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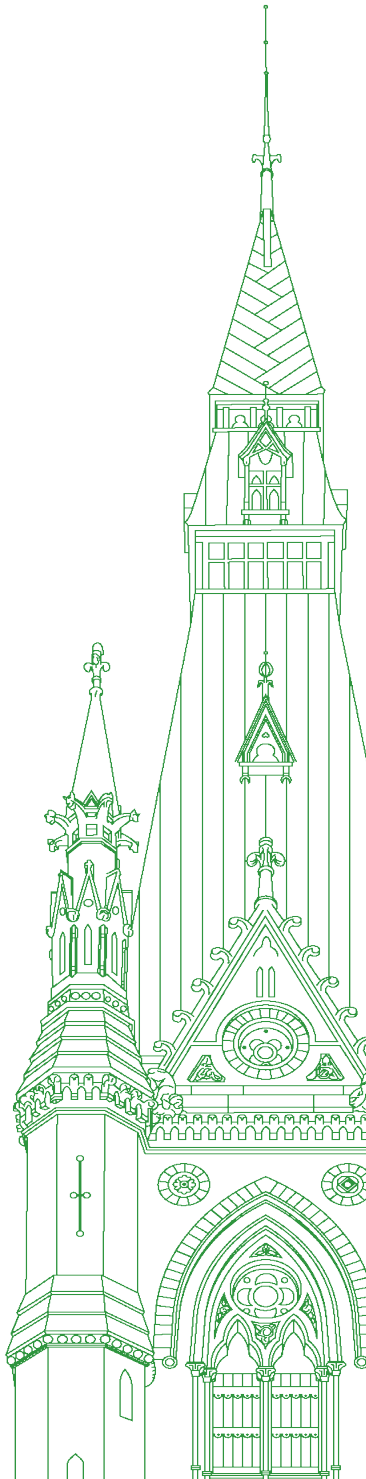

Chair: Mr. Ron McKinnon

# Standing Committee on Health

**Monday, July 6, 2020**

● (1100)

[*English*]

**The Chair (Mr. Ron McKinnon (Coquitlam—Port Coquitlam, Lib.)):** I call this meeting to order.

I'd like to welcome everyone to meeting 31 of the House of Commons Standing Committee on Health. Pursuant to the order of reference of May 26, 2020, the committee is resuming its briefing on the Canadian response to the outbreak of the coronavirus.

To ensure an orderly meeting, I would like to outline a few rules to follow. Interpretation in this video conference will work very much the way it does in a regular committee meeting. You have the choice, at the bottom of your screen, of the floor, English or French. As you are speaking, if you plan to alternate from one language to the other, you will need also to switch the interpretation channel so that it aligns with the language you are speaking. You may want to allow for a short pause when switching languages.

Before speaking, please wait until I recognize you by name, except during questioning. The questioner will generally indicate to whom the question is directed. When you are ready to speak, you can click on the microphone icon to activate your mike. I remind you that all comments by members and witnesses should be addressed through the chair. When you're not speaking, your mike should be on mute.

I would now like to welcome our first panel of witnesses. From the Canadian Center for Vaccinology, we have Dr. Scott Halperin, director of microbiology and immunology and professor of pediatrics at Dalhousie University. From the Canadian Generic Pharmaceutical Association, we have Mr. Jim Keon, president, and Mr. Peter Hardwick, chief commercial officer and executive vice-president of Apotex. From Innovative Medicines Canada, we have Ms. Pamela Fralick, president, and Mr. Dion Neame, country medical lead for Sanofi Canada.

With that, we will go to witness statements. Each group will have up to 10 minutes to make a statement.

We will start with the Canadian Center for Vaccinology.

Please go ahead, Dr. Halperin, for 10 minutes.

**Dr. Scott Halperin (Professor of Pediatrics and Microbiology and Immunology, Dalhousie University, and Director, Canadian Center for Vaccinology):** Good morning. Thank you for the invitation to meet with your committee and provide my thoughts about Canada's response to the COVID-19 pandemic. I am speaking to you as an individual and I am not formally representing any particular group. I will spend most of my time describing the research group and the research networks I lead, since my message to you is reasonably short and the details of my research activities will provide you with greater context for the questions you may have for me.

I am a professor of pediatrics and microbiology and immunology at Dalhousie University. I am also a pediatric infectious diseases subspecialist at the Izaak Walton Killam Health Centre in Halifax, Nova Scotia. I have been in Halifax for 35 years, after growing up and undertaking all of my training in the United States. I spend approximately 25% of my professional time doing clinical work, 25% in teaching and administrative work, and the remaining 50% dedicated to vaccine-related research. My declarations are that I am a researcher and I receive research funds from multiple sources, including federal and provincial funding agencies, foundations and vaccine manufacturers. I also serve on federal and provincial government advisory bodies, and ad hoc industry advisory panels. One such federal committee currently is the Canadian immunity task force.

As part of my 50% research time commitment, I am the director of the Canadian Center for Vaccinology, or CCfV for short. CCfV is a research collaboration of investigators at Dalhousie University, the IWK and the Nova Scotia Health Authority. While primarily based in Halifax, CCfV also has investigators from St. Francis Xavier University and other Atlantic academic centres. CCfV is organized into three groups.

The discovery group comprises basic scientists, including virologists, bacteriologists and immunologists, with the goal of creating new and improved vaccines, new adjuvants and new vaccine delivery systems, and understanding the immune response to infectious disease pathogens. The discovery group is actively involved in COVID-19 vaccine development. It is establishing the animal model for COVID-19 infection and evaluating biomarkers of COVID-19 disease.

The evaluation group is made up of clinician scientists, epidemiologists and statisticians who do epidemiological studies [*Technical difficulty—Editor*]. As one of the primary vaccine trial sites in Canada, our group is busy preparing for multiple phase one COVID-19 studies.

The policy, programs and implementation group is our most diverse group, comprising nursing researchers, pharmacists, health economists, bioethicists and experts in health law, anthropology, psychology, pediatrics, internal medicine and public health. This group endeavours to understand how and when vaccines are used, understand attitudes amongst the public and providers, and evaluate the effectiveness of public health policy and programs. The PPI group has CIHR and SSHRC funding to explore the effects of public health COVID-19 policy on various communities in Canada and overseas.

As part of my research program, I am the nominated principal or co-principal investigator for two national networks relevant to vaccine research. The designation “nominated PI” is a term that designates a person as responsible for administering the network in a fiscally responsible manner and meeting the funder’s objectives. It does not imply that the person is the one doing most of the research, which in fact gets done by the co-PIs and co-investigators.

IMPACT, the immunization monitoring program, is a Public Health Agency of Canada-funded surveillance network administered by the Canadian Paediatric Society at 12 of the country's pediatric hospitals, accounting for 90% of the tertiary care pediatric hospital beds in Canada. IMPACT has been in existence for 30 years and it undertakes surveillance for selected vaccine-preventable, or soon to be vaccine-preventable, infectious diseases and adverse events following immunization that are severe enough to require hospitalization.

The second network is the Canadian Immunization Research Network, which is also called CIRN. CIRN was originally established in 2009 as the PHAC-CIHR Influenza Research Network, or PCIRN, to build Canadian research capacity in anticipation of a predicted influenza pandemic, which happened to be declared within one week of receiving funding. PCIRN was granted $3.5 million a year for three years, which was increased to $4.5 million a year when the pandemic was declared.

PCIRN was highly successful at undertaking rapid clinical trials of candidate pandemic flu vaccines, undertaking large-scale safety surveillance during the initial vaccine rollouts and establishing the safety of vaccination in individuals allergic to eggs, amongst many other studies. PCIRN was so successful that it was decided at the time of its renewal to expand its mandate from just influenza to all vaccines of public health interest, changing its name from “Influenza Research Network” to “Canadian Immunization Research Network” and cutting its budget in half from $4.5 million a year to $2.2 million a year.

● (1105)

Here's my first message.

While I'm very appreciative of the substantial research support for PCIRN and the continuing research support for CIRN, pandemics and emerging infectious diseases are not solved. They are mitigated and will continue to occur. Over the last 11 years, globally, the WHO has declared public health emergencies of international concern for H1N1, influenza, polio, Zika, Ebola—twice—and now, SARS-CoV-2. Cutting back on public health readiness between crises slows the response to the next emerging disease. While paying for readiness may seem wasteful and an easy target when cost-cutting is occurring, eventually a price has to be paid. Once the COVID-19 pandemic passes—and it will pass—we should not drop our guard in regard to pandemic research capability.

What is CIRN doing now, in the current COVID-19 pandemic?

CIRN is organized as a network that comprises eight subnetworks. These networks span the country. Over 100 investigators at over 30 institutions are members of CIRN. The CIRN networks are either actively engaged in the COVID-19 research response or are poised to participate once vaccine candidates are identified.

The serious outcomes surveillance network of adult acute care hospitals has already received supplemental funding to undertake COVID-19 surveillance at adult hospitals and collect specimens to understand how people develop immunity and biomarkers that might predict patients who develop severe disease.

CIRN's clinical trials network, which performed phase one and two studies on Canada's Ebola vaccine five years ago, is currently designing phase one and phase two studies for candidate COVID-19 vaccines. Over 10 groups have approached CIRN to undertake phase one studies for them, and five are in the active planning stage.

CANVAS, the vaccine safety network, is prepared to undertake broad surveillance to detect any vaccine-associated adverse events during the early phases of a vaccine's rollout. CIRN's social sciences and humanities network will examine the public's response to novel vaccines developed to prevent COVID-19.

CIRN's other networks, including the reference laboratory network, the modelling network, the special immunization clinic network and the provincial collaborative network will also be heavily engaged as vaccines become available.

What's going well with Canada's COVID-19 public health and research response?

I am very pleased with Canada's aggressive research response to this pandemic, with rapid calls for proposals and awarding of research funds. The tri-council competitions have been well publicized and well managed, and the amount of funding has been substantial. Could it be more? Sure. Given that virtually all research, except for COVID-19-related research, was brought to a halt in Canada because of the health restrictions in the workplace, including in universities. This means that all of Canada's research talent turned to focus on COVID-19.

Despite increased levels of funding, the success rate of grants at the granting councils did not rise, the scores required to be successful did not fall and research that received very high peer reviews still did not get funded. Message two is that Canada has a lot of talent, and if everyone focuses on a single topic, it takes a lot of money—even more than the impressive amount already committed—to fund all the projects that are worthwhile.

My next point is a bit beyond my scientific expertise and more of a personal observation. A key aspect of Canada's successful public health and research response to the pandemic is that it has not become politicized. Canada, to date, has maintained the commitment to let the best scientific evidence guide its public health policy and research priorities. I think this is a critical factor in the control over the pandemic that we have achieved to date and our best effort to maintain control while awaiting a vaccine solution.

To close, while I don't think there is anything that has gone poorly in Canada's response, I do think there might be room for improvement. In the vaccine research and development arena, the process under way may have been more effective if there were a single person tasked to coordinate all of the activities required to bring a new vaccine into general use.

While all necessary activities are under way, some have been delayed, and information has not always been readily available when needed. There has been no single source for all information, or a directory to point someone in the right direction for answers about what are the required next steps. This leads to processes at times being established after actors in the field have already had to make critical decisions, leading to false starts and wasted time and effort.

A central clearing house established early in the pandemic in anticipation of vaccine development might have smoothed the process and made it more transparent to all involved parties. However, this is a criticism or suggestion regarding logistics in an otherwise very effective response to the COVID-19 crisis.

● (1110)

**The Chair:** Thank you, Dr. Halperin.

We go now to the Canadian Generic Pharmaceutical Association. I believe it's Mr. Hardwick who will speak.

You have 10 minutes. Please go ahead.

**Mr. Peter Hardwick (Chief Commercial Officer and Executive Vice-President, Apotex, Canadian Generic Pharmaceutical Association):** Good morning to you all. Hopefully you can hear me. I would like to thank the chair and honourable members for inviting the Canadian Generic Pharmaceutical Association to appear before the committee today.

In addition to my elected role as chair of the CGPA, I am the chief commercial officer and executive vice-president of Apotex, a Canadian-owned multinational pharmaceutical company and Canada's largest manufacturer of medicines.

CGPA president Jim Keon and I are pleased to have the opportunity to share our industry's response to the COVID-19 pandemic and highlight some of the ways that Canada can do more to ensure a sustainable and more resilient supply of prescription medicines for Canadians, moving forward.

Generic pharmaceutical companies are Canada's primary medicine manufacturers and exporters. CGPA member companies operate the largest life sciences companies and pharmaceutical manufacturing facilities in Ontario and Quebec. The industry directly employs more than 11,000 Canadians in highly skilled research, development and manufacturing positions. In addition to producing medicines for the Canadian market, made-in-Canada generic medicines are exported to more than 100 countries around the globe.

Our industry also plays a significant role in supporting Canada's health care system. Generic medicines are dispensed to fill 73% of all prescriptions in Canada but account for 19% of the $31 billion spent annually on prescription drugs. Up to 10 generic prescriptions can be filled for the cost of one brand-name prescription today.

From the outset of the pandemic, CGPA member companies have worked to provide support to our front-line workers. This has included donations of personal protective equipment and hand sanitizers, as well as financial supports for hospitals.

The industry has also provided support for potential COVID-19 treatments that are generic medicines. This has included two primary areas of focus. First, our industry has worked to secure a supply of generic medicines for these products to meet existing patient needs to ensure the continuity of their care. Second, our industry has donated tens of millions of tablets for use in Canadian and international clinical trials, and has expressed a willingness to retool our facilities and ramp up production for such products if they are found to be effective COVID treatments.

Our industry has also worked with governments, public health authorities, hospitals and international partners to help develop lists of essential drugs that are needed now and those that are needed for stockpiling in the event of subsequent pandemic waves. However, perhaps the most significant contribution by the generic pharmaceutical industry to Canada's COVID-19 response has been to provide Canadians with the medicines they need every day and to work to meet the new demands for hospital products and other products required to treat patients with COVID-19.

The pandemic has created unprecedented challenges and uncertainty for global supply chains in all industries, with border closures and export restrictions imposed by some countries and significant reductions in global shipping capacity. The pharmaceutical industry was not immune to these challenges.

Consider for a moment the sheer number of medicines we are dealing with. Generic pharmaceutical companies supply the Canadian market with hundreds of different medicines in thousands of different dosage forms. These products are used to fill three out of every four prescriptions. While many of these medicines are made in Canada, the industry is fully globalized. Finished products, manufacturing inputs and active pharmaceutical ingredients are also sourced internationally.

The CGPA is extremely proud of the dedication and hard work of generic industry employees to keep medicines in production in our manufacturing facilities and to keep medicines moving through the supply chain. They continue to provide an essential service for Canadians every single day, and we thank them. We would also like to recognize the important work of Health Canada and the trade commissioner service in helping our members address supply chain connectivity challenges, as well as the work of several provinces, distributors and pharmacists to help us ensure equitable access to the supply of medicines in a time of global supply chain upheaval.

The movement of all products internationally, including medicines, is much slower and more difficult that it used to be, and it is much more costly. While the situation has stabilized considerably, our industry is monitoring developments around the world on an ongoing basis to identify potential supply chain risks.

I will now turn the floor over to Jim Keon to provide our industry's recommendations from the lessons learned from COVID-19.

● (1115)

Thank you.

**Mr. Jim Keon (President, Canadian Generic Pharmaceutical Association):** Thanks, Peter.

I know the clerk has circulated to members a summary of the CGPA blueprint for a sustainable supply of prescription medicines for Canadians. The CGPA developed this blueprint based on some of the lessons learned during the first three months of the pandemic. It outlines our recommendations to make the prescription drug supply chain even stronger and more secure for Canadians.

The COVID-19 pandemic has served as a wake-up call for governments, health care professionals and the broader public on the importance of having a robust and resilient domestic pharmaceutical industry. In a recent interview with CBC Radio's *The House*, Deputy Prime Minister Chrystia Freeland noted that “one of the consequences of coronavirus is going to mean, for the economy, a shift from a sort of just-in-time, get-the-very-cheapest-input-possible model, to a model that puts a greater emphasis on resilience, puts a greater emphasis on supply chains that are closer to home”.

Putting a greater emphasis on resilience in the pharmaceutical supply chain will mean challenging the status quo and adopting new policy approaches. That is precisely what the CGPA is recommending.

