹ <https://betweenrockandhardplace.wordpress.com/2016/04/08/is-icnirp-reliable-enough-to-dictate-meaning-of-science-to-the-governmental-risk-regulators/>

³² Sage C, Hardell L, Carpenter DO. Comment on SCENIHR: Opinion on Potential Health Effects of Exposure to Electromagnetic Fields, *Bioelectromagnetics* 36:480-484 (2015)

The only evaluation of the science at the specific peer-reviewed, published, study level was performed by IARC in 2011 that led to the Class 2B, *possible* carcinogen designation. All the other organizations, including Health Canada in its 2015 update, performed a review of review documents with a few new studies included. This incomplete and sloppy review of the scientific evidence led to inaccurate conclusions.^{33 34}

Health Canada's participation on these bodies allows the Department to leverage these large-scale and highly resourced international efforts which are widely recognized as comprehensive, and more detailed, than any review from a single jurisdiction could be. In addition to participating in the international monograph exercises, Health Canada officials carry out an ongoing review of emerging scientific studies in this area. If new scientific evidence were to demonstrate that exposure to RF energy below levels found in Safety Code 6 from wireless technologies is a concern, the Government would take appropriate action to help protect the health and safety of Canadians.

The evidence submitted to HESA regarding missing studies, examined reference lists of all of the referenced "authoritative reviews" as well as Health Canada and Royal Society of Canada documents. The 140 missing studies illustrating harm from RF radiation³⁵, including the 36 studies³⁶ Health Canada acknowledged were in scope per content, study design and reporting, were omitted from *all* of these international reports.

QUESTION: What methods and software are used by Health Canada to systematically, continuously update the science regarding health effects of rapidly escalating exposure to radiation from wireless devices?

Since the Thirteenth Report of the Standing Committee on Health was originally tabled in 2015 (re-tabled 2016), dozens of peer-reviewed studies have been published showing harm at levels below Safety Code 6. A recent paper summarized 100 recent peer-reviewed *in vitro* and *in vivo* experimental studies at non-thermal RF radiation exposure levels and found that 93 reported significant oxidative biological activities.³⁷

QUESTION: What process does Health Canada use to evaluate this evidence? Why do these studies not trigger improvements in Safety Code 6? The most recent dated reference Health Canada provided in the HESA hearings was the IARC review in 2011.

With respect to the recommendations to work with partners in the examination of cancer data collection methods and information on wireless device use and cancer, Statistics Canada has collected cancer data broadly since 1969, initially with the National Cancer Incidence Reporting System and currently with the Canadian Cancer Registry (CCR) established in 1992. The CCR is a collaborative effort between Statistics Canada and the 13 provincial and territorial cancer registries to create a single database to report annually on cancer incidence and survival at the national and jurisdictional level.

The CCR contains demographic data and information related to the characteristics of the cancer (such as primary site and morphology), on each cancer case diagnosed in Canada, however it does not include any

³³ <http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7892702> time 16:45

³⁴ <http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7936469> time 16:46

³⁵ [140 studies omitted from the Safety Code 6 \(2015\) update](#)

³⁶ [Health Canada's list of 36 studies that were in scope in response to C4ST's list of 140 omitted studies](#)

³⁷ <https://www.ncbi.nlm.nih.gov/pubmed/26151230>

information on health behaviours or environmental exposures, such as diet, tobacco use, or the use of wireless devices. As the research community continues to study the question of wireless device use and cancer, Statistics Canada will, with the involvement of its partners, and the research community, assess the suitability of the cancer incidence data collected within the CCR as a source of information for the research community.

It is our understanding that the CCR data is not sufficiently detailed to discern the increases in younger populations of more aggressive brain tumours similar to those seen in the Central Brain Tumor Registry of the US. During the HESA committee hearings a clear explanation was provided why Canadian data regarding cell phone use (and habitual storage against the body) needs to start to be collected today.³⁸

Activities in early planning stages are underway which may lead to the addition of socio demographic information and information about treatment in the future.

Greater Understanding and Management of Electromagnetic-hypersensitivity (EHS) (Recommendations 2, 3, 4, and 5)

Recommendation 2

That Statistics Canada consider including questions related to electromagnetic hypersensitivity in the Canadian Community Health Survey.

