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Chair

Mr. Ben Lobb

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● (1530)

[*English*]

The Chair (Mr. Ben Lobb (Huron—Bruce, CPC)): Good afternoon, ladies and gentlemen. We're going to start our committee meeting right now. We have a slightly condensed meeting today. The bells will ring at a quarter after five and the votes will take place some time after that. We're going to have to condense each panel by about seven minutes to fit everything in. Also, to make sure that we get our normal rounds of questions in I think we should go from seven-minute questions to five-minute questions, just to make sure everybody gets a chance.

We have two people here by video conference, Ms. Bray and Ms. Nicol. Seeing you're here through our technology, we'll have you go first.

Ms. Bray, you can present first, and then Ms. Nicol, you'll go after Ms. Bray.

Go ahead.

Dr. Riina Bray (Medical Director, Environmental Health Clinic, Women's College Hospital, As an Individual): Good afternoon. My name is Dr. Riina Bray. I have a degree in chemical engineering and a master's in pharmacology in the area of addictions and toxicology. I studied medicine at the University of Toronto and did a specialty in family practice. I have a master's in health sciences, public health, in family and community medicine.

I have been medical director of the environmental health clinic at Women's College Hospital and associate professor in the department of family and community medicine, University of Toronto, since 2002. I was chair of the environmental health committee of the Ontario College of Family Physicians for over 10 years. I have taught university-level courses, lectured widely to the public and peers, mentored and taught hundreds of medical students, done environmental health research, and published and created educational materials. I have been investigating electromagnetic fields and human health for the past 10 years.

Dear honourable chair and members of the committee, thank you for inviting me to speak about my experiences in caring for patients who have developed hypersensitivities from chronically high levels of exposure to electromagnetic fields in everyday life.

Since the time these diagnoses were initially made 10 years ago, the numbers have increased dramatically, perhaps due to increased awareness and perhaps due to increased unrestrained use of wireless devices—it is difficult to say.

Individuals who are sensitive to EMF, or those with electromagnetic hypersensitivity, are canaries in a coal mine and lucky enough to have discovered what it is that is making them feel unwell. Many of them find everyday life and work difficult and uncomfortable. Most often we see them with family members who thought the patient had gone mad, but then realized that what they were saying was actually true, through observations.

We see EHS in people who have predisposing stressors such as cardiac arrhythmias, neurological problems, physical and mental exhaustion, previous prolonged exposures as with teachers and technicians working in wireless institutions, the airline industry, computer and information technology, and health professionals in institutions where wireless technology is used for monitoring.

In my opinion, based on what I have seen and read, those at highest risk for EHS include the fetus, children, the elderly, the infirm, those with predisposing morbidities—usually cardiac and neurological—and those with a toxic overload. They are all at risk for adverse health effects from this insufficiently regulated, poorly studied, man-made environmental health hazard—the radio and microwaves ranging from 10 kilohertz to 10 gigahertz to hundreds of gigahertz.

Despite the way they are feeling, people have no choice to stop the radiation on their bodies or their children's bodies, but must put faith in the government that there is indisputably no harm being done. Sources causing a majority of problems in the patients we have seen include airport technology, cellphone units and towers, cellphones, Wi-Fi routers, Wi-Fi hubs, laptops, iPads, baby monitors, and fluorescent lights.

Signs and symptoms include skin irritations, headaches, tinnitus or ringing in the ears, brain fog, listlessness, fatigue, concentration problems, dizziness, low mood, irritability, malaise, heart palpitations, nausea, and gastrointestinal disturbances. We have found that about half have chemical sensitivities. Holter monitors have been helpful in proving that cardiac symptoms can be induced or provoked with increasing levels of exposure, such as being close to cellphone towers or Wi-Fi hubs.

EHS is characterized by these signs and symptoms, which occur due to prolonged exposures at home, work, or school, and abate when the person has been removed from that environment. Depending on the extent of disability, the symptoms can come on in one to five minutes and require the patient to take time off work or school in order to recuperate sufficiently. We have noted that it can take up to one day to recover, although recovery is sometimes much faster, such as a few minutes, depending on the health of the individual.

The question that continues to alarm me is this. What of those who have not yet become sensitized, or those who are unwell but have not realized it is the EMFs provoking the problem and continue to try to function in an environment where the electrical and magnetic fields are high? Multiple Wi-Fi hubs, laptops, and cellphones all in one space can reach levels of over one million microwatts per metre squared. This has been measured in a high school from the proximity of an adjacent classroom. The electrical field would be greater than 10^7 microwatts per metre squared in that occupied classroom.

What are the exposure levels for the students and teachers in a class of that type for hours daily, year after year? Has anyone done a study on that? No. Teachers are forbidden by school boards to take measurements on their own or turn off Wi-Fi hubs that are not even in use, or they will lose their jobs.

As a physician who has specialized in the area of environmental health for over 20 years, I am mortified at the lack of accountability regarding radio and microwave radiation use in the everyday lives of Canadians both young and old. I am appalled by the poor, impractical, and unrealistic research done in this area and the lack of proper, relevant investigations that need to be done and have not.

● (1535)

There are no longitudinal studies except the one going on right now on people who did not ask to be subjects, who gave no research ethics board consent, and on whom data is not being collected. That is not a study at all.

Some of my patients are going to Green Bank, West Virginia, to recuperate. In Green Bank, there is a ban on sources of EMFs that would interfere with the operation of radio telescopes. All these patients' symptoms abate after a few days but unfortunately return when they return to their Canadian environments. Diagnosed and properly managed hypersensitive patients get better slowly over one to two years with the treatment of their current comorbidities, the use of shielding to reduce exposure—and this is at their own expense—the diligent avoidance of environments with high exposures, and proper accommodation at work or school.

Questions that need answering include what other physicians in the community are finding. Anecdotally, they tell me they are reporting more patient concerns for EMF exposures and noting symptoms related to EMFs, but we need to gather statistics properly. We also need to have a public opinion poll on the matter. The CCHS, the Canadian Community Health Survey, would be useful in that regard. We need to find out how many complaints doctors are getting. How many people out there are feeling unwell from something they can't touch, see, smell, or taste? We must protect our citizens properly, and we have to be educated in order to do that.

How much are children, including the fetus, being exposed cumulatively on a daily basis, and how much EMF exposure could potentially cause problems in the early years, or disease and illness in the latter years?

Some physicians are taking some initiatives. For example, the Austrian Medical Association published a report on diagnosis and treatment of patients with EHS and ongoing research examining biomarkers associated with the condition.

As a physician, educator, advocate, and health care leader, I feel physicians are seriously lacking in the fundamentals of science of EMFs from a physical science, technological, and biological standpoint. They need to become aware of the EMF sources and how the characteristics of this radiation impact on the body. They need to understand the condition of EHS, which affects about 3% of the population severely, and how this condition is related to other coexisting medical conditions. They need to understand the impacts of EMFs on children, issues arising in schools, baby care, and pregnancy. They need to become aware of ways they can help patients protect themselves by minimizing exposures through common-sense measures and shielding.

The EMF phenomenon has increased in intensity in our society from 10^{-6} microwatts per metre squared, the natural background level for our very recent ancestors, to 10^7 microwatts per metre squared. This is an increase of 10 million million times. This should be alarming. Tobacco, pesticides, lead, mercury, BPA, particulates in air pollution, and a plethora of other environmental health hazards, which have been deemed as having increasingly smaller "safe" limit thresholds, are a reminder to us that radio and microwave use, which is supposedly regulated and considered safe, is more than likely going to come to a similar unfavourable end. I hope we are not too late. It does not have to be this way, if we use technology responsibly.

Thank you very much.

The Chair: Thank you very much, Dr. Bray.

Dr. Nicol, go ahead.

● (1540)

Professor Anne-Marie Nicol (Assistant Professor, Faculty of Health Sciences, Simon Fraser University, As an Individual): Good afternoon. Thank you for inviting me. My name is Anne-Marie Nicol. I am a Ph.D. epidemiologist trained at the University of B.C. in the faculty of medicine. I'm a professor at Simon Fraser University. I also work at the B.C. Centre for Disease Control. My usual area of expertise is ionizing radiation. I deal predominantly with radon. I was asked to be part of the Royal Society panel as an expert on risk communication and risk perception, which is where I do a majority of my research.

In my capacity on the panel, I was not asked there to be a radio biologist or a radiation scientist. I was there to help with the public meeting and to understand better the perceptions of the public through the Royal Society process. To speak quickly to the Royal Society process, we were asked to review Safety Code 6. We were given a very clear mandate to evaluate the science. The Royal Society decided that it would be prudent to provide a day in which we listened to people's perceptions, given that there had been a number of inquiries from the public and different NGOs regarding their desire to speak to the process.

