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Chair

Mr. Ben Lobb

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● (1535)

[*English*]

The Chair (Mr. Ben Lobb (Huron—Bruce, CPC)): Good afternoon, ladies and gentlemen. We're continuing on with our study of the Health Canada Safety Code 6.

We apologize for the brief delay starting the meeting today. We're moving into the paperless world here on the Hill and committees are one of the areas where we're trying to go paperless. We're working on that and some presentations.

We're going to start off with Professor Miller first. You can go first if you're ready, sir. You have about 10 minutes for time.

How much time?

Dr. Anthony Miller (Professor Emeritus, Dalla Lana School of Public Health, University of Toronto, As an Individual): Mr. Chair, members of the committee, thank you very much for giving me the opportunity to present on Health Canada's review of the evidence for Safety Code 6, which I believe has led to unsafe conclusions.

I am a physician and epidemiologist specializing in cancer etiology, prevention, and screening. I have performed research on ionizing radiation and cancer, electromagnetic fields and cancer, and other aspects of cancer causation. I have served on many committees assessing the carcinogenicity of various exposures, including working groups of the International Agency for Research on Cancer, commonly known as IARC, of which Canada is a member. I was the first Canadian member of their scientific council.

I was a visiting senior scientist in the monographs program in IARC in September 2011 until January 2012, where as part of my duties I reviewed the scientific literature that was used by a working group to designate radio frequency fields as a class 2B carcinogen, that is, a possible carcinogen. I was also one of the peer reviewers invited by the Royal Society of Canada to review the draft report of the Royal Society panel on Safety Code 6.

I have a number of concerns over the documents that have recently been released by Health Canada on Safety Code 6 and the document called “Rationale”. What Health Canada has said in its latest iteration of Safety Code 6 is that it should be distinguished from some municipal and national guidelines that are based on socio-political considerations. I find that a strange statement because it seems to provide no room for emerging evidence on health hazards, which surely should be considered if the safety of humans is the objective.

Since the IARC review, which identified radio frequency fields as a possible human carcinogen, there had been a number of studies that have been reported. In my view—and that of a number of colleagues who've written a couple of papers with me on this issue, one of whom will present to you next week—these studies, we believe, reinforce the evidence that radio frequency fields are not just a possible human carcinogen but a probable human carcinogen, putting it in the category 2A. It would be impossible to ignore such a hazard in regulatory approaches.

One of the most important was a study in France, a large case-controlled study, which found a doubling of risk of glioma, the most malignant form of brain tumour, after two years of exposure to cellphones. After five years it was five times the risk. They also identified the fact that in those who lived in urban environments, where there are probably a number of other carcinogens that could impact upon brain tumours, the risk was even higher.

That brings us back to Safety Code 6 and the document that Health Canada contracted to produce a review of the evidence. This was the document produced by the Royal Society panel. I feel that panel was conflicted. As you probably know, the chair changed and the panel had insufficient expertise in epidemiology. My friend, Paul Demers, was called in to be chair of that panel. I believe he presented to you fairly recently. I feel he was put in an impossible situation.

If you read that document carefully, it says that the panel did not have adequate time to do a full review of the data, they therefore relied on reviews of other people and they did not do a detailed evaluation of the studies. That led them, I believe, to false conclusions.

It's important to recognize that there are no safe levels of exposure to human carcinogens. Although risk increases with increasing intensity of exposure, and for many carcinogens, such as tobacco smoke, even more with increasing duration of exposure, the only way to avoid the carcinogenic risk is to avoid exposure altogether. This is why we tend to ban carcinogens from the environment. Asbestos is one particular example of why much effort is taken to get people, particularly young people, not to smoke. Further, we now recognize that people vary in their genetic makeup, and that certain genes can make some people more susceptible than others to the effect of carcinogens. It is those who are susceptible that safety codes should be designed to protect.

As an epidemiologist who has done a great deal of work on breast cancer, one of the most concerning factors that have come to light is a series of case reports, starting with some reports from California and recently with the identification of a similar case in Saskatchewan. In all, there are now seven case reports of women who developed unusual breast cancers in the exact position where they kept cellphones in their bras. These are unusual tumours. They're multifocal, which means they occur in several places. They seem to mirror where the cellphone was being kept. The radiation from the cellphone seems to have increased in these women the risk, which they presumably already had, of developing breast cancer. They were all relatively young women. This is a most unusual occurrence that must concern us greatly.

We have brain cancers and parotid gland tumours, which are tumours of the salivary gland. There have been several instances of people who have developed this. In Israel recently a study identified increasing risk of these cancers, particularly with increasing exposure.

Given the long natural history of cancer and the fact that human populations have not been exposed for a sufficient length of time to exclude a carcinogenic effect, it is in my view extremely important to adopt a precautionary approach to the exposure of humans, particularly children, to radio frequency fields. We should note that an individual, if appropriately informed, can reduce their exposure to radio frequency fields from devices that use Wi-Fi, but in the case of cell towers and smart meters, the exposure they receive is outside their control. Then, with the people who manufacture these devices and those who promote Wi-Fi in all sorts of instances, we're reaching a situation where homes are being saturated with radio frequency fields.

It will be very difficult to prove conclusively an effect. Spread over a large population, if the normal occurrence is relatively rare—and it is relatively rare for brain tumours to occur—even if you double the risk, triple the risk, or even quadruple the risk, it will be difficult to identify that precisely. We need to do these studies.

In the meantime, to avoid a potential epidemic of cancer caused by radio frequency fields from Wi-Fi and other devices, we should strengthen the codes that are meant to protect the public. In my view, Health Canada has not done an adequate job. Safety Code 6, in its current iteration, needs to be re-revised.

● (1540)

I thank you, Mr. Chairman.

● (1545)

The Chair: Thank you very much.

Next up is Mr. Frank Clegg.

Go ahead, sir.

Mr. Frank Clegg (Chief Executive Officer, C4ST, Canadians For Safe Technology): Mr. Chair and committee members, I'd like to thank you for the invitation to speak with you this afternoon and for deciding to invest committee time on Safety Code 6.

When I ran the Canadian operations for Microsoft, I learned that it is critical to focus on process. Today, as a board member for Indigo Books and Music, my role has shifted more towards governance and oversight. In both roles, process is critical to success. Government is the largest corporation of all, so process is of paramount importance. As someone who regularly examines success and failure, I believe I can explain why the Safety Code 6 process is a failure by all metrics and has left Canadians unprotected.

There is a book written by Nassim Taleb called *The Black Swan*, a focus on very low-probability, high-impact events that aren't supposed to happen. Oil spills, train derailments, and airplane crashes are some of the events in this category. Taleb calls these "black swan" events.

If one decides that all swans are white and refuses evidence of black swans, then one will conclude that all swans are white. Black swans are rare, but they do exist. Unfortunately, experts convinced themselves that these events had zero probability. They did not plan appropriately and people died.

The American Academy of Environmental Medicine is an international organization of physicians and scientists that has predicted, among other things, the rise in multiple chemical sensitivity, which is now protected in many public policies. Regarding the unprecedented increase in wireless devices, the academy forecasts "a widespread public health hazard that the medical system is not yet prepared to address".

I believe Health Canada's analysis focuses on identifying and counting white swans, while ignoring black swan evidence. Health Canada's representative informed this committee on March 24:

> ...some of these studies report biological or adverse health effects of RF fields at levels below the limits in Safety Code 6, I want to emphasize that these studies are in the minority and they do not represent the prevailing line of scientific evidence in this area.

In other words, black swans exist.

In your handout—I don't know if you have it, as we put it in for translation—is a document entitled "Analysis of 140 Studies Submitted by Canadians for Safe Technology (C4ST) During the Public Comment Period on Safety Code 6". A chart in that document shows that Health Canada accepts that there are in fact 36 studies all passing Health Canada's quality criteria showing harm at levels below Safety Code 6.

As a Canadian, I find this confusing. As an executive, I find it inexcusable.

Of the 36 studies Health Canada deemed satisfactory, cancer is linked in six of them. In 13 of them, the brain and/or nervous system is disrupted. In 16 studies, Health Canada admits that biochemical disruption occurs. Finally, seven high-level scientific studies indicate an effect on intellectual development and/or learning behaviour. All of these studies show impacts with radiation below Safety Code 6 limits. How was this black swan evidence evaluated?

In our two-year investigation, C4ST has determined that Health Canada doesn't even have the proper software required to access, summarize, and analyze the large number of relevant studies. If our group of learned and qualified volunteers can uncover 140 studies, how many more are being missed or ignored?

Health Canada references its weight-of-evidence approach. It is unclear how many studies you need to outweigh 36 studies that show harm, especially to children. I just can't fathom why Health Canada is not highlighting these studies and prioritizing their implications. Despite requests to publish the weight-of-evidence criteria as per international standards, Health Canada refuses to do so. Even the recent 2015 rationale document does not provide this critical information.