Recommendation 3

That the Government of Canada, through the Canadian Institutes of Health Research, consider funding research into electromagnetic hypersensitivity testing, diagnosis and treatment, and its possible impacts on health in the workplace.

Recommendation 4

That the Canadian Medical Association, the Royal College of Physicians and Surgeons, the College of Family Physicians of Canada and the World Health Organization consider updating their guidelines and continuing education materials regarding the diagnosis and treatment of electromagnetic hypersensitivity to ensure they are based on the latest scientific evidence and reflect the symptoms of affected Canadians.

Recommendation 5

That the Government of Canada continue to provide reasonable accommodations for environmental sensitivities, including electromagnetic hypersensitivity, as required under the Canadian Human Rights Act.

Health Canada acknowledges that some people have reported an array of health symptoms that they attribute to exposure to EMF. At present, the symptoms attributed to EMF exposure have been termed idiopathic environmental intolerance (IEI-EMF) by the WHO, where "idiopathic" refers to unknown causes. This means that while the symptoms attributed by some persons to EHS are real, the scientific evidence provides strong support that these health effects are not associated with EMF exposure. Other recent reviews have been carried out by international bodies including the European Commission (2015), the Swedish Radiation Safety Authority (2015), Public Health England (2012) and the Australian Radiation Protection and Nuclear Safety Agency (2015); all reaching similar conclusions. Domestically, in its 2014 review of Safety Code 6 the Royal

³⁸<http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7892702&File=0> time 17:09

Society of Canada found, "taken together, research in the past ten years does not provide firm evidence for the hypothesis that people with IEI-EMF can perceive RF energy levels below the limits in Safety Code 6 or that there is a causal link between exposure to RF and their symptoms".

The HESA 2015 Committee asked Health Canada to invest resources to better understand electromagnetic hypersensitivity (EHS) testing, diagnosis and treatment, and its possible impacts on health in the workplace.

QUESTION: In preparing its response, did Health Canada (or Minister Philpott) reach out to HESA committee witness Dr. Riina Bray³⁹ to learn more about the patients her clinic diagnoses with EHS, to HESA committee witness Dr. Anne-Marie Nicol⁴⁰ who stated "*we need a place for people to go and discuss their symptoms or the constellations of symptoms*", or talk to the Austrian Medical Association about their campaign to educate physicians on how to diagnose EHS in their patients?⁴¹

Health Canada agrees that the Government of Canada should continue to provide accommodation measures for individuals suffering from disabilities, as required under the *Canadian Human Rights Act* and has shared a copy of the Committee's report with officials at the Canadian Human Rights Commission for their consideration as appropriate.

As outlined above, the Government of Canada supports research in areas related to EMF and health through CIHR's investigator-initiated research programs. We encourage scientists interested in conducting further research studies in this area to make use of CIHR funding opportunities (<https://www.researchnet-recherchenet.ca/rnr16/search.do?fodAgency=CIHR&fodLanguage=E&all=1&search=true&org=CIHR&sort=program&masterList=true&view=currentOpps>).

C4ST would appreciate assistance to identify specific opportunities for research funding. When investigated, no opportunities appeared to be open. There are, however, opportunities regarding app development.

The Canadian Community Health Survey (CCHS) is a cross-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population. New questions related to EHS could only be included in the CCHS once they meet Statistics Canada quality criteria for content. In the case of EHS, the lack of a clear etiology and definition by the research community (standard and accepted definition related to an accepted medical disorder) would limit the feasibility of interpreting and reporting on any data collected.

Health Canada could look to France on how to conduct public consultations on EHS in Canada. "The objective of the consultation is to gather additional scientific comments and data ... All of the comments received, as well as the Agency's response, will be published in an annex to the final report.... the working group also examined testimony by hospital physicians and general practitioners, researchers, associations, and groups of citizens and elected officials."⁴²

Questions on Multiple Chemical Sensitivity were twice included in the CHMS. Results identified considerable co-morbidities among this population that is recognized to have genetic traits indicative of poorer toxicant metabolism. There are overlaps among environmental sensitivities, and this

³⁹<http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7945128> time 15:31

⁴⁰<http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7945128> time 15:43

⁴¹<http://www.magdahavas.com/wordpress/wp-content/uploads/2012/06/Austrian-EMF-Guidelines-2012.pdf>

⁴²<https://www.anses.fr/en/content/anses-organises-public-consultation-its-report-electromagnetic-hypersensitivity>

constellation of difficulties coping physiologically with today's world results in considerable disability and costs to society and healthcare. It could be highly informative to add a question regarding EHS, along with other environmental sensitivities.