I sat for nine hours and listened to the testimony from people all day long, both in person and over the Internet, about their concerns around Wi-Fi, EMF, and RF in general. My job was to collate that input, organize it, and provide the information back to the Royal Society.

In doing so, I came up with four major areas. The first was major concerns about health impacts and health effects, which Dr. Bray has eloquently described. There were also serious concerns about exposure. People were very worried about what they were exposed to. People were very concerned about the Royal Society process and whether or not it was being manipulated or controlled by Health Canada. There was also a very clear desire for more communication about RF in general.

I'm going to unpack each of those four. There were other findings, but these were the four findings, overall, that we tried to address in the final report for Safety Code 6 from the Royal Society.

Regarding health effects, there was incredibly poignant testimonies from a number of people who have obviously been affected by something in their lives. I'm not a clinician, nor am I a diagnostician, so I can not tell you what was causing these people's pain, but I can tell you in a very heartfelt way that it was hard to sit and listen to person after person discuss how their life had been significantly affected.

One of the recommendations that I feel is prudent, which Dr. Bray has also discussed, is that we need a place for people to go and discuss their symptoms or the constellations of symptoms. Here in B. C. we have what are called complex chronic disease clinics. I know in Ontario we have environmental health clinics. I think these are very important places for people to be treated and to start to collect data for surveillance.

As an epidemiologist I believe it's important that we understand what people are exposed to, or their symptoms, so that we can at least come up with an overall sense of what's going on in this country. Currently that data is not being collected. In fact, we allow these people to be shunted from one specialist to another where they get increasingly frustrated and become incredibly vulnerable to non-medical interventions. I think, as a society, we need to be doing a better job of addressing these people who appear to be very seriously affected by this.

On the topic of exposure, it's very clear that most people have very little understanding of what radio frequency is. Most people do not realize that this is a question of proximity. They're very concerned about the ubiquity of exposure without an understanding that the closer a technology is to your body, the more dangerous it possibly could be to you. This is a question of proximity and a question of education. Given the ubiquity of radio frequency in our society, I do find it amazing that we are not doing a very good job either in the public school system, or in general, of discussing what RF is.

I think one of the more poignant stories was a conversation with someone regarding a baby monitor. People had no idea that baby monitors emitted some kind of radio frequency. They put the baby monitor next to the child, which would be a normal thing that you would want to do with a baby monitor. Then they were shocked to realize that was emitting something that could potentially have some impact on a child. They felt essentially deceived both by the product manufacturer and the government in part because they don't understand what RF is or how the technology exists.

● (1545)

I'm sure these people are not alone, and as a result we are essentially breeding—if you think about risk-perception research—a whole group of people who are suddenly very distrustful of both the government and the manufacturers for not telling them what's actually in the product and how it emits.

When we think about cellphones, it's the same issue. Many people were concerned about Wi-Fi, but less concerned about cellphones. If we look at how much RF is emitted between Wi-Fi and cellphones, it is clear that a cellphone is a major emitter of RF, and Wi-Fi much less. Again, this is an issue of proximity. Most people don't realize that a cellphone used like a normal phone is not the most prudent way of operating that device—that again, distance is important. There's interesting messaging that's coming out, for example, that texting is safer than talking on the phone, yet we have whole public health campaigns around not texting during certain activities.

So you can see we're getting very mixed messages to the public—if they even understand this at all—around the technology. I think we need overall much better information to consumers about what their exposure is, about this issue of distance. It could be done in a number of different modalities, but it is a very important component that is missing in our dialogue with the public around RF.

Regarding the process, I was brought into the process because my predecessor on the board had to step down due to a potential conflict of interest. I did come to the board as a independent academic. We had no involvement from Health Canada; I can speak to that. We were not micromanaged by Health Canada in the Safety Code 6 review process at the Royal Society, although there was a lot of mistrust in the community around that. You can see why that would occur, given some of the other factors that have gone around. These are people who have not been heard, people who are potentially suspicious of a process that they have had no real dialogue with.

In terms of risk communication overall, people want more education. Perhaps this would be labelling on products, or a basic primer that a cellphone is not like a normal phone. People don't even realize that cordless phones—your home cordless phone—emit RF. I believe that people have the right to be informed of what they are exposed to regardless of whether or not it's at a level that can cause them something like a thermal heating effect. I like to use the analogy of salt. We all know that salt is in our diet. Some people choose to pursue low-sodium options for a number of reasons. We make those labels very clear to people. From a communication perspective, I don't see this as being much different.

I know we don't have a lot of time. There were more findings from the public input that the Royal Society collected. I commend the Royal Society for including a space for a public voice on this issue, because I believe it is important.

I will stop here and anticipate any questions you may have.

The Chair: Thank you very much.

Our final presentation for this panel is from Ms. Krogh and Ms. Harrington.

I understand, Ms. Krogh, you'll be doing the presentation. You have it on slides, so we'll see how our technology is performing.

Ms. Carmen Krogh (Independent Health Researcher, As an Individual): Great.

Beth Harrington is my colleague and we thank you for this opportunity. We've been working on wind turbine health risks for about seven years together.

Some of you may ask yourselves why wind turbines should be considered under Safety Code 6. We are finding that people exposed to wind turbines are also complaining of the many symptoms and the issues that have been described by the previous speakers. Wind turbine facilities do emit electromagnetic energy and radio frequency because of their infrastructure and operations. For example, under the infrastructure and operational mandate, such facilities use remote monitoring and Wi-Fi technologies for communications, have databases, and interfaces, transformer stations, and so forth. From a community exposure point of view, communities are exposed to these energies.

The scale and the scope are surprising because they monitor and use the communications network 24 hours a day, 365 days a year, and back in 2010 one of the wind turbine manufacturing companies indicated that globally there were about 6,000 remote operational centres established. Since that time five years have passed and more and more approvals are occurring in Canada, in Ontario, and we're expecting more to come up, so the exposure is going to be higher. This is the reference there for that particular slide.

We provided in a submission a number of references and links, and if you go on this particular link you will see a large number of infrastructure modules and methods for how wind turbines are using the infrastructure and the communications network. We don't do solar ourselves. However, one of the methods...there's a solar panel up on the right-hand side, and they are also monitoring through the infrastructure.

We have competing claims about whether there's a risk or not, and this is of concern. It's very difficult to get the message out, but one study that was conducted in Ontario supported the official position of Health Canada that it didn't consider any precautionary measures because the levels of exposure, at home and at school—and incidentally, turbines are going around schools—are low and there is probably no conclusive evidence of an issue.

We also have other competing claims where while it's acknowledged by the National Collaborating Centre for Environmental Health that the emissions do occur at these facilities, the emissions for EMF are not a significant amount.

We're seeing a lot of interest generally in these types of emissions that we're talking about. Of interest is that we know that insurance companies are risk adverse. There's a very interesting insurance process for engineers and architects where it appears that in terms of liability, electromagnetic fields for these two groups are not being underwritten. Therefore, we can see there's some interest there.

One of the consultants who does quite a lot of work for wind energy development notes that these fields can damage human health, so that's an industry acknowledgement. Also researchers here in Ontario have indicated that some people get electromagnetic wave exposure through poor power quality and these people are adversely affected. The ones who are electrically hypersensitive are at risk.

I'd like to talk a bit about the general population exposure. This has already been very well done by Dr. Bray, where the Women's College Hospital is looking at this, and her very elegant presentation spoke to this. We have general population exposure and we haven't even considered the wind energy facilities yet.

● (1550)

I'd like to move a little bit to show the potential risk factors through excerpts from the BioInitiative working group, because they talk about risk factors and susceptibility to exposures for children, especially if they have had maternal exposure. As well, they have a very strong statement that there's little doubt that the exposure to electromagnetic low frequencies causes childhood leukemia.

Another excerpt has been addressed by Dr. Bray that when we have children exposed, we don't know if that carries over into adult life. I think that needs to have vigilance and long-term surveillance as well, because the impacts could be significant in affecting cognitive and behavioural control.

As well, there are potential risk factors for women in the workplace, where extremely low frequencies can be a risk factor for breast cancer over a prolonged period of time. I think we would all be concerned about that type of exposure. Another exposure risk factor is the potential damage to the DNA.

These are pretty serious and significant things.