Health Canada dismisses scientific evidence unless it shows harm where the microwave levels are strong enough to heat your skin. The notion that microwaves are not harmful unless they heat your skin is decades out of date. The core premise of this white swan dates back to Einstein's theory that non-ionizing radiation cannot cause harm, or if it does, it must heat tissue to do that. Albert Einstein passed away the same year Steve Jobs was born. To think that science has not evolved since then is classic white swan thinking. It's part of a process predetermined to fail.

● (1550)

Health Canada says on its website today that there is no chance that Wi-Fi or cellphones can harm you because it has studied all the science, but when pressed under oath, Health Canada officials give a more fulsome answer. In Quebec Superior Court in September 2013, Health Canada senior scientist James McNamee admitted that Health Canada only assesses risk based on the thermal effect, i.e., the heating of tissue.

Unfortunately, Canada has not invested the necessary time nor had the balanced opinion of experts necessary to undertake a proper review. Our research has uncovered that the Health Canada author of Safety Code 6 has published papers demonstrating his bias towards this topic.

In a few hours over three days, this health committee has spent more time speaking with scientific experts who believe there is harm from wireless radiation below Safety Code 6 than all of Health Canada combined. You can't find black swans when you don't talk to the experts who've identified them.

There is a fundamental business rule: you can't manage what you don't measure. It is clear that Health Canada not only doesn't follow that rule but even resists it. A memo obtained under access to information to the Minister of Health in March of 2012 revealed that Health Canada “does not support the recommendation to establish an adverse reaction reporting process specifically for RF exposures”. The memo goes on to state that “consumer complaints...may be directed to...the web-based system...under the...Canada Consumer Product Safety Act”. This is an inadequate solution and, I believe, a missed opportunity.

I refer you to the C4ST fact sheet. I think you have it. I'd like to highlight three examples from that fact sheet: Health Canada's Safety Code 6 is among the countries with the worst guidelines in the world; Canada has fallen behind countries such as France, Taiwan, and Belgium in protecting Canadians; and finally, Health Canada wasted over $100,000 of taxpayers' money, as the Royal Society report is not an independent review.

Health Canada also states that Safety Code 6 is a guideline and that other organizations at the provincial and local levels of government are free to implement lower levels as they see fit; however, that's not the reality of what happens. We have witnessed school boards, power and water utilities, Industry Canada, and manufacturers depending on Health Canada's analysis, and frankly, abdicating to it. They don't perform their own analysis.

Safer solutions exist. There are several situations in Canada regarding cell towers where the proponents have voluntarily offered to restrict radiation exposure, in some cases to thousands of times less than Safety Code 6. There is a solution in Iowa for smart meters that use a wired meter that provides a safer, more secure solution at a lower cost.

Given that our track record in North America is not successful regarding such products as tobacco, asbestos, BPA, thalidomide, DDT, urea-formaldahyde insulation, and many others, use of the precautionary principle of prudent avoidance should be recommended until the science proves beyond reasonable doubt that there is no potential for harm.

For the last three years, science has published a new study every month that shows irreparable harm at levels below Safety Code 6. That is why we're asking the committee to take three decisive steps.

First, conduct a national campaign to educate Canadians about methods to minimize exposure to RF radiation, ban Wi-Fi in day care centres and preschools, and ban the marketing of wireless devices to children.

Second, protect individuals who are sensitive to RF radiation by accommodating them with safer levels of wireless exposure in federal workplaces and federal areas of responsibility.

Third, and finally, create an adverse reporting system for Canadians and a publicly available database to collect improved data regarding potential links between health effects and exposure to RF radiation.

Parallel to the above, recommend that Health Canada conduct a comprehensive systematic review, subject to international standards, regarding the potential harmfulness of RF radiation to human health, with a scientific review panel that is balanced in opinion. It was a textbook case of black swan thinking that has led to this failure of Safety Code 6.

● (1555)

In conclusion, C4ST volunteers found 36 black swans that Health Canada agrees are high quality. How many would be available if Health Canada sincerely looked? Better yet, how many black swans will it take before Health Canada takes serious actions? Thank you very much.

The Chair: Thank you very much. Next up we have Professor Havas.

You have a presentation.

Dr. Magda Havas (Professor, Environmental and Resource Studies, Trent University, As an Individual): I do. It will come partway through my talk.

The Chair: Great.

Dr. Magda Havas: Thank you very much for the invitation to address you today. My name is Dr. Magda Havas and I'm an associate professor of environmental and resource studies at Trent University in Peterborough, Ontario.

For the past 25 years I have been teaching university students about the biological effects of electromagnetic fields and electromagnetic radiation, which are collectively referred to as “electrosmog”. It is my belief that electrosmog is the emerging public health issue, due largely but not entirely to the rapid proliferation of wireless technology. Concern among health care practitioners and the public is growing as chronic illness increases and health care costs rise.

Since 2000 I have been invited to give more than 300 lectures at medical conferences, at universities, to congressional and Senate staff in the United States, and to community groups concerned with Wi-Fi in schools and antennas in their neighbourhoods. In 2002 Charles Caccia invited me to present to the environment committee of the House of Commons. In 2010 I appeared before the HESA committee to discuss the very same issue we are discussing today. In 2013 we presented to the Canadian Medical Association and the Royal College of Physicians and Surgeons about the harmful effects of electrosmog and the need for public protection.

I began my career as an environmental toxicologist in the mid-1970s, and the emerging issue at that time was acid rain. I was one of the scientists who studied the damage that acid rain does to forests and lakes. My peer-reviewed, published research and that of other scientists helped bring in clean air legislation, referred to as the acid rain accord, signed into international law by Prime Minister Mulroney and President Bush in 1991. This accord guaranteed cleaner air and a healthier environment for millions of Canadians and Americans, and protected our aquatic and terrestrial ecosystems.

We need similar steps to be taken for electrosmog legislation. That accord was due to the work of the Canadian Coalition on Acid Rain, federal and provincial ministers of the environment like Charles Caccia and Jim Bradley, and a large number of scientific studies from eastern North America and north-central Europe. The accord came 15 years after my studies on the effects of acid rain began. We were able to get clean air legislation because members of Parliament based their policy decisions on the science and not on misinformation provided by industry representatives.

At that time, acid rain was not taken seriously. Industry scientists repeatedly claimed that acid rain did not exist or was natural, and was not responsible for the loss of fish and the death of trees. This denial of a problem is common in health and environmental issues that have financial consequences for those generating the pollution. We have seen it with asbestos, DDT, lead, cigarettes, and now electrosmog.

Today I find myself in a situation similar to the one I was in with acid rain. We have industry scientists who repeatedly claim that electromagnetic pollution does not cause cancer or adverse effects on health. These wireless industries are able to hide behind Health Canada's Safety Code 6, which affords more protection to them than to the public.

Schools that have installed Wi-Fi, the telecommunications industry that installs antennas on hospitals and in residential communities, and provincial and municipal governments that do not have expertise in this area, all hide behind Health Canada's Safety Code 6, with the false perception that they are being protected. What they don't realize is that this guideline was designed to protect military personnel from heating of tissue averaged over a six-minute period. It was not intended to protect the infant in the crib lying next to a wireless baby monitor that emits microwave radiation for 12 hours a day.

The science that I teach dates back to the 1940s, when U.S. Navy labs documented illness among radar equipment operators. Back then it was called microwave illness. Today it is called electrohypersensitivity. Radar operators were made sick by the same frequencies later used for the microwave oven, which originally was called the radar range. The same frequencies are now used in Wi-Fi devices. We wouldn't want to live near a radar installation, yet we generate radar frequencies in our home with our wireless technology.

Symptoms of electrohypersensitivity include headaches, chronic pain, chronic fatigue, sleeping problems, difficulty concentrating, poor short-term memory, mood disorders including depression and anxiety, dizziness, nausea, and tinnitus. As many as 3% of the population, one million Canadians, have EHS symptoms that are so severe they are unable to function in our modern world.

● (1600)

Another 35%, 10 million Canadians, have mild to moderate symptoms. These symptoms resemble aging and I refer to electrohypersensitivity as rapid aging syndrome.

My research shows that radio frequency radiation from a cordless phone at levels well below 1% of Safety Code 6 causes an irregular or rapid heart rate in those who are sensitive. This is called tachycardia. In a few individuals, their heart rate increases from 60 beats per minute to 100 beats per minute while they're lying down on a bed without knowing whether the device is turned on or off. The tachycardia is often associated with anxiety. The feeling is that they are experiencing a heart attack.

Dr. Stephen Sinatra, an American cardiologist, believes that minor heart abnormalities, one of which is called Wolff-Parkinson-White syndrome, affects one in 700 children. Combined with exercise and exposure to microwave radiation, such as Wi-Fi or nearby cellphone antennas, this creates the perfect storm that could result in cardiac arrest.

The population in Ottawa elementary schools, with approximately 143,000 students, may have as many as 200 students who are at risk because of this particular heart effect if they have Wi-Fi in their school environment. In the early studies with radar operators, doctors recommended that workers be screened for heart irregularities before working with microwave radiation. Perhaps students should be screened before attending Wi-Fi-equipped schools.