QUESTION: Given the above information, will Health Canada reconsider its decision to not invest resources to better understand electromagnetic hypersensitivity (EHS) testing, diagnosis and treatment, and its possible impacts on health in the workplace? In response to the Committee's recommendation for updates to clinical guidelines and continuing education materials for health care providers, Health Canada has shared the report of the Committee with the Canadian Medical Association, the Royal College of Physicians and Surgeons, the College of Family Physicians, and the WHO for their consideration of recommendations relating to their respective mandates as appropriate.

Protecting the Most Vulnerable, Enhancing Stakeholder Engagement and Information Sharing (Recommendations 6, 7, 8, 9, and 12)

Recommendation 6

That Health Canada ensure the openness and transparency of its processes for the review of Safety Code 6, so that all Canadians have an opportunity to be informed about the evidence considered or excluded in such reviews, that outside experts are provided full information when doing independent reviews, and that the scientific rationale for any change is clearly communicated.

Recommendation 7

That the Government of Canada establish a system for Canadians to report potential adverse reactions to radiofrequency fields.

Recommendation 8

That an independent scientific body recognized by Health Canada examine whether measures taken and guidelines provided in other countries, such as France and Israel, to limit the exposure of vulnerable populations, including infants, and young children in the school environment, to radiofrequencies should be adopted in Canada.

Recommendation 9

That the Government of Canada develop an awareness campaign relating to the safe use of wireless technologies, such as cell phones and Wi-Fi, in key environments such as the school and home to ensure that Canadian families and children are reducing risks related to radiofrequency exposure.

Recommendation 12

That the Government of Canada and manufacturers consider policy measures regarding the marketing of radiation emitting devices to children under the age of 14, in order to ensure they are aware of the health risks and how they can be avoided.

It is Health Canada's position, and that of the Expert Panel of the Royal Society of Canada, that current measures on RF EMF protect our most vulnerable.

Both Health Canada and the Royal Society of Canada had an incomplete database of literature. See 140 omitted studies report.⁴³ The Royal Society of Canada had a conflicted panel.⁴⁴

⁴³ [140 omitted studies omitted from the Safety Code 6 \(2015\)update](#)

Research using actual devices such as phones, is usually excluded by Health Canada. Nevertheless, this research is rich, demonstrating biochemical, genetic, developmental and other effects in cells and animals. In epidemiology studies, "status quo" exposures indicate increased brain tumours and fertility affects. RF radiation may also magnify effects of known toxicants such as lead.^{45 46} Citizens' groups including C4ST and others hear regularly from intelligent, rational individuals asserting that current exposures are causing them harm.

Safety Code 6 human exposure limits, established by Health Canada, are designed to provide protection for all age groups, including infants and children, on a continuous basis (24 hours a day/seven days a week). This means that if someone, including a small child, were to be exposed to RF energy from multiple sources for 24 hours a day, 365 days a year, within the Safety Code 6 limits, there would be no adverse health effects.

This "design" is based solely on heating effects.

In a submission to Health Canada during the recent Safety Code 6 update, 40 MD's from across Canada signed a declaration requesting that *"Health Canada develop and support strategies to raise awareness about microwave radiation impacts and to minimize prolonged exposure to microwave radiation in schools and other places where children are regularly exposed."*⁴⁷

Fifty (50) international scientists, who are experts in the field of wireless radiation, also signed a declaration to Health Canada. The scientists called for Health Canada *"to end its' reliance on outdated "thermal measures of harm" which only evaluate temperature changes in tissue"* and to provide *"Safety standards based on a full review of current scientific literature which Health Canada acknowledges it did not do prior to its latest update of Safety Code 6."*⁴⁸

Based on a thorough review of all available data, it is Health Canada's position that there are no established adverse health effects at levels below the limits outlined in Safety Code 6. This conclusion is similar to that arrived at by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), the European Commission's Scientific Committee on Emerging and Newly Identified Health Risks, and the WHO.

