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Chair

Mr. Ben Lobb

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● (1550)

[*English*]

The Chair (Mr. Ben Lobb (Huron—Bruce, CPC)): Good afternoon, ladies and gentlemen. I think this is the last committee meeting for all committees in the 41st Parliament, so the health committee is working right till the end.

We have two panels this afternoon. For our first panel, we have three different groups. As per usual, we'll connect first with Kathleen Cooper by video conference.

Welcome, Kathleen. You're welcome to go ahead with your presentation.

Ms. Kathleen Cooper (Senior Researcher and Paralegal, Canadian Environmental Law Association): I thought I was going third, but that's fine.

The Chair: You're first today.

Ms. Kathleen Cooper: First of all, to tell you about the Canadian Environmental Law Association, we're a non-profit public interest organization specializing in environmental law. We're also a legal aid clinic within Ontario. We provide legal representation to low-income individuals and vulnerable communities.

Then we have law reform priorities, and in setting our strategic priorities, one of those is environment and human health. In deciding within that large topic how to set priorities, we take a population health approach, the same as Health Canada, the Public Health Agency of Canada, and public health agencies everywhere do. You set priorities by focusing on issues where large numbers of people are potentially or directly affected or where you have serious outcomes.

You can't get much more serious than a known carcinogen where there's strong science. Radon, as I'm sure you're going to hear later as well, is in a class by itself compared to most other environmental carcinogens. That's why we've focused on radon.

I'm going to speak today to a report we prepared last year, “Radon in Indoor Air: A Review of Policy and Law in Canada”. I believe you've been circulated the media release that was issued the day we released the report. That's all I was able to have translated given the time pressure of meeting with you today.

We canvassed policy and law across Canada at the federal and provincial levels and looked at jurisdictions and roles. We focused on public buildings and building codes, looked at other relevant provincial policy and law and the associated common law, and made a number of recommendations, but I'll focus today on just the recommendations we made with respect to the federal government.

Overall, our findings were that Canadians need better legal protection from radon. We found a patchwork of inconsistent and mostly unenforceable guidance.

For the federal government, we found that really important leadership has occurred, and Kelley Bush from Health Canada will provide some details on that for you today, although we definitely made recommendations for more that can be done. At the provincial and territorial level, where actually most jurisdiction lies, we found a wide range of laws that need to be updated or that contain gaps or ambiguities. There's very limited case law, which points to the need for improving a law or for law reform. I won't get into detail on what's been done at the federal level on radon, although the report does, because Kelley will be doing that for you later on.

Just in summary, under the national radon program there has been very valuable research, testing, and mapping of high -radon areas. The guideline for indoor radon was updated in 2007. The national building code was updated with respect to radon provisions, there's a certification program for radon mitigators, and there has been a national campaign to urge the testing by Canadians of their homes. It's recommended that every home in Canada be tested.

We recommended, to build on that important work, that there really is a logical next step here. Through the work of the Green Budget Coalition this past year, we recommended a tax credit for radon remediation. We recommended that the Income Tax Act add a tax credit for radon mitigation of up to $3,000 for individual Canadians, so long as it's done by a certified expert under the national program. That was not included in the budget, although we think it's still a very good idea. We had some very positive response from the federal officials we spoke to about it.

We also recommended that there be clearer messaging about radon, and that we use words like “radiation” and “radioactivity” because they are accurate and are what people understand more in terms of the risks of radiation and radon. We also recommended that there be better data sharing nationally between the federal government and the provinces and territories in terms of the testing that's done, along with the sharing of information that's paid for nationally, and that information be available publicly.

In terms of recommendations for federal action as well, we note that the David Suzuki Foundation report that came out just last month says the World Health Organization has recommended a lower level of 100 for indoor radon. Currently, our federal level is 200 becquerels per cubic metre. We definitely supported that recommendation and recommend that the federal government reduce the indoor radon guideline to 100.

The other two areas I want to touch on that are relevant to your investigation here have to do with the Canada Labour Code and the need to update it as well, and also the need for improving the uptake across Canada of the naturally occurring radioactive materials guidelines, the NORM guidelines. I'm going to speak to those two areas now.

Under the Canada Labour Code, there is the only legally enforceable limit for radon in Canada that's broadly applicable, but it's only for federally regulated workplaces and it remains at an outdated level of 800 becquerels per cubic metre. We think it should be brought down to the federal reference level of 200 becquerels per cubic metre to begin with, and we think that level should come down to 100 becquerels per cubic metre. On the updating of that level, apparently what was going to happen in 2015 now sounds like it's going to happen in 2016, so it would be great if your committee recommended speeding up that process.

In terms of the NORM guidelines, these are guidelines that were prepared by a federal-provincial-territorial committee. We interviewed occupational health and safety inspectors across Canada and found a lot of confusion and uncertainty about workplace radon rules or whether the NORM guidelines apply. In fact, they apply to every workplace in Canada. In any indoor space that is a workplace, including the room in which you are sitting, those guidelines apply.

However, it's a reactive, complaint-driven system. Inspectors get few or no complaints because there is a lack of awareness, so they don't take enforcement action. Also, some inspectors didn't think that radon was an occupational health and safety issue at all. They said that enforcement action was unlikely because the only agreed-upon levels for radiation are those for radiation-exposed workers. That is just not accurate, so we've made recommendations in response to that situation.

Turning to the recommendations we made with respect to the Canada Labour Code, as I've mentioned, it should be brought up to date swiftly. It's out of date by many years and still at that level of 800 becquerels per cubic metre.

With respect to radon, we recommended that the federal-provincial-territorial radiation protection committee, which deals with far more than radon—it deals with a whole manner of radiation exposure issues—convene a task force for occupational health and safety inspectors across the country so that there is clarity and there is a more generalized consistent application of those NORM guidelines to ensure worker health and safety. The consequences of that inconsistent application are that you're going to have uneven worker protection across the country and the possibility that people are overexposed, both in the workplace and in their homes, if they happen to be unlucky enough to have high radon levels in both of those indoor locations where they live and work. Related to that, we made a range of recommendations about provincial labour codes, which I won't get into.

In another area of occupational exposure, with respect to radon mitigators, we also recommended that CAREX Canada, who you're going to hear from later today, undertake, with the Canadian national radon proficiency program, research and dosimetry monitoring for radon mitigators so that we can make sure their workplaces are safe as well.

● (1555)

Just to recap on the findings in this report and to recommend to you to take up some of these recommendations in your deliberations on this topic, we found a need for greater legal requirements rather than guidance in this area for several reasons, including the need to underscore the seriousness of the problem and to support public outreach messages by the federal government and by other organizations who you're going to hear from today, including the Canadian Partnership for Children's Health and Environment.

Also, there's a need for legal requirements to require testing in public buildings and to ensure public access to that information. As well, there's the need to correct that inconsistent response among both the public health and the occupational health and safety inspectors and to provide them with tools to take action with respect to radon. As I mentioned, we found limited to no case law under either statutes or common law. We also found that improving the law or law reform is a better remedy than costly and situation-specific litigation to resolve radon problems.

Then, as I mentioned, there's a need for specific federal government action, including updating that federal guideline and putting in place a tax credit to help Canadians undertake radon mitigation when they have high levels, updating that Canada Labour Code, and ensuring the NORM guidelines are applied.

We've calculated the health care savings from prevented lung cancer deaths. If all homes in Canada were mitigated to the level of 200 becquerels per cubic metre, you'd see more than $17 million a year in savings through prevented lung cancer deaths. It likely would be double that if you were to reduce the level to 100 becquerels per cubic metre. Then, of course, anyone who works in cancer will tell you that the indirect costs are five times higher than the direct costs, so a lot of savings are possible there, along with the avoidance of the pain and suffering associated with lung cancer.

● (1600)

The Chair: Ms. Cooper—

Ms. Kathleen Cooper: I will stop there. Thank you very much for your time.

The Chair: You're right on time. Thank you.

Next up will be Erica Phipps from the Canadian Partnership for Children's Health and Environment.

Ms. Erica Phipps (Executive Director, Canadian Partnership for Children's Health and Environment): Thank you, Mr. Chairman.

Good afternoon. Thank you for the opportunity to contribute to this important discussion.

I'd like to share a few perspectives based on our work to raise public awareness, particularly among families with young children, about the lung cancer risk posed by radon and what can be done to reduce that risk.

My name is Erica Phipps. I serve as executive director of the Canadian Partnership for Children's Health and Environment, CPCHE, a collaboration among public health, medical, legal, and child-focused organizations that have been working together for nearly 15 years to advance children's environmental health protection in Canada. The 10 core CPCHE partners include the Canadian Environmental Law Association—you've just heard from my colleague, Kathleen Cooper—and the Canadian Child Care Federation, which has been actively involved in our work to promote radon action in the child care sector.

Much of our work within CPCHE involves engaging with and learning from service providers, such as public health nurses and child care providers and others, who work with families on a day-to-day basis and empowering them to integrate children's environmental health protection into the support they provide to families.

I thought it would be fitting to start with one of their voices. These are the words of a child care provider in Winnipeg, who was one of the participants in the radon vanguard initiative that CPCHE and the Child Care Federation undertook last year, with support from Health Canada. She said:

> I wouldn't want to work in a centre that had [high radon] and didn't do anything about it. I wouldn't want to do that. I wouldn't work there. And I wouldn't put my children in the centre either.

This child care professional had known very little about radon before getting involved, but she, like others in the project, was motivated to learn more because of her dedication to the children in her care and because she desired a healthy workplace. It did not take her or any of the other staff involved in the project very long to get that this is a critical issue and one that demands action.