The Biolnitiative working group did not speak about wind turbines per se, nor does Safety Code 6. However, the working group did identify another concept of labelling and informed choice, which has already been raised. They speak about the smart grid and those technology tools that I've just talked about. They know that there's little labelling, little or no informed choice, and that people cannot get away from the source easily because it's quite pervasive in our society now. We agree, my colleague and I, that there's been a failed government process here to help people.

Of interest is that in California they have started to look at disclosure of risk. One of the utilities there, Con Ed, has distributed a brochure that addresses the scientific uncertainty and the opportunity for people to reduce EMF exposure if they can, so I think we're starting to see disclosure of risk.

With respect to industrial wind turbine facilities, there's a lack of disclosure, no warning labels at all. In fact, any risks to health are frequently dismissed. Those who step forward and talk about this when they've been exposed to wind energy sources are really dismissed and have a hard time carrying their message forward.

One other point is that non-participants—that would be people who have not signed agreements to host turbine facilities on their land—are exposed to these energy sources without consent. So we have that issue to face as well.

I think the prevention model has been overlooked in this case. World Health Organization does speak and advocate that if we have a reasonable possibility that public health is at risk or would be damaged, we don't need full scientific proof before taking some type of action. I think that's required now.

The advocate for children is quoted in the Policy Interpretation Network on Children's Health and Environment, and they also support that we don't need full scientific proof before taking action. We have that, not only from the children's perspective but also the general population's perspective.

We would like to recommend that industrial wind energy facilities, and possibly solar facilities, should be included under Safety Code 6. This is based on the discussion around the operation and infrastructure. As I briefly described, we have a 10-page briefing note with references available for the committee. We also have an expected increase of facilities, with more exposure going to happen. Risk factors are being explored and discussed, so we're on our way to looking at that. There's an opportunity for the committee to capture the aggregate of all possible exposures.

● (1555)

Our recommendations are that investigation of Safety Code 6 be broadened to include industrial wind energy and solar facilities. While we have to be concerned about the general population at large, we would like to see priorities given to the fetus and neonatal exposure, as well as babies, children, youth, the elderly, and those with pre-existing medical conditions or disease and special needs. I think we all are concerned, as a society, that our youth are possibly at risk and vulnerable to long-term effects. We also would recommend that requirements for public disclosure about risk factors be established. I think this will go a long way.

My final wrap-up is that we have to understand that these facilities are not installed in urban communities. They are being installed in rural communities, and no attention is being paid right now to these emissions.

● (1600)

[*Translation*]

Thank you very much for your attention.

[*English*]

The Chair: Okay, thank you very much. That concludes our presentations. Now we'll have some questions.

Again, we are going to trim it from seven minutes to five minutes just to make sure we have a full round.

Go ahead, Ms. Moore.

[*Translation*]

Ms. Christine Moore (Abitibi—Témiscamingue, NDP): My questions are for Ms. Bray and for the two researchers here in Ottawa.

Last week, a representative of Canadians for Safe Technology, or C4ST, appeared before this committee and told us that he had submitted 140 studies to Health Canada about Safety Code 6. But we only have 36 of those studies. So 104 of them were not included in Health Canada's study because there were some problems with scientific standards.

Should those studies have been considered—albeit with some caution—especially because there are so many of them? Should they have at least been considered as potential warning signals?

In your opinion, does the scientific information show that there are currently enough concerns for us to seek to protect vulnerable populations, women and children especially? In your opinion, do we currently have enough scientific data for us to err on the side of caution, as a principle?

[*English*]

Dr. Riina Bray: It's Dr. Bray here.

Absolutely. We have enough information to put that on board. There need to be studies in other areas related to this field, but in terms of the precautionary principle and putting that into place right now, it is imperative that we do that. It is absolutely imperative that we don't wait.

Ms. Carmen Krogh: My first thought is that we listen to the people who are telling us that they are having some problems. Unless we start to acknowledge that there are risk factors and issues here, we can never move forward to solve them. It is related to proximity and the full-scale emissions that are there 24-7, 365 days a year. I am in agreement that we have enough warning signs to move forward, and it may take a while to build what we call “scientific certainty”. Sometimes you can't have scientific certainty for a long time. Many conditions in medicine are known for which we don't have scientific certainty about a causality, but we treat and we look after that, and we remove the source as much as possible.

[*Translation*]

Ms. Christine Moore: Ms. Bray, which easily followed recommendations do you regularly make as you seek to reduce the patients' exposure?

[*English*]

Dr. Riina Bray: First off, it's to avoid the exposure, and then we try to talk about distancing. We try to make sure that at home there is as little EMF exposure as possible, especially during sleep, that they turn off everything that might be emitting—their routers, etc.—that they get corded phones as opposed to cordless phones in their home, that they basically clean up their home in that regard.

At work it's not so easy, because accommodations can cause job loss, conflicts, and a lot of friction between bosses and workers. These folks need to be educated about shielding and protecting themselves so that they can navigate through the day and be able to do their jobs.

It basically requires a unified approach, but unfortunately there isn't enough in our society that helps these folks, protects them, or even looks at the possibility of there being a problem. We have a very big uphill battle that we need to deal with, with every patient. We also have to address the other physical problems that they need help with so that they can tolerate the exposures better on a daily basis, and that takes a bit of time as well. We spend many hours at a time with patients to try to get to the bottom of their exposure histories.

● (1605)

The Chair: Thank you very much.

Ms. McLeod.

Mrs. Cathy McLeod (Kamloops—Thompson—Cariboo, CPC): Thank you, Chair. Could you let me know when I'm at three minutes, because my colleague, Ms. Gallant, would like two minutes.

I guess I'd better move fairly quickly.

I will start with Dr. Nicol. I spent this weekend not only going through the briefs, but also trying to do my own literature review on this issue. I can tell you that I became more confused. There are people with some very strong credentials and some very different viewpoints on what the harms potentially are. I'm not sure my weekend was spent all that well in terms of getting a clearer picture.

To go back to the society, the process that we set in place was to have people who are more expert than I am take on that task. I know there have been some concerns about the process. As someone who participated in that process, could you walk us through how you went through and analyzed the different science, the different reports, out there?

Prof. Anne-Marie Nicol: I can speak to that although only in part, recognizing that my role is not to discuss the health impacts per se. I was brought on more as a person to understand public perception and risk perception. But the process was that we were given a very specific question to answer: to evaluate the scientific rigour.

Why I say that, I frame that, is that I believe there's a bigger question that could have been asked or could be asked again. We're hearing a lot of concerns around the health impacts and risks of those technologies, but this was not a risk-risk or risk-benefit analysis. We didn't hear from people who were happy about RF, who found RF important for their work. So the question was bounded very much by what the scientific evidence of harm was. It wasn't a bigger question of how we manage this risk or how we deal with competing risk-benefit interests.

So that very narrow question.... There were scientists and experts from all over the world. There was lively debate among them about how we were going to collate all the evidence: the discussions of lower dose exposures and what the health impacts were, and the frustration of not being able to say with any sort of certainty what's going on in low dose levels. I believe that one of our major recommendations, which I'm hearing echoed, is that we need better, more robust research on this area. It looks as if there are signals in that large body of literature, but it's very scattered.

The information on thermal heating, which is what Safety Code 6 is all about, is quite clear. The rest of it is quite scattered. We need better informed research to bring that together so we have clear answers and can take precautionary steps to try to find a level that might be more acceptable to everybody.

But when you start to talk about questions of acceptance and risk management, that's a bigger question than just a scientific question. It's what is our society...? What do we want to do as a country around regulating this exposure? That doesn't just have to do with science. It has to do with the benefits of the technology, the impacts on a larger scale. We're a big country. We need technologies that move information across the country, but we also need to do it in a safe way. I think that's a much bigger question than what we were asked to address in the Royal Society panel. I believe those questions are valid and need to be addressed.

● (1610)

Mrs. Cheryl Gallant (Renfrew—Nipissing—Pembroke, CPC): Thank you very much.

I have two questions. I heard childhood leukemia and I'd like to know the epidemiology between that and RFs or EMFs is.

I also understand and would like Ms. Krogh to answer my question with respect to comparing and contrasting how the initial cases of thalidomide compare with the anecdotal evidence we're seeing with the EMFs.

Ms. Carmen Krogh: There are analogies with that; you have to listen to the people first. They're the start. We have, for example, some situations.... Thalidomide is one example. Its history was ignored for some years. We also have things like fibromyalgia. We don't know exactly what causes it, yet we treat it and we do whatever we can to avoid what we suspect are exposures. Chronic fatigue syndrome is another example.