The CGPA identifies specific measures to enhance Canada's existing pharmaceutical manufacturing capacity and domestic capabilities, create a more resilient pharmaceutical supply chain with increased supply redundancy, ensure Canada's role within a well-functioning global supply chain and encourage the establishment of a more coordinated approach to equipping Canada for future health emergencies.

I'm going to turn to our first area: strengthening the domestic pharmaceutical industry. Investments are needed to support Canada's pharmaceutical infrastructure. Companies will need assistance in preserving, refocusing and expanding domestic manufacturing infrastructure, and in increasing other infrastructure capacity such as warehousing. Companies may also require additional support to address the significant financial burden associated with maintaining higher stock levels of key manufacturing inputs and medicines.

The second aspect of strengthening the industry is increased regulatory convergence, both nationally and internationally. The reality is that Canada is a costly and complex jurisdiction for generic manufacturers to operate in. Removing unnecessary regulatory hurdles should be a priority.

The third aspect of this is pricing levels. “How low can you go?” pricing does not build resilience. A review of Canada's current pricing regime is needed to ensure that it is economically feasible to manufacture medicines in Canada and to be sufficiently competitive to acquire finished products and other inputs on the international market.

The fourth aspect of strengthening the market is strengthening the domestic industry. If the percentage of generic drugs used in Canada matched the current levels of use in the United States, Canada would save more than $11 billion annually.

The fifth aspect is that we are arguing for a sustainable domestic market for biosimilars to be implemented. This would involve maximizing the use of biosimilar medicines through broad implementation of well-controlled switching policies by public and private drug plans in Canada, including federal plans.

A second key area of our focus of the blueprint is securing and enhancing Canada's role in the international pharmaceutical supply chain. This could include, for example, the development of an international pharmaceutical supply chain security agreement, which is something we have recommended.

The third and final key area of focus in the CGPA blueprint is identifying essential generic medicines to domestically produce and stockpile for Canadian needs. A coordinated approach is needed among federal, provincial and territorial governments to establish a list of high-priority medicines. Building a domestic stockpile of these products would also require guaranteed volume and price agreements with companies.

The CGPA and its member companies look forward to working with Canadian governments and other stakeholders to turn the objective of a sustainable supply of prescription medicines for Canadians into a reality.

Peter and I would be pleased to answer any questions you may have this morning. Thank you.

● (1120)

**The Chair:** Thank you.

We go now to Innovative Medicines Canada.

Ms. Fralick, please go ahead for 10 minutes.

**Ms. Pamela Fralick (President, Innovative Medicines Canada):** Thank you, Mr. Chair and honourable members, for the opportunity to meet with you today.

I'd like to start by acknowledging the efforts of the entire federal government to fight the spread of COVID-19 and to protect our economy. As a Canadian, I'm proud of how our government has risen to the challenge. I've spent most of my working life in the health care sector. I can honestly say that the degree of co-operation we are seeing across governments, our health systems, industry and civil society is something I've never experienced, and Canadians will be better off for it.

I'm here today on behalf of Innovative Medicines Canada. IMC represents not just 40 companies from the innovative medicine and life sciences sectors, but also the tens of thousands of Canadians who work for them. Day in and day out, they dedicate themselves to ensuring all Canadians have the medicines they need, when they need them.

I'm joined today by one of them: Dr. Dion Neame. Dr. Neame is a country medical lead for Sanofi Canada and country medical head for Pasteur, the vaccine arm of Sanofi. He's also a pediatrician working in urgent care clinics. He's here not as a company representative, but as an expert in the field of vaccines who can answer any questions you might have about some of the COVID-19-related developments taking place in Canada and around the world.

I mentioned that our membership consists of 40 companies. Together they contribute $19 billion annually in economic activity and support 30,000 high-value jobs across the Canadian economy. They also invest 10% of their revenues, or $1.2 billion per year, into research and development in Canada. Currently, there are more than 500 new products, medicines and vaccines in development in Canada, including therapies focused on some of the most devastating illnesses like cancer, as well as rare and infectious diseases.

Today, though, there is no greater priority than the fight against COVID-19.

Our members are collaborating like never before to accelerate the discovery and development of treatments for people infected with the virus and of vaccines to stop its spread. Our members are also providing financial support and in-kind donations to organizations on the ground in Canada and around the world. They're maintaining patient support and compassionate care programs put in place by industry to help keep Canadians out of hospitals and reduce the burden on health systems, and they're working with governments and other stakeholders to help ensure that patients, doctors and hospitals continue to have access to the medicines they need on a daily basis.

Dr. Neame will now describe the activities our members are undertaking towards a discovery of a vaccine.

**Dr. Dion Neame (Country Medical Lead, Sanofi Canada, Innovative Medicines Canada):** Mr. Chair, for over 100 years, through innovation, altruism and collaboration, Canada has successfully responded to infectious disease outbreaks. From Dr. John FitzGerald and the University of Toronto preparing a diphtheria and tetanus antitoxin to vaccine researchers developing the freeze-dried smallpox vaccine, Canada's innovation has helped save millions upon millions of lives.

Today, during the COVID-19 pandemic, 15 IMC companies have opened up their libraries of molecular compounds to share with the global scientific community to spur the development of vaccines and treatments for the COVID-19 virus through the Bill & Melinda Gates Foundation COVID-19 therapeutics accelerator.

In just two weeks, Roche Canada received over 800 submissions from Canada's scientific community through its COVID-19 innovation challenge, a $900,000 funding program created to bring forward innovative ideas to address the pandemic. In Atlantic Canada, BioVectra is manufacturing critical raw materials for COVID-19 diagnostic testing kits and collaborating with multiple Canadian biopharmaceutical companies and researchers on COVID-19 therapeutic products. Quebec's Medicago is rapidly moving forward on clinical trials to assess the safety and efficacy of a candidate vaccine, and scaling up production. In British Columbia, Amgen is building on 20 years of experience in the field of therapeutic antibodies and is actively engaging in anti-COVID-19 therapeutic antibody discovery efforts.

In short, we are witnessing an unprecedented effort in terms of the financial commitment to, and accelerated research and development of, prophylactic and therapeutic treatments for COVID-19, while continuing to produce and supply medications for existing patients. The ingenuity, innovative, creative and collaborative spirit and commitment of our industry are a testament to our values and our sense of responsibility to our country—Canada.

● (1125)

**Ms. Pamela Fralick:** Thank you, Dr. Neame.

I would like to shift to a topic that I know is on the minds of many, and that's the potential for drug shortages as a result of COVID-19.

IMC's membership consists of the pharmaceutical companies that discover, develop and deliver innovative new medicines, that is, brand-name prescription medicines. Our members continue to be vigilant in identifying potential supply issues and are committed to working closely with Canadian governments to quickly identify solutions. We support the efforts of Health Canada in this regard. In the event of any anticipated delays in supplying the Canadian market with an approved medicine to meet expected patient demand, our member companies would, in full compliance with the law, report this to Health Canada, and it would be made public on the drugshortages.ca website.

If there is one area where the federal government could provide additional support, it is in the area of COVID-related hospital products. Specifically, there may be an enhanced role for the federal government to play in coordinating provincial requests for additional supplies of drugs to ensure that no province and no Canadian goes without the medications they need.

Speaking more broadly, we recognize that reliable access to medications depends on many factors. These include regulatory simplicity, timely approvals for new medications and the continued smooth functioning of global supply chains. In this regard, we support Health Canada's ongoing commitment to take steps toward a simpler regulatory regime. However, more needs to be done to quicken the approval of new medications. We applaud the efforts made by the federal and some provincial governments to protect medical supply chains serving Canada.

On the topic of regulations, we remain deeply concerned about the impact that amendments to the patented medicines regulations will have on Canadians' access to new medications. Industry's concerns have not been adequately addressed by the recently revised guidelines. Our concerns are supported by independent studies and by the delayed product launches as a result of the regulations. The regulations will also hurt Canada's ability to realize the Department of Innovation and Science's HBEST strategy and attract investment to our life sciences sector at a time when provinces such as Ontario and Quebec want to build capacity in this area.

Let me assure you that IMC members are sensitive to the increasing strain on health budgets. However, since the recent federal court decision removed a key pillar of the PMPRB's approach to price regulation, a fundamental rethinking of PMPRB's approach is now required. We remain keen to work with the federal government on alternative solutions to the proposed changes to the patented medicines regulations that would ensure that Canadians continue to have access to affordable, innovative medicines. It is not too late to find another solution to reach this objective.

To return to the industry's response to COVID-19, I'd like to leave you with three examples of my members' contributions.

First, some of our member companies are ensuring patients' continued access to the treatments they need by providing their medicines free of charge if patients cannot afford them or if they lose private prescription drug coverage due to COVID-related unemployment. On this point, I am able to report that based on feedback received from some of our members, there has in fact been minimal demand for free medication from patients. One of our members, for instance, reported that they have seen less than 2% of anticipated demand for free medicine. Others are reporting similar experiences. This suggests to us that there are far fewer people without access to the medicines they need than expected.

Second, with some provincial health care systems experiencing critical skills shortages, Innovative Medicines Canada member companies are stepping up to help patients and communities. Many of our members are providing paid leave to health professional employees, enabling them to volunteer in health care facilities, where the need is greatest.

Finally, IMC members have created a special COVID-19 fund. A key initiative created through this fund is the creation of a research chair in pandemic preparedness. This is industry's way of helping Canada prepare for the next health crisis.

Thank you again for the opportunity to talk with you about how Canada's innovative medicines and life sciences sector is responding to COVID-19. Like your other witnesses, we would be pleased to answer your questions.

● (1130)

**The Chair:** Thank you all.

We will now start our questioning. We will do two rounds of questions and will start the first round with Mr. Jeneroux.

Please go ahead, Mr. Jeneroux, for six minutes.

**Mr. Matt Jeneroux (Edmonton Riverbend, CPC):** Thank you, Mr. Chair, and thank you to all the witnesses for taking the time out of the summer to be here with us.

Dr. Halperin, I have a quick comment to your comments. Coordination and logistics are certainly things we've heard about across the board in the response to this pandemic. Any specific examples that you can provide in that regard would certainly be helpful, as of course we're looking to make sure that the government's response to other potential pandemics is better the next time around.

Dr. Neame, I would like to start with you. With regard to some of the comments you made about the vaccine and vaccine research, we're hearing daily that new research dollars are being put here and new research dollars are being put there, not just in Canada but across the world. How likely is Canada to receive this vaccine, given competition from other countries such as the U.S. and China?

**Dr. Dion Neame:** Many of the IMC companies are, in fact, global companies. We will be working to develop vaccines, and when we develop those vaccines, it will be based on many of the volumes that we will...to understand the distribution.

I think one of the most important things is that it may necessarily not be—

**The Chair:** Pardon me, Mr. Neame, but could you hold up your mike, please?

**Dr. Dion Neame:** Yes. Thank you.

Part of what's going to be happening is the distribution of the vaccines. We have global organizations, in which Canada is involved, to understand how we will be distributing those vaccines. That also depends on, specifically, which company would produce the vaccine. I can direct you to Dr. Halperin, who is doing a lot of work on research for vaccines that are going to be in clinical trials here in Canada. He may be able to comment on that.

I can say that—

**Mr. Matt Jeneroux:** Sorry, Dr. Neame, but I'm short on time. Is it your opinion that Canada is at the table right now in terms of being able to get a vaccine, while in competition with other countries like the U.S. and China that are pouring lots of money into this?

**Dr. Dion Neame:** Yes, I would say that, and I would actually direct you to Dr. Halperin at this point.

**Mr. Matt Jeneroux:** Sure, I'd love to talk to Dr. Halperin about that, but I also want to talk to Ms. Fralick in regard to some of the PMPRB comments, as well. It's a major hurdle in getting a lot of these drugs to market.

Recently I read a few pieces that you produced, Pam. Would you say that here in Canada pre-COVID-19 to post-COVID-19 there has been a drastic increase in the competition for global investment dollars?

**Ms. Pamela Fralick:** I don't have data to speak specifically to that demarcation.

I can certainly say that in the pharmaceutical world and in life sciences, we have been struggling to attract global investment to Canada over the last couple of years, and that continues, but that is related to the uncertainty and now, frankly, the devastating implications of the Patented Medicine Prices Review Board changes that have been made, the regulatory changes.

**Mr. Matt Jeneroux:** I will just highlight some of your comments. I believe it was in The Globe and Mail that you said the following:

> Companies are not going to bring their latest, greatest, newest innovative drugs into a clinical trial in Canada if they have a good sense that that drug is not going to be available in Canada after the trial.... This means the patients, you and I, our families, friends and colleagues, are not necessarily going to have the drugs we need and should have.

That was on June 18. Has anything changed, in your opinion, since then?

**Ms. Pamela Fralick:** No, in our opinion, it hasn't. Our concerns remain the same. Our biggest driver in this industry is making sure that Canadians, patients, have access to the medicines they need. It sounds like a cliché, but there is no business without that outcome.

What we are seeing is, again, the uncertainty and the lack of balance between cost-containment initiatives and a drive for investment in this country, which is affecting the global desire to invest in this country. The companies are very aware of sustainability issues in health systems, but they need a viable business model to bring their products into this country. They're quite, and increasingly, reluctant to bring new, innovative products for clinical trials, as an example. We've seen a reduction of up to 50% in clinical trials since the regulations were brought in. Ethically, they understand that these drugs may not be available to those Canadians, given the regulations that will, at this point in time, come into play on the first of January.

● (1135)

**Mr. Matt Jeneroux:** Ultimately, it's the patients who will suffer, in your opinion.

**Ms. Pamela Fralick:** It's all about the patients. As you say, there is no industry without patients, and there is no industry without good outcomes for these patients. That is the driver, yes.

**Mr. Matt Jeneroux:** We heard that recently the PMPRB changes have now been pushed back to January. Have you had any sense that this is going to make a difference in terms of...? I believe one of your comments was that “Fortunately, it is not too late to find a solution that will avert this outcome. Industry is prepared to come forward.... We hope that government will be a willing partner.”

Have you had any sense that things are going to change?

**Ms. Pamela Fralick:** I remain an eternal optimist. I would like to think that this slight delay will give us the opportunity to open that door.

The industry has, for the last two years, been very open to working with government to find the best policy solutions possible. We have brought ideas and efforts forward. We are a global industry. We have many examples of where there is a very strong and collaborative relationship between industry, patients and governments. We've drawn from those to produce some ideas that we think government should be considering. We are entering into further discussions over the summer to do exactly that, and we will be pushing hard for a door to be opened. Let's get the best solution for Canadians, not just the one that is perhaps expedient.

**The Chair:** Mr. Kelloway, you have six minutes.

**Mr. Mike Kelloway (Cape Breton—Canso, Lib.):** Thanks, Mr. Chair.

Hello to staff, colleagues, and witnesses.

My questions will be focused on Innovative Medicines Canada.

It was maybe three or four months ago now that I spoke with one of your team members, Bobby Sutherland, and learned that a number of your clients from start-ups to large companies were involved in researching COVID-19, and specifically vaccine exploration.

Can you give me an idea of how many of these vaccine development projects are still under way, and are there any hopeful candidates? Can you give us a sense of where we are with what you know at this time?

**Dr. Dion Neame:** There are about 150 different companies across the world that have SARS-CoV-2 candidate vaccines. These are distributed into different types. It seems mRNA vaccines and subunit vaccines are the ones people are working on.

It is extremely complicated to make a vaccine, because it's a biologic. Usually, we're looking at 10 to 15 years, as I'm sure you well know, but now we're trying to cram that into approximately one to two years.

Many of the companies have moved very quickly, because they have had previous platforms for different types of viruses, whether it be Ebola or influenza virus vaccines. Those are the ones that are jumping ahead. Most likely, we will see a vaccine within the next year to two years. The question is always, “Is it safe, and is it efficacious?” This is where we must continue to do substantial phase one, phase two and phase three trials. If they work, they'll be ready to come to Canada.

We have to understand that we are dealing with infectious diseases. Although we talk about infectious disease and vaccines hand in hand, some infectious diseases are very amenable to vaccine production, and some are much more difficult. We're dealing with coronavirus, which sits in the middle. It's not HIV, which is very difficult for vaccine development, but it's going to be challenging.