Through the vanguard project, she and other child care providers shared information on radon with their client families and voluntarily tested their child care centres for radon. Through that process, the project participants made the transition from a group of people who had hardly even heard of radon to being nearly unanimous in rating it as a high priority for health in their centres.

When asked what they thought would need to happen to protect children and staff from this lung cancer risk, most felt that radon testing would somehow need to be made mandatory. In the words of another participant:

> ...what I see in child care tends to be...people don't take action unless they're forced to, unfortunately.... It's like carbon monoxide detectors, right. We never had them before and then finally we were forced to have them and so everybody got them. And you know meanwhile they're only like $40 dollars or $50, and yet people didn't do that before it was made sort of expected of [them].... I think unless [radon testing] was made mandatory or there was some kind of assistance in ensuring that it was done, I think it would be unlikely to get done...when it should be.

This viewpoint was echoed by others and supported by the results of the vanguard project. Despite good intentions and the fact that radon test devices were supplied directly to the participating day care centres, only two-thirds of them were able to complete the testing. What this suggests is that for a sector in which staff are already stretched, providing them with information—and even providing them with do-it-yourself test devices—is not likely to be enough.

CPCHE has been putting significant effort into radon outreach over the past few years, including developing a plain-language tip card for families and teaming up with Health Canada, the Canadian Lung Association, Parachute, and the Canadian Association of Fire Chiefs in a campaign that links radon testing to the more familiar home safety messages of smoke detector use and carbon monoxide detector use. I've brought copies, which you should have before you.

We have prioritized radon as a focus of our collective work because of the well-established high level of risk posed by radon and because we firmly believe that protecting children is an investment in lifelong health. The harm from radon exposure is cumulative, which means that if we can ratchet down exposures during childhood by promoting radon safety in homes and by zeroing in on those six to eight hours that many children spend per day in child care or other learning environments, we can give Canada's kids a better start towards lifelong health, such that their generation and future generations are less likely to suffer from the devastation of lung cancer.

There's also an equity question here. Radon exposure is a prime example of a housing-related health risk that is beyond the ability of low-income people, especially tenants, to address on their own. Knowing about radon is not enough if you can't afford to buy a test kit, let alone pay for a remediation. It is just this sort of issue that we are seeking to address in a new CPCHE-led initiative called “RentSafe”, which will build social service sector capacity to respond to health concerns in low-income housing.

● (1605)

Reducing the financial barrier to radon mitigation should be a matter of priority if we are to achieve the goal of healthier housing for all Canadians. That would potentially include the Green Budget Coalition ask that Kathy mentioned in her remarks, of having an income tax credit for radon mitigation. Federal leadership to help families get action on avoidable health risks in their housing, including radon, would be a well-targeted investment in the health and well-being of the people of Canada.

In our toxics work within the CPCHE partnership, we frequently bump up against the complexities of scientific evidence, fraught with great debates about cause and effect and proof of harm. Radon, regrettably, is refreshingly simple. Radon causes lung cancer, full stop. We know how to test for it. We know what to do if levels are high. We know that it amplifies the risk posed by the other big lung cancer culprit, tobacco smoke. Now we need the courage and investment to ensure that the homes and buildings where we spend time, and especially where our children spend time, are not a source of this preventable lung cancer risk.

Thank you.

The Chair: Thank you very much.

Next up we have Kelley Bush, senior head of radon education and awareness at the Department of Health.

Go ahead, please.

Ms. Kelley Bush (Section Head, Radon Education and Awareness, Radiation Protection Bureau, Environmental and Radiation Health Sciences Directorate, Healthy Environments and Consumer Safety Branch, Department of Health): Good afternoon. My name is Kelley Bush, and I am the head of radon education and awareness under Health Canada's national radon program.

[*Translation*]

Thank you, Mr. Chair and members of the committee, for inviting me to be here today to discuss radon as a cause of lung cancer and to highlight the work of the Canadian – National Radon Proficiency Program.

[*English*]

Through the ongoing activities of this program, Health Canada is committed to informing Canadians about the health risk of radon, better understanding the methods and technologies available for reducing radon exposure, and giving Canadians the tools to take action to reduce their exposure.

Radon is a colourless, odourless radioactive gas that is formed naturally in the environment. It comes from the breakdown of uranium in soil and rock. When radon is released from the ground in outdoor air, it gets diluted and is not a concern. However, when radon enters an indoor space, such as a home, it can accumulate to high levels and become a serious health risk. Radon naturally breaks down into other radioactive substances called progeny. Radon gas and radon progeny in the air can be breathed into the lungs, where they break down further and emit alpha particles. These alpha particles release small bursts of energy, which are absorbed by the nearby lung tissue and lead to lung cell death or damage. When lung cells are damaged, they have the potential to result in cancer when they reproduce.

The lung cancer risk associated with radon is well recognized internationally. As noted by the World Health Organization, a recent study on indoor radon and lung cancer in North America, Europe, and Asia provided strong evidence that radon causes a substantial number of lung cancers in the general population. It's recognized around the world that radon is the second leading cause of lung cancer after smoking, and that smokers also exposed to high levels of radon have a significantly increased risk of developing lung cancer.

Based on the latest data from Health Canada, 16% of lung cancers are radon-induced, resulting in more than 3,200 deaths in Canada each year. To manage these risks, in 2007 the federal government in collaboration with provinces and territories lowered the federal guideline from 800 to 200 becquerels per cubic metre. Our guideline of 200 becquerels per cubic metre is amongst the lowest radon action levels internationally, and aligns with the World Health Organization's recommended range of 100 to 300 becquerels per cubic metre.

All homes and buildings have some level of radon. It's not a question of “if” you have radon in your house; you do. The only question is how much, and the only way to know is to test. Health Canada recommends that all homeowners test their home and that if the levels are high, above our Canadian guideline, you take action to reduce.

The national radon program was launched in 2007 to support the implementation of the new federal guideline. Funding for this program is provided under the Government of Canada's clean air regulatory agenda. Our national radon program budget is $30.5 million over five years.

● (1610)

[*Translation*]

Since its creation, the program has had direct and measurable impacts on increasing public awareness, increasing radon testing in homes and public buildings, and reducing radon exposure. This has been accomplished through research to characterize the radon problem in Canada, as well as through measures to protect Canadians by increasing their awareness and giving them tools to take action on radon.

[*English*]

The national radon program includes important research to characterize radon risk in Canada. Two large-scale, cross-Canada residential surveys have been completed, using long-term radon test kits in over 17,000 homes. The surveys have provided us with a much better understanding of radon levels across the country. This data is used by Health Canada and our stakeholder partners to further define radon risk, to effectively target radon outreach, to raise awareness, and to promote action. For example, Public Health Ontario used this data in its radon burden of illness study. The Province of British Columbia used the data to inform its 2014 changes to their provincial building codes, which made radon reduction codes more stringent in radon-prone areas based on the results of our cross-Canada surveys. The CBC used the data to develop a special health investigative report and interactive radon map.

The national radon program also conducts research on radon mitigation, including evaluating the effectiveness of mitigation methods, conducting mitigation action follow-up studies, and analyzing the effects of energy retrofits on radon levels in buildings. For example, in partnership with the National Research Council, the national radon program conducted research on the efficacy of common radon mitigation systems in our beautiful Canadian climatic conditions. It is also working with the Toronto Atmospheric Fund to incorporate radon testing in a study they're doing that looks at community housing retrofits and the impacts on indoor air quality.

This work supports the development of national codes and standards on radon mitigation. The national radon program led changes to the 2010 national building codes. We are currently working on the development of two national mitigation standards, one for existing homes and one for new construction.

[*Translation*]

The program has developed an extensive outreach program to inform Canadians about the risk from radon and encourage action to reduce exposure. This outreach is conducted through multiple platforms targeting the general public, key stakeholder groups, as well as populations most at risk such as smokers and communities known to have high radon.

[*English*]

Many of the successes we've achieved so far under this program have been accomplished as a result of collaboration and partnership with a broad range of stakeholder partners. Our partners include provincial and municipal governments, non-governmental organizations, health professional organizations, the building industry, the real estate industry, and many more. By working with these stakeholders, the program is able to strengthen the credibility of the messages we're sending out and extend the reach and impact of our outreach efforts. We are very grateful for their ongoing engagement and support.

In November 2013 the New Brunswick Lung Association, the Ontario Lung Association, Summerhill Impact, and Health Canada launched the very first national radon action month. This annual national campaign is promoted through outreach events, website content, social media, public service announcements, and media exposure. It raises awareness about radon and encourages Canadians to take action. In 2014 the campaign grew in the number of stakeholders and organizations that participate in raising awareness. It also included the release of a public service announcement with television personality Mike Holmes, who encouraged all Canadians to test their home for radon.

To give Canadians access to the tools to take action, extensive guidance documents have been developed on radon measurement and mitigation. Heath Canada also supported the development of a Canadian national radon proficiency program, which is a certification program designed to establish guidelines for training professionals in radon services. This program ensures that quality measurement and mitigation services are available to Canadians.

The Ontario College of Family Physicians as well as McMaster University, with the support of Health Canada, have developed an accredited continuing medical education course on radon. This course is designed to help health professionals—a key stakeholder group—answer patients' questions about the health risks of radon and the need to test their homes and reduce their families' exposure.