As part of my research, I am trying to find biomarkers for electrohypersensitivity so that doctors can be better equipped to diagnose the environmental illness. So far we have found several—heart rate, heart rate variability, blood viscosity, sugar among diabetics, and muscular coordination problems with people who have multiple sclerosis. More biomarkers are needed. Unlike epidemiological studies that document an association between an agent and an outcome, our studies demonstrate a cause and effect relationship.

Experts who testify at hearings such as this have general or specific backgrounds in science or medicine. Those with a general background and no experience with their patients, or through their own research, are likely to provide misleading information. The reason for this is that we are going through a paradigm shift in our understanding of the relationship between electromagnetic energy and how the human body works.

We now recognize that our cells and organs communicate with each other using electromagnetic impulses rather than just chemical messengers. Any signal that interferes with that communication may adversely affect the health of individuals. The effects are a function of not only intensity, but also frequency modulation waveform.

What you see in front of you, in the bottom slide, is a picture of my blood under the microscope. The cells around.... A few are connected. Most of them are free. This looks like fairly healthy blood.

After I use a computer for 50 minutes, I get the blood you see in the top left-hand corner. The blood cells are sticking together. Ten minutes after using a cordless phone, my blood becomes very sticky, very viscous, and it doesn't distribute the oxygen in my body the way it should. This is one of the symptoms of electrohypersensitivity.

Doctors are not taught in medical schools about electrosmog, as it is a relatively recent problem, nor are they taught how to diagnose electrohypersensitivity. For them, this illness does not exist. When doctors can't identify an illness they often assume it is psychological. I have spoken to psychiatrists who tell me that they are regularly sent patients who have physiological problems and not psychological ones. Some of these people are electrically hypersensitive.

Industry scientists often refer to studies that report that subjects who claim to have EHS are unable to subjectively determine whether a device is on or off. They falsely conclude that this means the person is not electrically hypersensitive. The flawed assumption here is that perception is not necessary for a physiological action to occur and that reactions occur immediately. Neither are true.

We can be outside on a sunny day when the sun is not visible or hot and still get a sunburn. We do not perceive ultraviolet radiation. The sunburn develops over time. Sensitivity to the sun varies among individuals, as does electrohypersensitivity. Indeed, sensitivity to the sun is a good analogy for EHS. The longer you are exposed, the more severe the sunburn.

If you look at the 20 years it took for acid rain and the 50 years it took to address tobacco, the outlook for wireless technology is bleak. That's because it's not one culprit. There are many things in our environment that generate electrosmog.

● (1605)

The bottom line is that levels of microwave radiation are currently well above background levels and continue to increase as more wireless devices are brought to market. These levels, despite being below Safety Code 6, are adversely affecting human health. We can wait another five years, or we can take steps in the right direction to reduce our exposure. If we err, we should err on the side of caution.

I have a quick demonstration if you give me half a minute.

The Chair: We could do half a minute, yes.

Dr. Magda Havas: Thank you.

What I have here is a metre that measures radio frequency radiation. It's a directional metre. What I also have is a wireless baby monitor that's kept by the infant's crib. You can see that we're picking up microwave radiation converted into sound. This radiation actually goes for quite a distance. Infants are basically exposed to this radiation all the time.

We have technology in Europe that is voice activated. That technology is not available here in Canada, so our infants and others in the household are exposed when they don't need to be.

Thank you very much.

The Chair: Thank you very much.

That concludes the presentations. We'll now move into the questions.

We're going to get the first seven minutes of questions in French, so you'll need your earpieces.

Okay. Go ahead, Ms. Moore.

[*Translation*]

Ms. Christine Moore (Abitibi—Témiscamingue, NDP): Thank you, Mr. Chair.

First I would like to speak to Professor Miller.

According to my clinical experience, when young people have cancer it spreads quite rapidly, because its spread is often proportional to the immune system's strength. When young people are healthy, they have a very good immune system and so this often translates into very aggressive cancers.

Should we worry particularly about the fact that young people seem to be getting these cancers? We may see cancers that spread very quickly, and we will have more trouble treating them than cancer in older individuals.

[*English*]

Dr. Anthony Miller: I think that's indeed possible.

As you may know, there is a study being conducted in Canada currently, together with other countries, Australia and some European countries, which is trying to evaluate whether an association exists between exposure to radio frequency fields and the occurrence of highly malignant brain tumours. Of course, the two examples I largely spoke to, brain tumour and breast cancer, were related to the position of the device that was emitting radio frequency fields, i.e., the cellphone.

If this is now happening increasingly with children being exposed, I think we can expect to see more cancers that could well be very difficult to treat. As you know, brain cancers are not easy to treat, and some breast cancers, like these multifocal cancers, are not easy to treat. Of the seven cases, two already have metastasized.

There is a potential risk of rapidly progressive and more malignant tumours. I agree.

● (1610)

[*Translation*]

Ms. Christine Moore: At this time, the exposure limits in Safety Code 6 apply to the general population and there are no special provisions for at-risk populations.

My question is addressed to the three witnesses. Should there be studies targeting at-risk populations such as children, pregnant women and individuals with compromised immune systems?

[*English*]

Dr. Anthony Miller: I do indeed.

I think there should be much greater caution in relation to exposure of children because of what we've already discussed. Their cells are developing much more quickly. Devices such as that which Dr. Havas demonstrated, I think should be banned.

Mr. Frank Clegg: What we asked, or are suggesting, as one of the recommendations is that we think there's a lead the federal government can play in identifying federally regulated buildings and federal properties, and make those the leading examples in Canada in protecting individuals who are electrosensitive, and children and pregnant women. I think there's an opportunity for the federal government to take the lead. We hope and believe that if the feds take the lead, then other municipalities and provinces will follow as well, by focusing on the electrosensitive, pregnant women, and definitely children.

Dr. Magda Havas: Could I add something to that as well?

Ms. Christine Moore: Sure.

Dr. Magda Havas: We have precedent setting. When it comes to water quality, the nitrogen levels in drinking water are based on protecting infants. They're not based on protecting adults. I think Safety Code 6 guidelines should be based on protecting the most sensitive people within our population.

[*Translation*]

Ms. Christine Moore: Mr. Miller, you talked about tumours that have been found on the side of the head where people hold their cell phones. In some women, breast cancers have been found next to where they kept their phone in their bras. Have any studies been done on that? Have any problems been detected in men who keep their cell phones in their pants pocket? Was there an impact in that regard? Are there testicular cancers or issues with male fertility that have come out in these studies?

[*English*]

Dr. Anthony Miller: Yes, particularly fertility problems have been identified. I believe a witness next week will expand upon this. I'm not yet aware of any studies relating to testicular cancer, but that might happen. I don't know.

Dr. Magda Havas: There is evidence of testicular cancer among police officers that had radar guns and were using radar to detect speeding. They very seldom turned the guns off and just kept them on their laps. They do have an increase of testicular cancer. Radar is microwave radiation.

[*Translation*]

Ms. Christine Moore: We know that provincial health care is paying more and more for infertility treatments. Should we, in your opinion, pay particular attention to this issue if we want to avoid getting an enormous bill later? Often, people try to have a child for a long time before realizing that they have these problems. If someone has been carrying a cell phone in his pocket for 20 years, then it may be difficult to help with related issues later. Should this be of particular concern to us, in your opinion?

[*English*]

Mr. Frank Clegg: One of our recommendations is for Health Canada to raise an awareness campaign. Part of that awareness campaign should be telling young men to keep the phone out of their pants' pockets, because that's where men keep their phones. Young men keep their phones in their pockets. That's why we were calling for a recommendation to have Health Canada educate people to be aware that there is a potential risk and prevent it.

Dr. Magda Havas: We have evidence that it affects sperm, so what Frank Clegg is saying is correct. We don't know how it affects egg cells. We know that sperm are reproduced regularly. After three months you have fresh sperm. One of the recommendations is for people who are trying to get pregnant to not have the male use his cellphone for at least three months, or at least not keep it in a pocket. Women are born with all of their egg cells and if our egg cells are damaged this could have long-lasting effects on the population.

● (1615)

[*Translation*]

Ms. Christine Moore: Thank you very much.

[*English*]

The Chair: Thank you very much.

Next up is Mr. Wilks. Go ahead, sir.

Mr. David Wilks (Kootenay—Columbia, CPC): Thanks, Chair.

Thank you to the witnesses for being here. I'll share my time with Mr. Richards, because he has to leave here after the first hour, I believe.

You perked my interest when you said police officers and radar because I did that for a year and a half.

Professor Miller, you mentioned in your opening remarks that an opportunity to provide greater safety to the public has been missed. You did explain a bit about it, but I wonder if you could articulate a little more on what we've missed and what we could move forward with in respect to recommendations to Health Canada and to the minister.