ICNIRP's statement on RF-EMF is from 2009 - before the IARC Class 2B *possible* carcinogenic classification.

The European Commission's Scientific Committee on Emerging and Newly identified Risks (SCENIHR) also did not do a systematic review of the literature and missed many publications. Its flawed analysis is detailed by Sage et al.⁴⁹ The WHO review, according to its own description, will not be reviewing the Russian language literature even though Russia has 100 times more stringent safety levels than most of the Western countries. The WHO also will not be including the West case report study documenting

⁴⁴ <http://www.cmaj.ca/content/185/13/E605.full.pdf+html?sid=67535412-2090-47c8-83ed-0e65295c7234>

⁴⁵ <https://www.ncbi.nlm.nih.gov/pubmed/23555766>

⁴⁶ <https://www.ncbi.nlm.nih.gov/pubmed/25749340>

⁴⁷ [Submission to Health Canada from 40 Canadian MD's](#)

⁴⁸ [Declaration from 50 international experts outlining their concerns with Safety Code 6](#)

⁴⁹ Comment on SCENIHR: Opinion on Potential Health Effects of Exposure to Electromagnetic Fields. Bioelectromagnetics 36:480-484 (2015) <http://onlinelibrary.wiley.com/wo11/doi/10.1002/bem.21949/full>

breast cancer in young women who developed cancer where their cell phones were tucked in their bras.⁵⁰ Details of breast cancer and related studies are detailed elsewhere.⁵¹

Over 220 scientists from 41 nations who have performed research in the field of wireless radiation signed the "EMF Scientist Appeal" which requests *"the World Health Organization (WHO) to exert strong leadership in fostering the development of more protective EMF guidelines, encouraging precautionary measures, and educating the public about health risks, particularly risk to children and fetal development. By not taking action, the WHO is failing to fulfill its role as the preeminent international public health agency"*⁵²

The approach applied in Safety Code 6 (2015), which specifically incorporated human exposure limits based upon child body sizes, was recently recommended by the French Agency for Food, Environment and Occupational Health and Safety (ANSES) in their recent review entitled "Exposition aux radiofréquences et santé des enfants" (<https://www.anses.fr/fr/system/files/AP2012SA0091Ra.pdf>).

France has legislated no Wi-Fi in nursery areas and kindergarten and there is restricted use in the lower grades.⁵³

Health Canada fails to note that, unlike Health Canada, ANSES *"has decided to give this question (hypersensitivity to electromagnetic fields) all the attention it deserves by dedicating a specific and in-depth expertise to it. For the ANSES, this choice attests to the importance it attaches to this subject, as well as to people who suffer from EHS."*⁵⁴ (translation by C4ST).

Children are not "little adults".⁵⁵ Children absorb radiation more avidly than adults. Safety Code 6 does not provide any additional allowances for children and other vulnerable individuals. The Canadian Teachers' Federation has expressed concern for students and their exposure to Wi-Fi.^{56, 57} *"That an education program regarding the relative safety of Wi-Fi exposure be implemented and that appropriate resources be developed to educate the public regarding ways to avoid potential exposure risks of Wi-Fi access points and devices."*⁵⁸

Health Canada's guidelines are among the worst in the world. China, Russia, Italy and Switzerland have guidelines that are 100 times safer than Canada's.

⁵⁰<https://www.hindawi.com/journals/crim/2013/354682/>. Dr. West reports that he has now documented over 30 similar cases.

⁵¹ <http://ehtrust.org/wp-content/uploads/2015/12/Breast-Cancer-and-Cell-Phones-A-Review-of-the-Evidence.pdf>

⁵² <https://emfscientist.org/index.php/emf-scientist-appeal>

⁵³ <http://www.complianceandrisk.com/france-publishes-law-on-electromagnetic-waves/>

⁵⁴ <https://www.anses.fr/fr/content/consultation-publique-sur-le-rapport-hypersensibilit%C3%A9-%C3%A9lectromagn%C3%A9tique-ou-intol%C3%A9rance>

⁵⁵ <http://www.sciencedirect.com/science/article/pii/S2213879X14000583> "Why children absorb more microwave radiation than adults: The consequences"

⁵⁶ Canadian Teacher Magazine. CTF [Canadian Teachers' Federation] sounds the alarm on Wi-Fi (page 46).

http://www.canadianteachermagazine.com/issues/2015/CTM_JanFeb15/index.html

⁵⁷ Canadian Teachers' Federation- The Use of Wi-Fi in Schools - Briefing document.