The national radon program also includes outreach targeted to at-risk populations. For example, Erica already mentioned the three-point home safety checklist that we've supported in partnership with CPCHE. As well, to reach smokers, we have a fact sheet entitled “Radon—Another Reason to Quit”. This is sent out to doctors' offices across Canada to be distributed to patients. Since the distribution of those fact sheets began, the requests from doctors offices have increased quite significantly. It began with about 5,000 fact sheets ordered a month, and we're up to about 30,000 fact sheets ordered a month and delivered across Canada.

In recognition of the significant health risk posed by radon, Health Canada's national radon program continues to undertake a range of activities to increase public awareness of the risk from radon and to provide Canadians with the tools they need to take action. We are pleased to conduct this work in collaboration with many partners across the country.

● (1615)

[*Translation*]

Thank you for your attention. I look forward to any questions the committee members might have.

[*English*]

The Chair: Very good.

In order to fit everything in for both panels I think we'll have to reduce the length of time for the questions to five minutes instead of seven. That will get everybody through and done in time.

Ms. Moore.

[*Translation*]

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

I will ask only one question, and then I will yield the floor to Mr. Rankin.

As we know, many homes have never been tested for radon, although a number of them are at risk. Could it be appropriate for CMHC, when processing a file for a home purchase, to require that the new buyer test for radon? That way someone buying a new home would know whether it contains radon or not and whether they have to make improvements to remedy the problem.

Ms. Kelley Bush: We are already working with CMHC on the radon issue.

Here is what is being done to remedy the problem. Canada Post has a program called smartmoves, or déménageur in French. Every time someone submits a change of address request, they receive an information kit on everything they need to think about when they move into a new home. Information on radon is part of that kit. That's a way to inform homeowners when they should test radon levels before they move into a new home.

You asked a question about moving, but I forgot what the second part of your question was about.

Ms. Christine Moore: That's okay. I'm finished.

Ms. Kelley Bush: Okay.

[*English*]

Mr. Murray Rankin (Victoria, NDP): I want to just say thank you to everyone for being here, and I want to start by saying thank you to Mr. Lizon, my colleague, for bringing this to the attention of the committee. I confess I've never thought much about radon until the last few days, and it's very sobering. I intend to have my house tested and I want to ask others in my community to do it as well, so thank you for the education.

I just wanted to start with Ms. Cooper about the WHO report. I'm confused because I understood from Ms. Bush, if I heard properly, that there's a 100 to 300 range of becquerels per cubic metre, yet we are at 200 in Canada. I thought I heard you say, Ms. Cooper, that the standard recommended now by WHO is in fact 100. Have I got that right?

Ms. Kathleen Cooper: We're both right. The World Health Organization recommends 100 as a guidance level, but they do suggest a range as do some other countries. The 100 level is their recommendation and they also recommended that you try for the lowest as reasonably achievable, so you really try to get even lower than 100.

● (1620)

Mr. Murray Rankin: All right.

Ms. Kathleen Cooper: It is a range. The International Atomic Energy Agency, I think, is the other organization that recommends a range, so you get both. We're both right.

Mr. Murray Rankin: I understand now.

In order to go down from 200 to 100 becquerels per cubic metre, you indicated—I thought really properly—the direct and indirect costs are enormous given the existing radon. If we had done the work required to reduce that risk we'd save a lot of money. Then you said that we'd probably save twice as much if we went to 100. I'm not sure that's true. To get down from 200 to 100, it wouldn't in fact be a doubling. It might be much more expensive to get to a lower level, isn't that so?

Ms. Kathleen Cooper: I was talking about health and prevented lung cancer deaths, not the cost of remediation. I'm not sure if we're talking about the same thing. We just did a rough estimate. We looked at the cost of lung cancer deaths and the number of lung cancer deaths that is expected if you're above 200. That's how we came up with that calculation, so if you lower the guideline to 100, you can probably expect that number to at least double.

Mr. Murray Rankin: Sorry for being short on time. I do understand that now.

Ms. Phipps, I wanted to just ask you to tell us a little bit more about your RentSafe program. How does it work?

Ms. Erica Phipps: Thanks very much for the question.

RentSafe is the collaboration that we as CPCHE lead but it involves many agencies as well as the legal aid clinics and the public health units. It's based in Ontario because of the funding. We're funded by the Ontario Trillium Foundation and we really look at indoor environmental health risks and what those mean for tenants. If a tenant is experiencing mould, radon, pests, pesticide overuse, or whatever, what recourse do they have? What happens if they pick up the phone and call their public health unit? Will they get a response? Do the public health units work with the legal aid clinics and with the settlement services to try to ensure that at the end of the day a tenant, potentially with young kids and on a very low income, will get a response from social services? We're really trying to network among the social services to make sure that those issues are addressed.

Mr. Murray Rankin: Thanks very much.

The Chair: Thank you.

Ms. McLeod.

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

I too am very appreciative of the witnesses coming here today and sharing. I actually have to agree with my colleague. My background is health care. I was involved in primary health care, public health, and child care licensing, and to be frank, I was completely unaware that this was an issue.

I was elected in 2008, so I guess my first question is: when did this awareness and focus come into being? As I said, I don't recall anything in the early 2000s, or at least anything that I was familiar with. That's my first question. When did we start to really put a bit of focus on this particular initiative?

Ms. Kelley Bush: We'd had the same guideline level since 1988. The original guideline was set based on available research on miners' exposure. It was only in the early 2000s that there was new pooled research that distinctly demonstrated that there was a risk at lower levels in a residential environment, and that research led to Health Canada and our federal-provincial-territorial committee reviewing the guideline and lowering the reference level to 200. We knew at the time that was a significant decrease, and if we were going to decrease the guideline to that extent, we wanted to have a full program to support it to make sure that we educated Canadians about what the guideline meant, and the actions that they could take to reduce their risk.

Mrs. Cathy McLeod: Great. I'm also thinking about something in line with what my colleague was saying. I look at the Mental Health Commission of Canada, and it actually engaged members of Parliament in something it called “308 conversations”, which were focused on suicide prevention. I think all 308 of us have opportunities within our communications. That's just another method. Although it sounds as though a ton of work has been done, I don't know if there's been any research on the level of penetration and awareness of this as an issue.

Ms. Bush, maybe you could talk to the issues of penetration and awareness.

Ms. Kelley Bush: Absolutely. We did some public opinion research comparing where we were at the beginning of the program in 2007 to where we were in 2013, and we've definitely seen an increase from about 50% to about 65% in the level of awareness, and a significant increase from 4% to 25% with regard to Canadians' awareness of where they can get detectors and how they can test their homes. The challenge with this issue is that while levels of awareness have definitely increased, our research so far demonstrates that we haven't achieved a significant increase in action, i.e., testing.

The conversation about the challenges around risk communication and radon could be a very interesting one, because you can't blame anyone. There's no immediate health effect, and a lot of people tend to be apathetic towards the issue. We're making good strides, but the point we're at now is that we need to convert awareness to action. We're starting to see that, but there's still more work to be done.

● (1625)

Mrs. Cathy McLeod: Let's say you take a neighbourhood of 1,000 homes on average, what percentage of homes do you anticipate would have levels that are above our current standards?

Ms. Kelley Bush: According to the cross-Canada survey data that I mentioned earlier, it's estimated that across Canada 7% of homes have high levels of radon, but that varies quite significantly across the country. In Manitoba and New Brunswick, it was over 20%, but in every single province there were regions where 10% to 20% and in some places 40% to 50% of homes tested high. The average across the country at 7% of homes is still very significant.

Mrs. Cathy McLeod: As my last comment or question, I certainly see both a federal and a provincial role. There were some comments in terms of the Canada Labour Code, and I'm just trying to get a sense of to what degree, because obviously the provincial and territorial ministers regularly meet with their federal counterparts. In your awareness, has this issue ever been discussed at those particular meetings?

Ms. Kelley Bush: I can speak to what Health Canada has done there. We have gone to make a presentation about the revised guideline, and we follow up on a very regular basis. It is the intent to have the Canada Labour Code harmonized with our current Canadian guideline. It's just been delayed. The most recent information we have is that it's supposed to be updated by the winter of 2015-16.

Mrs. Cathy McLeod: But that would not necessarily translate into what the provinces are doing in terms of their labour codes or workers' compensation.

Ms. Kelley Bush: No.

Mrs. Cathy McLeod: Thank you.

The Chair: Thank you, Ms. McLeod.

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

Mr. Ted Hsu (Kingston and the Islands, Lib.): Thank you.

I'd like to start by continuing the questioning from Ms. Moore regarding labelling of homes. As you say in your notes, the International Agency for Research on Cancer classifies radon in group 1, which means we know it's carcinogenic.

This is a question for everybody. Do you think houses should be labelled once they've been tested and that before and after remediation perhaps one could have a different label?

Ms. Kelley Bush: I think Kathy would like to respond there.

Ms. Kathleen Cooper: We looked at the provincial statutes, which I didn't get into in my presentation, and there is home warranty legislation in several provinces that says new homes are statutorily deemed to come with what are called “implied warranties of habitability”. In that case, it would mean that they had followed the building code, and the building code requirements largely have been or are being updated across the country to incorporate the national building code requirements for radon.

When you talk about existing homes, that's a little trickier, because when you sell a home, you have similar kinds of disclosure statements and requirements, and they may or may not provide information about radon. I think the idea is intriguing.

I think it would be better if we were to increase this awareness. One of the reasons we wanted that income tax credit was for the federal government to send a strong signal to the public to take the issue more seriously, get their homes tested, get them remediated if the levels are high, and have a tax break to be able to accommodate it.

I'm sorry; I'm drifting a little bit from your question.