**Mr. Mike Kelloway:** As a pharmaceutical company, how has your organization benefited from the $1 billion in national medical research strategy monies that were announced earlier in this pandemic? That's for either or both.

**Dr. Dion Neame:** With regard to the research funds, my company Sanofi has not benefited, but other companies have. This is not about one or two different companies. Across the board we have to try to—

● (1140)

**Mr. Mike Kelloway:** It's a web.

**Dr. Dion Neame:** —do our best.

I've been in great communication with Health Canada. It has asked me to find small biotechs in Canada that we can introduce to Health Canada, to find the best research possibilities. It's not a guessing game here. This is a science game. We have to find the best opportunities and back those best opportunities with funds. I think we've done a really good job here in Canada.

Again, it's going to be hard. When you look at the therapeutics—I'm jumping away from vaccines for a second—we've been looking at in regard to clinical trials, there have been many indications that some of our already licensed products might have effects with COVID-19, and we've gone through it. We've gone through many trials and lots of money.

Unfortunately, with all that we've done, we're not really seeing many candidates that are actually going to be helping us, and that's just the nature of the business. We have to innovate. We have to invest. We have to study, and then we're hoping we will find some help from therapeutics and vaccines.

**Ms. Pamela Fralick:** If I may add one quick comment. It's almost a good news story that I can't give you a list of every company and how many dollars they received and how they benefited, because what it means—to Dr. Neame's point—is that everyone is working in collaboration.

I can point to a company of ours in Quebec, Medicago, which we mentioned in the opening comments. It identified a candidate vaccine in 20 days from the virus first being identified here in Canada. In British Columbia, we have Eli Lilly, one of our member companies working with AbCellera. They have taken advantage of a great deal of funding to work on the antibody side of this particular situation.

We could go on with a list of where our companies have benefited. Our website, actually, keeps a daily and weekly update of all of the projects under way, if you'd like to have a look at those. We're very grateful that the government has really acknowledged the important role that the life sciences play at this particular time, and has put money behind that.

**Mr. Mike Kelloway:** It's fantastic to see that collaboration, which is obviously important and needed.

I'm wondering if we can go back to a couple of comments that were made just previously. When I'm asking questions to witnesses, I'm doing a deeper dive on some of the questions. I'm really curious about your perspective. I think you touched upon it a little bit, but what influences companies to invest in research in Canada. What would be the top three that you would be looking at? Based on that, would your web of companies, or your network of companies, consider manufacturing or further research investments here in Canada?

I guess my first question is this: What influences companies to do research and to invest in Canada?

**Ms. Pamela Fralick:** Let me say first of all that Canada is seen as a very attractive country, so companies want to invest here. We have a good health care system. We have excellent researchers. We have good institutions. We have diverse populations with clinical trials. We are an attractive place.

The CEOs of our member companies spend a lot of their time competing, if you will, and trying to bring investment dollars into this country. We can show you studies done by Ernst and Young that have evidence that 10% of the revenue does go into R and D in this country. That being said, we can do so much more. I think COVID-19.... I hate to look at it as an opportunity for anything, but it is a chance to recalibrate how we're doing business in this country. We need a very supportive regulatory environment. We are out of balance right now. I don't want to harp on that issue—I will if given the opportunity—but we need to balance that out.

We need to address a system that has been constructive in pieces and is very slow to bring products to market. It will take Canada over 900 days to bring an innovative product from initial approval into patients' hands. The OECD medium is down around 500 days, and I can cite many countries that are in the 300-day range. We are out of step. To the government's credit, Health Canada is working on changing this, but we are very far behind. We need to have that faster time to list.

Those are a couple of the key issues. There are others that I could cite, but in the interest of time, perhaps those are the two most important.

**The Chair:** Thank you, Mr. Kelloway.

**Mr. Peter Hardwick:** I have one comment, if I may.

[*Translation*]

**The Chair:** We will now move to Mr. Desilets.

Mr. Desilets, the floor is yours for six minutes.

● (1145)

**Mr. Luc Desilets (Rivière-des-Mille-Îles, BQ):** Thank you, Mr. Chair.

My thanks to all our guests. Their remarks are very interesting and they will allow us to move forward towards the report that we will be producing in a few months.

Dr. Neame, If I understood correctly, you said that there are about 150 candidate vaccines in the world. First of all, let us stay objective, since we are all from the same country; can you tell us which vaccines are the most promising from those that are being worked on around the world? What is the difference between those vaccines?

[*English*]

**Dr. Dion Neame:** Thank you very much for the question.

“Promising” is an interesting word. It's almost like what is coming first. We have a number of vaccines that are coming first. There's one in particular out of Oxford that is associated with AstraZeneca. It is a vector form of vaccine with an mRNA on the adenovirus. Now, once again, that's wonderful. As a candidate vaccine, it seems that in theory and science it would work, but we have to do clinical trials. To get to the finish line first, with regard to a candidate, doesn't mean it's actually going to be safe and it doesn't mean it's going to be effective.

We have another vaccine in Canada coming from CanSino, and Dr. Halperin can speak to that. This is a vaccine that is in place right now. Dr. Halperin will be in clinical trials phase three fairly soon in the Halifax area.

We have Sanofi and its collaboration with GlaxoSmithKline. They are using an influenza manufacturing system called a baculovirus expression system. Because that has created flu vaccines in the past, we feel confident that we can create COVID proteins with an adjuvant from GSK, and that will come fairly soon. However, once again, we have to do clinical trials to make sure it's safe and efficacious.

There are a number of different vaccines that are called mRNA or RNA vaccines. Moderna—you may have heard of that company—is moving along quite quickly in its trials as well.

Once again, and I hate to keep repeating myself, it has to be safe and it has to be efficacious.

[*Translation*]

**Mr. Luc Desilets:** This is very interesting.

We are all assuming that, once the finish line has been crossed, that is to say, in the fall, one or more of the vaccines will have gone through the three stages and will be ready to be brought to market.

First, I would like to know what difference there will be between the two vaccines that have gone through those stages. You mentioned the effectiveness, and I would like some more details. For example, could we accept one vaccine that is 60% effective and another that is 80% effective?

Then, could you also tell us about prices in the current situation, considering all this competition, the Chinese market, and our friends and enemies all around the world?

[*English*]

**Dr. Dion Neame:** I don't think there's going to be a single vaccine that's going to be the solution. A lot of that has to do with production capacity. We will have, hopefully, many successful safe and efficacious vaccines, and then we will see the manufacturing and production ability.

I understand from our colleagues in Swiftwater, Pennsylvania, that we may be producing 600 million doses if our COVID-19 candidate vaccine is successful, but you can see that 600 million per year is not going to take care of eight billion people.

Multiple vaccines will come into play. It will certainly not be a pharmaceutical company that's going to define how much it can produce, and where it's going to go. That will be decided by governments in regard to the previous agreements they may have had with pharmaceutical companies. There are also organizations that are looking at the ethical distribution of COVID-19 vaccines, and they will be involved.

Pamela, do you have any comments on that?

**Ms. Pamela Fralick:** I would emphasize the policy-making decisions that are going to be required by every government to determine who gets these vaccines first. There's a lot of coverage in the media these days about that very question. First of all, once we get the vaccine—and I say “once”, because I'm confident we will—we have to create the supply and the distribution. Every country will likely take a different approach.

● (1150)

[*Translation*]

**Mr. Luc Desilets:** Ms. Fralick, apart from the criteria of effectiveness, safety and, I imagine, price, what could influence a government's decision?

[*English*]

**Ms. Pamela Fralick:** I think my colleagues, Drs. Halperin and Neame, might be the best to respond to that.

As I say, there's quite a bit of coverage in the press right now in terms of making that decision. Do you provide it to the most vulnerable, the elderly, the marginalized populations, or do we identify the biggest spreaders, young people, etc., who are perhaps asymptomatic but spreading the disease? Do we give it to front-line health professionals? These are big questions for policy decision-makers.

Drs. Halperin or Neame, you may wish to jump in on this one.

**Dr. Dion Neame:** The epidemiology has been fairly clear on this in regard to who are the most vulnerable. Certainly, they are people who are the most frail in our community, and it's quite horrible when you look at Canada and the statistics for Canada. Initially, when you were looking at the mortality rates, particularly, almost 85% of people were from long-term care and seniors homes.

Because they're the most vulnerable, they tended to unfortunately pass quite quickly. You'll see that the numbers now have gone down to about 65%. However, when you look at the reason they have dropped from 85% to 65%, it's that people may be living outside of a long-term care or seniors retirement home. They are also the people who may have multiple comorbidities and tend to be above 65 years of age.

The epidemiology for me is fairly clear. Dr. Halperin, would you like to comment?

[*Translation*]

**Mr. Luc Desilets:** Do I have any time left at all, Mr. Chair?

[*English*]

**The Chair:** No, your time is up, sir.

[*Translation*]

**Mr. Luc Desilets:** Okay. Thank you very much, everyone.

[*English*]

**The Chair:** However, I'll let the witness quickly respond.

**Dr. Scott Halperin:** The other thing will be that there's a process that is taking place by the national advisory committee on immunization, which will be recommending how the vaccines, when they are available, should be used, how they should be rolled out and who should have priority. Those recommendations will be federal recommendations made to the provinces, and then each province will interpret those based on their own population. The vaccine will be rolled out based on that prioritization.

That's very similar to what was done with the H1N1 pandemic. A process will take place. It will take into account bioethics, the epidemiology, the effectiveness of the vaccine on different populations, etc.

**The Chair:** Thanks you, Mr. Desilets.

We go now to Mr. Davies for six minutes.

**Mr. Don Davies (Vancouver Kingsway, NDP):** Thank you, Mr. Chair.

Thanks to the witnesses for being with us today.

Mr. Keon, you were quoted recently as saying the following with respect to the provisions of the COVID-19 Emergency Response Act, which provides the federal government, or anyone it designates, with the authority to make, sell or use patented inventions to the extent necessary to respond to a public health emergency:

> The ability of a country to issue compulsory licenses for medicines and other urgently needed items to respond to a health crisis is not a novel approach, and is embedded in international trade agreements such as the WTO Agreement on the Trade-Related Aspects of Intellectual Property Rights. This is a prudent and reasonable precautionary measure.

Given that this authority in the legislation is set to expire on September 30, do you believe that Parliament should extend it?

**Mr. Jim Keon:** Yes, we made that comment. The government moved with emergency measures in March when the COVID shock first hit. I think while we support that legislation, to be very honest, it has not been our focus. Our focus has been on the 75% of the medicines that we are now producing and that we are able to continue to manufacture and provide to Canadians. When a vaccine is developed, we will see what the situation is, but our focus right now, as I said, is on ensuring that those three out of four medicines that we now produce, providing billions in savings to the health care system, are protected and that we have greater access to them going forward.

● (1155)

**Mr. Don Davies:** Okay. Before I leave that area, I'm curious about your comment on one aspect of this. Remdesivir, which is the first drug approved by licensing authorities in the U.S. to treat COVID-19, is made by Gilead, and that's been shown to help people recover faster from the disease. The first 140,000 doses supplied to drug trials around the world have been used up, and we now see that the Trump administration has now bought more than 500,000 doses, which is all of Gilead's production for July, and 90% of it for August and September.

In your view, should Canada issue compulsory licences in order to secure a sufficient domestic supply of COVID-19 treatments like remdesivir?

**Mr. Jim Keon:** I won't speak for Gilead because they're not a member of our group, but in general the trials on remdesivir are ongoing. It appears that it has had some effect in reducing the morbidity of COVID-19, so that's excellent. I think when the approvals are forthcoming stating that it is an effective treatment, we'll see whether Gilead is making the product available by licensing. I think it already has around the world licensed the product, in particular in developing countries. We'll see how that evolves in Europe and Canada and the U.S. and whether there's an issue there. Right now, though, my understanding is that the product is available in Canada for use.

**Mr. Don Davies:** Thank you.

Dr. Halperin, if you know this, what stage are you at in terms of studying the safety and/or effectiveness of the CanSino Biologics vaccine candidate?

**Dr. Scott Halperin:** The phase one and phase two of the CanSino vaccine in Canada has not started yet. Its start is imminent. The final approvals that are required to have the vaccine shipped to Canada are being finished. Once that happens, we'll be starting the trials here. As you're aware, the vaccine has undergone phase one and now phase two studies in China. Studies designed for Canada are a little bit different, to expand the information about the vaccine.

**Mr. Don Davies:** Staying with that, Dr. Halperin, in a May 19, 2020, news release from Dalhousie University, you noted that the intellectual property rights for that vaccine will “stay in Chinese hands”, but the National Research Council's involvement would help ensure that Canada gets its guaranteed domestic supply.

Precisely what conditions are in place to ensure that Canada will receive a sufficient domestic supply of the vaccine if it proves to be successful?

**Dr. Scott Halperin:** From my understanding of the agreement—and again, that's an agreement between the National Research Council and CanSino—the National Research Council is being provided with the seed stock of the vaccine and will be able to manufacture it in Canadian facilities, not for sale but for utilization in Canada, once the Canadian manufacturing capability is up and running. It's by that method that Canada's supply will be assured because we'll have the manufacturing capacity here in Canada.

**Mr. Don Davies:** Thank you.

Back to you, Mr. Keon, I understand that the generic industry has a different take—I think it would be fair to say—on the amount of research that is being done by pharmaceutical companies in Canada and whether or not they in fact have met the 10% commitment that they made back in the 1980s as a condition of receiving extended intellectual property protection.

What's your association's view on that?

**Mr. Jim Keon:** We've been clear. The commitment on intellectual property has not been reached for many years now. I think that's a matter for IMC to address with the government.

We have particularly raised this point when there have been discussions in international trade agreements, where countries like the United States, or the European Commission, have pressured Canada to increase intellectual property protection. We have pointed out that, in the past, when Canada made agreements around certain levels of research and development in return for greater intellectual property protection, it didn't work out. We continue to say that in trade agreements, intellectual property protection in Canada needs to be addressed from a Canadian perspective. You need to look at the amount of research and development, the jobs and the health care savings available.

Every year that a patent or intellectual property is extended means that the generics, which are priced in some cases at a 90% discount, will not be available. That's a very high price to pay in the health care system.

● (1200)

**Mr. Don Davies:** Ms. Fralick, if I may, I'll direct my final question to you.

The Government of Canada estimates that proposed reforms to Canada's drug pricing regulations—you referred to them as the PMPRB proposals—will save Canadians $13.2 billion over 10 years on patented drug costs. They say the new rules will save money for patients, employers and insurers, at the expense of drug industry profits.

In response, Innovative Medicines Canada has argued that these regulatory changes will result in fewer clinical trials and new medicines being available for sale. However, Doug Clark, executive director of the Patented Medicine Prices Review Board, has stated publicly that there is virtually zero correlation between prices and drugs coming to market, R and D spending and clinical trial intensity, in any country that the PMPRB has looked at.

How do you respond to Mr. Clark's position?

**Ms. Pamela Fralick:** Thank you very much for the opportunity to respond to that. I also have something to add to your previous question to Mr. Keon, if there is time.

We looked at Health Canada data—it isn't our data but Health Canada's data—and compared the data from Q4 2019. The regulations were passed on August 21, 2019. We looked at Q4 and how many new drugs were brought into Canada versus the previous three years. Depending on the year, there is about a 50% decrease on drugs being brought to Canada. I noted that Mr. Clark said that perhaps we don't have all the data, but if we don't, then I hope he would share that with us. Similarly, using Health Canada data, we've noticed that clinical trials have dropped between 38% and 47% in that same quarter, so the evidence is very clear to us.

Very recently, a literature review of about 49 papers that looked at the link between pricing and drug launches was released. It showed, clearly, that 44 out of these 49 papers that were reviewed found a significant negative relationship between drug price controls, or a significant positive relationship between drug price levels. There are more details on this. I know we don't have time, but I'm happy to share the information with you. The bottom line is that there is absolutely no question in our minds that there is a very clear link between pricing and drug launches, as well as investment and obviously, at the end of the day, access to medicines.

I would like to make one other comment vis-à-vis your question around investment, because that really was more about our members and the commitment with PMPRB to invest 10% of our revenues. The definition that was reflected in the PMPRB agreement was a very particular program, SR and ED, which you are probably familiar with, a tax credit program. At that time, the industry did commit to 10%, and for many years it increased its investment in that program. The problem is that the industry has changed. The world has changed in 30 years, so while it is accurate that the industry only contributes now about 5% rather than 10% in SR and ED, it does commit at least 10% of its revenue to R and D in this country.