Dr. Anthony Miller: When I think about Health Canada, I'm not saying this committee has missed. What Health Canada has missed is a proper scientific review of the data that would convince them—and I don't understand why they haven't been convinced—that the limits they have placed in their advisory limits are not sufficiently safe to protect the population. That's why I believe an opportunity to protect the population, and potentially to prevent a major cancer problem in the future, has been missed by Health Canada.

Mr. David Wilks: All three of you talked about different types of cancer. The one that interested me most is the one around the ear because it seems to me that would be one of the more difficult ones to deal with if you attract cancer in that area. I wonder if the three of you could speak to that and the difficulties that may arise.

One last thing and then I'll turn it over to my colleague, Mr. Richards.

I have four grandkids and they have these things. What they do is they put them on their lap to play because that's the most convenient way to do that. What would your suggestion be on educating Canadians with regard to young children playing with their laptops or iPads on their laps because it's just convenient? They don't think any other way.

Is there something we should be encouraging them to put between where they're placing the iPad and the iPad itself?

Whoever wants to answer that and then Mr. Richards....

Dr. Magda Havas: Regarding the last question that you asked about the iPad, if they have the iPad in airplane mode, then there's no problem. They're not being irradiated. However, there is now a device that you can connect to your iPad and hook it up through ethernet. As long as you have ethernet in your home, you can actually use the iPad. There's information regarding that on the web. We did it with my grandson and he's now as happy as a dumpling because we allow him to use his iPad, but it's not wireless. We have it in the wired way.

Dr. Anthony Miller: In relation to your first question, one of the things that has been clearly identified is that the brain cancers, the gliomas, the malignant brain cancers, are occurring in the position in the brain where physics demonstrates the radiation from a cellphone placed to the ear actually focuses. I think it's extremely clear and it's been very well documented.

Mr. Blake Richards (Wild Rose, CPC): I have a couple of questions, so hopefully I'll have time for both.

I'll start with you, Dr. Havas. You mentioned, in response to one of the other questions, and also in your opening remarks, a couple of things that people could do to try to, I guess, decrease their exposure to some of the electromagnetic radiation.

I'm kind of curious because for many of us it's almost a part of our day-to-day lives to have to utilize this kind of technology or that kind of technology. I'm aware that obviously turning it off when you don't absolutely have to transmit—I'm not sure if I have the right technical terms—but the transmitting not taking place is advantageous. I would assume that when you're actually using the phone that you're being exposed to higher levels of radiation, so when you're carrying it and it's not in use, that's helpful.

Can you give us some sense as to what are some of the things that Canadians could be doing to limit their exposure, or things they could do to better protect themselves from any effects?

Dr. Magda Havas: Probably, the three worst culprits in the home are the wireless baby monitors, the cordless phone, and the Wi-Fi, because they're on all the time, whether you're using them or not. With the phone, you can have it wired. You can still buy wired phones. You would have to have multiple ones.

When it comes to the baby monitors and the cordless phones, in Europe the baby monitors are voice activated, which means there's no radiation until the baby cries. We've been trying to get these into Canada and we haven't been successful so far.

Also in Europe, the cordless phones that you have there do not radiate until you actually use them. We had them here in Canada. They were banned by the FCC and Canada simply followed suit. It's almost impossible to get them unless you go to Europe and buy them.

When it comes to Wi-Fi, you can simply connect the ethernet connection. There's also something called a home plug, which means that you can put the information onto the electrical wires in your home and use your computer in any outlet, so you can still get Internet access anywhere in your home without having microwave radiation.

● (1620)

Mr. Frank Clegg: I would like to add a comment. What we recommend to a lot of people is that sometimes you can't run the wires, so go to Canadian Tire and buy a timer that you put your Christmas lights on, your holiday lights, so at least while you're sleeping, while your children are sleeping, your body is in a state of repair and growth.

Just as you said, distance is your friend, so I have a book that I carry that has a little insert in it and I put my phone in there; guys don't usually carry books against themselves. Just be aware that distance is your friend and think about it at all times. Anything that's wireless in your house, do what you can to either eliminate it or reduce the amount of time that it's turned on.

Mr. Blake Richards: Those are excellent suggestions. Thank you very much.

I hope I have just a little bit of time.

The Chair: You have about 30 seconds.

Mr. Blake Richards: Okay, I'll try to be very quick.

Mr. Clegg, my understanding is that Industry Canada had taken some steps to try to better enforce safety guidelines with new cellphone towers that are being constructed. Do you know much about that and could you tell us your thoughts around that?

Mr. Frank Clegg: We're very aware and actually we're involved with part of that.

What Industry Canada did—and it was a good step forward—was to provide more notification, but all that does is provide more notification to communities when a cell tower antenna is being put into the community. They default to Health Canada for anything to do with the levels of radiation that come from it.

The Chair: Ms. Fry, go ahead.

The Honourable Hedy Fry (Vancouver Centre, Lib.): This is like déjà vu. I think you asked a very important question, Dr. Havas. I don't understand. Inherent, for instance, in the medical ethos is to first do no harm, so the primary thing for a physician is the precautionary principle unless you see that the benefits outweigh the risks and you are prepared to do some harm in order to divert worse harm.

I've been listening to this so I called up my son and my daughter-in-law and I said, “Hey, you guys have a wireless baby monitor on my granddaughter's crib. I'm hearing this stuff and I think maybe you should take precautions and get a plug-in monitor or find a way to turn it on only when you need to”.

They said to me, “Oh, for God's sake, that is such a bunch of hokey stuff. The guidelines are clear, blah, blah, blah”, and of course I was almost accused of crying wolf.

If I couldn't convince my children that this is not reasonable and fair.... I think you said that it was 50 years before we got anybody to understand, in spite of evidence, that cigarettes caused cancer; and in the case of acid rain, it was 20 years. Surely to goodness we have learned by now that we shouldn't be taking that long. We need to see the harm that not acting on evidence sooner does.

Given that those blocking this the most are in industry themselves, and the fact that, let's be honest, governments have to balance economic growth and development and progress against harm to the greater good, and given that there is almost this conflict of interest between how governments currently operate and how governments could operate to protect people, how can we convince the public, which is completely addicted to Wi-Fi and to wireless devices, when they don't know anything else?

I'm addicted. I can't put away my stupid BlackBerry, so how do we convince people, because public awareness, obviously, as Frank said, must be a part of the recommendations? How do you put forward a public awareness program that will actually reach people and sink in without people saying, “Oh my God, everybody is being so hysterical about this”?

● (1625)

Mr. Frank Clegg: I would make two comments, Dr. Fry.

I would say that people are smart, and when they have the right information, they act appropriately and they act responsibly, particularly parents with newborns.

What I've heard though, hundreds of times now, is that it must be okay if Health Canada says it's safe. They don't understand that it takes time for this information to be digested. As Dr. Miller said, we are befuddled as to why Health Canada isn't being more active. If the health authority in Canada, which is Health Canada, came out with very clear statements that said there is proof that there could be harm, so we should be careful and take a precautionary approach, I think you would see the majority of Canadians change what they do.

You also made a comment about industry. I have spent my life in industry. We go out and work hard to provide technology that is cheaper, faster, better. That's the way we work.

Hon. Hedy Fry: That's a good thing.

Mr. Frank Clegg: But we also react when you challenge us, and we're not challenging industry right now. I think if you challenge my industry to come up with more effective ways to do it....

As I said, we have seen situations of cell towers going into the communities where they are thousands of times more safe than specified by Safety Code 6 because the community has made a fuss. We know the industry can do it, and the industry has demonstrated that.

We have technology in Europe. The industry is not jamming it or trying to go through the process to get it into Canada because they don't need to. The industry will respond, it will react, and it will act responsibly if we set the challenge in front of it. I think we're missing that opportunity to go to the industry to lower the standards on Safety Code 6. If we did that, industry would react and provide better products.

I mentioned the State of Iowa. They put in full smart meter functionality but with wired meters. That state chose to do that.

If you go to the technology industry and tell them they are no longer allowed to sell wireless tablet devices to schools, you will immediately have many solutions that are wired. So challenge. I'm asking the community to challenge my industry to do a better job.

Hon. Hedy Fry: I do think, however, there's this inherent conflict and problem because Industry Canada should be looking at how we can make sure that industry is progressive, is functioning, and we have economic development going on in the country. But that is not Health Canada's mandate.

Mr. Frank Clegg: No, it's not.

Hon. Hedy Fry: Health Canada's mandate is very clear. It is supposed to protect the health and safety of Canadians.

Mr. Frank Clegg: Agreed.

Hon. Hedy Fry: Surely to goodness I think we in this committee here, having heard the things we heard, and having learned—because I'm long in the tooth—from the things we had been fighting against, for such a long time, that cause great harm and eventually everyone.... Now we have seatbelts in legislation, and all of those kinds of things that protect people. It was a long fight.