● (1630)

Ms. Kelley Bush: The only thing I can add is that under the national radon program we have worked with the Canadian Real Estate Association, and they now do have guidance that they provide with regard to radon. Based on our discussions with other countries, such as the U.S., that have had a national radon program in place for longer, with regard to.... Every home has radon. It's not a question of whether or not it's in there. I don't know about labelling, but I can tell you—

Mr. Ted Hsu: Well, on labelling, if you've done a test, presumably the results of the test are there.

Ms. Kelley Bush: When we get calls from members of the public who have tested their home and are concerned because they want to sell it but they've mitigated it, our response to them is that everything that we've seen in the U.S. in regard to what they can communicate is that they've addressed the issue, they've made their home a healthier home, and it's a value-add. That's what they've seen in the U.S. It doesn't impact it in that way. I don't know if that directly answers your question.

Mr. Ted Hsu: I just wanted to throw it out there.

Mr. Rankin had another question, which I want to ask in a different way. I'm wondering if anybody has thought about it from an economic point of view. If you had an extra dollar to spend, where would you help people the most? Would it be in spending it on reducing smoking or on reducing exposure to radon? Has anybody tried to figure out which one of those two will have a bigger effect on lung cancer? It's an economics question, so maybe it's too hard to calculate or something.

Ms. Kelley Bush: I'm not aware of any comparison like that being done within Health Canada. Smoking is definitely a bigger contributor. I think I should make that statement very clearly because we've worked with our colleagues on the tobacco side. With regard to a comparison, from an economic perspective, no.

Mr. Ted Hsu: Maybe I'll try another question. You mentioned that Health Canada has studied the effects of energy retrofits on radon. My question is about whether there's a synergy. We want to encourage energy retrofits for other reasons, and I'm wondering in terms of these two issues, energy efficiency and exposure to radon, whether there's some synergy in promoting both at the same time.

Ms. Kelley Bush: That is absolutely what Health Canada's looking at with the research we're doing, from two perspectives. From the perspective of the work that's being done to retrofit a home, is there an opportunity to build radon out in that situation? Secondly, with regard to what's being done to retrofit and seal up the home, is there a risk of increasing the radon level in the home? That research is still ongoing so we don't have all of the results.

The Chair: Thanks very much. Seeing as how it's Mr. Hsu's final committee meeting, we were generous in giving you an extra 20 seconds, sir. We're very generous on the health committee.

Next up, Mr. Young. Go ahead, sir. We'll have to take it off your time.

Mr. Terence Young (Oakville, CPC): Thank you, Chair. Thank you all for being here today.

Kelley Bush, I'm looking at your job title. I'm wondering if it actually fits on your business card because it's so long. I'm assuming you're the go-to person in the Government of Canada on this issue.

Ms. Kelley Bush: I do have a colleague who is responsible for the technical operations side and all the research, so we are both the go-to. It takes a big group to run the program.

Mr. Terence Young: Okay, good.

Do new homeowners have obligations to build with building codes across Canada to reduce the radon that gets into the house after the house is built?

Ms. Kelley Bush: The way the building code works is that at a national level it's a model code. If it's adopted at the provincial level then it's enforceable. The large majority of the provinces and territories have adopted the codes related to radon. Several of them are now taking them and making them more stringent as they have more data available with regard to the risk of radon in their provinces and municipalities.

Mr. Terence Young: Thank you. I bought four new houses since I got married. The last one was a few years ago. I don't know what they do. They pour a concrete frame. They put bricks up. What do they do to make the house safer from radon, to reduce the radon in the house? Physically, what do they do, or is it just a matter of ventilation?

Ms. Kelley Bush: There are two codes now. One is a sealing application, so it's a vapour barrier, basically, a very thick piece of plastic that goes under the concrete slab, and there's also a rough-in for a radon mitigation system. One of the most significant parts of installing a radon reduction system is having to core through that slab. If you have that four-inch PVC pipe there, capped, and it's available, it's much easier to install a radon reduction system.

● (1635)

Mr. Terence Young: How would I know if I have one of those?

Ms. Kelley Bush: It should be labelled.

Mr. Terence Young: It should be labelled. Okay, I'll take a look. Thank you. I also want to get my home checked.

I bought this kit for $35 at Home Depot, and then when I went to use it there were a bunch of reasons I couldn't use it, like the temperature wasn't right in the room. There has to be a certain temperature and you have to leave it somewhere for three months. I found it awkward, and then I made a mental note to bring in a company. I just checked online here. It's $300 to have your house tested—which I'll probably do—but then they want $400 to test the granite counters.

Can you talk about the risks from granite counters, please? In Oakville, every house has a granite counter; otherwise, no one's going to buy it.

Ms. Kelley Bush: Right. This was a concern that was raised in 2008, so in response Health Canada did a study. We looked at 35 different commonly used granites in Canada. Essentially, the result was that the risk is not from your granite countertops. Enjoy them. Keep them. The risk is in the ground under your home. The best thing you can do is to test your home for radon.

Mr. Terence Young: Thank you. You just saved me $400.

Voices: Oh, oh!

Ms. Kelley Bush: My pleasure.

Mr. Terence Young: You said there are two mitigation standards. There are building codes, etc., that they're working on. They're starting to realize them, but there's no line. One of my colleagues on the opposite side was talking about it. Is there a line when you buy a house that has to be there and your lawyer checks for it to make sure?

They used to have urea formaldehyde foam and it would say, “No, this house was never insulated with that foam.” Here, it would maybe be, “Yes, this house had a radon test and here's the result.” There's nothing like that out there, is there?

Ms. Kelley Bush: It's in very few communities. They have it in some communities. Those real estate documents differ quite a bit across the country.

Mr. Terence Young: Is there any measurement of what percentage of lung cancers, or...? What is the contributory factor of radon to lung cancer nationally?

Ms. Kelley Bush: I'm not sure I completely understand the question.

It's been estimated that 16% of lung cancers are related to radon exposure, but....

Mr. Terence Young: That's helpful. Thank you very much.

Is there any evidence that there are more lung cancers in those communities you mentioned earlier, where there are more houses with an amount of radon that's up to 10% or 20% above normal, where it should not be?

Ms. Kelley Bush: I don't know that I can speak to that in detail. There have been some, but there are also communities where that hasn't been demonstrated. Probably the best answer is that it's not consistent.

Mr. Terence Young: There's only one kind of radon, right?

Ms. Kelley Bush: There is.

Mr. Terence Young: Is it a matter of ventilation in the homes or something, or maybe some mitigation the homeowners have done, or maybe some populations aren't as susceptible to it as much as others are? Is there any hint of that?

Ms. Kelley Bush: Similar to the question of asking a lifelong smoker why they didn't develop lung cancer, it's very hard to explain exactly why some are impacted more than others.

Mr. Terence Young: Right.

Perhaps you could take a minute and tell us, so that it's in the record here, the steps that homeowners who are concerned about this should take.

Ms. Kelley Bush: Test their home. They have two options. They can buy a do-it-yourself test kit or they can hire a certified professional. If the levels are high, take action to reduce, because it's easy. The cost is similar to other home maintenance costs. It's similar to a new air conditioner or a new furnace, and it will reduce your radon by up to 80% to 90%.

Mr. Terence Young: That's it.

Ms. Kelley Bush: That's it. They can call Health Canada if they have any questions, because we're more than willing to help.

Mr. Terence Young: Thank you very much.

Do I have any more time, Chair?

The Chair: Only if you're resigning.

Voices: Oh, oh!

The Chair: Unless you have an announcement to make, that's it.

That concludes our first round. We'll suspend for a minute and bring up our next panel.

Thank you for your time.

● (1635)

(Pause)

● (1640)

The Chair: Let's begin. We are on a very tight timeline here.

First up is Tom Kosatsky, scientific director from the National Collaborating Centre for Environmental Health.

Go ahead, sir.

Dr. Tom Kosatsky (Scientific Director, National Collaborating Centre for Environmental Health): Thank you.

I am Tom Kosatsky, as introduced. Thank you so much for having me and my colleagues Sarah Henderson and Anne-Marie Nicol.

The National Collaborating Centre for Environmental Health is one of six such centres funded by the Public Health Agency to increase the game, to up the game of public health practice across the country. We do it by letting people know about what's new, about what's effective, and by working with public health practitioners across Canada to do that. We're housed at the British Columbia Centre for Disease Control, where I'm also the medical director for environmental health. Radon is one of my interests.

I'll speak to lung cancer—not to smoking, although, as you've heard, it will come into the conversation—and radon in terms of public health policy for Canada. If you can follow the slides, you'll see that the first one looks at the importance of lung cancer across the country. It's the second leading cause of cancer in men, third in women, but the leading cause of death from cancer in both men and women. I'm not sure everybody knows that. It's far more important as a cause of death than breast cancer, as an example, in women, and far more important than rectal cancer, colon cancer, or prostate cancer in men.

The next slide looks at some of the historic evidence linking smoking, which everyone now knows is linked with lung cancer. Even when I was born, around when those studies were done, this was something that was denied. You remember those ads: your doctor smokes Marlboro.

It was found through studies of doctors that they demonstrated that smokers had 25 times the lifetime risk of lung cancer—

The Chair: Excuse me, Mr. Kosatsky.

Go ahead, Mr. Toet.

Mr. Lawrence Toet (Elmwood—Transcona, CPC): Dr. Kosatsky seems to be referring to a slide deck that I don't seem to have.

I think many of my colleagues are scrambling to find it too.

The Chair: It was the motivation of our committee to be paperless. I think that perhaps is why many members do have it, but just not on paper.