One example...and we've been talking about this throughout the morning. Clinical trials are a critical piece of the research process. At any given time, there are about 4,500 going on in Canada. They are funded by this industry. Health Canada does not consider that research. Many of you will be familiar with MaRS in Toronto, and JLABS, which is an incubator for new research, with millions of dollars poured into that annually. That is not included.

The Government of Canada has recognized that the definition of research and development does need to be modernized. ISED and StatsCan have a project with the industry where we have redefined what R and D means, and the data is being calculated as we speak. Ernst and Young did a study a couple of years ago, and that's why we've come up with the 10%—it's actually 9.97% of revenue. The industry is a very strong contributor to R and D in Canada and would like to do more if circumstances and the situation were more amenable to that.

I'm sorry for going on at length, but I felt you deserved an answer to those questions.

● (1205)

**The Chair:** Thank you very much.

We will start the second round with Mrs. Jansen, for five minutes.

**Mrs. Tamara Jansen (Cloverdale—Langley City, CPC):** Dr. Halperin, how much money has your research centre received from the federal government for work on vaccines with CanSino Biologics?

**Dr. Scott Halperin:** At this stage, we have an agreement. We're not receiving any funds from CanSino. The funds are from the Canadian government, the National Research Council.

**Mrs. Tamara Jansen:** How much is that?

**Dr. Scott Halperin:** I am not sure of the exact amount. It's in the range of approximately $800,000. We haven't received any funds as of yet, but the agreement is done. The funds will come in once the study starts.

**Mrs. Tamara Jansen:** Isn't it true that the vaccine you're working on with CanSino uses a very similar platform technology—specifically the modified adenovirus vector expressing the virus's S protein—to another vaccine that's already being worked on at Oxford University?

**Dr. Scott Halperin:** It's a different vaccine. The Oxford vaccine uses the chimpanzee adenovirus. As Dr. Neame mentioned, that's not expressing the protein but expressing the genetic material that then produces the protein. CanSino's is an adenovirus 5, which is a human adenovirus strain, and it expresses the spike protein.

**Mrs. Tamara Jansen:** It's more alike than it's different. Is that correct?

**Dr. Scott Halperin:** It's a similar platform. There are about five or six different platforms. This is one platform, which has another organism, a non-pathogenic organism, express the proteins of SARS-CoV-2.

**Mrs. Tamara Jansen:** The Oxford University vaccine is already in the final phases of clinical trials, phase three, and one of the world's leading pharmaceutical firms, which was mentioned already, AstraZeneca is already manufacturing hundreds of millions of doses to be ready by the end of the year, where in comparison, according to ClinicalTrials.gov, your trial at Dalhousie is not even recruiting patients yet for phase two trials and the company that you're partnered with, CanSino, hasn't sold a single product outside China.

With respect, how is it possible that Dalhousie and CanSino will be able to outrace Oxford and AstraZeneca to a vaccine?

**Dr. Scott Halperin:** The race is for successful vaccines, not just a vaccine. As Dr. Neame mentioned, we need vaccines and we need multiple vaccines. It's not just because of manufacturing capability, but that is clearly one reason. We need multiple companies with multiple facilities to produce vaccines that are going to have a global demand. Also different vaccines and different platforms may turn out to be more effective in different subpopulations. For example, there may be vaccines that work better in the elderly, others that work better in young, healthy adults and others that work better in children.

We need multiple vaccines, so we want to support any vaccine that is successful.

**Mrs. Tamara Jansen:** I understand. It's like having more than one iron in the fire.

Last week we learned that CanSino is skipping the phase three trial. Its vaccine is going to be injected into Chinese soldiers. Not only would that never happen in Canada, but soldiers cannot insist on informed consent. That's obviously against the rules of medical ethics.

Have you told the government that you will refuse to work with such a partner, which is violating those medical ethics, and if not, why not?

● (1210)

**Dr. Scott Halperin:** CanSino is not going to be avoiding phase three trials. CanSino is currently, working with the WHO and other country partners, planning phase three studies, which are going to take place in various countries around the world. As with all manufacturers, they will be undertaking phase three studies.

My understanding is that the Chinese government has decided to use that vaccine—and again this is from the news, not from CanSino—in Chinese soldiers under what would be called, in Canada, an emergency authorization. In Canada, we may also use an emergency authorization down the line with one of the vaccines that is successful. What that means is we would be able to use the vaccine on a large scale prior to having full phase three information and full market authorization.

**Mrs. Tamara Jansen:** Is that like throwing out the medical ethics due to the urgency? Is that what we're thinking?

**Dr. Scott Halperin:** No, that's not at all what we're thinking.

What we'd be doing is exactly what was done with Canada's Ebola vaccine, where phase one and two studies were done and then phase three studies and an emergency authorization were used, and that stopped the epidemic in west Africa. In fact, that vaccine, which was ultimately being developed by Merck, only received licensure, full market authorization, about a year and a half ago, four years after it stopped the epidemic in west Africa.

Emergency authorization is one of the tools Health Canada has as well, and may be something that may be used for a promising vaccine, no matter who the manufacturer is. That's done in a perfectly ethical manner.

**The Chair:** Thank you, Ms. Jansen.

We go now to Mr. Van Bynen for five minutes.

**Mr. Tony Van Bynen (Newmarket—Aurora, Lib.):** Thank you, Mr. Chair, and thank you to the witnesses who are making themselves available for this important research.

My first question is for Dr. Halperin. Around the globe people are hungry for a vaccine to put an end to the COVID-19 pandemic, but we also have an anti-vaccine movement that seems to keep growing, even during a pandemic.

In your professional opinion, could the anti-vaccine movement undermine the efforts to end the COVID-19 pandemic? To people wondering whether or not they should take the vaccine, once ready, what challenges may an anti-vaccine movement pose?

**Dr. Scott Halperin:** The anti-vaccine movement, or anti-vaccine sentiment, is a challenge to any vaccine program, whether it's COVID-19 or any of our routine vaccinations. There's been a lot of effort to understand that movement and to address it.

The anti-vaccine sentiment runs a wide range, from people who are just a bit hesitant because they don't feel there's enough information, to people who are philosophically opposed to a vaccination. The latter tends to be the minority, maybe a couple of per cent, but in terms of vaccine hesitancy, it may be as high as 20% or 30% of people who have some concerns. The important part about addressing vaccine hesitancy is to be as open and as transparent as possible, to provide as much safety information as is possible and to address people's concerns, both at an aggregate level but then also at an individual level.

The Public Health Agency of Canada understands that vaccine hesitancy can be an important factor in the response once we have a COVID-19 vaccine. It's one of its priorities for CIRN, the Canadian Immunization Research Network's social sciences and humanities network, to address and do research on those concerns in preparation for potential vaccine hesitancy as vaccines are rolled out. It is a high priority of our research.

**Mr. Tony Van Bynen:** Could you confirm how large the threat of the anti-vaccine movement is in Canada, what we are currently doing to counteract it and if you're satisfied with that? If not, what else would need to be done?

**Dr. Scott Halperin:** Overwhelmingly in Canada, Canadians are pro-vaccine. The vaccine hesitancy probably accounts for approximately 20% of the population. When we talk about vaccine hesitancy, that doesn't mean 20% of people aren't getting immunized, but they may delay their immunization or want to try an alternative schedule. It runs that whole range across the board from just a little bit hesitant up to absolutely not being immunized. The absolutely not being immunized is only a couple of per cent, to our best understanding.

Improving vaccine coverage has been a high priority of the Public Health Agency of Canada and recent governments. There has been a fair amount of funding that's been given to CIRN to understand and improve vaccine coverage over the past five years. We know a lot more about vaccine hesitancy, and we are developing interventions to address it.

● (1215)

**Mr. Tony Van Bynen:** My next question is to each of the groups represented. How can Canada support more research in biomedicine? Could you elaborate on what we're doing well, what we should improve and what we should be doing to do so? Why don't we start with Innovative Medicines Canada?

**Ms. Pamela Fralick:** I hate to sound like a broken record on this particular question, but probably the most important piece that we could do in Canada would be to get that balanced, whole-of-government approach to the two issues of cost containment and the investment attraction programs that are in place.

On the one side we have PMPRB. It plays a good role for Canadians when well implemented, but its current measures are too extreme. When companies are looking at losing up to 70% or 80% of their revenues, they basically don't have anything left to invest. On the other hand, we have some exciting programs out of ISED, with its HBEST, health/biosciences economic strategy table, where it wants to double investment in Canada, double employment levels, etc., by 2025. This is something that gets the companies that are my members very excited.

However, there is an imbalance right now without a whole-of-government approach to balance those two off. The regulatory regime needs to be taken down a notch, so that we can take advantage of investment, and obviously, get all the best medicines to Canadians. It's that, and as I mentioned as well, the time to list, making sure our system is as smooth and as well sequenced as possible.

**Mr. Tony Van Bynen:** Okay.

The CGPA.

**Mr. Peter Hardwick:** This was fascinating. I'm voting for IMC to find a vaccine sooner than possible for Canadians. Keep up the great work.

I can speak to Apotex specifically. On the generics side we spend close to $200 million a year on research and development in Canada. A lot of this is in biosimilars. I think for us it's around sustainability and predictability, and having a pricing model and system that we can see out in time so we can plan our business more long term. That predictability in pricing is going to be key. A lot of the things that Ms. Fralick said around regulatory regime, etc., I agree with.

I'll turn it over to Jim, if he has anything to add.

**Mr. Jim Keon:** Yes, we have the largest R and D company in Canada, as Peter mentioned. We also have the largest company in Quebec. I think that while we are focused on the vaccine, our message today is we have thought about this. We put out a blueprint on how we ensure that three-quarters of the medicines that are critical, that are genericized, continue to flow into Canada so other countries can't put up export blocks in other ways. We want to strengthen and build our industry in Canada.

We are recommending the government also build up safety stocks so if there's a wave two or a future pandemic or problem, we're more ready than we were this time.

**The Chair:** Thank you very much.

We go now to Dr. Kitchen for five minutes, please.

**Mr. Robert Kitchen (Souris—Moose Mountain, CPC):** Thank you, Mr. Chair.

Thank you, everybody, for being here today. Your presentations are greatly appreciated, enlightening us and educating us a little more on a lot of the stuff we've heard.

Throughout these meetings we've heard significant responses on issues. One that is concerning to me, and I've heard from most of you today, is the issue of supply chain challenges and risks. I believe Mr. Keon talked about how the movement is slower and more costly. We've heard about potential drug shortages, etc.

I go back to a number of meetings, when I was looking at things a little more closely than I have today, when there was a shortage of Epinephrine, and Diovan, Gabapentin, Carbathol, Cyclosporine, Novamoxin. Many of these drugs are definitely needed by Canadians today. We're seeing shortages of them.

It would be interesting to hear comments. Dr. Neame, I think you mentioned potential supply issues. I'm wondering if you could start. We would then go on to the CGPA.

● (1220)

**Dr. Dion Neame:** My expertise is in vaccines.

It is extremely difficult to make biologic products. If you're developing an infant vaccine, for example, Pediacel, if you have a quality issue, that whole vat will have to be removed, and that is an 18-month delay. We have to replenish the supply. It's very challenging. We do everything we can to maintain the integrity of our manufacturing processes, and that's why our levels of quality are so high. Health Canada inspects us regularly.

We do our best. We're trying not to have breakdowns in supply, but it is part of the manufacturing process. We work with Health Canada. We have drug shortage notification protocols on the Health Canada website. Whenever we are in a situation where we start to run short, we will always post them. If it's a situation where a patient is running into a drug shortage, we always ask them to call their health care professional to look for alternatives.

**Mr. Robert Kitchen:** Ms. Fralick, do you have any comments?

**Ms. Pamela Fralick:** No, consistent with Dr. Neame, we've been monitoring very vigilantly throughout this time. We check with our members regularly. We do everything we can to make sure that drugs are in full supply. Our members have told us there have not been problems. This is on the patented drug side. Mr. Keon's organization has a slightly different position. Essentially, we've been monitoring it.

We've been supportive of the 30-day refill limit during the worst of the pandemic to make sure the drug supply is consistent. Right now we've been very fortunate that there have been no significant issues in the supply of any of the drugs our members produce.

**Mr. Robert Kitchen:** Thank you.

Mr. Keon, I'll get you to try to answer that first question, but I'd like to throw this into it as well. In your executive summary you talk about how warehouse and vault capacity might be a challenge and a risk that we'd see in the supply chain. We've heard about particularly the NESS storage, where masks, etc., were becoming obsolete in terms of expiry dates and so on. I'm wondering how that might fit into some of your comments dealing with the issues that you would see that we need to move forward on.

**Mr. Jim Keon:** The issue of drug shortages has been an issue, for the last five years and more, worldwide. It's not just a Canadian issue. I think part of it has been the interaction of increased regulatory scrutiny around the world. Agencies have gone to locations where they hadn't before. I think that's a good thing. Products are safer than before. When it's also combined, however, with very low pricing in Canada and internationally—the “how low can you go" model that I touched on earlier—I don't think it works.

I quoted the Deputy Prime Minister earlier in my comments. I think we need to step back and look at the pricing situation. We need to develop a policy around trying to encourage domestic production, domestic R and D and manufacturing, plus, as you mentioned, warehousing and vault capacity. These are all expensive investments to make. We want them here. We want them in Canada. With regard to pricing, plus some of the regulatory flexibilities that Health Canada has shown during the pandemic, we're arguing that we'd like to look at those going forward. If products can be brought in safely during this pandemic period, we think that can go forward.

I know that Peter wanted to say a couple of words on this too, if we have time.

● (1225)

**Mr. Peter Hardwick:** From the generics industry perspective, and again from an Apotex perspective, any drug shortage is an issue. I would say, however, that one thing we have to learn from this pandemic is this: Strengthen our domestic manufacturing capabilities. Canada is 2% to 3% of the global pharmaceutical market. My key message today is that we need to learn from COVID-19. What happened around the world was that there were restrictions on exports.

I can tell you that what gets me out of bed in the morning, as it does all of my colleagues, is the patient dealing with anxiety, depression, cardiovascular illness or oncology. We go to work every day to make sure there's a continuity of therapy for Canadians. We need to make sure. A lot of the manufacturing has left this country.

In terms of what Apotex produces, almost 80% of all the drugs we sell are manufactured in Ontario for Canadians. I can tell you two stories. There was a global shortage of tamoxifen. Were it not for our facilities in Canada.... We actually reprioritized all of our production schedule for Canadians. No one's doing—

**Mr. Robert Kitchen:** Mr. Hardwick, while I still have you here—

**The Chair:** Thank you, Dr. Kitchen—

**Mr. Robert Kitchen:** —Mr. Davies talked about remdesivir. Do we have the capacity to make that?

**The Chair:** Dr. Kitchen, thank you.

**Mr. Peter Hardwick:** I think that's part of our blueprint. If you take that product, we've talked about retrofitting our facilities, working with Health Canada, working with the Canadian government, working with Ontario. We're prepared to do what we need to do to support Canadians. Right now—

**The Chair:** Thank you. I'm sorry; I have to cut you off.

Mr. Fisher, please go ahead for five minutes.

**Mr. Darren Fisher (Dartmouth—Cole Harbour, Lib.):** Thank you very much, Mr. Chair.

Thank you to all of our amazing witnesses who are here today to provide this level of expertise.

Not because he's in Nova Scotia and is a three-decade Nova Scotian, I want to stick with Dr. Halperin, if I could.

Dr. Halperin, the Canadian Centre for Vaccinology is leading the first human clinical trials in Canada for a COVID-19 vaccine. Can you describe the technology used and how it differs from other potential vaccines?

**Dr. Scott Halperin:** Sure. In terms of the trial we're doing with CanSino, which may or may not be the first, depending on when the vaccine arrives, that vaccine is, as I'd mentioned before, an adenovirus 5, which is a normal human respiratory pathogen that causes an upper respiratory infection, that has been modified to express the spike protein to make the spike protein of the SARS-CoV-2 virus. Therefore, when the host sees that platform, it makes antibodies against the spike protein. Hopefully, that would then protect somebody who comes in contact with it. The adenovirus 5 has been modified so that it's a non-replicating virus, which means it doesn't replicate in the host.