For me, the idea that we should let Health Canada believe that it has to be true to its own mandate, which is the protection of Canadians, should be the overriding concern of this committee. I can tell you now it's something that I've taken seriously and it's something I'm going to do something about. I've lived through this stuff, as a physician and in all of my years as an environmental advocate, etc., and we have to do better than we currently do now.

I want to thank you for your presentation, actually, because it's clear and it's scientifically based. The evidence you talked about is something that we need to call for, which is a new review. Given that other countries have set the tone, France and Israel, and other countries, I think this committee should hear you very clearly. I know some of us are.

Dr. Magda Havas: May I give you some advice about your grandchild.

There is material you can buy that has silver in it that you can place over the crib. The wireless baby monitor will still work but the infant will be protected. There are companies in Canada that sell these products. You can still protect an infant—

Hon. Hedy Fry: That can be a little gift from grandma.

Dr. Magda Havas: Yes, that would be a lovely gift from grandma.

Mr. Frank Clegg: May I comment, though, grandmother, that's interim. We want you to change safety concepts.

Hon. Hedy Fry: That's my other hat.

Mr. Frank Clegg: That's fair.

We have both hats in mind.

The Chair: Up next is Ms. McLeod.

Go ahead.

Mrs. Cathy McLeod (Kamloops—Thompson—Cariboo, CPC): Thank you.

I'd like to thank the witnesses for their presentations.

Certainly, as I mentioned before, I was on the committee that originally set that process in place in terms of the work done by the Royal Society. Certainly the intention of the committee was to have something that was very solid in terms of its response to that issue.

I understand Canada is also currently very active with the WHO in terms of a massive undertaking. Is maybe that the better place to be really looking at the scientific reviews around this issue?

Could someone speak to the WHO process? It seems sometimes like we have all these different countries that spend a lot of time, money, and energy, and keep reinventing the wheel. What about this international collaboration piece and is that the better mechanism?

● (1630)

Dr. Anthony Miller: We would like to believe it was, but unfortunately the information coming out in the form of drafts for comment have suggested that the WHO process has been as conflicted behind the scenes as the Royal Society panel in Canada. It's unclear where the problems are arising from, but there do appear to have been substantial industry links of some of the people who were in the WHO division before. Although we would hope things would improve at the moment, I am not confident that it will happen.

Mr. Frank Clegg: I would also add, Ms. McLeod, that as a Canadian I am proud that we're leading the world on some things, like acid rain. I don't want to wait for an international consensus to act. I would be afraid to death that my future grandchildren would have to wait for the WHO to lead what I think is clear evidence today that Health Canada has the mandate, the authority, and the resources to lead the world, or be among the leaders, in fact, not even lead the world, but catch up to some countries. I would really resist relying on a WHO process.

When they did the IARC committee—and you'll hear from the next speaker, that the IARC committee, and Dr. Miller wrote the paper on the cancer section—you had a full body of scientists who had contrarian opinions. That's what I have learned over the last several years now is where good science happens. You have two sides of the debate and they get in a room and debate, as they did in 2011 when they debated among 30 scientists around the world. The WHO committee is not made up of a balance of scientists with opposing views.

Mrs. Cathy McLeod: I really appreciate that. Of course, as you can imagine, we need to listen to the people who are saying "black swan", but we also, if there's consensus within the scientists.... It becomes a bit of a challenge for some of us to weed our way through the different processes.

I have a quick question for you, Dr. Havas. Why was that phone banned, and why is the baby monitor not in—

Dr. Magda Havas: The reason the Federal Communications Commission gave was that it interfered with military frequencies, which is nonsense.

Mrs. Cathy McLeod: Thank you.

Dr. Miller, you talked about case studies. As we all know, they can be that black swan that starts to alert us, but then obviously we need some processes after that. Can you talk about that? Maybe I missed it in your presentation, but have we gone beyond the obviously significant past case studies to actual epidemiological data that is showing dramatic increases that have happened over time?

Dr. Anthony Miller: A number of us are working on this. There is now evidence that in the United States there have been increases in brain cancers associated with cellphone use. People have said that it hasn't happened, but in fact it has happened. I'm collaborating with Dr. Davis, who's coming here next week, on a paper that will document this further.

There is also a large international collaboration now ongoing of studies identifying large numbers of people whose exposure will be documented. They will be followed for several years to find out whether or not their exposure to the radio frequency field has increased their risk of cancer. But this is a very long-term endeavour. It will probably take a decade or more to get information of that sort.

So there is a lot of activity. There isn't very much, I'm afraid, in this country, except for the MOBI-KIDS study, but I believe people are increasingly recognizing the need to collect the necessary data to provide us with the information we require.

Mrs. Cathy McLeod: Now, you mentioned EHS...or is it EFS?

Dr. Magda Havas: It's EHS, electrohypersensitivity.

Mrs. Cathy McLeod: Is that actually a recognized diagnosis now?

Dr. Magda Havas: It's recognized by the Austrian Medical Association. They recently put out a document trying to alert doctors on it and how to identify it. The World Health Organization in 2004 held a conference on electrical hypersensitivity. That's what they called it, but they decided that a better name for it would be idiopathic environmental illness. As "idiopathic" means that we don't have a clue as to what's causing it, this meant that they didn't have to do anything about it. There was a lot of debate on that and a lot of disagreement among the scientists. It just means that you don't have to deal with the problem, because you assume that you don't understand what it is.

It is recognized in parts of Europe. It's recognized by certain associations within the United States. The American Academy of Environmental Medicine is one of the groups that recognizes electrohypersensitivity along with multiple chemical sensitivity.

● (1635)

Mr. Frank Clegg: I would add, too, that the Canadian Human Rights Commission does recognize electrohypersensitivity as well. If somebody is diagnosed in the workplace, they actually have the ability to go through the process and get support and compensation.

Mrs. Cathy McLeod: Is there any sort of indication of what percentage of the population might struggle with this?

Dr. Magda Havas: I think probably between 1% and 3% have severe electrohypersensitivity. It's very difficult for them to survive in our type of world. Many of them have to move to the country, and they can't use computers. Probably another 35% have mild to moderate symptoms, which means when they come home after a day of work they have headaches, they feel awful, they can't sleep, but they can still trudge on.

Women's College Hospital in Toronto actually diagnoses people with electrical hypersensitivity, so we have diagnostic capabilities here in Canada.

The Chair: Thanks very much.

That will conclude the first panel. We thank the guests for appearing.

We'll suspend while we bring online our video conference guests.

● (1635)

(Pause)

● (1640)

The Chair: We're back in session, ladies and gentlemen. Conversations at the back will have to be completed later.

We have two guests by video conference, Professor Leszczynski and Professor Tarzwell. I would note that Professor Leszczynski is from Finland. For him it's quite late in the evening right now, so I appreciate his time and consideration for this.

I'll call for a little bit of order at the back, please. I was an auctioneer as a child, growing up in my dad's business, so I do know how to call a room to order if I have to. Thank you.

First, we'll get Professor Leszczynski to start his presentation, then Professor Tarzwell, you'll follow up after him.

Go ahead, sir.

Professor Dariusz Leszczynski (Adjunct Professor, Department of Biosciences, University of Helsinki, As an Individual): Thank you very much.

Thank you for inviting me to this hearing. It's an honour and a pleasure.

My name is Dariusz Leszczynski. I'm currently adjunct professor for biochemistry at the University of Helsinki, in Finland. I have done research in the area of biological and health effects of cellphone-emitted radiation since 1997. I was a member of the expert group of IARC, which in 2011 classified cellphone radiation as a possible human carcinogen.

When scientific evidence is unclear, contradictory, or ambivalent, careful and unbiased interpretation of it is of paramount importance. However, it is often the case that such scientific evidence gives room for a diverse interpretation that may lead to the development of contradictory expert opinions, causing confusion and impairing development of rational recommendations aimed at protecting the general population.

This is the current situation in the area of cellphone- and wireless communication-emitted radiation. Unclear experimental evidence leads to the polarization of the scientific opinions into two extremes: the no-effect opinion and the harmful-effect opinion. Currently scientists do not agree on the matter of biological and health effects of radiation exposures. The term “consensus” might be be misleading for the general public. We should rather speak about “differences in scientific opinion”.

A recent comment by the head of the World Health Organization's EMF project, Dr. Emilie van Deventer, well describes the current situation, and I will quote her comment given for *The Daily Princetonian*, “There is no consensus, it’s true. There’s a big group and a little group, but it’s still two groups.”

Talking about a big and a small group is a pure speculation because the size of the groups was never examined. From my nearly 19 years of experience in this area of research, I know that the vast majority of the scientists do not openly take a side in the debate.

The interpretation of scientific evidence by committee is of most use for the decision-makers. This is the reason that the development of unbiased opinions by committees are of paramount importance. Opinions of committees are defined by the expert composition. In an ideal committee, experts would not have conflict-of-interest issues and would be independent of any kind of lobbying; only science would matter. Nearly all of the committees dealing with the health effects of radiation emitted by wireless communication devices have a problem of biased expert selection, a potential conflict of interest, and a potential influence by an industrial lobby, which may occur in spite of set-up firewalls.