<http://www.ctf-fce.ca/en/Pages/Issues/Wi-Fi-Briefing-Document.aspx>

⁵⁸ <http://www.ctf-fce.ca/en/Pages/Issues/Wi-Fi-Briefing-Document.aspx>

QUESTION: Why does Health Canada refuse to investigate the pro-active actions in other countries, the rationale for those actions and implement better protection for children and vulnerable individuals?

Health Canada's latest process to revise Safety Code 6 was the most comprehensive, inclusive and transparent process to date. Health Canada published its proposed 2014 revisions to Safety Code 6 for public consultation between May 16 and July 15, 2014 and welcomed feedback from interested Canadians and stakeholders. The revised Safety Code 6, which was published in 2015, as well as the summary of consultation feedback is available on Health Canada's website. The revised document also underwent an extensive independent peer review by an Expert Panel of the Royal Society of Canada; a process which further considered stakeholder feedback. Overall the Royal Society's review of Safety Code 6 was favourable and supported the science based conclusions that the basic restrictions in the Safety Code 6 provided adequate protection. Based on evidence which emerged after Health Canada submitted Safety Code 6 for review, the Society did recommend slightly more restrictive reference levels in some frequency ranges to ensure larger safety margins for all Canadians, including newborn infants and children. Health Canada accepted the recommendation and adjusted Safety Code 6 accordingly.

The Royal Society of Canada (RSC) panel was identified, in an article in the Canadian Medical Association Journal, as failing in its duty to the public by two scientists who were invited to peer-review the document before final publication.⁵⁹ The RSC report has also been challenged for its lack of an independent panel⁶⁰ and the lack of independence from Health Canada through information discovered in Access to Information Requests.⁶¹

As outlined above there is ongoing significant international work on RF EMF and its impact on our health. The collective expertise of the international scientific community working for these bodies, which include Health Canada scientists, is a valuable world-class resource. Given the Government frequently makes use of international standards in other areas, Health Canada will, over the medium to long term, examine how it can better leverage international scientific expertise in its work on RF EMF.

When establishing Safety Code 6, Health Canada incorporated several tiers of precaution into the human exposure limits. These included conservative thresholds for the occurrence of adverse effects, extreme worst-case situations for body size and orientation in relation to the RF fields, and additional safety margins. Since these conservative approaches are cumulative, i.e., stacked upon each other, Safety Code 6 provides very large margins of safety against the occurrence of all established adverse health effects associated with RF field exposure.

In addition, Health Canada maintains messaging on its website that reminds cell phone users that they can take practical measures to reduce their RF exposure by limiting the length of cell phone calls, using "hands-free" devices and replacing cell phone calls with text messages. This messaging also encourages parents to take these measures to reduce their children's RF exposure from cell phones in acknowledgement that children are typically more sensitive to a variety of environmental agents.

Health Canada does not proactively warn Canadians about the potential harm from wireless devices.⁶² A 2015 law in France requires a campaign of "awareness and information on the responsible and rational use of mobile devices" and also restricts the use of Wi-Fi in schools.⁶³ Requests for similar messages regarding Wi-Fi in schools to Health Canada have been ignored. Safety warnings are buried within the

⁵⁹ <http://www.cmaj.ca/content/186/9/E300>

⁶⁰ <http://microwaveneews.com/news-center/rsc-sc6>

⁶¹ [Result of ATI requests re Royal Society panel and Health Canada](#)

⁶² <http://www.parl.gc.ca/HousePublications/Publication.aspx?Language=e&Mode=1&Parl=41&Ses=2&DocId=7892702> time 16:11

⁶³ <http://www.complianceandrisk.com/france-publishes-law-on-electromagnetic-waves/>

manuals of all wireless devices.⁶⁴ These warnings state the distance required to keep the cell phone, baby monitor, tablet, etc. away from the human body in order to meet Safety Code 6 regulations. All requests of Industry Canada/Innovation, Science and Economic Development Canada and Health Canada for industry to make these warnings more public have been ignored.