There are a lot of conditions where there are analogies that we could follow. We're seeing risk. People are telling us. I'm not a physician but I'm used to vigilance monitoring and surveillance. As pointed out, we don't have those kinds of mechanisms in place right now. We need to go to places as described by Dr. Bray. We could do a lot, but you have to work with people first and listen to them.

The Chair: We are quite a bit over time. We'll have to catch that next question on another round.

Ms. Fry, go ahead, please.

Hon. Hedy Fry (Vancouver Centre, Lib.): Thank you very much.

I want to thank everybody for their presentations and I want to apologize for being late. There's some stuff going on and I'm being called to the telephone on emergency calls during this time, so I was late for listening to what you had to say.

I was reading the presentation from Ms. Krogh and Beth Harrington; and I heard some of what you had to say, Ms. Nicol.

The bottom line really is that we know there is not conclusive evidence linking cause and effect. We know, however, there is an upgrading to a possible carcinogen by the World Health Organization.

We have had people telling us about linkages that may not have the causality piece in it, but make us want to stop and think. I think that for me the question is simply this. We should have learned lessons from cigarettes. We should have learned lessons from acid rain. We should have learned lessons from thalidomide. The question about thalidomide is a good one. In every case, as far as I'm concerned—this is a health committee—the ability to look at risk management, i.e., weigh up the benefit versus the risk, is always at the foremost of whatever you do, and you mentioned that as well.

When we're talking about human health, we have historical experiences of how we went ahead and we allowed things to happen, and we are now trying to deal with the fallout of it in terms of cigarettes. How many people have died from cardiovascular disease? It's not just lung cancer, but from COPD, emphysema. How many people have been severely maimed through thalidomide when at that time it was just one person's gut feeling in the United States that said, "Let's not do this"? Then eventually we saw that it was right.

The bottom line for me is simply this. The precautionary principle is extremely important. My mother, who was neither a scientist nor a researcher or anything like that, used to always say that a pound of prevention is worth an ounce of cure. In other words, if you prevent things, then you will actually prevent the fallout. When we talk about human health, especially in this particular instance, I just think we need to err on the side of precaution.

You had suggested, Ms. Krogh, that we look at some things that are happening in California, which is in the brochures here that help people to know, to be warned—some kind of warning, a caveat emptor kind of thing—and then what you can do to minimize your use.

We had lots of people tell us that looking at just the thermal effects was only looking at a certain sector of the community that uses electromagnetic energy. We're not talking about thermal effects. We're talking about other kinds of effects.

My question is simply this. Would you recommend, all of you, that we work with industry to develop some sort of brochure or whatever to tell people there may be linkages? Because you do that on labelling. This may cause a problem, please be careful when you're using it. People do it to protect themselves. Companies do it all the time. Then we could also talk to people about how you unplug the baby monitors, just simple little precautionary measures.

That is something I would like to see happen. I would also like to hear what you think about that, and what you think about Health Canada working with groups like you who were not part of this panel. You are researchers and people who are actually out there in the field who might be able to help look at a reasonable way of telling people that this could cause problems and here's how they might use it more carefully down the road, and help deal with industry to look at how they can minimize the amount of radiation emitted when people use their products. We see that Europe does it. We saw some actual examples here of what is happening in Europe with regard to cordless phones and what's happening with regard to child monitors.

I just wondered if any of you had any comment on how we could do that without causing a panic and going, "Oh, my God, this is going to harm you," but do that sort of precautionary use.

● (1615)

The Chair: I'm sorry, but perhaps I could interrupt. We're right at five minutes, so if you could provide some very brief comments that would be great.

Prof. Anne-Marie Nicol: If I may address that, Hedy, I think the answer is yes. I think it's necessary. We need labelling. We need awareness. We need government leadership. People aren't necessarily going to believe what a manufacturer says by themselves, because they're trying to sell you something. Some form of labelling and better awareness about what's in products—particularly products in the home and ones you keep close to your body, where we know exposure is higher—is merited and should be considered.

The Chair: Well said.

Ms. Bray, did you want to comment briefly?

Dr. Riina Bray: Yes. I think there should be some legislation in schools to have hard-wiring throughout and not expose our children to this unnecessary radiation. We've talked about the precautionary principle. I think it's very important there be some legislation saying that everything needs to be hard-wired, that Wi-Fi is to be used only if necessary, and that hubs should be turned off if they're not in use. Therefore, you'd decrease the exposure of a vast number of children to unnecessary radiation. We don't know where we're going with that, as I was saying in my speech in reference to the tobacco industry and everything else that's come before that.

The Chair: To be fair with time, we should go to Mr. Lizon. He has the last question for this panel.

Go ahead, sir.

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

The first question I have is for Dr. Bray. Electromagnetic radiation has been around for over 100 years, ever since electricity was invented. People have been exposed to it in different settings for many years.

Is there a case of negligence if there are no conclusive studies done on the impact of electromagnetic radiation on the human body? There are workers in workplaces who are working around electric motors. You can name many professions where people are affected. There must be some kind of impact on their health. How come we neglected it for so many years?

● (1620)

Dr. Riina Bray: There are a lot of questions there, but the long and short of it is that the occupational medicine side of this has a lot of studies showing how workers are affected by microwaves and radio waves. As you know, this all started about 100 years ago, but now it's throughout our whole society. Adults are not the only ones being exposed. We don't have any studies on children. Are we going to wait until the children start developing cancers, etc., to act? We don't have any studies like that. We don't want to do longitudinal studies on a vulnerable population.

Yes, indeed, studies are missing, but they're missing because we've never had this amount of microwave and radio-wave radiation in our society, in everyday lives, in people's homes, in their bedrooms, at their schools, at their work, and at such high volumes. We're looking at all different types of frequencies and power outputs. We're looking at clusters of technology that have never occurred before. They're unprecedented in society.

Our ancestors...my grandparents and my great-grandparents had not a single ounce of this when they were in existence. It's 10 million million times greater for us than it ever has been. It's a huge amount that cannot be studied easily and has not been studied. Basing our actions today on studies done 30 or 50 years ago, or even occupational studies, does not help us at all. It's not practical and it's not what reality's about.

Mr. Wladyslaw Lizon: You used in your remarks the expression “the canary in the mine”. I'm a mining engineer by profession. I can assure you that canaries have not been used in mines for many years. There are devices. Science has made great progress. I truly feel that in this case, on this topic, we are at the time when mining was using those little birds to check the quality of air in the mines.

Madame Nicol, you mentioned when you were working on the Royal Society panel that you were reviewing the science. What did you mean by reviewing the science? If there is not much that exists, what can be reviewed to come to any conclusive results?

Prof. Anne-Marie Nicol: As epidemiologists we have what are called hierarchies of evidence in which we evaluate studies based on how well they're done. There are specific ingredients that are necessary in order to consider a body of literature valid. It is the basis of my field and it is what we use.

The evidence fits into that structure best around thermal effects. The challenge is that the BioInitiative results, and all of the other science that's coming along, does not fit into the parameters of prudent epidemiology. What we need in order to make a science-based ruling, which uses that type of evidence, is to find lower level exposures and do the kinds of quality studies that would allow us to use that rubric on that body of evidence.

Health Canada could commission research. Industry Canada could do research. We could actually try to address this problem in a way that makes sense and allows us to rigorously evaluate it with the same degree that we evaluated thermal heating.

The Chair: That's about it. Thanks very much.

We'll excuse our panellists here, our guests, and then bring on our new set, then we'll be starting right up and carrying on.

We'll now suspend for a couple of minutes.

● (1620)

(Pause)

● (1625)

The Chair: Thank you very much. We're back in session and we'll try and keep tight with the time here so that we can get all the questions and the presentations in.

Ms. Herbert, can you hear us okay?

Dr. Martha Herbert (Assistant Professor Neurology, Harvard Medical School, Massachusetts General Hospital, As an Individual): Yes. Can you hear me?

The Chair: Yes, we can.

We'll get you to present first, because you're using technology. You can start when you're ready.

Dr. Martha Herbert: My presentation is called "Evidence indicates a plausible link between autism and radio frequency radiation exposure", and my name is Martha Herbert. I am a board-certified neurologist with special competency in child neurology and a specialization in neurodevelopmental disorders. I am a research neuroscientist.

I am on the faculty of Harvard Medical School, on staff at the Massachusetts General Hospital, and an affiliate of the Harvard MGH/MIT Martinos Center for Biomedical Imaging. I have an extensive history of research and clinical practice in neurodevelopmental disorders, particularly autism spectrum disorders, and I have published research papers on brain imaging, physiological abnormalities in autism spectrum disorders, and environmental influences on neurodevelopmental disorders such as autism, as well as on brain development and function.