The majority of the committees consist of scientists having the same expert opinion. Individual committees experts commonly do not reflect all current scientific opinions. This concerns both international committees and national committees. This includes the committee in Canada that provided evidence for Safety Code 6. The composition of the Health Canada expert committee was clearly biased towards the no-effect opinion, and some of the experts are known to advise the telecom industry. This is a serious potential conflict of interest.

The above-mentioned system of firewalls to protect experts from influence of industry doesn't work. Industry sponsors know who receives funding; sponsored scientists know who provides funding. This is especially worrisome when the influential ICNIRP committee is in part funded by the industry through firewalls of the Royal Adelaide Hospital in Australia. The same goes for the EMF project of the WHO. If your experts know very well that the opinions of ICNIRP will be unfavourable for the telecom industry, their sponsorship may end. The firewall is only a gimmick.

● (1645)

Currently, WHO's EMF project is preparing an evaluation of the scientific evidence concerning health effects of radiation emitted by wireless communication devices, the so-called environmental health criteria for RF-EMF. The major problem with the draft document of environmental health criteria is the lack of balanced presentation of the scientific evidence. The environmental health criteria draft was written solely by scientists with a no-effect opinion.

The environmental health criteria document will have a global impact on billions of users of wireless technology and on the multi-trillion dollar business. This is why it is disturbing that preparation of such a document is solely reflecting opinions of ICNIRP, an organization with a firm, single-sided, no-effect opinion. This is a disturbing situation, where one group of scientists was given preferential treatment only because of their close link with the WHO and where other relevant expert opinions were deliberately and arbitrarily excluded without scientific debate.

Recommendations for decision-makers developed by committees, where memberships are consistently biased towards either a no-effect opinion or harmful effect opinion, are not representative of the whole currently available scientific evidence and should be viewed with extreme caution, or outright dismissed, until the proper, unbiased evaluation takes place.

To my knowledge there was only one scientific committee—IARC's working expert group in 2011, of which I was a member—where the full scope of diverse scientific opinions were represented. IARC classification completely disagreed with one-sided opinions of the majority of international and national committees, including Health Canada. Until an unbiased, round table of scientific debate takes place, where all scientific opinions will be duly represented and evaluated, the opinions developed to date by various international and national committees, based on biased expert selections, should be dismissed by decision-makers as insufficient.

According to year 2000 documents of the European Union on the precautionary principle, there are three criteria that need to be fulfilled in order to implement the precautionary principle. All of them are currently fulfilled.

Number one, scientific information is insufficient, inconclusive, or uncertain to make a firm decision. This is exactly what the IARC classification says on cellphone radiation as a possible human carcinogen, group 2B.

Number two, there are indications that the possible effects to human health may be potentially dangerous. Increased risk of brain cancer in long-term, avid users is a dangerous outcome, shown by three replicated epidemiological studies: European INTERPHONE, Swedish Hardell group, and French CERENAT studies.

Number three, the effects are inconsistent with the chosen level of protection. Epidemiological studies showing an increased risk in long-term, avid users were generated in populations using regular cellphones meeting all current safety standards. This means that the current safety standards are insufficient to protect users because the risk of developing cancer increases in long-term, avid users.

Proponents of the precautionary principle need to understand that precaution does not equal prevention of use of wireless technology. Requirements to develop more efficient, less radiation-emitting technology, and further biomedical research on the radiation effects, will create new knowledge through research and will create jobs in the research and technology. Implementation of the precautionary principle will not prevent technological developments. Claims by some that the implementation of the precautionary principle will cause economic stagnation are unfounded.

● (1650)

In the current situation of inadequate review of scientific evidence by groups of scientists with biased selection of members, and until the round table, unbiased review is performed, decision-makers should implement the precautionary principle. The reason is not that the harm was proven beyond doubt, but because the harm is possible and evidence is uncertain and suggesting that harmful health effects are possible. The precautionary principle was developed just for such situations where scientific uncertainty with concomitant indications of possible harm requires society to wait for more scientific evidence. Saying, “Better to be safe than sorry” applies here.

Thank you.

The Chair: Thank you very much.

Next up, is Professor Tarzwell. Go ahead, sir.

Dr. Rob Tarzwell (Clinical Assistant Professor, Faculty of Medicine, University of British Columbia, As an Individual): Good afternoon, and good evening in Finland.

Thanks very much for inviting me to appear before this committee. I think it's an ongoing and imperative role of the state to assess risks to society and take appropriate mitigation where necessary. The issue before the committee today is the risk of cellphone radiation, and for simplifying purposes, I'll assume radiation meaning more than approximately the one-gigahertz to three-gigahertz range.

As for my own background, I am competent in and am a practitioner of nuclear medicine. I also am a psychiatrist. I've an interest both in the human radiobiological effects of ionizing and non-ionizing radiation, and an interest in the psychological factors that relate to medically unexplained symptoms or medical-appearing presentations of skin situations where there's no evidence of organic pathology, but perhaps psychopathology.

I provided some documents to the committee. I don't know if those were received in time and distributed. The first document I want to make reference to is the preamble from the International Agency for Research on Cancer, which outlines how its findings should be interpreted. First of all—

The Chair: Professor, I should just let you know that they were submitted and they're in translation right now, so—

Dr. Rob Tarzwell: Okay.

The Chair: —the members of Parliament here won't have the documents in front of them. You'll have to be very descriptive if you're referring to anything specifically. Okay?

● (1655)

Dr. Rob Tarzwell: Very good. I'll pull direct quotes, then, in that instance.

The IARC working group—this would be the first document you'd be looking at—has a single-page summary of evidence leading to the 2B conclusion in 2013, based on the 2011 meetings, and 2B means “possibly carcinogenic to humans”. What the IARC means by that is, and I'll quote directly from their preamble:

> This category is used for agents for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals. It may also be used when there is inadequate evidence of carcinogenicity in humans but there is sufficient evidence of carcinogenicity in experimental animals.

The document itself makes reference to a number of different studies that were broken down into occupational, environmental, and personal exposures. The studies that the committee thought presented the strongest evidence were specifically the case-control studies that have been referred to. INTERPHONE has been mentioned. The Swedish studies have also been mentioned.

It's important to understand what a case-control study is. As has been pointed out, the real way to find out if something is a health risk is, prospectively, to look over time at individuals who are experiencing the exposure, documenting rates of conversion to disease in the exposed versus the non-exposed, and then see if there's a dose-response relationship. In other words, do individuals with higher levels of exposure to a risk convert to disease at higher rates? As far as I'm aware, this sort of information is not available in human populations for RF-EMF, so we do the best we can with case-control studies.

Both the INTERPHONE and the Swedish studies relied on interviewing individuals with glioma, with acoustic neuroma, and then interviewing random controls. What they found was that in individuals with these neoplasms, or cancers, was that the individuals report higher levels of exposure than controls. The question of recall bias is really important in a study like this, because we're relying on indirect lines of evidence to conclude what the exposures might have been. These folks weren't carrying detectors on them for years and years. These are telephone interviews, questionnaires.

The important thing which IARC, to its credit, acknowledges, is the potential for what's called “recall bias”. In other words, if you have a catastrophic health outcome, you will naturally search for causal evidence for that outcome. If a well-funded scientific committee wants to talk to you, then the implicit suggestion may be that it thinks there might be a link there. As a result, anxiety rises, and it's not very difficult to imagine how individuals with a glioma might report, “Why, yes, I believe I did have higher exposure to radio frequencies.”

The IARC also concluded that although this was a significant bias, they couldn't completely rule out these studies on the basis of bias. What they concluded, therefore, was that there's limited evidence of carcinogenicity, meaning the quality of the evidence is limited.

I want to point out what a 2B means. The IARC, again in its preamble on page 23, says the following:

> This category is used for agents for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals—

Wait. I've gone a bit backwards. I've already read that part.

● (1700)

I want to talk about what IARC means by “limited evidence”. The data suggest a carcinogenic effect, but it is prevented from making a definitive evaluation because, and I think in this case paragraph 6(b) is the most important, “there are unresolved questions regarding the adequacy of the design, conduct or interpretation of the studies”.

Of course this is an important signal within the literature and it's one that needs to be pursued, and indeed it has been pursued. The just-published 2015 text, *Current Understanding and Treatment of Gliomas*, which is available from Springer, the medical publisher, contains a book chapter titled, “The Epidemiology of Gliomas”; in other words, the causes and distribution of this disease.

Page 11 of that book reads as follows:

> The scientific evidence used to produce the 2011 IARC report, as well as the scientific evidence reported since its publication does not support a significant association between use of cellular phones and risk of glioma. This exposure warrants continued monitoring and examination, as the potential risks of long-term heavy use, risk of use during childhood and adolescence, and length of glioma latency is not well understood.

However, the studies so far, in fact, would suggest against an association. Even in 2011 the strongest association that could be found was actually very weak.