Dr. Tom Kosatsky: I think members have it now, from what I can see.

The Chair: Yes, they all received it; it's just in another place.

Dr. Tom Kosatsky: You know, anyway, that smoking causes lung cancer in smokers. You probably also know that to a degree it causes lung cancer in people who live with smokers. I won't really talk about either of those things, but if you can get to the slide that's marked “Lung Cancer in Lifelong Non-Smokers”, you'll see that there is a new thing that's been described only over the last, about, 10 years, which is lung cancer in lifelong non-smokers, something which, before this committee invited me to speak with you, I didn't know much about. It turns out that it's a whole other disease. It has some similarities to smokers' lung cancer but some very important differences.

The geography is different. It's a huge phenomenon in Asia and in Asians in Canada. It has a female predominance, so there are far more lung cancers in female non-smokers than in male non-smokers. The age distribution is different, so it tends to present itself at a much younger age than smokers' lung cancers do. The cell types, the cancer types are different. The typical small cell squamous lung cancer that you see in smokers, you don't get in non-smokers. You get a whole different cell type and cell shape. The genetics are different, so there is some family relationship. It's not very strong, but there's a very strong genetic relationship based on genetic analysis. You can almost predict who's going to get it, which is a really important thing. Further, it tends to be much more symptomatic at diagnosis than is lung cancer in smokers. The five-year survival, oddly, is better, even though it presents later, for non-smokers' lung cancer than for smokers' lung cancer. In many ways it's a different disease.

Radon-related lung cancer is somewhere intermediate, because, as I'm going to say, most radon-related lung cancers occur in smokers. The question of whether it is more cost-efficient to stop smoking was right on the mark.

The next one is called “Principal risk factors (excluding occupational exposure)”, only because you asked. There are a number of conditions, including radon exposure, that are associated with non-smokers' lung cancer, like the history in your family. It's associated with hormone use in women. It's associated with environmental tobacco smoke. It's associated, to a degree, with air pollution. It's associated with cooking-oil fumes, so indoor cooking over a long period of time. It's associated in Asia and Africa with domestic heating by wood and wood products in the home. Those are also associated with lung cancer. Something that I didn't know much about before is that it's associated with lung infections like tuberculosis and other lung infections over a long period of time. It's also, like so many of the other bad things in life, associated with being poor. Getting lung cancer is associated with being poor, even if you eliminate all the other stuff. To a degree it's mitigated or prevented by a diet high in fruits and vegetables, so eat your leafy greens, eat your fruit, and you're less likely to get lung cancer no matter what else you do.

The next one is an American slide. It has a little American flag, and it looks at the attributable percentage of lung cancer by cause. For active smoking, it's 90%. For radon exposure in the U.S., it is between 9% and 15%, and in Canada it's estimated at 15%. For workplace carcinogen exposure, it's 10%. For air pollution, it's 1% to 2%. That adds up to more than 100% because, as you'll see, some of those causes add to or multiply each other. If you're exposed to radon, don't smoke. If you smoke, don't be exposed to radon.

Non-smokers' lung cancer is a really important cause of lung cancer. It's about number six in terms of all the causes. Radon-related lung cancer—this is U.S. data but for Canada it would be the same—is number eight. How could that be? It could be because smoking and radon exposure are interactive, so one multiplies or adds to the effect of the other. That leads, in any case, to non-smokers' lung cancer being a very bad issue.

Any radon exposure is bad news, not just at over 200. An artificial limit, no matter what it is, is not very useful for lowering the whole population's exposure. It would be better if we were all exposed to less radon rather than picking one area, maybe for convenience, or one level. It may be good for convenience, but it's not a really useful population health measure. For the whole population, it would be better if we were all exposed to less radon. It's a linear relationship. The more radon you're exposed to and the longer you're exposed, the more likely you are to get lung cancer.

● (1645)

The other thing is that, as I was saying, the more you smoke the more it interacts. On the last slide, which I made up using Canadian data, most radon-associated lung cancers occur in smokers. If you've never smoked, as you get up to high levels, like interior B.C. levels, of radon about 36 people out of 1,000 exposed to those levels would get lung cancer. On the other hand if there was no radon exposure and you did smoke, about 100 people would get lung cancer. If you add the two together, you're exposed to a high level of radon and you smoke, 270 people exposed to those two for their whole lives, smoking and radon, will get lung cancer. It's 270 out of 1,000 people; that's tremendous.

How can you lower it? The number one way to lower it is to stop smoking or to never have smoked. The number two way to lower it is to lower your radon exposure, and you'll do that for everybody in the population. The less smoking there is, the less radon there is, the less lung cancer there will be, to the point that as we lower the level of smoking exposure, radon will become a more important cause of lung cancer. But there will be a lot less lung cancer. If we eliminate smoking, there will be less lung cancer in general, but all of these other causes other than smoking will increase in focus. The big issue is the interaction, the doubling, tripling, quadrupling, or really octupling effect, because it's an eight-time effect, of smoking and radon will go away.

What's been the Canadian public health stance on radon? Before the year 2007, it was pretty passive and largely seen as a private issue. Health Canada was helpful. They gave advice when people asked for it. That was at the time of the 800 becquerels per metre cubed, or 800 disintegrations per second per metre cubed level, which is what a becquerel is. Then when the level was lowered a more active stance was taken. Health Canada was involved with large-scale testing across the country to establish a radon profile across the country so that we knew what our levels were likely to be. They were much more active in terms of giving advice, and with this lower guideline, they promoted it and they encouraged “test and remediate”. Test and remediate to me is not the way to go. The way to go is to build it out in the first place.

If you look at this complicated Ontario slide, Ontario looked at levels of radon across the province and how many cases of lung cancer could be saved by doing something for those above 200 becquerels per metre cubed, by adopting 100 becquerels per metre cubed, by adopting 50 becquerels per metre cubed—all of which are attainable—or by going to as low a level possible and getting close to outdoor air levels, which are relatively benign. At 200 becquerels per metre cubed, if every Ontario resident got their house from that point down to outdoor levels, 2% of all the lung cancers in Ontario would be averted. If you got down from current levels above 200, if everybody tested and remediated and they successfully got their house down to background or no radon, it would avert 2% of all lung cancers. If all houses in Ontario with any level of radon in them could get down to outdoor levels, we'd get rid of 13% of all Ontario lung cancer deaths. If there were a way to do it, why not do that? Why not get it down lower?

The next slide looks at the change in levels of radon over time. This is Dutch data. Canada would be the same. Yes, as we've made our buildings tighter, radon levels have increased. This is even more reason to look at the joint effects of building changes on radon.

● (1650)

The Chair: Mr. Kosatsky, we're a bit over time. I'm just wondering if you could wrap it up.

Thank you.

Dr. Tom Kosatsky: I can finish in one minute.

Even if everybody tested, and everybody whose house was over 200 did remediation, we'd only touch lung cancer in Canada in a minor way. So what should we do? We should and we can build radon out. The new building code, the guidance levels, and provincial adoption help but only in a minor way. It would really help if we installed fans along with this dead-end piece of plastic that's part of the new building code, vent the radon out, and have very low levels in people's houses. People wouldn't tamper with it. You'd live in a low radon house. You wouldn't have to label it. You would know it when you moved in.

It will take years before every new house in Canada has a low radon level, but at least our children and grandchildren won't have this scourge. It's much more cost-effective to do that than it is to mitigate. The cost is much lower per house, and it will have long-lasting effects on the house itself.

What should we do? We should adopt a population approach, look at the whole population and not just the people who have a lot of radon in their houses. We should question the current guideline and lower it to as low as reasonably possible. We should legislate radon-resilient building stock, so we could build radon out of new buildings. People who live in existing houses will say, "How come my neighbour has this house? I want that too." That would be the best encouragement for people themselves to test and remediate.

We should use provincial authorities for day care centres, schools, and workplaces to emulate what goes on there in our own houses, and we should integrate the anti-smoking and radon-lowering messages, because if we have no smoking and no radon, we will have almost no lung cancer, the number one cause of cancer deaths in this country.

That's the message. Thank you for hearing me.

● (1655)

The Chair: Okay. Thanks very much.

Next up from the BC Centre for Disease Control is Sarah Henderson.

Dr. Sarah Henderson (Senior Scientist, Environmental Health Services, BC Centre for Disease Control): Good afternoon.

There is a slide deck for me as well. The first page of that slide deck should say, "Radon risk areas and lung cancer mortality trends in British Columbia". I hope that you all have it. I will try to speak to the slides as I go along for those who don't have them.

I want to start by saying thank you so much for inviting me to be here. It's a real honour.

My title at the BC Centre for Disease Control is senior scientist, and I'm really a research scientist. The mandate of my role is to conduct applied public health research in support of good environmental health policy for the province, and that's how I first became interested in radon in British Columbia.

I'm going to show you some real, hard numbers today that come directly from the population data for British Columbia, and that's a bit different from what everybody else has been talking about so far.

If you move to the first slide, it's just a recap of the current guideline values for radon in Canada. We've heard about the number 200 all day, and any concentration lower than that is below the Health Canada guideline. Then if you measure your home and the concentration is between 200 and 600 becquerels per metre cubed, Health Canada currently recommends that you try to remediate that within the next couple of years, whereas if your measurement if over 600 becquerels per metre cubed, they really recommend that you remediate right away. That is the high-danger area for radon.

We've used these values in British Columbia to sort of break up the province into areas that we consider to be low, moderate, and high radon areas. If you are not seeing this in colour, the darkest areas there are coloured in red, and those are the high radon areas.