I'll start with the increasing prevalence of autism, the numbers from the U.S.A., and its high costs. Autism spectrum disorder diagnoses are increasing rapidly in North America, as well as elsewhere, with profound effects on those affected, as well as parents, families, caregivers, communities, and societies at large. In the U.S., the rates have gone from three to four in 10,000, 20 years ago, to over one in 68 today.

Annual costs for treatment of an affected child can reach between $40,000 and $60,000 U.S., with lifetime support for an individual costs topping $1.2 million to $3.2 million U.S. per affected individual. This translates into approximately $240 billion annually in the U.S. The graph shows a striking prevalence over the last 10 to 15 years. Those are CDC figures.

In the next slide, you see there are many factors associated with autism spectrum disorder numbers, including parental age, greater awareness, increased diagnosis, and spatial clustering, but there is a large proportion in this graph, 46%—in another paper, from the University of California, Davis, it was 65%—unaccounted for by these other factors. Potentially, at least, some of that may be associated with environmental influences.

What is autism? It is difficult for many to imagine how autism could be influenced by environmental factors, but this difficulty comes from holding assumptions, particularly that autism is genetically hard-wired into the brain from birth or conception. While this assumption is referred to and utilized by many scientists in interpreting their data, the actual assumption is not proven scientifically, and probably cannot be.

More and more scientific and clinical observations suggest that we need to think about autism differently. Autism is not a broken brain. Many with autism are highly gifted, albeit with issues that are often dyspraxic, that is to say, problems with expression and coordination, not lack of capability, not purely genetic. Hundreds of genes by now are associated with autism. They are also common in healthy people. The environment plays a big role.

Autism is not a life sentence. It is variable and changeable. It can get worse and better in a day or even in moments. It is treatable, and some people lose their diagnosis. High intelligence is common. The assumption, now out of date, that low intelligence is by far predominant was never proven and is now not consistent with the facts.

Autism may be centrally about brain function, which is pertinent to the comments about electromagnetic fields and RFR, and it may turn out to be more about impaired or altered function than about altered brain anatomy, since the anatomical differences are subtle, while the functional differences are more striking.

Autism involves not just the brain. Multiple systems are involved. While it is defined psychologically by a set of neurocognitive symptoms, much research has identified many underlying systemic physiological disturbances at the molecular, cellular, organ, and brain nervous system levels. Researchers are starting to study the way these physiological functional disturbances alter brain function.

● (1630)

Particularly important is the electrophysiology, the brainwaves and other electrical properties of the central and autonomic nervous system. The underlying chemistry and health of the cells in the brain and nervous system set the terms within which the brain can function.

As it turns out, the alterations in cell chemistry and physiology that have been identified in autism have virtually all been documented as affective electromagnetic frequencies including radio frequency radiation. Other environmental exposures and genetic vulnerabilities may also contribute to this impairment of cell function, but the cumulative effect, the total load of these environmental stressors, is likely to be what causes autism and triggers or exacerbates its challenging behaviours, and we can do something about the contribution of electromagnetic fields.

So might EMF contribute to the development or worsening of autism spectrum disorders or conditions? My co-author, Cindy Sage, and I wrote a paper called "Autism and EMF? Plausibility of a pathophysiological link", which is published in the peer-review journal *Pathophysiology* as parts I and II in June of 2013. I also posted it on my personal website marthaherbert.org, and a short summary for a lay audience was recently published online in the Autism Notebook.

In this longer paper and in the shorter one, we delineate parallels between observed dysfunctions in autism and the biological effects of electromagnetic radiation. The damage induced and seen in autism spectrum disorders includes oxidative and cellular stress, lipid peroxidation in membranes and other lipid substances, stress protein responses, genetic alterations and de novo mutations, altered membrane and barrier structure and function, calcium channel disturbances, and altered function at cell junctions. There's a slide schematically illustrating the different types of damage at the cellular level that are found in autism spectrum disorders and that overlap just about entirely with cellular functional problems that are inducible by EMF or RFR.

At a higher level of organization, there's a degradation of functional systems both caused by EMF and RFR and present in autism spectrum disorders or conditions that include dysfunction in energy and metabolism seen in the mitochondria and in altered brain glucose metabolism, alteration of important functions in the perinatal infancy period, brain cell structure alteration and damage, and melatonin dysregulation. Conversely melatonin can attenuate the impacts of EMF and RFR, immune dysfunction, and electrophysiological alterations.

It is very notable that these physiological disturbances are mirrored in many other common and costly chronic diseases. These include diabetes, cancer, obesity, hypertension, neurodegenerative disorders, and more. The cumulative cost of these conditions is enormous to the point of straining our health care systems and economics beyond tolerance.

Electrophysiological perturbations are central to autism spectrum disorders and are also significant and overall effects of EMF and RFR. Altered molecular, cellular, and physiological function in the brain and body, along with altered immunity in turn, impact the electrical signalling activities of the brain and nervous system. Electrophysiological perturbations are seen in many conditions including seizures and epilepsy, sleep disturbances, sensory processing, diminutions of cognitive efficiency, and autonomic dysregulations such as elevated heart rate and stress reactivity. These features are all present in many or even most people with autism spectrum disorders. Moreover, these effects, when induced by EMF and RFR, occur at exposure levels substantially below Safety Code 6.

Let's talk about children's vulnerabilities. Children are not little adults. They are developing, and perturbations during windows of development may have lifelong repercussions.

● (1635)

In August of 2013, the American Academy of Pediatrics addressed their concerns in a letter to the U.S. FCC about the need for re-evaluating EMF and RFR, given that exposure has skyrocketed while regulations in place in the U.S. date back to 1996, way before this exposure acceleration occurred. The AAP expressed particular concern about the use of devices like cellphones and laptops in pregnant and nursing mothers and children. Safety Code 6, it should be noted, has seen only minor modifications since being introduced in 1979.

Radiation from cellphones and other sources penetrates deeper into the heads of children, which leads to persistent stress on the cells in the brain, and over time, more and more serious problems can develop. Certain tissues...and there's a slide. It shows, from left to right, the greater penetration of cellphone exposure in the brain of a child, less in an older child, and still less in an adult.

● (1640)

The Chair: Excuse me, Dr. Herbert. We're at 11 minutes here and we're a little over time.

Would you be able to conclude soon and then we'll flesh it out more with questions?

Dr. Martha Herbert: Yes, sure. Absolutely.

There are differences in tissue and geometry in children's heads. The use of cellphones in children under 20 can result in a fivefold increase in glioma and acoustic neuroma, and exposure in utero and from birth is huge. Exposure concomitant body burden of other substances like lead can make the consequences worse.

The conclusion is vulnerability of children and individuals with highly prevalent and costly illnesses should be a major consideration in the discussion of risks. We need new public standards to go as low as reasonably achievable. There are many precautionary and also simple and practical everyday methods to minimize exposure to radiation that should be aggressively presented to the public in an educational way with particular attention to reducing children's exposure: banning Wi-Fi in day care, preschools, and up to grade 3, turning off Wi-Fi when not being used, and banning marketing of wireless to children.

Thank you.

The Chair: Thank you very much.

Next up from the Environmental Health Trust is Dr. Davis.

Please go ahead.

Dr. Devra Davis (President and Founder, Environmental Health Trust): Good afternoon. It's an honour to be here, and I want to thank the committee for inviting me to talk with you today. I'm going to talk with you about the impact of electromagnetic fields on male and female reproduction from current devices. I want to stress that in Safety Code 6 they said they did not include some of the 140 studies because the exposure used was not adequate.

I'm going to skip talking to you a great deal about my credentials. They are in the next slide; you have an opportunity to look at them later.

I'll just say that I did my doctorate at the University of Chicago. I did three post-doctorates, the last of which was a post-doctoral master's in public health at Johns Hopkins University. For 10 years I was the founding director of the board on environmental studies and toxicology at the U.S. National Academy of Sciences. I also was a member of the group awarded the Nobel Peace Prize with Al Gore in 2007 for serving as a lead author on several chapters of the report for the United Nations on climate change. I was the founding director of the Center for Environmental Oncology at the University of Pittsburgh Cancer Institute, and I've received various awards, including a lifetime achievement award from Green America, as well as a National Book Award for my first book, *When Smoke Ran Like Water*. I've worked with officials at the United Nations, and in governments in India, Japan, and Canada.