Just to put this into some context, because I think Bill C-648, which in its own preamble specifically mentions the 2B classification as being relevant, there are currently 287 agents within category 2B. Essentially, if you cannot definitively exclude a risk, then you have to consider that it's possible. I'll give you some examples of what appears as possible carcinogenic agents: whole leaf extract of aloe vera, carpentry and joinery as an occupation, coconut oil, coffee, ginkgo biloba extract, kava extract, pickled vegetables, and talc body powder used perineally—in other words, baby powder.

The problem of scientifically proving a negative is very difficult. I can't prove to you that Santa is not real, because I'm not at the hearth of every single home on Christmas Eve. So from a purely scientific epidemiological point of view, I must concede it is possible that Santa Claus exists. But given the fact that scientifically I have to concede that possibility, it would be problematic to conclude that there is scientific evidence that Santa possibly exists. No, there is not sufficient evidence to completely refute it.

Epidemiologically speaking, that is how these studies are meant to be interpreted. Of course since, as the previous witness pointed out, the outcome is catastrophic, ongoing study is warranted. Studies to date, based on the latest and greatest evidence from glioma researchers and treaters, suggest there is no significant association.

As I said in my appearance before the Royal Society, I think Safety Code 6 is currently an adequate and satisfactory standard. I don't believe it needs to be changed. I believe if the committee wants to apply labels to RF-emitting devices on the basis of a 2B classification, then the door is open to labelling all 287 agents on the basis of their 2B classification. I don't know if that's territory into which the state wants to intrude to such a significant degree.

The Chair: Thank you very much for your presentation.

Ms. Moore, you're up first.

● (1705)

[*Translation*]

Ms. Christine Moore: Thank you, Mr. Chair.

My questions are mainly addressed to Professor Leszczynski.

You talked a lot about conflicts of interest in the scientific arena. You said that it is sometimes complicated to obtain a scientific consensus and that in those circumstances we should apply the precautionary principle. This raises a lot of questions for me, particularly regarding vulnerable populations such as pregnant women, young children, seniors and those with compromised immune systems.

In your opinion, what measures should we immediately put in place, in light of the precautionary principle, so as to limit potential risk to these vulnerable populations? It could turn out that there is no risk, but we are talking here about being prudent.

[*English*]

Prof. Dariusz Leszczynski: We said earlier that when we began to smoke tobacco we waited 50 years to find out that it had some detrimental health effects. It was the same, for example, for the Hiroshima nuclear bomb. People got more cancer. We waited several tens of years after that ionizing radiation exposure.

Therefore, it is very problematic to say what we should do if later it appears that this was an unnecessary step. Should we protect ourselves when we are uncertain, or should we wait for the next 40 or 50 years for some sort of more definitive evidence and answer? But then we are facing another problem. What if indeed those epidemiological studies indicating that if somebody is using cellphone avidly....? "Avid" use was considered then to be using a cellphone for 10 years every day for half an hour per day. It was a long time ago—10 or 15 years ago—when cellphones and using them were expensive. People were not using them so much. Nowadays, with free minutes from the operators, people are using cellphones much more than before.

Already in 2011 we had those two sets of studies, the INTERPHONE one and the studies from Sweden. They were considered by these 30 scientists and 26 of them voted that there was enough scientific evidence to say that this is a possible human carcinogen. So we had two studies, and then, in 2014, last year, another study was published. It was the same type of study, from France, done in a different population, and arriving at exactly the same result: if a person is using a cellphone for 10 years or more avidly, half an hour per day or more, the risk of getting brain cancer increases. Many people say this, as was mentioned just now about what glioma scientists are thinking in regard to the connection between cellphone radiation and gliomas. It is not exactly so, because they say that right now they don't have the evidence.

But we have to remember two things. First of all, cellphones have been in common avid use for not very many years, maybe for 10 or 15 years. They have been in use longer in Scandinavia, but at the beginning people were using those cellphones very little, because it was very expensive. In avid use, those cellphones last maybe 10 years, and we know that the glioma takes several tens of years to develop, 40 or 50 years. Therefore, when we expose ourselves for 10 years but glioma development takes 40 or 50 years, there is not the time for this exposure to affect this tumour that is happening later. There is simply no time for development.

We have to balance those two issues: one, a potentially serious outcome like glioma, and then, exposure to cellphone radiation, meaning not forbidding people to use it, but developing this technology better and limiting unnecessary exposure. What is better? Limiting unnecessary exposure and being sort of at peace with this, in that in 40 or 50 years we will not have a bump of gliomas? Or is it that we use cellphones widely, as we are using them right now, and rely on this point that within the first 10 years of avid use nothing was happening?

This is something like saying that within the first hour after midnight there was no daylight, so apparently there is no daylight, because it would be coming only eight or nine hours later. This is the sort of issue to consider.

I think that not only should we look into the population of normal healthy people, but we should also think about those populations you were asking about, people who might be compromised or weakened, such as children and pregnant people, those with threatened immune systems.

● (1710)

We are all different and we all may respond differently to this exposure because of our genetic predispositions and because of our environment. It is no wonder that there may be some people who would be more sensitive. Those who are more sensitive may be, of course, those developing organisms like young children, or developing organisms in the womb of mothers, or a person who does not otherwise have very good health or immune system and is not capable of combatting radiation exposure or the effects of radiation exposure.

The Chair: Mr. Young.

Mr. Terence Young (Oakville, CPC): Thank you, Chair.

Dr. Tarzwell, we just heard about the paramount importance of objectivity in scientific evaluation of technology from Dr. Leszczynski. We know that when you publish an academic paper, the expert reveals all potential conflicts of interest as part of that publication.

In the interest of objectivity, could you please identify to the committee your business enterprises that you're personally involved in, if any, that depend on Wi-Fi, cellular signals, or other wireless technology to succeed?

Dr. Rob Tarzwell: I'd be happy to do that.

I am a shareholder in a mobile gaming company called Hothead Games, based out of Vancouver, British Columbia. I was an investor in a telemedicine company called Medeo, which has subsequently been acquired.

Mr. Terence Young: I'm just looking at Medeo corporation, which you say has been acquired, and a quote from one of their, I guess, flyers or their statement of purpose, says, "With Medeo.ca, Canadian medical care joins the mobile revolution".

A quote from the statement of purpose for Hothead Games says, "to create and publish great games exclusively for mobile users."

Do you have any interest in the One Minute Medical School?

Dr. Rob Tarzwell: I'm the creator of One Minute Medical School. That's a YouTube channel with short videos on medical topics.

Mr. Terence Young: These would be videos watched by people who are interested, laypersons or medical students, mostly on hand-held devices. Is that right?

Dr. Rob Tarzwell: In terms of the composition of the audience, that I don't really know. I assume there will be some viewership on mobile devices.

Mr. Terence Young: A lot of eggs in the wireless basket, that's for sure.

Dr. Rob Tarzwell: You could say so. You'd be hard-pressed to find anyone who's not sort of intimately connected with wireless technology. If any of those are a significant conflict—

Mr. Terence Young: They are. I'm just saying there might be a potential conflict.

Would it be fair to say that any regulatory actions that the government might take regarding wireless communications or Safety Code 6 might significantly affect your business success in these enterprises?

● (1715)

Dr. Rob Tarzwell: Speculating, I suppose that's possible. I suspect not, but of course, it's hard to read the future. I certainly have to concede the possibility

Mr. Terence Young: Is there a possibility of a potential conflict of interest when you present your credentials as an objective scientist to this committee, rather than in your other role as a business investor in a technology that depends on wireless?

Dr. Rob Tarzwell: Yes, and it's extremely important to be as clear as possible and as honest as possible to the data and the evidence, which is why I've provided the documentation from the sources that I'm relying upon directly, so that the committee can peruse these in significant depth, rather than simply just relying on the pull-quotes that I've assembled today.

Mr. Terence Young: Dr. Leszczynski, what happens to humans when we face possible carcinogens or other environmental hazards that industry tells us are safe, for example, tobacco, BPA, asbestos, and we wait for scientific consensus before taking prudent measures to avoid that hazard or banning it?

Prof. Dariusz Leszczynski: Of course, if we are comparing, for example, tobacco, if we are waiting tens of years to get final proof, during those tens of years people are exposing themselves to tobacco or another agent that is considered as safe because we don't yet have final proof. It means that they will get health problems during these 50 years or over a long period of time when we are waiting for final proof, final evidence.

There is this difference. When we have an agent that might cause health problems and we're waiting for final proof, and we have to consider tens of years of waiting, we should think this way. What is better, to implement precautionary measures right now and wait peacefully for those tens of years for the final evidence, or should we continue business as usual, and in case it appears that this health problem materializes, then during these tens of years of waiting people will get this health problem, meaning a large part of the population?

In the case of cellphone radiation, of course, we are talking in the sense that we always have to consider seven billion users.