We're very lucky right now in British Columbia. We have a database of over 4,000 residential radon measurements, including measurements from Health Canada national surveys as well as from a bunch of surveys that have happened in the province, so we were really able to use the data that we have observed in the province to break things up this way. These geographic regions are called local health areas. They're the smallest health geographic unit that we use in British Columbia. We are able to look at deaths that have occurred in this province at this geographic scale, which is why we've used this geographic scale.

We did something quite simple, but I hope you'll agree, also quite effective. We looked at the province by those regions, and over the course of 25 years we summed up all of the deaths attributed to lung cancer in the low, moderate and high regions, and all deaths attributed to all natural causes, and then we divided the number of lung cancer deaths by the number of deaths from all natural causes, and in general, we expect about 7% of all deaths in B.C. to be attributed to lung cancer, which is probably true for most of Canada.

Slide number 4 shows the hypothetical situation. If there were no lung carcinogens in the world other than radon, we would expect lung cancer to be high and steady in the higher radon areas, somewhat lower and steady over time in the moderate radon areas, and then lower still and steady over time in the low radon areas. That's the framework I want you to think about when we go to this next slide.

When we looked at all deaths in British Columbia, we saw something quite different from what one would expect to see under that hypothetical scenario. The bottom line there shows the low radon areas. You might not be able to see that if you're not looking at it in colour. The middle line, which is just a little bit higher than the bottom line, shows the moderate radon areas. Then that line that is sloping upward over time and is quite distinct from the low and moderate lines is the lung cancer mortality proportion that we see in high radon areas over the past 25 years in British Columbia.

We don't have a lot of data about these people. We're doing this with only administrative data. We don't know whether or not they smoked. We don't know whether or not they lived their entire lives in those high radon areas. There are a whole lot of limitations here that we simply can't speak to.

● (1700)

When we split up these data by the higher and lower smoking regions of the province—we know that smoking rates can be up to 30% in some areas and down to 12% in some areas of B.C.—we still see these same persistent trends. It does seem to be that radon is an important factor here.

Another important distinction, and I think it's probably why I was asked to be here today, is what we see when we look at the trends for men versus women.

To look at men, the low line shown on the slide is the low radon areas, the middle line is the moderate radon areas, and the top line is the high radon areas. There's not as big a difference among those three lines as there was when we were looking at everybody together. In general, the lung cancer rates are going down. That's what we expect as the population stops smoking. When we go ahead and look at women, as shown on the next slide, we see the low and moderate lines towards the bottom there, and then the line for women is just taking off and is quite divergent from the other regions.

We're seeing a pretty big difference with respect to the two sexes here when we split up these data. Speaking anecdotally, it's not very scientific, but those of us who are interested in radon in British Columbia hear so many stories from people who say, “My wife died of lung cancer and she never smoked a day in her life.” This matches up with what we hear anecdotally, although that's not very scientific.

Somebody asked about the burden of radon-related lung cancer in high- and low-risk areas according to the current Health Canada guidelines. On this next slide, what we see is from data published by Jing Chen from Health Canada. There's an estimate of 6% of the housing stock currently being over the 200 becquerels value, and that's related to 28% of lung cancers in Canada, versus 94% of the housing stock being under the guideline value and 72% of all radon-related lung cancers being attributable to homes in that range. The bulk of the burden really remains below what we're currently talking about in terms of the Health Canada guideline.

This very point is something that we've addressed in a new paper. I want to make it clear that this work has not been published yet. It's currently under review, but it's not in the scientific literature and it has not been peer-reviewed. We looked at a bunch of different threshold values. It's really just a line in the sand that we're drawing when we say that 200 is the level or 100 is the level. We took that line in the sand and drew it at 600, 500, 400, 200, 100, and 50 becquerels to see whether or not we could still see a clear distinction between high and low radon areas in B.C. with respect to lung cancer mortality trends when we drew that line in the sand in different places.

Indeed, if you look at the far right-hand side, that top plot shows you lung cancer mortality trends in men and in women at a threshold value of 50 becquerels per metre cubed, and you can see that the trends are still distinct from one another. We still see that sharp increase in lung cancer mortality in women in the high radon areas.

In the final slide, the key message again is that these are very limited administrative data. This is something we've done as a surveillance exercise. It was really an exercise we undertook because a lot of the evidence we use in Canada to build our policy comes from places other than Canada. We're pulling together studies that have happened in Europe, the U.S., and elsewhere. We really wanted to show some hard-hitting data from the Canadian context.

Again, most radon-related lung cancers in Canada happen below the current guideline of 200 becquerels per metre cubed. We see clear temporal trends by radon risk areas of British Columbia. We have not repeated similar analyses elsewhere in Canada, but I wouldn't be surprised to see similar results. The trends that we see at 200 becquerels per metre cubed persist when we drop that threshold to 50 becquerels per metre cubed. This is really supportive of that idea of ALARA, or “as low as reasonably achievable”. As Tom said, the way to pursue ALARA in Canada is really through widespread changes to our national building code to protect the population into the future.

● (1705)

We have estimated that it would take about 75 years to turn over the entire residential building stock in Canada, or most of it, but at the end of that 75 years, you would have a radon-resistant building stock and a population that was well protected.

Finally, there does appear to be a difference between men and women in terms of risk.

Thank you very much for your time.

The Chair: Thank you very much.

Anne-Marie Nicol, go ahead.

Professor Anne-Marie Nicol (Assistant Professor, Faculty of Health Sciences, Simon Fraser University, As an Individual): You should also have a slide deck from me. It says “Radon and Lung Cancer” on it. I recognize I am the very last person, and I appreciate your persistence. Luckily many people have also spoken to a number of the points that I wish to discuss, so I will go very quickly over the first few slides.

I am an assistant professor at Simon Fraser University in British Columbia. I also work at the National Collaborating Centre with Tom and Sarah, and I also run CAREX Canada, which is the carcinogen surveillance system funded by the Canadian Partnership Against Cancer. I am here because we prioritized Canadians' exposure to environmental carcinogens and the leading causes of cancer-related deaths from environmental exposures, and radon gas was by far the most significant carcinogen. I admit that when I started my research at CAREX, I had never heard of radon gas either. When I went back into the literature, I realized that over time Canada has actually played a very important role in understanding radon and lung cancer.

The data from many of the studies that were done on uranium miners, at Eldorado and even here in Ontario, has been used to determine the relationship between exposure and lung cancer. We've actually been on the forefront of this issue but very much in an academic context rather than in a public health context.

We've already discussed the fact that the WHO notes that this is a significant carcinogen. I would also like to point out that agencies around the world are coming to the conclusion that radon is more dangerous than they had previously thought. In 1993 we had a certain understanding about the relationship between radon gas and lung cancer. That's doubled. The slope that Tom was talking about used to go like this and now it goes like this. Radon is now known to be much more dangerous than we had originally thought. The reason for that is that radon is actually an alpha-particle emitter.

We are a uranium-rich country. Uranium is in the soil and as it breaks down there is a point at which it becomes a gas. That means it becomes movable within the soil. That gas itself gives off alpha radiation, which is a very dangerous form of radiation that can damage DNA. On the next slide you'll see both direct and indirect damage to DNA. This information is compliments of Dr. Aaron Goodarzi. We actually have a Canada research chair studying this at the moment in Alberta.

The next slide, on radiation and DNA damage, shows that alpha radiation is powerful. It doesn't penetrate very far, so if it hits our skin, it doesn't do as much damage as it does if it gets into our lungs. Our lungs are very sensitive. The lining of our lungs is sensitive and when the cells in them are irradiated, they get damaged. Alpha particles are very destructive. The damage is akin to having a cannon go through DNA. That kind of damage is hard to repair, and as a result the probability of genetic mutations and cancer goes up.

The next slide is on strategies for reducing risk. Just to recap, the kind of damage done by the radiation emitted from radon is significant. The damage is difficult for the body to repair once radon is in the lungs.

The next slide is on education and priority setting. Radon does exist across the country. People have developed radon-potential maps. This one is compliments of Radon Environmental where they've looked at where uranium exists and where the potential for higher-breakdown products is, although we do recognize that every home is different. Also there's a map of the United States to show that we are not alone in this and that the states that are on the border have a similar kind of radon profile to that found in Canada. We know that under our current Canadian strategies, we need to educate not just the public but ourselves. Most public health professionals have never heard of radon. When we do work out in public health units, environmental health inspectors, public health inspectors, and medical health officers are still unaware that radon is dangerous. Many bureaucrats and ministries of health are unaware that radon is dangerous.

Also health researchers are only really beginning to do work in this area across the country. In order to have building codes changed, people need to know why you're changing them. We need testing and remediation training. People need to understand why they're actually doing this kind of work.

Kelley Bush alluded to the fact that they've been tracking awareness among the population. This is done by Statistics Canada. The next slide shows a representative Canadian sample. It's been done since 2007 actually, but these are results for 2009 onward. You can see that about 10% of the population were aware of radon. That's gone up to about 30%. This is the number of people who know what radon is and can accurately describe it. We're still at around 30% of the population who know that radon can cause lung cancer.

● (1710)

Health Canada does recommend that everybody test their homes. The next slide, which is also using data collected by Statistics Canada, clearly shows that very few people have tested their homes. Less than 10% of Canadians across the country have tested their homes. We have had a radon awareness program since 2007, so why aren't people testing? We don't have regulatory requirements, as Kathleen Cooper stated earlier. People need to be aware and motivated to change. It's up to the consumer. We have left it up to the consumer to test their own home.