So that's the platform. That's how it works.

**Mr. Darren Fisher:** Where are you right now with regard to safety and effectiveness? Are you able to provide any of your early results?

**Dr. Scott Halperin:** We haven't yet started the trial with that vaccine here in Canada. We're hoping it will start in the very near future.

That vaccine has undergone phase one and phase two studies in China. The phase one studies were quite successful and were published in The Lancet Infectious Diseases. Phase two studies have now been completed. My understanding is that those should be published within the next week or two in the same journal, also showing safety and good immunogenicity. With regard to the effectiveness or the efficacy of those vaccines, we will need to await the phase three studies that will be taking place.

**Mr. Darren Fisher:** When the clinical trials roll out across Canada, will that be just in Nova Scotia or will you be going to other provinces? Will you be utilizing or testing vulnerable populations in these clinical trials?

**Dr. Scott Halperin:** We'll be using all of our CIRN clinical trial sites as these trials roll out. Medicago's going to be using sites across Canada with its vaccine. We are talking with at least four others besides CanSino that will be rolling out, hopefully, over the next several months as they become available and ready for phase one studies.

Of our 10 clinical trial sites, five of them have a lot of experience in phase one studies, but most of these trials are being designed as phase one and two studies. The phase two portions will be done in several of those other cities. It will be a cross-Canada effort to undertake these trials.

● (1230)

**Mr. Darren Fisher:** That's excellent.

When we talk about immunity for folks who have had COVID-19, I don't know if the science is really there yet, but we've heard that it could be just two to three months. How does something like that impact an outcome of a vaccine?

**Dr. Scott Halperin:** It's very important. We don't have full information about a natural immunity after a natural infection with SARS-CoV-2. That's a very important priority for the immunity task force. Canada's immunity task force is undertaking seroepidemiology studies on patients, just on the general population, to see how many have become infected without any symptoms and without being diagnosed, as well as to follow patients who've recovered from SARS-CoV-2, to see how long they maintain their antibodies.

Again, we're not 100% sure yet, and research is still under way about what is the most important factor in the immune system. We talk about an antibody, but there's also cellular immunity, which in viruses is very important. How long the protection lasts is something we need to know. That's with every vaccine, not just SARS-CoV-2 vaccines, which is why for the measles vaccine, for example, you get one dose as a child and you're protected for life, whereas with the influenza virus, it lasts for, perhaps, one season. We know that for an influenza virus, even by the second half of a season immunity is dropping off. Where SARS-CoV-2 will fit in, time will tell. If it's not of very long duration, that may just mean we will need to have second boosters, which again becomes a question of how many doses we are going to need over time.

**Mr. Darren Fisher:** Thank you.

**The Chair:** Thank you, Mr. Fisher.

[*Translation*]

Mr. Desilets, you have the floor for two and a half minutes.

**Mr. Luc Desilets:** Thank you, Mr. Chair.

My question is for Ms. Fralick or for Dr. Neame.

Professor Kelly Grindrod, an expert in the School of Pharmacy at the University of Waterloo, is conducting research to verify and validate the supply of medications in Canada. She considers that the country is already in the grips of one of the worst shortages of medications in our modern history. She claims that, before the arrival of COVID-19, there was already a shortage of more than 1,900 of the 7,000 or so prescription medications in Quebec. That is about 25%.

Ms. Grindrod insists that, in Canada, the entire system lacks transparency. She says that planning is already difficult in normal times, that information is vague and that it is even difficult to find out where the medications are made and where they end up. In her opinion, it is practically impossible to do that kind of monitoring.

Could you please tell us whether you share that opinion and what you think about it?

[*English*]

**Ms. Pamela Fralick:** I will start by acknowledging, as several have, Mr. Keon in particular, that the drug industry is global. Whether we're referring to generic or patented drugs, it is a global industry with inputs from around the world. There are multiple ways in which the supply, the supply chain, the flow of drugs can be affected. That's a starting point.

The drug companies—all of them—are required by law, and they do follow this, to report any drug shortages on a Government of Canada website, drugshortagescanada.ca. We have been monitoring that website on a daily basis, just to see where the shortages might be. I'm not quite sure how to respond to a charge of lack of transparency, because this is followed through.

As I said earlier, with our companies we have been extremely vigilant in monitoring any drug shortages, not only from the website itself, but also through talking with our companies on a regular basis, sometimes daily. While we recognize the need to continue to be vigilant, we have not found ourselves in a position where we've been unable to supply the drugs that have been needed.

That being said, I think there's a slightly different story on the generic side. You may wish to also throw your question over to Mr. Keon.

● (1235)

**Mr. Jim Keon:** Well, I'm happy to answer again. Just quickly, we in the generic pharmaceutical industry have worked throughout this very closely with distributors and pharmacies in Canada, and with our own member companies. Our own member companies are, as was said, required to report all shortages wherever there has been a shortage.

There was a concern at one time about the increased use of sedatives and muscle relaxants, etc., in intensive care units treating COVID patients. Our companies were able to repurpose to increase production and increase the products coming into Canada. We worked with Health Canada. We worked with the group purchasing organizations in the provinces. We ensured that products were available in all cases throughout the pandemic.

As we said earlier in our presentation, we are quite proud of the fact that a lack of medicines, or shortages of medicines, never became a major problem for Canada, even at the worst of the pandemic shock that we faced.

**The Chair:** Thank you, Mr. Desilets.

We go now to Mr. Davies. Please go ahead for two and a half minutes.

**Mr. Don Davies:** Thank you.

Dr. Halperin, according to a May 19 news release from Dalhousie University, the National Research Council will work with manufacturers so the vaccine can be produced and distributed here at home—or, hopefully, a vaccine, if it proves to be successful. Are you confident that Canada has sufficient domestic manufacturing capacity to produce a sufficient supply of vaccines for all Canadians, particularly if we have to have booster shots and extensive revaccinations?

**Dr. Scott Halperin:** Manufacturing capacity in Canada is one of the biggest concerns, and that was highlighted very early on in the pandemic, and before. Part of the funds that the government announced early on in the pandemic were to be provided to the National Research Council, NRC, to upgrade its facility in Montreal. This will permit it to do what's called a GMP, or a good manufacturing process, when manufacturing the vaccine. Based on that, my understanding is that it will be able to supply the needs with CanSino's vaccine.

Now obviously that's not the only vaccine that's being developed. My understanding is that each manufacturer, when it's doing studies and getting supported, in order to get support from the Canadian government, has to demonstrate what its plan is for manufacturing. Whether they are proposed vaccines from Medicago or VIDO-InterVac, all have to look at the manufacturing capacity.

I think manufacturing capacity will be an issue. Obviously, the larger multinationals, such as Sanofi Pasteur, which Dr. Neame mentioned, certainly have the manufacturing capacity.

**Dr. Dion Neame:** If I could add as well, and I apologize for jumping in on Dr. Halperin's question, but the fact is that this is where collaboration occurs. To produce 60 million doses of infant vaccines each year on the Toronto site, this is where we have to sit down and talk. We could potentially retrofit something at the Toronto site, which could help out. It's all about Canadians and getting vaccines for Canadians.

**Mr. Don Davies:** To each of you doctors, then, would you recommend that the federal government develop a national plan in order to ensure that we have domestic manufacturing capacity for any vaccine that, hopefully, will be developed for Canadians?

**Dr. Scott Halperin:** Absolutely. As I mentioned in my initial comments, that's part of it. We all know what the steps are in order to get vaccines to individuals. Hopefully, all of that is being worked on simultaneously. There is now a vaccine task group that's been tasked to oversee the process, and manufacturing is clearly on its radar.

**Dr. Dion Neame:** Just remember there are actually companies like GlaxoSmithKline. GlaxoSmithKline has a great pandemic plan. The only problem is it's for influenza. We didn't expect it for COVID. There needs to be some expansion on the infectious diseases that we're covering in pandemic plans.

● (1240)

**The Chair:** Thank you, Mr. Davies. That brings round two to a close.

I'd like to thank all the witnesses for sharing your time with us today, and for your expertise. This is most helpful to our study.

We will suspend, and bring in the next panel.

● (1240)

_____(Pause)_____

● (1255)

**The Chair:** The meeting has resumed.

I'd like to welcome back everyone to meeting number 31 of the House of Commons Standing Committee on Health. Pursuant to the order of reference of May 26, 2020, we are continuing a briefing on the Canadian response to the outbreak of the coronavirus.

I'd like to make a few comments for the benefit of the new witnesses. Before speaking, please wait until I recognize you by name, except during questioning. I'll ask the questioners to indicate whom they wish to respond to the question. When you're ready to speak, you can click on the microphone icon to activate your mike. I remind you that all comments should be addressed through the chair.

Interpretation in this video conference will work very much like in a regular committee meeting. You have a choice, at the bottom of your screen, of floor, English or French. As you are speaking, if you plan to alternate from one language to the other, you will need to switch the interpretation channel so it aligns with the language you are speaking. You may want to allow for a short pause when switching languages.

When you're not speaking, your mike should be on mute.

I'd like now to welcome our second panel of witnesses. Appearing as an individual we have Mario Possamai, who was senior advisor, Commission to Investigate the Introduction and Spread of Severe Acute Respiratory Syndrome, 2003-07; for Mapsted, we have Paramvir Nagpal, founder and chief executive officer; for Medtronic Canada, we have Patrick Hupé, senior director, health systems strategies.

I will ask the panellists to make their statements. Each group will have up to 10 minutes.

We'll start with Mr. Possamai. Please go ahead.

**Mr. Mario Possamai (Senior Advisor, Commission to Investigate the Introduction and Spread of Severe Acute Respiratory Syndrome (SARS), 2003-2007, As an Individual):** Good afternoon, Mr. Chair, and members of the committee. Thank you for the opportunity to brief you on how COVID-19 has revealed that the system to protect Canadian health workers during a public health emergency is broken, and must be fixed urgently before the expected second pandemic wave.

From the start of the outbreak, the Public Health Agency of Canada has said that droplet precautions, including surgical masks, are sufficient protection for our health care workers, because COVID-19 could not spread through the air, and only spreads through large droplets.

In those early days, Canadian experts who supported the agency's position said that if COVID-19 was airborne we would see outbreaks in places adhering to droplet prevention. One expert said that if this was airborne, all those health care workers would be getting sick.

Here's what's happened since. Nationally, Canadian health care workers comprise nearly one in five of all COVID-19 infections in Canada. That is almost three times the global average as reported by the International Council of Nurses.

It is also approximately four times the rate in China where there was a requirement for the use of airborne precautions, including N95s, in late January. Most health work infections in China occurred before these higher precautions were implemented. This troubling situation is why I have been retained by the Canadian Federation of Nurses Unions to use the lens of the SARS commission to investigate why so many Canadian health care workers are being infected. While the investigation is at an early stage, I would like to share some preliminary findings and recommendations.

The first preliminary finding is regarding the precautionary principle, and the question of airborne transmission. When your committee met on April 7, dedicated Canadian experts, with the best of intentions, said that COVID-19 only spreads through large droplets and contaminated surfaces, and that surgical masks were sufficient protection. N95s, they said, were only needed for high-risk procedures. Since then, the science has evolved. The researchers in Hong Kong, who first identified SARS airborne transmissibility in 2004, have recently published a peer-reviewed article suggesting that large droplets are a negligible transmission route compared to airborne.

The CDC in the U.S. is now suggesting that infected surfaces may only play a minor role in COVID-19 transmission, and most importantly, an open letter published today by 239 scientists from 32 countries, the WHO and public health agencies, states that studies have demonstrated beyond any reasonable doubt that the viruses are released during exhalation, talking, and coughing in microdroplets, small enough to remain in the air, and impose a risk of exposure at distances beyond one to two metres.

Time will tell who is right and who is wrong in this debate though I believe the scales are increasingly tipping toward the growing evidence of airborne transmission. This is precisely the kind of situation where the precautionary principle and the findings of the SARS commission should be invoked. When there's uncertainty about a new pathogen, it calls for erring on the side of safety, and protecting health workers with the higher protections of airborne precautions, including N95s or higher, until the science is clarified. This is what China has done so successfully, and that is why the WHO has concluded that the transmission of COVID-19 among health workers and in health care settings is not a factor in China.

Keep in mind that it was not until a year after SARS that the best evidence of its airborne transmissibility under certain conditions was published. Justice Archie Campbell, who led the SARS commission, found that this was strong validation of the prudence of taking a precautionary approach until the science was settled.

● (1300)

Having regard to growing evidence of airborne transmission and with news that domestic production of N95s is coming on stream, I recommend that the Public Health Agency of Canada invoke the precautionary principle and require airborne precautions, including fit-tested N95s for all health care workers in all health care settings with suspected and confirmed COVID-19 cases. I also recommend that the federal legislation be amended to require the agency to take a precautionary approach to all worker safety guidance.

The second preliminary finding is with regards to our severe shortage of N95 respirators. Even though the SARS commission recommended stockpiling this vital piece of equipment, the federal health minister and the chief medical officer of health have claimed stockpiling was a provincial responsibility. I respectfully disagree. Ottawa destroyed two million N95s last year. It should have replaced them and purchased more, as the Prime Minister now seems to concede. Remember the federal stockpile had only 100,000 N95s entering the pandemic.

But setting this aside, I believe the chief medical officer of health and her immediate predecessor failed in their responsibility under section 12 of the Public Health Agency of Canada Act to warn Parliament and Canadians that we weren't ready, that we didn't have enough personal protective equipment, especially N95s.

When Dr. Tam's office and that of her Ontario counterpart were being established in 2004, Justice Campbell advised both governments to make chief medical officers of health the public guardian by giving them the rights, duties and independence to speak out on public health risks. Both levels of government listened and the wording of section 12 of the federal act and the equivalent section 81 of the Ontario act are virtually identical. Over the past five years Dr. Tam and her immediate predecessor have issued seven reports to Parliament and the public on a variety of important public health issues, including on alcohol and substance abuse. None, however, examined whether we were ready for an existential public health threat like the pandemic, including whether we had enough N95 respirators, despite the explicit intent of the act.

In view of the systemic failure I recommend that Parliament consider amending the Public Health Agency of Canada Act on an urgent basis to require the chief medical officer of health to report in detail each year on the state of Canada's preparedness for the future of public health emergencies and to request that the Auditor General of Canada independently evaluate on a regular basis the Public Health Agency of Canada's ability to monitor and evaluate our public health emergency preparedness.

Thank you.

● (1305)

**The Chair:** Thank you.

We go now to Mapsted.

Mr. Nagpal, please go ahead for 10 minutes.

**Mr. Paramvir Nagpal (Founder and Chief Executive Officer, Mapsted):** Thank you, Mr. Chair and members of the committee.

I'd like to start off by giving you some background about our company, Mapsted. We have been in business since 2014. We're an award-winning Canadian technology firm that provides highly scalable and accurate location-based solutions inside and outside any building without the use of additional external hardware such as Bluetooth beacons or Wi-Fi connectivity. Instead, our technology uses innovative, adaptive, data-fusion and self-learning algorithms to deliver an accurate and scalable positioning using any off-the-shelf smart phone. This means our technology can work anywhere, including in areas that are usually thought of as "dead zones", like underground locations or skyscrapers.

We further expanded our core technology and developed an extensive location-based service platform, which includes seamless outdoor-indoor wayfinding, asset tracking, targeted alerts and notifications, analytics, location intelligence and secure contact tracing. We work with a wide variety of businesses and industries, including retail, health care and higher education. Our technology has been recognized as one of the most advanced location-based technologies in the world, with 62 patents granted to date. We have deployed our technology across 255 million square feet worldwide.

Over the last few months, we have seen an unprecedented response from the technology sector to the global spread of COVID-19 in our communities. Most countries have focused on developing technologies to help with contact tracing to try to flatten the curve and also prevent the health care system from becoming overwhelmed.

Singapore was an early adopter of a community-driven contact-tracing app, and now European member states are adopting a decentralized Bluetooth model for contact tracing. In this model, no data is stored centrally, ensuring that it's not possible to reconstruct an individual's relationships or identity. They are planning an international "roaming" feature that could help revive travel and tourism across the area. Each country would have its own app, but the apps could "talk" to each other and help make travel across the region safer.