Mr. Terence Young: Thank you. Would you agree the world waited too long to act with regard to tobacco, and asbestos, and BPA?

Prof. Dariusz Leszczynski: I didn't hear your question from the beginning.

Mr. Terence Young: Would you agree that governments world-wide waited too long with regard to tobacco, and asbestos, and BPA, to take precautionary measures?

Prof. Dariusz Leszczynski: Yes, absolutely. I think we should learn from this experience.

Mr. Terence Young: Thank you very much.

Dr. Leszczynski, are you familiar with the World Health Organization's warning list on agents that might cause cancer? They've maintained this list for 30 years. It includes 900 agents, and most of them on that list move up over the years. Are you aware of any agent that has ever gone down the list? Were there any false alarms, or do they generally go up the list to categories of higher danger?

Prof. Dariusz Leszczynski: I cannot give you an example. I don't know.

The Chair: Thank you very much, Mr. Young.

Ms. Fry, go ahead.

Hon. Hedy Fry: Thank you very much. I want to thank our two presenters.

I want to pick up and follow on my colleague Terence Young's questions a bit, because he was asking a question, and I understand, Dr. Leszczynski, you didn't have these answers at your fingertips with regard to possible carcinogens that were moved off or down the list, but I think you gave your own examples at the very beginning.

What I heard you asking in your particular presentation, which I think is what we need to struggle with here as a committee, is this. Is there an ethical and moral need for us to look at a precautionary principle, or do we continue to follow what we saw with acid rain, with cigarettes, etc., where generations of people were harmed, died, got cancers, heart diseases, etc., and the ecosystem was destroyed by acid rain? What is the ethical duty of parliamentarians or people who are in charge of the health and safety of a nation or communities to have a consideration of not just the clear and definite evidence...? As Mr. Young and Dr. Tarzwell were saying, yes, there is some evidence but not all.

I think this is eventually an ethical and moral issue for us all. Do we err on the side of safety and precaution so that we do no harm or as little harm as possible, or do we wait for definitive studies?

You talked about that, but you didn't give me an answer about what you think is the moral and ethical duty of people like us, parliamentarians, who actually have to create, make legislation or regulations that would keep our citizens safe. You didn't answer that question yourself. You posed it a lot of times. I'd like to hear what you think.

● (1720)

Prof. Dariusz Leszczynski: There are two take-home messages from my presentation and what I wanted to present you with.

First, we need an unbiased, thorough review of the scientific evidence that is currently available. This is not done in most cases because the majority of committees that are set up have bias problems. We need this good review of evidence. This is what is most important for you as decision-makers, that you can have an unbiased evaluation of science, and this will be the basis of your decision on what to do.

When one committee was set up by IARC in such a way that many diverse scientific opinions were included, scientists with very different opinions, often opposite opinions, were invited to this working group. During nearly two weeks of debate we came up with the conclusion that we have evidence of possible harm. We found limited evidence in the epidemiology and limited evidence in animals that there is a possibility of harm. None of the committees, for example as I mentioned, ICNIRP, which is a very important committee, Health Canada, and many other committees came to the same conclusion. Either committees come to the conclusion there is absolutely no harm or they come to the conclusion there is really very serious harm, but when looking at the composition of those committees' experts, we can see that either committees consist of experts having a no-harm opinion or a harm opinion. This is one problem.

Second, once you have this kind of round table unbiased evaluation of science, there's this moral, ethical question. Should business go on as usual or should we protect the population, take some precautionary steps?

Because we don't know for sure, but we have indications, we have red flags that something might be happening. Should we protect the population or not? At the moment, I would suggest looking at our past. We should not forget about our past and we should learn from our history. We should learn from tobacco, asbestos, DDT, and from many other miraculous agents that we first developed. Humanity thought that was a really fantastic chemical, a fantastic application, we could use it fully to advance our goals, and later on we have to wait for tens of years to find out if there is some problem.

We should learn from the past. When we see some red flags, we should take precautions and use the precautionary principle.

● (1725)

Hon. Hedy Fry: You answered my questions.

Are you a researcher, Dr. Tarzwell?

Dr. Rob Tarzwell: My main areas of publication are functional brain imaging and psychiatric disorders and the interaction of medically unexplained—

Hon. Hedy Fry: I only have a minute, so I'm trying to get to my question.

Dr. Rob Tarzwell: —so yes.

Hon. Hedy Fry: In other words, you researched your presentation to us.

Looking at glioma, because that's not your area of expertise, I'm just wondering, glioma is not the only thing we need to look at. We saw and heard today in a presentation of a researcher herself who had a clear indication on slides of clumping of her cells after a 10-minute exposure. Clumping of her cells doesn't lead to glioma or other blood diseases. It could easily lead to thrombosis, etc. Especially if she travels a lot or she sits a lot, those are clear things she has to think about. We have other areas in which we need to look at the broader amount of harm that could possibly be done.

Have you looked at all those areas that people have suggested could be a problem, especially in children and in vulnerable populations, with regard to exposure to these radio frequencies and Wi-Fi? Do you have an answer for that? I have about 30 seconds for your answer.

The Chair: Just give a brief answer, sir.

Dr. Rob Tarzwell: The brief answer is no, I have not examined the entirety of the scientific literature on harms.

The Chair: Thank you very much.

Mr. Lizon, you have seven minutes. Go ahead, sir.

Mr. Wladyslaw Lizon (Mississauga East—Cooksville, CPC): Thank you very much, Mr. Chair.

Thank you, Dr. Tarzwell and Professor Leszczynski. Thank you for appearing at the committee, especially Professor Leszczynski. I think it's after midnight in Helsinki and that's where you are.

Prof. Dariusz Leszczynski: Yes, it is quite late over here.

Mr. Wladyslaw Lizon: Let's look at two scenarios. First, there is no effect on human health, and therefore, you're okay.

Let's look at the other scenario. You made comparisons to smoking and to asbestos. We all know that the population that was affected by smoking, or by asbestos, was only a fraction of the total population. In the case of cellphones, when we look at the scenario, there is a serious problem and it's a huge number of people. In many countries 70% or 80% of the population uses some kind of wireless device, whether cellphones or those who have a work area with Wi-Fi, etc. If there is a serious issue, do you have any estimates, if there is a bomb down the road, of how big it is going to be?

Prof. Dariusz Leszczynski: I do not have estimates right now, but yes we may talk about it as potentially a large problem. You said a large part of the population is exposed. Right now there are over seven billion cellphone users. If you can imagine, in Finland we have a total population of slightly over five million and we have over six million cellphone connections. Therefore, humanity is saturated with those devices, but at the same time we have to remember that we all are different, and therefore, we may respond differently to this radiation. Not every smoker gets lung cancer and this we have to consider also with exposure to cellphone radiation.

Therefore, those who are saying...they often show different kinds of blocks where there is a dramatic increase in the number of cellphones in the world and there is not much increase, if at all, in brain cancer. First of all, we are talking about the first 10 or 15 years of avid use in comparison with development of glioma for 40 years or 50 years. This is not yet indicating what will happen.

Another problem is that since not every smoker gets lung cancer, not every cellphone user will get brain cancer, if this radiation exposure will be finally proven to cause this. Therefore, it is not possible to expect that if we have a huge bump in cellphone numbers then we should expect a huge bump in brain cancers. It is not so.

● (1730)

Mr. Wladyslaw Lizon: If you were to advise the committee on the precautionary measures, what would your advice be? We did hear from the previous witness, Dr. Miller, who stated that there is no safe level for radiation because it's the strength of radiation and also the time of exposure. What would your advice be? How should we proceed?

Prof. Dariusz Leszczynski: This is difficult to say right now because we don't know what the cap-off level would be. We don't have enough good studies for this sort of research to find out what is a safe level, or a cap-off level, where the majority of the population is not affected. We don't have this kind of study. We didn't do this kind of human experiment where we could see that if we exposed people to certain levels nothing happens and if we went above the certain level something happens. We don't have such a study, not at all.

Even though for tens of years we did research in this area, we don't have such studies because those studies believe that we should take people exposed to cellphone radiation and take some of those biochemical samples, analyze their content, and see what is happening on a molecular level. We have only done three of these studies on humans so far, with seven billion users. That shows what kind of problem we are facing. We don't do correct research to find out what the problem is. Very often what we are doing is a gimmick.

Mr. Wladyslaw Lizon: In your personal view would lowering the level be a good first step or not?

Prof. Dariusz Leszczynski: Yes, it would be a good step although I cannot tell you honestly how much we should lower this level. There is always the fact that people using regular cellphones, like you and me who buy them from a shop, assume that they're buying a safe phone off the shelf because the government is watching this. If after 10 years of using this cellphone I'm increasing my risk of getting brain cancer, something is wrong there. The safety standards are not protecting me.

Mr. Wladyslaw Lizon: Thank you very much.

The Chair: Thank you very much. We certainly appreciate the time you have taken.

For the professor in Finland, thank you very much for working well into the evening.

That will do it for today. The meeting is adjourned.

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