QUESTION: Will Health Canada provide advisories to inform Canadians that having wireless transmitting devices touching their bodies may exceed Safety Code 6 (2015) limits? The limits within Safety Code 6 are designed to provide protection for all age groups, including infants and children, on a continuous basis. Under the *Canada Consumer Product Safety Act*, it is prohibited to advertise a consumer product, including consumer products that are radiation emitting devices, if the advertisement in question creates an erroneous impression regarding the device's safety, or if the product itself is a danger to human health or safety. Prohibitions respecting the advertising of radiation emitting devices are also set out in the *Radiation Emitting Devices Act*.

These limits are based only on heating and are made using "models" and calculations. It is illegal to market cell phones to children less than seven years of age in Belgium.⁶⁵

Health Canada has shared the report of the Committee and its recommendations with both Advertising Standards Canada and the Canadian Radio-television and Telecommunications Commission (CRTC) for their consideration as appropriate.

Consumer complaints concerning products, such as cell phones, can be directed to Health Canada using the web-based system developed under the *Canada Consumer Product Safety Act* and accessible through the Healthy Canadians website <http://www.healthycanadians.gc.ca/report-signalez/index-eng.php>. The system identifies hazards that can then be addressed by appropriate experts within Health Canada and ISEDC.

This is a method to identify problems with products. The situation here is that people are being made ill by the RF radiation in their surroundings, not a particular make or model of a device. This calls for other measures.

Question: Given the above examples and suggestions, will Health Canada reconsider its decision not to establish a system for Canadians to report potential adverse reactions to RF radiation?

Health Canada, other leading health agencies, and the WHO, have concluded that, to date, there is no convincing scientific evidence linking adverse symptoms to levels below existing RF exposure limits.

As such the feasibility and utility of a dedicated adverse reporting system specific for RF devices, similar to the reporting of adverse drug reactions, is limited.

Consequently, Health Canada does not support the establishment of an adverse reporting process specifically for RF exposure, but will continue to monitor the international scientific literature and incident reports arising from existing web-based reporting systems, and promote information sharing amongst all levels of government.

In response to HESA's recommendations, Health Canada will communicate more effectively on how it contributes to international organizations (WHO, IARC, etc.), other governments, and non-governmental organisations in managing and monitoring scientific research on RF impact on human health. It will further elaborate on its process to review and consider emerging scientific literature published subsequent to these international exercises.

⁶⁴ <http://c4st.org/major-device-safety-warnings/>

⁶⁵ www.expatica.com/be/news/belgian-news/TMag-Mobile-phones-to-be-banned-for-children_259994.html

Health Canada maintains web-based information to inform the public on exposure to RF energy. Components include the "Healthy Canadians" web-based series of publications, which address issues such as the safety of cell phones and cell phone towers, electric and magnetic fields at extremely low frequencies, electromagnetic hypersensitivity, Wi Fi equipment and smart meters (http://healthycanadians.gc.ca/drugs-products-medicaments-produits/consumer-consommation/home-maison/cell-eng.php?_ga=1.256297484.608447883.1437502675). Health Canada will seek opportunities to strengthen public communications as appropriate.

Health Canada has previously provided timely scientific information and messaging on EMF and health to federal, provincial, and territorial partners, including through the Pan Canadian Public Health Network. The Department will maintain this practice and its ongoing relationship with its FPT partners in an effort to support regional efforts and decision-making in this area.

In response to the Committee's recommendation that Health Canada ensures the openness and transparency of its processes for the review of Safety Code 6, the Department will consider various strategies for further supporting transparency in the process including implementing an enhanced process for the systematic review and documentation of scientific literature related to RF EMF exposure and health.

QUESTION: When will this be made available? Will it follow international scientific systematic review best practices?⁶⁶

⁶⁶ 1. Rooney AA, Boyles AL, Wolfe MS, Bucher JR, Thayer KA. Systematic Review and Evidence Integration for Literature-Based Environmental Health Science Assessments. Environ Health Perspect . 2014 Apr 22; DOI:10.1289/ehp.1307972. Available from: <http://ehp.niehs.nih.gov/1307972>