Other countries like China went beyond contact tracing and developed additional uses for location technology to help people access products and services during this challenging time by helping them check store levels for masks, sanitizer and gloves at nearby stores and also moving a significant portion of their everyday health care to online consultations.

In addition, they adopted the use of health QR codes to ensure that workplaces that had to remain open were safer. If an employee received a green QR code, they were able to work. A yellow or red code would require self-isolation. Population density maps have also been used to help pinpoint vulnerable populations, large gatherings and, along with some real-time data related to health and travel, to provide citizens with a visual representation of where potential hot spots are likely to occur, helping them to reduce their risk by avoiding those areas.

As we have seen recently, there have been some challenges and concerns with this type of technology, one of the main ones being privacy. Canada is looking to adopt a decentralized model of contact tracing moving forward, which will help address many of the privacy fears that currently exist, but right now, this concern has led to poor adoption rates of the apps, making them less effective. Alberta's app, for example, has been downloaded by just 200,000 people out of a population of approximately 4.4 million. We need to have approximately 60% of the population using this type of app for it to be effective.

As the country moves to reopen in stages, we need a way to ensure that we can keep our population safe while allowing for Canada's economic growth to move forward again. Essentially, we need to find a way to safely function in a society with the virus, as we wait for a vaccine to be developed. Location-based technology will play an important role in this process.

● (1310)

First, integrating the digital contact-tracing technology with traditional contact tracers can prove to be more effective in stamping out the virus hot spots and tracking the spread of the disease. Integrating these two approaches ensures that we address the issues inherent to each method. For example, traditional contact tracing has limitations of scalability, notification delays, and contact identification in public spaces. And even if we don't have full adoption of the digital contact-tracing technology, many of the gaps could be filled by traditional methods, ensuring greater effectiveness overall.

As we get back to using many non-essential services, additional location-based technology can keep us safer. It's not enough just to ensure that our health care system doesn't get overwhelmed by COVID-19 cases. We need to work to accommodate patients who need diagnostics and care for other conditions and help them safely and securely access the services they need. Patients must have access to timely cancer screenings, and people with compromised immune systems need a way to safely plan their hospital or clinic visit for treatment so they don't unnecessarily expose themselves to the virus by coming into prolonged contact with members of the public.

Seamless outdoor-indoor navigation technology, combined with location-based notifications and analytics, can help these patients plan optimized routes, from finding the closest hospital entrance to their appointments to planning the shortest route through the building to multiple appointments in different sections of the hospital. It can further help by sending notifications telling them when it's safe to enter a waiting area, and giving them instructions detailing any safety precautions that must be followed. Heat maps could also be used to prevent bottlenecks and show the busy areas, so vulnerable patients could avoid walking into a situation that would increase the risk to their health.

This approach would also allow appointments to be spaced out, allow ample time for cleaning before and after patient visits, and help ease the anxiety of such visits significantly, helping to ensure that fewer people put off potentially life-saving tests and treatments because of the fear of getting infected.

Ontario's upcoming cloud-based case management system, which will connect the lab system with the public health system, is another example of where location-based technology could complement a service to make going to appointments for tests and diagnostics safer. This technology would send patients to labs close to where they live, and use targeted notifications to let patients know when the doctors and technicians are ready for them, so they don't need to wait with others in a room, potentially increasing their risk of exposure. To address any privacy concerns, all data should be stored locally on each device for a limited period of time, and would be anonymized.

Using location technology in this way would allow people to continue to practise effective social and physical distancing, while allowing them to access the needed services. This type of approach would also work well in malls and big box retail stores. This type of navigation technology would not only give customers the shortest or the most optimized route to the department they need, but it would also lead them directly to the product they are looking for, eliminating the need to wander around the store aisles in frustration trying to locate it. This would help reduce the time people spend inside around groups of other shoppers, reducing their exposure risk.

Many stores, including grocery chains, face problems with lineups as fewer shoppers are being admitted into the store at once. These lines put people in contact with others for longer periods of time as they wait outside. This is especially true ahead of holidays and long weekends. This is where the location-based solutions really shine, by ensuring that essential services like grocery stores can create a safe shopping environment for their customers, enforcing physical distancing measures and reducing the possibility of the spread of the virus. Stores can use this technology to set up a geofence around their location and control foot traffic into the store without any lineups, preventing crowding and bottlenecks.

This technology will continue to play a critical role as we move past the initial measures to help slow the spread of the virus and start to ease restrictions and open more businesses in the transition back to a new normal.

● (1315)

The uses of this technology go far beyond health care or retail applications. Contact-tracing apps can be a trade-off between privacy and effectiveness, but if we integrate this technology with traditional methods, and supplement it with additional location-based products and solutions such as indoor navigation, targeted notifications, geofencing and tagging, they could help more Canadians safely return to work, attend medical appointments, events or extracurricular activities, and much more, as we wait for a vaccine or an effective treatment for COVID-19 to be developed.

Thank you.

**The Chair:** Thank you.

Mr. Nagpal, I'm advised that the sound quality of your mike has degraded. Perhaps before you next have a chance to speak, you could unplug your mike and then plug it back in, and also select and reselect it. Thank you very much.

We will go now to Medtronic Canada.

Mr. Hupé, please go ahead for 10 minutes.

[*Translation*]

**Mr. Patrick Hupé (Senior Director, Health System Strategies, Medtronic Canada):** Thank you, Mr. Chair.

My thanks also to the members, the witnesses and the guests.

Thank you for giving us the opportunity to share with you our comments on the Government of Canada's reaction to the pandemic.

I would first like to congratulate the government for taking the following measures to date. It actively recognized the importance of maintaining international relations and the integrated global supply chain in order to make sure that infected patients have rapid access to medical technologies. That was critical. Canada played a key role in that regard, especially within the G20. It also established an action plan to mobilize industry in order to meet the challenges of the pandemic. It centralized the procurement of essential supplies and, lastly, created financial support for people who had lost their jobs in order to lighten the burden of the pandemic.

If I may, I would now like to give you a modest introduction to Medtronic Canada.

In fact, we are the largest medical technology and medical solutions company in the world. We have 90,000 employees globally, including 1,000 employees in Canada. We have a presence from coast to coast and our activities include marketing, research and development, production, education and training. The company focuses on five key areas: cardiac and vascular diseases, diabetes, minimally invasive therapies, neuroscience, and consulting services, which help healthcare systems to reduce wait times and improve the patient and caregiver experience.

Like many companies in the medical devices sector, we were significantly affected by the pandemic. First, there was an increased demand for our ventilators, pulse oxymeters, extracorporeal membrane oxygenation machines, and other devices used in respiratory care. That had two key consequences. First, we went into humanitarian mode, in the sense of delivering our devices that were in high demand to where the need was greatest. We were no longer in a conventional business mode, where we receive orders and process them on a first-come-first-served basis. In addition, we provided free access to our intellectual property in the case of a portable ventilator, so that other specialist partners, including Ventilators for Canadians, could manufacture more ventilators locally.

Lastly, our maintenance technicians and our clinical trainers had to work tirelessly to coordinate installation and maintenance and to train caregivers, particularly with regard to those ventilators. The cancellation of air routes made the task particularly difficult. Despite the crisis, our clinical teams continued to support essential surgeries all over the country.

Second, given that we provide technologies and services for more than 70 diseases, the cancellation and postponement of non-essential surgeries forced us to suspend our activities for a number of months. Despite the financial repercussions that ensued, we laid no one off because of the pandemic. Instead, we made preparations to support the resumption of surgeries by putting our experts and our products at the disposal of health care systems. We provided our expertise in clinical care pathways, in analysis, and in reducing wait times in order to redefine patient triage protocols, to optimize processes, and to shorten the time before discharge following a procedure.

Now we are at the point of considering the resumption of surgical procedures, we sincerely believe that Medtronic Canada and some members of the industry, given the international experience and the ingenuity of Canadian SMEs in our field, can be part of the solution rather than being simply restricted to the role of suppliers operating only in a purely transactional business relationship.

I would like therefore to focus my comments today on three areas. They are where we can provide tangible, proven and time-tested solutions so that procedures can be quickly resumed and the health and welfare of our fellow Canadians can be assured. These are the quickest possible transition from hospital to home, the procurement system, and the improvement of clinical care pathways. The pandemic has certainly highlighted the importance of keeping patients out of hospital once they have received appropriate care. Digital health care can certainly play a major role in that regard.

● (1320)

First, in a hospital setting, it allows physical distancing measures to be observed, thereby reducing the risk of infection. Moreover, this component of medical technology means that patients can be monitored at home, thereby reducing their number of hospital visits.

Clearly, health is essentially an area of provincial jurisdiction. However, the federal government has the opportunity to make better use of digital health care for the veterans and the indigenous population it serves, thereby becoming an example of health care innovation for the provinces of Canada.

Technologies that allow remote monitoring and virtual visits have been available for more than 10 years, but, because of the pandemic, we have seen those technologies adopted more quickly in the last three months than in the last 10 years. This is a tipping point and we cannot allow ourselves to turn back. Canadian companies are pioneers in this regard. According to Canada Health Infoway, before the COVID-19 pandemic, only between 10% and 20% of health care visits in Canada were done virtually. Today, that figure is closer to 60%. The federal government and each of the provincial governments have the opportunity to continue virtual visits, once the pandemic has been stamped out.

Let me illustrate all this with very specific examples. Digital health care does not just allow physical distancing, it is also an incredible tool for communicating with patients in remote locations. For example, a patient, a veteran or a member of a First Nation, who wears a pacemaker must have a check-up several times a year, with each appointment taking about 10 minutes. If that patient lives in the far north or in a remote region of our country, it can take him hours, even days, to get to the clinic. Using a form of digital technology that has existed for years and that involves an examination done remotely, reduces the risk of infection, reduces costs, and increases the efficiency of the services. Until now, that option was limited, because physicians could not bill for their services or because patients had no access to a stable Internet connection. Those two concerns can certainly be fixed with the support of the federal government.

Furthermore, in order to have access to the technologies and the solutions that help patients to obtain better care in a timely fashion, the government must focus on procurement. The pandemic actually proved beyond any doubt that procurement is not just a menial job that is simply about acquiring things. It requires men and women with a strategic vision, with a good understanding of the technologies that are needed, and with a solid foundation in new value-based procurement concepts. Those concepts, after all, have been adopted elsewhere in the world, particularly in Europe.

During the pandemic, the federal government took two steps in procurement. First, it centralized procurement, especially for ventilators and personal protective equipment. Once free from a part of that burden, hospitals and industries were therefore able to concentrate on what they do best, which is taking care of patients. Then, the government began to implement innovation policies focused on demand.

Historically, the federal government has focused on the supply of innovation rather than on the demand. For more information on this subject, you can read the article by Neil Fraser, the president of Medtronic Canada, in *Longwoods*. Right now, I can tell you that innovation policies focused on demand involve asking for and obtaining solutions, not just products. That is exactly what the federal government did when it launched Canada's Plan to mobilize industry to fight COVID-19.

By implementing innovation policies focused on demand, the government was beginning to follow the recommendations of the Economic Strategy Table for health and bio-sciences that the government established in 2017, with the Department of Innovation, Science and Economic Development collaborating with Health Canada. This crisis has shown us all the importance of having a more advanced manufacturing sector in Canada. I would say that the government can achieve that by re-examining the recommendations of the Economic Strategy Table for health and bio-sciences.

● (1325)

I would like to end with integrated health solutions.

In our search for solutions to improve our health care system, one of the greatest challenges facing the federal and provincial governments is to find a solution to eliminate the incredible delay in surgeries and diagnostic procedures, and to avoid other deaths because of those delays.

Before the virus emerged in Canada, hospitals were already operating in a complex environment. The way forward will be increasingly difficult if we do not act quickly. Hospitals also have to adapt to the new expectations of patients who have seen the advantages of virtual care, as opposed to being afraid to stay too long in a waiting room.

Despite everything, there is hope and a huge amount of optimism. Let me give you some specific examples. One is the Fraser Health Centre in British Columbia, which now conducts patient evaluations virtually, before they are admitted. In Ontario, virtual care is used for more than 50% of the patients at the Peter Munk Cardiac Centre. In New Brunswick, the Vitalité Health Network has established a specialized drive-through clinic for pacemakers, in order to reduce the growing number of patients waiting to have their cardiac devices checked.

Medtronic Canada has the expertise and the tools needed to help the government to develop those kinds of new protocols and thereby to create patient-centred health care pathways. These will help health care systems meet the new challenges and the new expectations. We are determined to deliver the results that we have promised.

On behalf of Medtronic Canada, I would like to thank you once more for making it possible for me to share my comments. I hope that this session today is just the beginning of a concerted initiative that will call on the leadership and the courage of our governments, the expertise of our academia, and the resilience, experience and ingenuity of Canadian companies and their international affiliates that have chosen to invest here in Canada. The benefits will be seen in the health of all Canadians.

● (1330)

[*English*]

**The Chair:** Thank you.

We will start our questioning now. We will undertake two rounds of questions. We will start the first round with Dr. Kitchen.

Dr. Kitchen, please go ahead for six minutes.

**Mr. Robert Kitchen:** Thank you, Mr. Chair.

Thank you, everybody, for your presentations. They are greatly appreciated.

Dr. Possamai, I really appreciate your being here and the work you did with the SARS Commission, because that facilitated the start of PHAC, as you mentioned a little earlier today, and the setting up of protocols and policies to deal with pandemics. We've seen that not only has Canada done that, but other parts of the world did that at that time.

Taiwan did exactly the same thing, and they implemented those policies and procedures from day one, right from the very start. My colleagues and I brought forward, a number of times, with the minister as well as the government, the issues of shutting down the borders, using face masks, testing, etc. As I said, Taiwan closed its borders and utilized masks and temperature screening from day one, and they've done a tremendous job in reducing the impact of COVID-19 and the number of deaths.

I have a question on the issue of temperature screening. Last month, the committee questioned officials from Transport Canada regarding the effectiveness of temperature screening for travellers during the COVID-19 pandemic, specifically at airports. Dr. Tam herself has said that when it comes to SARS, temperature screening was ineffective. My colleagues and I asked the Transport Canada officials to provide us with new, scientific evidence that would support the effectiveness of temperature screening. However, they've only provided what seems to be an opinion piece, without any scientific paper. They state, “The greater number of COVID-19 cases increases the likelihood of temperature screening effectiveness”.

From your experience and your review of the SARS epidemic, I'm wondering what scientific data proved the effectiveness of temperature screening.

**Mr. Mario Possamai:** That's a very good question. During SARS, there was some work on temperature screening, but it was inconclusive, and the information was that it appeared to be ineffective. This occurred over a short period of time. The equipment at the time was not as effective as it is today, so I think that it warrants, in a very speedy fashion, an examination of what the best technology is and whether it works.

One of the things I've noticed with PHAC is a lack of urgency to look at new technologies, to examine the best way to address this, and I think this may be an example.

**Mr. Robert Kitchen:** Thank you.

You indicated the fact that temperature screening can produce inaccurate results for a variety of reasons. They could include improper calibration of the machine, user error and environmental variations—the technology has changed, obviously—which could lead to false positives and false negatives that create incorrect data for scientists, as well as a potential risk to public health in general. Do you have concerns, not just about the effectiveness of temperature screening overall, but also about the integrity of the data collected?

**Mr. Mario Possamai:** You know, I'm not an expert in this area, so I don't want to speak on it. I do think the whole issue of border control is one that needs to be controlled in depth. What's the best way to do that? What's the best way to monitor movement? Is it the technology, as mentioned by the witness from Mapsted? I think we need a really holistic approach to examining the best way to do this.

● (1335)

**Mr. Robert Kitchen:** You did talk a little bit about masks. We're aware of the issue of droplets versus airborne transmission and the fact that certain masks meet certain standards. There's the standard mask that we see people walking around with today, which is just a cloth that basically keeps the droplets in but doesn't necessarily protect you from what's out there. We also talk about the N95. Obviously, the reason it's called N95 is that that's the percentage it reduces. We even talk about N99.9 masks that are out there.

These masks that are there, should we be using them today? Should it be something on the issue of...? Yes, N95s are of value in certain areas where there is a much greater risk, but is that a value that we see in the public?