I believe things like denial, the invisible nature of the gas, and people simply being unaware contribute to this. Test kits are still not that readily available across the country. You can phone and ask where you can find them, but they're not always there. In rural regions it's much harder for people to get access to test kits. People then fear the downstream costs of remediating—i.e., I don't want to go in there because I don't know how much it's going to cost me to fix my basement. In some cases the costs can be somewhat considerable, depending on the structure of the home.

Turning to the next slide, I believe to reduce the lung cancer risk from radon gas we need more leadership. The government can legitimate this as a risk. It's something that people don't know about, and we need to take a stronger role in getting people more engaged in this topic. It's not just Health Canada; it's all levels of government —ministries of health, provinces, municipalities. We need to be training people in the trades so they know what they're doing when they're building those radon-resistant homes, and why. Why is that pipe important? Why is that fan important? Again, we need to build radon out, going forward.

Other countries have shown that providing financial assistance works. People will energy-retrofit their home because they get a rebate, but the energy retrofit does increase radon levels. There is clear evidence that this exists. The tighter your home, the more the radon gas remains in your home. In Manitoba they're doing research to look at that at the moment. In Manitoba, though, you can also now get a rebate through Manitoba Hydro to do radon remediation. Some parts of the country are starting, but we need to be offering some kind of incentive for citizens to do this.

I would also like to put in a plug for workplace exposure, because I do study workplace exposure and radon. There are places in the country where people work underground, or in basements and even ground-level buildings, where radon levels are high. Some of these are federal government workers. We need more testing and remediation for workplaces.

That's it. Thank you.

The Chair: Thank you very much.

Mr. Sullivan, sir.

Mr. Mike Sullivan (York South—Weston, NDP): Thank you, sir. Thank you to the witnesses.

This is amazing information. If I take this home and talk to the folks in my riding, they'll get more scared than they already are. We've been fighting for the past 10 years to reduce the level of exposure to diesel exhaust, which the WHO has reclassified as a class A or class 1 carcinogen.

How does this compare with 464 diesel trains a day going past your house in terms of danger to the individual? Is this something we can wait on, or is it something we should be acting on immediately in a riding such as mine?

Dr. Tom Kosatsky: Diesel exhaust has a number of important health effects, primarily cardiovascular and respiratory. It increases the burden of emphysema. It makes you more likely to have heart disease. It makes you more likely to have a heart attack if you do have heart disease. It also can cause lung cancer. Radon only causes lung cancer. Effectively, it doesn't do anything else.

In terms of the impact, I don't know what the concentrations of diesel are by people's houses, but you don't live next to a locomotive or with a locomotive. I grew up in a basement in Winnipeg that had high levels of radon. And I don't blame my mother for that.

Voices: Oh, oh!

Dr. Tom Kosatsky: In any case, the intimacy of exposure to radon is more important than the intimacy or the regularity of exposure to diesel fumes. Between the two, in terms of the contribution to the population burden of lung cancer itself, radon would be far more important. Diesel fumes should be gotten rid of as much as possible as well.

● (1715)

Mr. Mike Sullivan: I agree.

The charts and graphs you showed us had two striking pieces to them. One, this seems to affect women more than men. I'll jump to the conclusion that maybe it's because their lungs are smaller; I don't know. Second, this seems to be on the increase since 1985, yet people lived in homes with radon many more years prior to that.

What is driving those two things? Are there any guesses from the panel?

Dr. Sarah Henderson: Everything would be speculation at this point. There does seem to be a bigger effect on women. We do know that if you took a population of non-smoking women and a population of non-smoking men, there would be more lung cancer in the non-smoking women. It might be that being female is, in and of itself, a risk factor for developing lung cancer, and that might be a genetic thing. There are lots of different ways that could go.

Also you have to think about this in the context of what the temporal trends were in smoking over the period of the analyses. Men took up smoking earlier and stopped smoking earlier on sort of a population scale. Women took it up later and stopped smoking later, so we're definitely seeing some of that interaction between smoking and radon in that upward trend. We do hope that over time it will plateau and start to come down again, and we'll keep paying attention in B.C. to evaluate whether or not that happens.

There's also the question of other environmental lung carcinogens. What is the interaction between radon and diesel exhaust? We don't know. What is the interaction between radon and something like asbestos or another lung carcinogen? We just don't know. There are all of these things happening in the environment and your lungs are the first things that the environment comes in contact with, so it's quite possibly interaction between radon and other stuff as well.

Mr. Mike Sullivan: You mentioned that only less than 10% have tested their homes and Manitoba is the only place where there is some kind of government position, through Manitoba Hydro, or aggressive position, I guess, on this whole notion of testing and remediation.

Are you recommending that the federal government also enter the fray and start to provide funding? I can think of many in my riding who couldn't even afford the test, let alone remediation. Is there something the panel is suggesting as something we ought to be doing nationally?

Prof. Anne-Marie Nicol: Kathleen Cooper's work has suggested a tax credit and there also are tax credits or different kinds of financial incentives that can be done through loans for renovation. Quebec does have a loan renovation program for which one can apply. They've just added radon to that as well, so if you have up to $3,000 of renovation costs and over, you can apply for radon remediation within that work.

There are different models for doing it, but I do believe that financial incentives are what get people to change. I changed my hot water heater because I got a financial incentive to do it. Otherwise, I don't think I would have done that. If we think about it, if we're offered just a little bit, all of us might take that extra step, plus it shows a leadership role.

Mr. Mike Sullivan: Thank you.

Dr. Tom Kosatsky: Also, we all agree that radon should be built out in the first place. That is the most important thing to do. Test and remediate should also be directed to priority areas. If you're living in interior B.C., your risk of having a higher level of radon in your house, never mind whether you test or not, is definitely higher. The chance if you live in Victoria or Vancouver is low. You might possibly have a slightly higher level, but the risk of that, based on tons of evidence, tons of tests that have been done so far, is very low.

Really, if we want to get a message across to Canadians about testing and remediation, it should really be directed to those areas where it's highest. But we'd all be protected if we built it out in the first place.

● (1720)

The Chair: Mr. Lizon.

Mr. Wladyslaw Lizon (Mississauga East—Cooksville, CPC): Thank you very much, Mr. Chair, and thank you to all the witnesses for being here.

First of all, I would like to thank the committee for agreeing to this study. It is my passion and I will be working on it because I truly believe that we should really address what is one of the major health issues that we have in this country.

To start, I have just a few basic questions for Mr. Kosatsky.

You mentioned in your presentation that lung cancer is actually different in smokers, in non-smokers.... Did you mention three types?

Dr. Tom Kosatsky: No. There are many types of lung cancer but the basic groupings of lung cancer tend to be different in non-smokers and in smokers so that if you looked at autopsy evidence, you would have a very strong chance of knowing whether the lung cancer you were looking at was occurring in a smoker versus a non-smoker without knowing the status of the deceased.

Mr. Wladyslaw Lizon: If you look at a smoker who also is exposed to radon and at people who are exposed to radon only, how do those types of cancer compare? Or do they compare at all?

Dr. Tom Kosatsky: It's a good question. Nobody has done a study like that. One could do it. That would be something that the CIHR, the Instituts de recherche en santé du Canada, should get into, because it's worth it.

You can almost pick them out. Typically, a non-smoker radon-exposed person would have a typical non-smoking cancer. They would have an adenocarcinoma with an early presentation at a late stage that was very sensitive to treatment. They would more likely be a woman. If they're also a smoker, on the other hand, they would tend to approach a smoker's type of cancer, which is a squamous cell cancer, more likely small cell, more likely less advanced at time of diagnosis, presenting based on an X-ray, not on symptoms, and not very responsive to treatment.

If you smoke, it pushes it towards the smoking zone.

Mr. Wladyslaw Lizon: This is probably a very basic technical question. Is the unit that's referred to a becquerel?

Dr. Tom Kosatsky: Yes, a becquerel.

Mr. Wladyslaw Lizon: I understand—and I don't know, so correct me if I'm wrong—that the radon gas we get at home would probably have different levels of radioactivity. How does this unit refer to the level of radioactivity in a gas? As I understand it, it's not only the level of the gas itself, but there's also the time of exposure. I would assume that the level of radioactivity plays a very important role here as well.

Dr. Tom Kosatsky: It's slightly complicated, but I'll get onto one of my other hobby horses, for what it's worth. It's not the radon itself that causes the lung cancer; it's the so-called degradation products of the radon. Radon is an inert gas, so it doesn't attach itself to lung linings. It's when radon transforms itself by atomic degradation into a radioactive metal that the problem occurs, because that attaches to your lungs. That attaches to dust, so more dust in your house is a bad thing if you also have radon. That's really what causes the damage.

A becquerel is a unit of disintegration. One becquerel per metre cubed is one disintegration per cubic metre of space, so that 750 becquerels per metre cubed is 750 disintegrations per cubic metre of space.

Dr. Sarah Henderson: That's disintegrations per second.

Dr. Tom Kosatsky: Yes, per second per cubic metre. Pardon me.

Each one of those alpha particles that either the radon itself or the metals it produces or releases causes a packet of energy to get into any cell it's next to. Radon gas itself, because it doesn't react—it's inert chemically—tends to be farther away. The radon-related metals that it produces tend to be very close to the cell linings. When they also release these alpha particles, it's the alpha particles themselves that wreck the nucleus of the cell and that ultimately cause lung cancer.

● (1725)

Mr. Wladyslaw Lizon: Just one last, maybe—

The Chair: A short comment, please, Mr. Lizon.