I'm pleased to be here today to try to work with the committee as it looks for advice on a very important and troubling issue. I want to stress that in my remarks today I'm going to talk to you about experiments that have been done on male and female animals—but one of those animals happens to be human, and I'll get to that in a moment—with currently used cellphones at current exposures. I want to stress that. What we see when we look at the studies that have been done at the Cleveland Clinic—which I think is well-known as an outstanding research centre—at the Australian national centre for research on male health, and in other institutions around the world is that they have all reported similar results to what I'm going to show you here today.

They've taken sperm from men and they have put them into two test tubes. One test tube gets exposed to cellphone radiation for two hours. The other test tube does not. Now, sperm will die because they're not supposed to live in a test tube, but the rate at which they die and what happens to them in that two hours tells you a lot biologically.

Let's look at the results from Professor John Aitken, who is Cambridge University trained. He is, in fact, a knight, so it's Sir John Aitken. If you look on the top left of the slide, at the control, the white box, those are the sperm that lived after two hours with nothing being done to them. On the right, the lower black box, is the number of sperm that lived after two hours of being exposed to a normal operating cellphone. On the other right, you see what we call a measure of motility, which is how well the sperm swim, and we need millions of sperm to make one healthy baby so they have to be good swimmers. Then on the bottom left you see an indication of damage to DNA, specifically the DNA on the mitochondria of the sperm—the mitochondria are the engines of the sperm—and you see that the control sperm on the bottom left have very little damage after two hours. The exposed sperm have almost four times more damage, as measured by standard laboratory tests conducted, again, by the equivalent of the National Institutes of Health in Australia.

Now, my colleague Stan Glantz, who is a professor of bio-statistics at the University of California, San Francisco, has concluded that based on all of the evidence—and I'm just showing you one study here—cellphones do, in fact, damage sperm, and they do it at a level that does not produce heat. So when Safety Code 6 repeatedly said there were no proven effects without heat, that did not include these studies. I think this is a very big omission, and I would think all of you here would understand that we have to protect sperm if we want to protect the continuation and the health of the species.

The next slide shows you a very interesting study that was done with a laptop directly over the petri dishes with the sperm. It was insulated so there was no heat, because we know that heat will kill sperm. This study again shows a significant increase in damage to the sperm that had been exposed to the laptop as opposed to the control sperm. These are very important results. Nowadays they call them tablets, because they belong on tables. They're tested 20 centimetres away from a body. Industry has advice about how to use these things, and I applaud them because recently they've become more forthright with advice, which I'm going to show at the end, about how to use these things safely.

I think the government's job is to make sure people know what advice is buried now, including that a laptop is supposed to be kept 20 centimetres away from the body. All of these little children with their iPads right next to their bodies.... Their arms aren't even 20 centimetres long.

● (1645)

I recently came from India where I was working with the government. It is conducting major research that is quite outstanding, and I think would offer some examples to what could be done easily here in Canada.

The Indian government sponsored research on mobile phone radiation, using a computer to generate the mobile phone signal. It was a standard generated signal. They exposed middle-aged male rats—maybe an age group of interest to this group—to cellphone radiation for two hours a day, for just 45 days. At the end of that, they did sophisticated biochemistry, and found increased DNA, lower testosterone, and lower fertility when the animals were allowed to breed.

If you look at the testes, which they did here, you see the normal testes—that nice, round, regular barrier. That's what we need. We need cells to be intact, to have a nice membrane around them. Cellphone radiation, as Dr. Herbert just said very eloquently, can damage membranes. It can disrupt the integrity of the cell. The damage test, as you see on the right, comes from the animals that were exposed; the ones on the left were not.

Now I want to show you a study that I think may explain some of what Dr. Herbert's results suggest. I want to stress that what I'm showing you here is one study; there are many of this type. They were done, in this case by a laboratory in Turkey, and were sponsored by NATO. NATO sponsored this research for years because the research is on radar. Radar, of course, is a form of microwaves. Cellphones emit microwave radiation as a two-way radio. The term used to describe that radiation is radio frequency energy. It is not a precise term. It is in fact a small form of radar. It is a form of microwave radiation. None of these terms—microwave or radio frequency radiation—is a precise term.

This study done by Turkey, and it's exemplary of others, took two groups of animals and exposed one group prenatally to a computer-generated signal to mimic a current cellphone. The results I think are quite stunning. If you look on the left, you will see healthy cells, all those nice, round, little circles. Those membranes are intact on the left, and you see them magnified—the control. If you look on the right and at the top, you see fewer cells and more damage.

I want to stress that this could explain part of what Dr. Herbert is talking about. What we're seeing here are alterations in DNA and membrane damage caused by prenatal exposure to cellphones. We don't know what's behind this epidemic of autism—we don't—but certainly this is an important hypothesis that needs to be fully explored and can be done.

The next slide shows the results of Dr. Hugh Taylor's work at Yale, which I know that Dr. Herbert is quite aware of. That study found that prenatally exposed animals produced offspring with significant behavioural problems, as measured by standard assays; essentially, a form of hyperactivity in the animals. Dr. Taylor says that the animals were literally bouncing off the walls, and this could be an example. We talked about Dr. Suleyman Kaplan's work on the brain; this may be showing you the consequences of that.

Finally, new data, which I'm sharing here with the committee for the first time, comes from the Korean government. Their ministry of science has released these numbers showing rapid growth in smartphone addiction rates—I need not tell you that there is an addiction going on, and it's an addiction classified by physicians and others as needing treatment, by the way—and a change in the number of dementia patients under age 65, when dementia is only thought to occur in inherited cases of risk.

Where are we now?

As in the opening comments, several other speakers have indicated that we must act on facts and we must take precaution.

Now let's talk about certainty. We asked about how certain we were about health effects. We can't be certain because epidemiology, which I do, predicts nothing; it only proves the past. Epidemiology can tell you about the past. It cannot and should not be used to try to set public policy. We can't wait for proof of dead bodies or sick people at this point. We have to act on what we know to prevent harm.

● (1650)

Several different governments have taken steps, and I will mention a few of them to you.

In Belgium, France, and Taiwan it is literally against the law to give a phone to a child aged two, and in Belgium and France, it's age seven. They're not allowed. There's actually a national law that was passed. Information on this can be found on our website. India has informally advised that nobody should use a phone for more than an hour a day, in government policy.

Health Canada's document actually supports this statement, and I commend Health Canada and I commend Safety Code 6 because it did announce that we should take special steps for children. That is in fact a policy decision, because we don't want to treat our children or the rest of us like lab rats in an experiment with no controls.

Simply to give you an idea of what the industry has done, Lloyd's of London and Swiss Re will not cover health damages from cellphones. They will not.

All the warnings appear now inside these devices. The bill that is proposed here would give those warnings and make them available publicly. We have done that on a website called showthefineprint.org. You can find that and more information on our website, and that is c4st.org. In short, it's better to be safe than sorry.

I'll be glad to take your questions.

The Chair: Thanks very much.

Mr. Lord, welcome, and it's your turn to present. Thank you.

Mr. Bernard Lord (President and Chief Executive Officer, Canadian Wireless Telecommunications Association): Thank you very much, Mr. Chair.

My name is Bernard Lord and I am the president and CEO of the Canadian Wireless Telecommunications Association. I'm here today with Kurt Eby who is the director of government relations and regulatory affairs with the CWTA.

As the voice of the wireless sector in Canada the CWTA represents wireless service providers as well as companies that develop and produce products and services for the industry, including handsets, equipment manufacturers, content providers, and app makers. I'm pleased to be here today to participate in the work of the standing committee's study of Safety Code 6.

Let me state from the outset that the wireless sector in Canada does not set or impose standards or guidelines. Safety Code 6 is enforced through Industry Canada as the standards are set in Canada, and that standard is set by Health Canada and the wireless sector in Canada fully complies. The wireless sector will continue to be responsible in adhering to the science-based safety standards enforced by the Government of Canada and set by the Government of Canada.

We commend the committee for the science-based review you're conducting today.

The wireless sector, in Canada as well as around the world, is committed to a completely open process in the study of health and safety issues related to wireless technologies.

Studies of the health effects of EMFs have been ongoing for decades and will probably continue for a while to come. The overwhelming evidence of the credible scientific community, as determined and published in studies worldwide, continues to support the conclusion that there is no demonstrated public health risk associated with the use of wireless technology.