**Mr. Mario Possamai:** That's a really great question. Dr. Osterholm of the University of Minnesota has raised this issue. He is in fact working on a plan to be able to create, for the public, masks that are as protective as N95s. I think that should be our goal. I think everyone should be protected, if the equipment is available, to the same level as health care workers.

This darn COVID-19 is extremely infectious. I think airborne infection is a real risk. I think our goal should be to protect everyone to the N95 level. I think Dr. Osterholm's project is a great way forward in that direction.

**Mr. Robert Kitchen:** In the CFNU press release, you're quoted as saying the following:

> The SARS Commission provided clear recommendations on worker safety and infection containment, lessons that have been overlooked in this pandemic. It is our hope that this investigation, prompted by the CFNU, will yield unequivocal, evidence-based recommendations that are urgently needed to prepare Canada and frontline workers for the next wave of COVID-19.

What are the barriers when it comes to knowledge transfer on the lessons learned from the previous pandemics and epidemics?

**Mr. Mario Possamai:** That's a great question. I think one of the problems is that PHAC and other public health agencies in Canada, and the WHO as well, don't have the kind of diverse knowledge and expertise that we need. They have very good knowledge in terms of epidemiology, but they really need to have broader knowledge on worker safety expertise, and also expertise on aerosols and aerosol transmission. For example, two of the top people in the world on aerosol transmission are Canadians. They are Dr. Raymond Tellier in Montreal and Dr. Lydia Bourouiba at MIT. They should be at the table. They should be involved with PHAC in developing the kinds of policies and procedures that could protect our workers.

I would recommend that there be a real review to ensure that PHAC's expertise is expanded and really reflects the latest science. A lot of the science that PHAC and WHO are relying on when it comes to disease transmission dates back to the 1930s and 1940s, when instruments were not good enough, sensitive enough, to measure aerosol transmission. The science has made incredible progress in looking at small aerosol transmission, but that expertise is not at the table at either PHAC or WHO. I would recommend that they really expand their knowledge base.

My last point is that we should look at the CDC. The CDC has two components. One is NIOSH. NIOSH is dedicated to worker safety. PHAC should have the same type of independent, very strong, very well-resourced and well-staffed expertise to look at this. We have Canadians who can do that, and we should bring them on board.

**The Chair:** Thank you, Dr. Kitchen.

We'll go now to Mr. Longfield.

Mr. Longfield, please go ahead for six minutes.

**Mr. Lloyd Longfield (Guelph, Lib.):** Thanks, Mr. Chair.

Thank you to all of the witnesses. I wish we had more time, but that's always the struggle we have.

I'm going to start with Medtronic, then go to Mapsted and then, time permitting, finish up with Mr. Possamai.

Mr. Hupé, it's great to have you here. You mentioned Ventilators for Canadians. We have a couple of Guelphites who are helping out on that project: Jim Estill from Danby and Rick Jamieson from ABS Friction. I had early discussions during the pandemic with Jim Estill about the war approach to treating industrial problems and sharing information in order to work together on problems.

However, one of the issues we studied on the industry committee is intellectual property. I wonder how you see intellectual property being managed and shared in the health sector as we go through the COVID crisis.

● (1340)

[*Translation*]

**Mr. Patrick Hupé:** Thank you for your question, Mr. Longfield.

Actually, as far as we're concerned, we haven't really had any intellectual property issues.

There are different types of ventilators. There are portable ventilators, which are mainly used by the military in case of emergency and allow evacuation of people in the field. If more advanced care is needed, there are much more sophisticated devices, with thousands of parts and very advanced technology.

There really is a whole spectrum of devices from the simplest to the most elaborate. So that needs to be taken into account. So it may be wrong to believe you can convert factories very quickly for the type of device that is at the extreme end of the spectrum in terms of complexity.

However, I won't go into detail, but devices with what could be described as fairly average technology, which aren't overly elaborate or as simple as the technology found in the armed forces and used in the field, are readily available to people. We've released this type of device around the world, and I think it's been a win for Canada, as we've seen Ventilators for Canadians take up this opportunity.

[*English*]

**Mr. Lloyd Longfield:** Thank you.

I come from a pneumatics background. I know that when you're operating under low pressure and low flow, which is what the lungs do, it makes for some challenges. You also need a fail-safe to make sure that if the unit doesn't work properly, there are ways to continue without starving the patient for air.

When working with universities and academics, developing and innovating, we've had challenges in the past in Canada to transfer intellectual property without other countries buying our intellectual property and then selling it back to us so that we have to manufacture under licence. Are you manufacturing under licence at your place, or are you working within the ideas from Canadians?

[*Translation*]

**Mr. Patrick Hupé:** You're referring to ventilators that are currently completely free.

However, academically, there is currently a trend that intellectual property is increasingly being freed up. I'm no expert, but I think McGill University's Montreal Neurological Institute and Hospital has moved in that direction. We may see this elsewhere in Canada.

[*English*]

**Mr. Lloyd Longfield:** Terrific. We have seen that in Germany, too, at Fraunhofer, with its institutes sharing information. Thank you very much.

Mr. Nagpal, the 62 patents that you mentioned always get my attention. I love ideas being patented in Canada, but then there is a time and a place where you have to operate openly.

Anonymizing and aggregating data is another thing we talked about, Mr. Nagpal. You also talked about location-based data. Are you able to still use the data for a limited amount of time? Could we use the data, and have protections on that data, so that the Government of Canada could aggregate and anonymize it, or does it just fade away once it's been used one time?

● (1345)

**Mr. Paramvir Nagpal:** We are an innovative technology company, and that's why we pride ourselves on having 62 patents in six years, from the company's formation.

Back to your question, any authentication and credentials can be done to control the data. First, the data is stored on your personal device. If you want to share that information with your local government authorities, you can do that by giving them a password that disappears automatically within seven to 14 days, depending on how the system is configured. At the end of the day, we want to give the control to Canadians so they can make their own choices.

**Mr. Lloyd Longfield:** That's great. Thank you.

**The Chair:** Thank you, Mr. Longfield.

**Mr. Lloyd Longfield:** That's too bad. I knew I'd run out of time. Thanks so much.

[*Translation*]

**The Chair:** It's your turn now, Mr. Desilets. You have six minutes.

**Mr. Luc Desilets:** Thank you, Mr. Chair.

My first question is for Mr. Nagpal.

Mr. Nagpal, what percentage of the population would be able to access this application, including of course those who don't have a cell phone?

[*English*]

**Mr. Paramvir Nagpal:** First of all, technically the entire population can have access to this technology. One of the main cases is that you need to have a smart phone to enable the use of this technology. Theoretically, you can deploy this using Google Play store or App Store, and you can give everybody the capability to use this technology.

That said, if a person doesn't have a smart phone, they can also use certain features of this technology by going through a website, where they can see how the spread is happening in their own locality. If they're seeing some symptoms, they can easily go to that website, enter that information, and then do contact tracing. There are various ways we can securely provide that access to Canadians.

[*Translation*]

**Mr. Luc Desilets:** Could you be more specific please, Mr. Nagpal?

I get the impression that not the entire population has a cell phone and would be able to install this app.

Honestly, I don't know what percentage of the population could install this app. Are we talking 70%, 80%?

[*English*]

**Mr. Paramvir Nagpal:** The percentage would depend on how we want to deploy the technology. If 70% of people have a smart phone, they can easily install the smart phone application, and the rest can go on a website and access similar features on a web browser. The compatibility depends on how we are deploying the technology. You can deploy it on a smart phone, a website, or a web browser.

Of course, there will be some situations where we won't be able to hit the prospects, where they're not able to access the Internet or a laptop or a computer. We will not be able to cover those kinds of populations, but the majority of the population will be able to do that using this technology. This is exactly how countries like Singapore or some European member states have done this very successfully.

We have some customers in Taiwan, and they were saying to us that they didn't face that type of challenge as it was faced by the rest of the world, and it's because of how countries are using specific technologies for the well-being of their citizens.

[*Translation*]

**Mr. Luc Desilets:** Okay, good.

What I fear is that this app won't be available to the part of the population that is underprivileged and who, perhaps at the same time, is simply more at risk.

Thank you for your answer, Mr. Nagpal.

I have a question for Mr. Possamai.

After more than three months of the COVID-19 pandemic, do you feel that the current measures are adequate and sufficient?

● (1350)

[*English*]

**Mr. Mario Possamai:** I presume you're asking about the personal protective measures for health care workers. Is that correct?

[*Translation*]

**Mr. Luc Desilets:** Yes.

[*English*]

**Mr. Mario Possamai:** They're not, and I believe the data showing that one in five of the COVID-19 cases in Canada involves health care workers demonstrates that point. I think we urgently need to take a precautionary approach and protect our health care workers across the country to the highest level using airborne precautions.

[*Translation*]

**Mr. Luc Desilets:** Right. I understand very well.

Should there be a potential second wave, is there enough time to turn things around to better protect these people and hope for lower infection rates?

[*English*]

**Mr. Mario Possamai:** We have enough time if we act urgently.

One of the really disappointing things thus far from the federal government and PHAC is that we have not acted urgently to ensure we had enough PPE. For example, in late December, Alberta bought a huge quantity of N95 respirators. PHAC and Ottawa sat on their hands. Federally, we didn't begin to buy in large scale until March, and by that time, as you have heard, it was like the wild west in trying to buy N95s. We lost that opportunity. We have to move urgently. We have to create a domestic supply and we also have to look at alternatives, because N95s are not the only way to protect health care workers. There are P100s and other types of equipment that should be looked at on an urgent basis so that we have enough equipment.

For example, we were talking about technology. There have been some efforts to begin creating new types of equipment, and we have to move quickly.

Thank you.

[*Translation*]

**The Chair:** Thank you, Mr. Desilets.

**Mr. Luc Desilets:** Thank you very much.

[*English*]

**The Chair:** We go now to Mr. Davies for six minutes, please.

**Mr. Don Davies:** Thank you, Mr. Chair.

Mr. Nagpal, you mentioned that Singapore was one of the earliest adopters of contact tracing and you commented on the European Union being in the process of developing a model for contact tracing. We have had many experts tell this committee that testing and contact tracing are vital parts of getting a good grip on COVID-19. Where is Canada today in our implementation of contact tracing?

**Mr. Paramvir Nagpal:** I believe Canada hasn't been the frontrunner in adopting contact tracing. In the past week we had an announcement from the PMO that BlackBerry and Shopify would be collaborating to build a contact tracing app that would be available for Canadians to download anonymously and voluntarily. We haven't used the technology the way we should have.

Other countries have adopted it very quickly at very early stages. Right now we don't have the available app. We don't have any available data to see how it can be used. If you can't analyze it, you can't improve it. Let's say somebody has COVID and he or she goes to the hospital. How can you find with 100% accuracy where that person went in the last week or the last 14 days? It's very difficult. I believe we are doing some good through the announcements that we will be launching it, but we haven't done that at this time.

**Mr. Don Davies:** Experts estimate that voluntary contact tracing apps usually need approximately 60% participation among the public to be effective. In your view, is that level of voluntary uptake realistic, or should we be looking at mandatory use of contact tracing? What's your advice to the committee on that aspect?

● (1355)

**Mr. Paramvir Nagpal:** First of all, I think it's true that it needs to have 60% uptake. I don't feel we would get a 60% uptake on a contact tracing app in Canada. I don't believe we should make it mandatory. We are not a country that would take away that right from its citizens. I feel we should complement that with other location-based technology or another traditional method. When you combine the new technology with the traditional methods and also use some other kind of location-based applications, you are able to get the result you are looking for, and I feel that's the unifying mixture we need to look for to get the maximum result out of such technology.

**Mr. Don Davies:** Thank you.

Mr. Possamai, on January 31 you wrote to the federal health minister, Patty Hajdu, urging her to adopt precautionary protections for health care workers. In that letter you wrote, “I am profoundly disappointed that the Public Health Agency of Canada is risking health worker safety by recommending lower protections against the novel coronavirus." You also wrote that failing to act with tougher policies “would be to do a grave injustice to the victims of SARS and their families. Half of SARS victims in Ontario were health workers.”

What was her response to your concerns?

**Mr. Mario Possamai:** She never replied to my letter.

**Mr. Don Davies:** Thank you.

Mr. Possamai, staying with you, we know that the final report of the independent SARS Commission in 2006 recommended very clear prescriptions for how to deal with a future pandemic. One of them, as you've pointed out several times, is that in any future infectious disease crisis, the precautionary principle should guide the development, implementation and monitoring of procedures, guidelines, processes and systems.

We've already pointed out that when it came to masks, droplet versus airborne transmission, asymptomatic transmission, community transmission, travel restrictions, border closures and emergency stockpiles, I think it's a fair comment to say that in all of those areas, if we did anything, it was that we ignored the precautionary principle and instead waited until there was actual evidence of something before we acted.

Would that be a fair characterization of Canada's response from January to date?

**Mr. Mario Possamai:** It is.

We had opportunities over and over, especially in the beginning and late December, when we had the first inkling that something very serious was happening in Wuhan. We had the opportunity to act boldly and quickly to protect our health care workers and, by extension, to protect the country, because protecting health care workers goes hand in hand with pandemic containment. The countries that have low levels of health care worker infections also have the best record of containing the pandemic.

**Mr. Don Davies:** Can you help us understand why that's the case? We had an unprecedented focus after SARS. As you mentioned, we had the Archie Campbell commission, and I think we had one at the federal level as well. We have very clear prescriptions about what to do, yet in the last 14 years, from 2006 to 2020, we have not only fallen down in that period, but also, from the beginning of COVID-19, we have failed to implement the very prescriptions in the independent SARS Commission report.

Can you give us your view on why that is? How could that happen?

**Mr. Mario Possamai:** I'll tell you personally that I'm gutted that it has happened, that things have gone the way they have here. This has gone far worse than my worst nightmare, and one of the reasons is that PHAC does not understand the role of unions and workers in worker safety. In any workplace, the responsibility for worker safety is a joint one between workers and their employer, which means, especially in the health care sectors, that nurses, doctors and other health care workers have a direct role in ensuring the safety of the workplace.

In the interactions that I know of and that I have heard of between PHAC and the unions, there's not been a positive dialogue, a collaborative dialogue, between workers, unions and PHAC. Instead, it's done cursory consultations with workers and unions, just ticking the box. In fact, there should be an ongoing dialogue, because front-line workers know first-hand what the risks are and how things are evolving. They can make real-time recommendations on how to ensure that everyone is protected. By "everyone", I mean workers, patients, visitors and the rest of us, because, as I said earlier, pandemic containment and worker safety go hand in hand.

● (1400)

**The Chair:** Thank you, Mr. Davies.

We'll go now to the second round. We'll start our second round with Ms. Jansen.

Ms. Jansen, please go ahead for five minutes.

**Mrs. Tamara Jansen:** Thank you very much. I would like to ask my first questions of Mr. Possamai.

I really appreciated your explanation of the lack of urgency. I can tell you that having been on this committee from the very beginning, I felt that very same lack of urgency coming from PHAC and from the government on a number of these things.

We had very serious concerns about the messaging from Dr. Tam regarding the danger that mask use would pose to Canadians and her insistence on ignoring the precautionary principle. This messaging, obviously, was subsequently repeated by Minister Hajdu at many of the COVID-19 briefings, and now, since then, there is new science that made them change their recommendation. Unfortunately, this meant that we lost a very important window of opportunity to get Canadians on board and comfortable with mask use.

From the various presentations we've had at this committee, it appears that Canadians were possibly being told not to wear a mask at the beginning because PHAC knew our national stockpile had not been maintained and there were not enough masks in Canada to protect even just our health care workers.

Would you say that the politicization at the highest level of PHAC has affected the decisions being made, to the detriment of Canadians?

**Mr. Mario Possamai:** I think PHAC has been slow to the game, and public masking is a great example. Early on I wrote a letter to Dr. Tam saying that concerns about self-contamination are warranted, but if that's the case, you should have an urgent, wide public health campaign—as they do in Singapore, as they do in Hong Kong, as they do in Taiwan—on how to wear a mask. That still hasn't happened. As I walk in Toronto, I see well-meaning Canadians wearing homemade masks, but they're wearing them with their nose exposed. I see Canadians with beards wearing masks, when we all know that beards prevent the safe wearing of masks.

There is a real failure there to really act urgently to protect Canadians and also to make sure they get the best information.