Mr. Wladyslaw Lizon: Yes, very short, Mr. Chair, because we were talking about an awareness campaign. Speaking for my constituents, the majority of them have no idea that we have radon and no idea about statistics.

When I go to a doctor's office, I see brochures about doing the PSA test or about checking my heart. I've never seen a brochure about checking my home for radon. Do you have any comments on that?

Dr. Tom Kosatsky: Both Health Canada and the BCCDC have encouraged doctors—those of us in British Columbia and Health Canada across the country—and have had awareness campaigns for physicians. We have issued pamphlets to physicians and have put it in the medical literature. Doctors can help with this, especially if their patients are smokers or live in high radon areas. They can do a lot to encourage people to do something to protect themselves from lung cancer. We could all do more, but we wouldn't need to do more if we'd build it out in the first place.

The Chair: Thank you.

Mr. Hsu, go ahead, sir.

Mr. Ted Hsu: Thank you.

My first question is just to satisfy my curiosity a little bit. I'm trying to interpret one of the graphs that Ms. Henderson produced. It's the one where at the top of the page there are different numbers corresponding to becquerels. There's a jump in the graph for women for higher radon areas, from between 400 and 300. Is that just statistics?

Dr. Sarah Henderson: Yes, it will be statistics. Basically, we're taking the province of British Columbia and we're saying, okay, if we draw the line in the sand at 300, these areas are higher-radon and those areas are lower-radon; and if we draw it at 400, these areas are higher-radon and those areas are lower-radon. The more area we have that is higher-radon, the more data we'll have from that area, and things will stabilize a little bit.

When you're talking about pretty unpopulated areas of the region, there are not that many lung cancer deaths in any given year, so it's definitely a statistical thing where the data get more stable as the threshold gets lower.

Mr. Ted Hsu: Okay.

The *y* axis of these graphs doesn't cross at zero. Presumably there's a whole bunch of lung cancer from smoking, and then on top of that you're seeing the effects—

Dr. Sarah Henderson: That's right. This is all lung cancers. We don't know which ones are attributable to smoking and which ones are attributable to radon. All we can say is that the areas with more radon and the areas with less radon have different patterns.

Mr. Ted Hsu: Okay.

Is this the only study that has picked out the difference between male and female trends in high radon regions over time?

Dr. Sarah Henderson: To the best of my knowledge, this is the only study to look at temporal trends in lung cancer mortality related to radon over time. We couldn't find anything else in the literature that was like this when we published it.

As part of the end of the study, we really encouraged other regions where there is a lot of radon to try to do the same thing with their data, to make sure that what we're seeing is true and not just some strange artifact of what happens in British Columbia.

Mr. Ted Hsu: Okay.

I'm just curious, have all federal government buildings been tested? Does anybody know the answer to that?

Prof. Anne-Marie Nicol: I think I know the answer to that. Most of the buildings have been tested. Kelley Bush probably has a better answer to this, but I believe the majority of them have been tested or are being finalized as being tested, yes.

Mr. Ted Hsu: You've proposed that we simply build out new residences and replace old residences as our priority strategy. May I assume that once you either build a new home to the correct specifications or remediate an old home, essentially for the life of that residence you don't have to...?

Your head is shaking, Ms. Nicol. When do you have to test again?

Prof. Anne-Marie Nicol: I'm not a radon remediator—I'll just put that out there—but one thing we're grappling with is that even with the new building stock, the building code does not have a requirement to test the home before people occupy it. In part that's because as you're building a home it's open to the air. Having a point at which the house is tested before an occupant enters is an important piece that's still being sorted out.

After the home is built to code, we still need to make sure it really is radon-resistant. Research in B.C. has found that in some cases the newer homes actually were higher than they had expected to begin with, so changes have been made and recommendations made in B. C. to fix that. But the building code is new, and it will go through growing pains. Understanding how effective it actually is will take a little bit more time.

● (1730)

Dr. Tom Kosatsky: Just for clarification, that's without a fan. If you build a home with the pipe that goes up to the ceiling and out the roof, and put in the fan, you're very likely to lower your concentration to negligible levels. If you just build the pipe and don't build the fan, you don't know what will happen.

The other thing is that because it's a passive system, you might help a bit or you might not. In some cases, you might even increase the level of radon in your house, especially if you open up the pipe and use it for your sump pump or a drain of some sort, as people do without knowing what it's for.

Prof. Anne-Marie Nicol: To clarify, the building code at the moment does not require a fan, just a pipe.

Dr. Tom Kosatsky: It does not require a fan, that's right.

Prof. Anne-Marie Nicol: So you can imagine that it would....

Mr. Ted Hsu: Has any research been done following remediation for perhaps older homes? How valid is the measurement—

Dr. Tom Kosatsky: There's a bit, yes.

Dr. Sarah Henderson: A student of mine actually talked to the primary contractor in British Columbia and looked at all of his pre-radon and post-radon tests; incredibly effective in terms of—

Mr. Ted Hsu: How many years does it last?

Dr. Sarah Henderson: How many years does it last? I think the point is that it will last as long as the system is well maintained, just like any other system in the home. Your furnace will last a long time if you put maintenance into it and make sure it's working properly. Radon reduction systems are very simple, really. It's just ensuring that the fan is operating correctly.

Dr. Tom Kosatsky: B.C. has looked at schools 10 years after remediation, and they've stayed low.

Mr. Ted Hsu: Okay.

The Chair: Good.

We're coming right near to the end. Mr. Toet and Mr. Clarke haven't had a chance to provide any comment. Do you have anything you'd like to add for the committee here?

Mr. Lawrence Toet: I just wanted to touch on one of the items that came up from Ms. Nicol.

You talked about why people weren't testing and one of the things I heard was this whole aspect of labelling. Was that part of what you did in any of that research?

One of my concerns with the whole labelling aspect, which we already run into now, is the stigma with homes that have been remediated from grow-ops. You have this stigma in Manitoba that a house will carry for the rest of its life. You could have spent $100,000 remediating the house and going right back to the basics and it will still carry that label for the rest of its life. You can't even get a mortgage for that house. Is that one of the things you've also heard people are afraid of with this whole radon thing, that if we start to label it, we're going to run into this same issue where that house will carry the stigma for its lifespan?

Prof. Anne-Marie Nicol: I think one of the things that the real estate agents are concerned about is that if someone has a house that tests high, then no one is going to want to purchase that house. But the evidence in the States where there are requirements for disclosure has been that people actually prefer a house that's already been fixed. With the corollary of asbestos, if you bought a house that had asbestos but has now been remediated, you're going to feel much better about being in that house than having to start from the beginning and testing it yourself.

It doesn't appear to be a stigma, at least in the United States, where people are required to disclose whether or not a house has been tested.

Mr. Lawrence Toet: I could ask you a lot more questions but I think Mr. Clarke wants to get a quick one in too.

Mr. Rob Clarke (Desnethé—Missinippi—Churchill River, CPC): Thanks very much.

Thanks very much, Mr. Chair.

One of the questions I have for you, Ms. Nicol, given that I come from northern Saskatchewan, relates to the high levels of uranium that we have, especially in northern Saskatchewan. In northern Saskatchewan a lot of the first nations and Métis communities have high cancer rates. Now it could be radon, but regarding the communities themselves, you mentioned that you had done a study in northern Alberta, but have you guys looked at northern Saskatchewan? We have a lot of myths out there: it could be from the radon, it could be from the food, it could be from the smoking, it could be from a number of environmental factors. Have you looked into that?

Prof. Anne-Marie Nicol: I personally have not, but there have been people across the country who have done work on first nations and Métis housing. There are people who could answer that question better than I could. It depends on the quality of how well the houses were built. Also, if houses were built badly but have lots of ventilation, that makes the risk of radon less than if they were enclosed.

Dr. Tom Kosatsky: It dissipates.

Prof. Anne-Marie Nicol: It dissipates. There are groups that are actually trying to assist first nation communities in this. I could provide you with information about that.

Mr. Rob Clarke: Yes, please do.

● (1735)

Mrs. Cathy McLeod: I have a point of order, Mr. Chair.

The Chair: Yes, Ms. McLeod.

Mrs. Cathy McLeod: Thank you.

Being that this is likely our last committee, unless we get recalled for some urgent situation over the summer, I just wanted to say that although I haven't been on the committee very long, I want to acknowledge your leadership and also the work of our clerk and analysts. Certainly from my perspective, it's been a committee that I've been very pleased to join at the end of the year. So thank you and a good summer to all.

The Chair: Thank you very much.

Mr. Murray Rankin: Perhaps on behalf of the official opposition, I could say exactly the same thing to our analysts, and to thank you as well, Chair, for your leadership. It's been really terrific to have unanimous reports, thanks to you—something that we rarely see in Parliament.

Thank you very much, Mr. Clerk.

The Chair: You'd wonder why we'd even have to have an election with all these unanimous reports.

Voices: Oh, oh!

The Chair: Mr. Hsu, do you have anything you'd like to add here?

Mr. Ted Hsu: On behalf of Ms. Fry, I would just thank you, Chair, the other members, and the analysts, the clerk, and all the others who work at this meeting, for your service.

The Chair: That's great.

Ms. Fry definitely was the spark plug in the engine that was the health committee.

Voices: Oh, oh!

The Chair: I would also like to thank all of our support staff who have done a great job for us—and you all know who you are. I thank everybody for working right to the end so that we could hear this important information and get it on the record.

I wish everybody a great summer and all the best in your future endeavours whatever they may be.

The meeting is adjourned.