In fact, when we look at the way that Canadians use wireless technology we can safely state that wireless technology makes our communities safer. Canadians are among the heaviest users of wireless technology in the world. We enjoy some of the fastest, most robust networks anywhere you can find. It helps us stay connected with family and friends. It helps businesses be more productive, and we know that in times of emergency wireless technology is extremely important. An overwhelming majority of 911 calls made in our communities come from wireless devices. We also know that close to 75% of families—especially those under 35—don't have a traditional landline, and in fact, use wireless only.

Government agencies responsible for establishing safe limits for signal levels of wireless devices also support that wireless technologies are safe and are not a health risk. The signal levels from all wireless devices and networks are well below the safety limits established by Health Canada and other international governmental departments.

When exposures remain below the safety limits set by science-based EMF exposure standards, including Health Canada's Safety Code 6, no adverse effects have been proven through credible scientific evidence. The sector has always supported scientific research into this topic and fully supports any ongoing research that is deemed necessary by the respected scientific community. Just the same, the sector has always adhered to the science-based safety standards set by the Government of Canada and will continue to do so in the future.

I really thank you for the opportunity to be here today. I thought I'd keep my remarks brief and I'll be very happy to answer any questions you may have.

● (1655)

Thank you, Mr. Chair.

The Chair: Thank you very much.

First up, Mr. Atamanenko. Welcome to the committee.

Mr. Alex Atamanenko (British Columbia Southern Interior, NDP): Thank you very much, Chair, and thanks to everybody for being here.

You made a statement, Mr. Lord, that wireless technology makes us safer. We've just listened to previous witnesses, and Dr. Herbert and Dr. Davis, who may not agree with you. They've done studies on child vulnerability, the stress on the brain, autism. A previous witness has talked about the fact that there have been no studies on exposure levels in schools. There's a lack of accountability. We've been told that 3% of the population is affected severely by this technology. We've touched on childhood leukemia, potential DNA damage.

I presented at a hearing in British Columbia sponsored by the utilities commission on smart meters, and I also found industry dismissive, and that was Fortis. When we presented cases of some of the things I just outlined, they basically said if you can't handle it, that's too bad.

I'm just wondering why industry has taken this approach. Why there hasn't been more detailed study on behalf of industry, and why are you not applying the precautionary principle to ensure that there's safety for Canadians? Many studies have been done—and my colleague wanted to mention this—about the cumulative effects when we talk about smart meters, cellphones, wireless, and routers.

Have you been looking at any of these studies and why are you not concerned about the potential and/or the current impact to the health of Canadians? I'd like to have some answers from you.

Mr. Bernard Lord: I'd be very happy to answer those questions, and thank you very much for the question. I will address two things that you say.

First of all, we rely on the scientific evidence that is produced worldwide and we rely on the standards that are set by agencies such as Health Canada, and we comply with those standards. We don't set the standards.

Mr. Alex Atamanenko: Okay, I'm just going to interrupt you. I'm sorry, we don't have much time. We understand that, and that's why we're here because we're trying to review Safety Code 6.

There are other studies. We've just had Dr. Davis talk about studies. We've had other people who have appeared, and research that I've been through over the past couple of years, yet you're saying, about the studies that you are relying on and Safety Code 6, that everything's fine. I don't quite understand that.

● (1700)

Mr. Bernard Lord: I'm not the one who produced those studies so I will not defend the studies. I will defend the scientists and those scientists are hired and they conduct their studies independently. It is their role to set the standards to ensure the safety of Canadians. What I'm telling you today is that the industry and the sector in Canada fully comply with those standards. I personally believe that those standards keep us safe and that when you use the devices under the limits that are set, they are believed to be safe in Canada and around the world. There have been numerous studies, and there are all sorts of studies that have been done. The World Health Organization has concluded that if you use the devices according to the limits, it is safe.

When I say that wireless devices keep us safer, I can tell you that as a parent. I'm a parent. My daughter left today. She's in South America and she can communicate with me because of her wireless device. I believe it makes her safer that she has that device with her. Consider how many 911 calls are made in Canada using wireless telecommunication. It does keep our communities safer.

When you talk about the precautionary principle, it is applied by the standards that are set by Safety Code 6 and Health Canada. You should ask the scientists who have set that standard to explain to you how it is applied here in Canada.

Mr. Alex Atamanenko: In your opinion, the fact that Belgium, France, and Taiwan have regulated cellphones for children, is this not a red flag that maybe we should be doing that for your children and others here in Canada?

Mr. Bernard Lord: My children are older than that now, obviously. That's something that legislators can consider. Legislators decide for all sorts of reasons to pass legislation.

What I'm suggesting today, and what I commend the committee for doing so far, and what I commend the Government of Canada for doing, is basing the regulation and their legislation on science, not just innuendoes or fear. Base legislation on science. If the science demonstrates that the standards need to be changed, change the standards, or keep the standards, but the industry and the sector in Canada will comply with the standards that are set by the Government of Canada.

The Chair: Perfect. Right on five minutes.

Mr. Young, you're up next, sir. Go ahead for five minutes.

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

Dr. Davis, I read your book *Disconnect* and I found it to be very enlightening. In fact, I believe it's important.

I have five minutes. I'm going to ask you three questions during that time. If you could provide around one-minute answers then we can get them all answered. I ask if you'd help me with that.

You're an expert on climate change. Most people believe that greenhouse gases play a causal role in global warming and in climate change. In this committee we've heard from numerous independent scientists that cellphone radiation, including from Wi-Fi, baby monitors, portable phones, and tablets plays a causal role in human health, including cancer and other diseases.

Would you say the level of evidence for radio frequency radiation causing adverse health effects is less, or at the same level, as the evidence for greenhouse gases causing global warming and climate change?

Dr. Devra Davis: I would say the evidence on the damaging effects of cellphone and other wireless radiation is as strong, if not stronger, than the evidence on climate change, which I've reviewed as a member of the IPCC.

I would also add that's the reason why Lloyd's of London and Swiss Re, in 1999, refused to cover health damages from cellphones. There is obviously a concern there.

I would further point out that there is advice inside the phone that tells you this, if you know how to find it. I would say with the evidence on the causal effect of mobile phone radiation on sperm, on pregnancy, on hearing, and on cancer—including acoustic neuroma, which is a tumour of the hearing nerve, and on leukemia, which we have less firm evidence on—there's growing evidence showing a causal impact, yes.

Mr. Terence Young: Thank you.

The American Academy of Pediatrics recently held a conference where evidence was presented with regard to health effects of radio frequency radiation on children. Could you please briefly tell us about this?

Dr. Devra Davis: At the annual meeting of the American Academy of Pediatrics, which took place in San Diego just a few days ago, they heard several studies reporting on the damaging effect of cellphone radiation on parent-child relationships and on the acquisition of language for children. Parents who are preoccupied with their cellphones, with their babies, and with their infants are not talking to those babies. We know, those of us who have survived motherhood, talking to babies is how they learn to babble back at you. When you talk to your baby from the time you're pregnant, when they're born they know your voice. You need to keep talking to them.

I remember, when I was doing a post-doc, reading to my child because I wanted her to hear my voice. If a parent is completely obsessed with these devices the child's acquisition of language suffers.

● (1705)

Mr. Terence Young: Thank you.

I would like to ask you a multiple question, the same question I asked the person at Health Canada who is ultimately responsible for Safety Code 6. His reply sounded like the mayor in the movie *Jaws*, saying the beaches are safe.

Here's the question. Can you tell me if it's safe for my constituents to hold a cellphone to their heads? Is it safe for my two-and-a half-year-old granddaughter to have a baby monitor in her room all night? Is it safe for a woman to carry a cellphone in her bra? Is it safe for young men to carry cellphones in their front pants pockets? Is it safe for children to use cellular phones and tablets?

Dr. Devra Davis: I guess it's easy to say no to all of those except that, if you have a sick child and you have a large house, and you have a baby monitor that would be located far away, and you were in Switzerland you would get a baby monitor that only turned on when you needed it.

Our baby monitors in the U.S. and Canada are programmed to be on 24-7. You could save greenhouses gases if the government, right now, mandated that all Wi-Fi devices could be automatically powered down when they weren't being used. It would not even be that difficult to imagine a way to save greenhouse gases. The Swiss phones, the Swiss so-called cordless phones, don't broadcast 24-7. They're only used when the person needs it. There's a way for software and hardware to be configured to make that happen. No one has ever calculated the energy savings that would result from it, but it would be substantial.

Mr. Terence Young: Dr. Davis, we're hearing a lot of evidence of potential harm and evidence of harm. The folks at Health Canada responsible for Safety Code 6 have taken this inflexible position. It seems like they have everything vested in saying it's safe. They don't even consider they might not be right and they're not offering any potential change.

Why is it that we're hearing from you and others that there are real risks and we're hearing from countries all over the world? Can you guess why Health Canada is taking this position?

Dr. Devra Davis: Of course, you'll have to ask them, but I'd like to point out to you that among the countries that have recently established a national institute for research on wireless radiation safety is Israel. Israel lives and dies by radar. They use it, they know what it is, and they know that they need to be smart in using it safely.

Other countries are Taiwan and India. India is a high-tech country, and has huge problems. The Indian Council of Medical Research has a major study under way now of cellphone users and health because they think it's a serious public health issue in India. Again, it's a very high-tech country.

Those countries have generally banned advertising with children and cellphones. That's an easy thing to do. Turkey did it. France has done it. The trash-talking babies with the cellphones, which looked really cute, is a horrifying idea for many reasons, which pediatricians and developmental neuropsychiatrists talk about as well. An iPotty, that is a potty with a holder for an iPad, is a terrible idea, yet it exists, and there are plastic baby teething rattle cases for iPhones, as well as iPads.

The Chair: We're over time, Ms. Davis.

Dr. Devra Davis: I do actually think that Safety Code 6 has done something good, and I want to commend them for that. In the beginning they acknowledge the need for more stringent standards for children. Samsung, in its insert, says a cellphone is not a toy. It would be good for that information to get more broadly distributed, getting the information out of the phones and onto them as labels.

The Chair: Okay, thank you.

Ms. Fry, go ahead.

Hon. Hedy Fry: Thank you very much.

There have been very interesting presentations today.

Dr. Herbert and Dr. Davis, it's very compelling evidence that you have basically with regard to autism and with regard to fertility. As a physician, I can tell you that it all makes a great deal of sense when you look at a mitochondrial breakdown of the walls and some of the slides that you showed us. I think your evidence is clear, compelling, very well done; your research is well done.

I wanted to ask my question of Mr. Lord. It would seem to me that industry should be concerned. We have listened now to three sessions of presentations, the majority of which, over 90% of which, have said to us that there is clear causal evidence between not just autism but brain tumours. There is clumping of red blood cells. There is the fertility issue. There are many issues. We heard from the last group that there are prenatal problems with women who may have carried a laptop on their laps while they were working, etc.

My question is this, and I know you weren't here to listen to all of the evidence. Shouldn't industry be looking at the fact that nothing is 100% great and good and wondrous and safe? Everything that we use has a plus and a minus to it. There's not a single thing in this world that is all perfect. Shouldn't your companies, and the cellphone companies and telecom people, start looking to see if in fact they could mitigate some of the things by looking at what the lowest possible frequencies that could be used are, or how you could create the kind of stuff we see in Europe, voice-activated powering on and powering off, so that the precautionary principle is there?

I can give you an example of one industry that actually continued up until 10 years ago to say that there is no side effect from their product's use, and that's the tobacco industry, which had to be legislated and had to be forced long after there was compelling evidence of harm done by using cigarettes. It's one thing that we know, if used as requested, it will cause you to become sick.

Do you think that there is some way that telecoms could look at maybe having some sort of monograph with the use of your product that's easy to read for everyone, that says, please don't keep this on your lap if you're pregnant? Nobody's saying that it can cause...but just in case here's what you do and here's how we can warn people by saying, please take care.

You just said you don't believe that there's hard evidence. But even without hard evidence, we've seen that it takes years sometimes —50 years in tobacco, 20 years in acid rain—to get that kind of evidence out there. Do you not think that there is work? We're told by some people that in fact telecom and wireless industries can in fact recommend a lower dosage use, ways of preventing and having caution.

● (1710)

Dr. Devra Davis: The Australian telecom industry does do that.

Hon. Hedy Fry: Is this something you would like your telecom companies to look at, given the evidence? WHO has upgraded this now to a possible carcinogen, so could we not get industry to be forward-thinking and progressive in trying to look at how they can prevent risks?

Mr. Bernard Lord: Thank you very much for your question.

The sector and the companies in Canada are very forthright. We continue to support and encourage more scientific research, if it is warranted and desired. There has been research on this for a very long time. It's easy to throw words around that incite fear that are not based on anything.

In Canada, we rely on government. You mentioned the health of Canadians. I think the people who really care and have the responsibility for the health of Canadians are the Canadian government. As a former minister of the Government of Canada, I'm sure you would agree this is very important. Standards that are set in Canada are set by the Government of Canada. They're not set by the industry. I think that's important to recognize. The industry will continue to fully comply with those standards.

We will support and we do support research, but you have to appreciate that when research is supported by the sector or the industry, then people who don't agree with the research will simply say the research is biased because it has been funded or supported by the industry. When the industry decides not to support research, then we're told we should support research.

The fact is that we do support research. We do fund independent research where we have no impact whatsoever on the research that is done. We take the evidence that is provided and supported by the World Health Organization, and the standards that are set in Canada are based on those international standards.

Hon. Hedy Fry: Thanks, Mr. Lord.

The Chair: We're over five minutes, I apologize.

Hon. Hedy Fry: I'm so sorry.

The Chair: Now I would ask the committee at this time...because we do know that the bells are going to go here in a minute or so. Ms. McLeod has a turn and we need unanimous consent to allow her to have her five-minute round. That would put us at about twenty after, and then we'd still have quite a bit of time, 25 minutes, to get to our vote.

I ask the committee for unanimous consent on that.

Some hon. members: Agreed.

The Chair: All right. Ms. McLeod, go ahead.

● (1715)

Mrs. Cathy McLeod: Great. Thank you, Chair, and thank you to everyone for providing that support for the final round. I think it's always nice to be able to do a full round.

We had heard earlier from Anne-Marie Nicol, and she indicated that the review of Safety Code 6 could have been much more comprehensive, so I thought that was interesting, because certainly this study is focused on emerging evidence and health risk. But I was very interested in also getting a bit of an industry perspective. I don't think there's a meeting I go to in a rural community that doesn't have service where they're not begging me for service. They frequently talk about accidents on the highway. They talk about their ability to set up small businesses. I think we have to be very cognizant of potential risks, but we also have to be aware of the critical importance of health and safety.

Mr. Lord, a number of countries have lowered standards significantly. What did the industry have to do to continue to provide the appropriate services, but meet those new standards? Can you walk me through how that can happen? We should be able to get baby monitors that people can turn on and off. I'm surprised they're not available in Canada because it seems logical. Can you walk me through the impact of different industry standards?

Mr. Bernard Lord: I cannot provide you that answer—I wish I could—because I don't have the data or the information based on how the standards would be changed.

I can tell you that the industry and the sector in Canada will comply with whatever changes are brought by the government. The fact that the government bases its regulations on science that is accepted worldwide I think is the right approach. The sector will continue to provide that. It's essential to ensure that Canadians do have access to that service. Everywhere I go in Canada, people ask us for more. Nobody asks us for less.

When we look at what's happening in Canada, Canadians are more connected than almost anyone around the world. We spend more time online than anyone in the world. We're among the heaviest users of mobile technology. What we expect—if we want to use numbers to scare people—is that in the next five years data consumption in Canada will grow by 700%.

What's happening is a rollout of more networks and more devices throughout our communities to enable that growth, which is supporting jobs, businesses, health care, education, community safety, everywhere in our communities. That's the part of the story that has to be told as well. This can be done, and it is done respecting the standards that are set based on science. I'm sure the folks from Health Canada have indicated to you that they apply the precautionary principle. It is included in the standards in Canada. I've asked those questions and they've told us that it is, and we respect that.

Mrs. Cathy McLeod: Quickly—I think the bells are going and I have only one minute—I would presume in these countries where they have made changes, industry has accommodated. But you haven't had those conversations in terms of how industry has made the adjustments.

Mr. Bernard Lord: If it's a question of not advertising devices to a certain group of the population, obviously that's easy to comply with. We'd have to look at each country to see how they've complied to the different regulations they have.

We have had conversations. We have conversations, at times, with other groups, other industries, and other countries. But to tell you specifically, I don't have that information. If you request that information, we can certainly find it.

● (1720)

Mrs. Cathy McLeod: I think it would be of absolute value.

Mr. Bernard Lord: Absolutely, yes.

Mrs. Cathy McLeod: As I said, the bells are ringing.

I appreciate it. I just wanted to get those quick questions in. Thank you so much.

The Chair: Thank you very much.

That's going to conclude this meeting.

I'd like to thank everybody for their respectful presentations and wish everybody a good evening.

The meeting is adjourned.

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