**Mrs. Tamara Jansen:** Many constituents in my riding wanted to use masks in the beginning, but it was suggested that wearing a mask in public would instill fear or a racist backlash. Since Dr. Tam would have known that masks were an added level of protection right from the start, why do you think she didn't insist they be used? Do you think she was pressured by the WHO or other political stakeholders?

**Mr. Mario Possamai:** That's a great question. It's one that I've wondered about. What I've seen is that PHAC's advice has been in lockstep with the WHO right from the word go. There has not been any critical thinking, any critical evaluation, on whether that's the right advice.

I'll give you another example, if I may. The WHO China mission, on February 28 this year, said that China was able to eliminate health care worker infections, but they didn't explain how. You have to go right to the back, to the fine print, to see that they did it because they ordered everyone to wear N95s. Now, that's a grey standard for the WHO, and I hope it's one the committee exposes if you get the right WHO witness. I am disappointed that PHAC didn't have the critical mindset to look at that and say, "Why was China able to protect its health care workers?"

**Mrs. Tamara Jansen:** I know when we had PHAC come by, we realized that they weren't even rotating our stockpile. How do we hold these people at PHAC responsible? Should there be an independent body doing a performance review, as you mentioned, on a yearly basis or something?

**Mr. Mario Possamai:** You know, when Justice Campbell gave the advice on setting up PHAC and Dr. Tam's office, he felt, and I agreed with him, that we had it covered, because it gave that office the independent ability to speak out on health risks. We thought that if there was a shortage of masks, they would speak out and would do so in a timely manner. It hasn't happened.

Parliament, in my view, should really require certification every year, in depth, on whether we're ready for such an existential risk.

● (1405)

**Mrs. Tamara Jansen:** Thank you very much.

I have a quick question for Medtronic. I read in your May company report that you had a 26% decrease in your first-quarter revenue due to COVID-19. Apparently the cardiac and vascular group saw the steepest decline, at 34%. We know that many procedures are being deferred right now in order to ensure that our health care system is not overwhelmed. Your falling revenue number suggests quite a high rate. What do you think that will cost in Canadian health outcomes?

[*Translation*]

**Mr. Patrick Hupé:** It's very difficult to predict this cost, but we know that the recovery seems to have been going fairly well across the country for a few weeks now. Obviously, following that, some urgent cardiac surgeries have taken place. Other operations are slowly but surely starting to resume. In this regard, it's very difficult for me to give a figure.

[*English*]

**Mrs. Tamara Jansen:** We've heard that many hospitals—

**The Chair:** Thank you, Mrs. Jansen. We'll go now to Ms. Sidhu.

Ms. Sidhu, please go ahead for five minutes.

**Ms. Sonia Sidhu (Brampton South, Lib.):** Thank you, Chair. Thank you to all witnesses for being here with us.

Patrick, I really want to say thank you to Medtronic. I had a great conversation with the Medtronic president, Neil Fraser. As you know, this is a very unprecedented time we are facing, really for the first time ever. I want to thank very much those who are doing great work, especially Medtronic from Brampton South, helping not just Canadians but people around the world as well.

In May Medtronic announced an expansion of the Medtronic insurance program, with a new option to support diabetes customers. As you know, Brampton has the highest rates of diabetes. How has the change assisted some of the most vulnerable customers during this pandemic? Can you elaborate on that?

**Mr. Patrick Hupé:** Can you repeat the last portion of your question, Ms. Sidhu, please?

Thank you very much.

**Ms. Sonia Sidhu:** You were helping diabetic patients in Brampton. Can you tell us how you were helping there?

Also, the federal government has invested $250 million into virtual care during COVID-19. You said in your statement that virtual care was used by more than 50% of patients at the Peter Munk Centre. Brampton Civic Hospital is overcrowded, overwhelmed. How can Brampton Civic Hospital benefit from your telehealth program?

[*Translation*]

**Mr. Patrick Hupé:** Thank you for your question.

First, we have a team called Integrated Health Solutions, whose efforts are optimizing clinical corridors and clinical care. This allows us to identify patient cohorts for health care professionals. Then, based on objective criteria, the programs in place and the indications for our products, we can select the right patients and see how we can support them. So we have a whole team that can support hospitals and clinical teams across the country to ensure that these programs are beneficial for the diabetic population in Canada.

[*English*]

**Ms. Sonia Sidhu:** That's great.

Would you like to talk about creating an app to help front-line medical workers during the COVID-19 pandemic? How has that been successful in assisting front-line workers?

[*Translation*]

**Mr. Patrick Hupé:** I'm not sure I understand exactly what you're talking about, but we currently have projects aimed at optimizing the use of personal protective equipment for certain interventions. With the personnel who must be on site for certain interventions, we're trying to coordinate the installation of this equipment to ensure that it's used properly. In particular, we run simulations using algorithms to support clinical teams in this regard.

● (1410)

[*English*]

**Ms. Sonia Sidhu:** Thank you.

What is Medtronic's current production capacity? Has Medtronic reached its production goal for June 2020?

[*Translation*]

**Mr. Patrick Hupé:** Absolutely. You're talking about ventilators, right?

[*English*]

**Ms. Sonia Sidhu:** Yes.

[*Translation*]

**Mr. Patrick Hupé:** Yes. In fact, we are in the process of increasing production fivefold. As I was saying to Mr. Longfield earlier, we're talking about highly sophisticated equipment that requires a lot of technology and a lot of parts, depending on the supply chain. Despite all the challenges that this may pose, we are well on our way to achieving what we said a few weeks ago, which is to increase our ventilator production fivefold.

[*English*]

**Ms. Sonia Sidhu:** Thank you.

Mr. Chair, do I have more time?

**The Chair:** You have half a minute.

**Ms. Sonia Sidhu:** Then I will pass.

**The Chair:** Thank you, Ms. Sidhu.

I advise the committee that we have a hard cap on the meeting facilities at 25 minutes after the hour. If we are extremely ruthless in the timing, we can get everybody's questions in.

We will carry on now with Ms. Kusie for five minutes.

[*Translation*]

**Mrs. Stephanie Kusie (Calgary Midnapore, CPC):** Thank you very much, Mr. Chair.

Normally, I serve on the Standing Committee on Human Resources, Skills Development, Social Development and the Status of Persons with Disabilities. The way things are done in this committee is different.

My first question is for you, Mr. Hupé. Generally speaking, have you noticed a change in global supply chains?

**Mr. Patrick Hupé:** Perhaps we've been lucky with supply chains because, so far, we haven't had any major problems in that area.

**Mrs. Stephanie Kusie:** Okay.

Does that include medical equipment?

**Mr. Patrick Hupé:** Absolutely.

**Mrs. Stephanie Kusie:** Okay.

Do you think it's important for Canada to ask for more trade with China? I think it would be important to have less trade with China.

**Mr. Patrick Hupé:** I'm not an expert on international politics.

I just think that, thanks to what's been done so far and to our own experience with the supply chain, we've been able to increase our production capacity. Also, in order to meet the needs as quickly as possible, we've opened up our intellectual property to certain technologies.

In addition, staff on the ground helped to get ventilators that had been left on shelves back in operation, install them and train health care staff.

**Mrs. Stephanie Kusie:** Do you think we'll see any changes in the supply chains since the reliance on China for supplying equipment is liable to decrease?

**Mr. Patrick Hupé:** I hope there will always be good planning.

As I said in my introduction, I think the procurement system should be seen as a very strategic aspect of moving forward, and it should be built on policy-based principles that allow us to access solutions, not volume or technology as such.

My guess is, if we're looking for solutions, technology will follow. That's how we're going to meet the demand. That requires strategic procurement expertise.

● (1415)

**Mrs. Stephanie Kusie:** I think it's important to have expertise in foreign affairs, but it's also important to have the industry's opinion because they know exactly what we need. I think it's really important to have the industry's co-operation.

During the pandemic, what have we learned about the second wave or a future pandemic?

**Mr. Patrick Hupé:** First off, I have to say that I agree with you completely: the industry has an important role to play. I also think that experience has been gained, both by SMEs and by multinationals such as ours.

I'm speaking on behalf of Medtronic Canada only. Since the company has a global presence, we've been in contact with different health care systems. Our expertise in this regard has allowed us to see how this has been done with the industry.

As I said in my introduction, if the industry wants to move forward, it must be seen not only as a supplier, but also as a true partner that can offer solutions without putting our health care system at risk. Indeed, it must remain public. We are very proud of the current health care system.

In my opinion, it would be horrible to do without another eligible party, either the supplier or the industry, in order to ask about certain solutions related to the future. We should start doing that immediately.

**Mrs. Stephanie Kusie:** Do you think the government has been a good partner so far in determining the exact inventory we have right now, but also in determining what we're going to need in the future?

We said that when the pandemic began—

[*English*]

**The Chair:** Excuse me, but we need a very quick answer. We're out of time.

Please go ahead.

[*Translation*]

**Mr. Patrick Hupé:** Listen, I think that having such a commission will help to find solutions. It's easy at this stage to go back and comment on the situation. It's been difficult to predict the scale of this pandemic, but I welcome the openness and the fact that we have this kind of exchange to learn quickly and take action before a potential second wave.

**Mrs. Stephanie Kusie:** Thank you.

[*English*]

**The Chair:** Mr. Kelloway, you have five minutes. If you're able to do it in three minutes, that would be most helpful.

**Mr. Mike Kelloway:** I will do that, Mr. Chair. I have just a couple of questions with respect to Medtronic Canada.

I understand that your organization has recently been named as a top workplace in Ontario for supporting the mental health of its employees. Can you tell us a little bit about your organization and what it has done to support the mental health of the employees in this pandemic? I'm looking at best practices, and I think sometimes the mental health side of things tends to get not as noticed as other things.

I'm wondering if you could briefly speak to that. Then I have one more question.

[*Translation*]

**Mr. Patrick Hupé:** Thank you for the question, Mr. Kelloway, and thank you for mentioning this recognition we received.

We do different things. First, it's all part of our mission. Medtronic Canada's mission was written 60 years ago by its founder, Earl E. Bakken, and it's all about that. It's essentially about making sure that we can relieve pain, prolong life and restore health to patients.

We are obviously very close to patients, and we see in a very real way the effect of our technologies on their health. This inspires our employees and gives meaning to what we do in practice. Often, employees tell us that when they go through a bit of a difficult or discouraging time, they remember this mission and the impact it has on patients. Sometimes even patients who benefit from our technology come and tell us firsthand about the benefits of our technology. That obviously has a big impact on all of us at Medtronic Canada.

● (1420)

[*English*]

**Mr. Mike Kelloway:** Thank you so much.

I have one last question, Mr. Chair. Then I will give up my time.

Dr. Possamai, as a former senior adviser on the SARS investigation commission, you've talked about this, but if you had to look at the now and in the future, which is not that far if we look at a potential second wave, I'm wondering what you would recommend now for front-line health care workers, of which I have many in my family, in terms of a number of ways to maintain their safety during the pandemic.

**Mr. Mario Possamai:** First of all, I think we need to move to the precautionary principle in protecting them. We need to go to airborne precautions. As we now move, as the government has said, to domestic production of N95s, we should really ramp that up to make sure we have enough supplies to do that.

We need to urgently try to find alternatives as well, because N95s are not the end-all and be-all. There are other ways. Unfortunately, PHAC doesn't have the internal worker safety expertise to really do that. I think it's important to reach out to health safety experts and industry to advise PHAC on doing that.

**Mr. Mike Kelloway:** Thank you so much.

Thank you, Chair.

**The Chair:** Thank you, Mr. Kelloway. I appreciate your help.

We'll go now to Mr. Desilets.

You have two and a half minutes, strictly, but if you could make it less, that would be very helpful.

[*Translation*]

**Mr. Luc Desilets:** Okay. Thank you, Mr. Chair.

My question is again for Mr. Possamai.

You mentioned earlier that it was important for the federal government to produce an annual report so that we don't end up in a situation similar to the one we've experienced and are still experiencing.

Can you tell me a little bit more specifically what you'd like to see in this report? Would it deal with stock levels, contingency plans? What would it deal with specifically?

[*English*]

**Mr. Mario Possamai:** That's a great question.

We need to know if we have enough supplies, enough N95 respirators, and we need to know where they are located. More importantly, we need to know if we have the right worker safety culture across the country in different settings, because the N95 is only part of what makes a workplace safe. There is a hierarchy of control. We need to engineer control.

It's really a holistic approach that leads to safety, and it goes beyond worker safety. It's also having the industrial support in place if we need to ramp up supplies in certain areas.

[*Translation*]

**Mr. Luc Desilets:** Thank you.

Mr. Hupé, do you think Quebec currently has all the respirators it needs?

**Mr. Patrick Hupé:** That's a good question, but it's very difficult to answer. The Department of Health may have that information, but we, as suppliers, have difficulty collecting it. We aren't the only suppliers. There are a number of others, so it would be difficult for us to give a definitive and comprehensive opinion.

**Mr. Luc Desilets:** Great.

Should there be a second wave that is larger than the one we've just had, could the problem with respirators be even bigger still? If not, will there be time over the next two months to meet the potentially greater needs?

● (1425)

**Mr. Patrick Hupé:** Concrete steps have certainly been taken. I'm not clairvoyant, but for our part, we've quintupled the production of the ventilators I mentioned, which are quite sophisticated. That will certainly be helpful.

We've also made our intellectual property available so that groups such as Ventilators for Canadians, with Baylis, which is headquartered in Montreal, as you know, can also produce another type of ventilator. Certainly, the quantity available will be greater than it was on March 12 or 13.

**Mr. Luc Desilets:** Thank you very much, gentlemen.

[*English*]

**The Chair:** Thank you, Monsieur Desilets.

We will go now to Mr. Davies.

You also have two and a half minutes. If you can make it shorter, that would be most helpful. Thank you.

**Mr. Don Davies:** Thanks.

Mr. Possamai, some of the things we're talking about are water under the bridge, but we're still currently in a health crisis and we have decisions to make now. I want to put a current situation to you and get your advice.

Recently, Dr. Theresa Tam advised Canadians to avoid the three Cs: closed spaces with poor ventilation, crowded places with large numbers of people, and close contact where you can't maintain optimal physical distancing from others. However, on July 1 we heard that Air Canada and WestJet are going to full cabins, where obviously you can't have physical distancing. Transport Canada is thus far refusing to enforce physical distancing rules on the airlines, as is the case with many of the businesses.

What would be your advice to the government on that? Should we be mandating physical distancing rules on airlines as a precautionary principle?

**Mr. Mario Possamai:** I think we should. I think it's very risky to do otherwise. I think the physical distancing approach that we take anywhere should also be occurring on planes. I don't see why they should be exempt.

**Mr. Don Davies:** Thanks.

I also have been on this committee for a number of years and from the beginning of COVID-19, and I remember that back in January, February and March, two things were going on. One was that we clearly had a shortage of personal protective equipment in this country. You've spoken of the expired masks, the destruction of two million N95 masks and the clear shortage. At the same time, our chief public health officer, Dr. Tam, was advising Canadians that masks would be harmful, never mind not recommending them. As well, clearly a number of health care workers were not getting the PPE they needed.

Do you think there was a connection between those two things? Do you think the reason the government was not recommending masks to the Canadian public in the early stages of this pandemic and was not providing them to front-line health care workers was because we had a national shortage?

**The Chair:** Give a 10-second response, please, or as quick a response as you can make it.

**Mr. Mario Possamai:** Sorry, I can't answer that quickly.

**The Chair:** Thank you, Mr. Davies.

**Mrs. Tamara Jansen:** I have a point of order.

Can we not give him a few more minutes? I'm sure the cleaning people can hold.

**Mr. Don Davies:** How about 30 seconds to answer?

**Mrs. Tamara Jansen:** I think that was a go-ahead, but you're—

**The Chair:** Sorry. Use 30 seconds if you can do it.

**Mr. Mario Possamai:** Thank you.

I think shortages were probably part of the thinking, and that's the wrong kind of thinking.

For example, if you run out of a certain antibiotic, you don't say that the disease has gone away. You might find an alternative type of antibiotic so that you can keep treating that disease. The same thing happened here in Ontario. The ONA brought a court case in which a medical expert said that yes, they went away from a precautionary approach because of shortages.

That is just unconscionable. If you have a shortage, you find a substitute or you find another way, but you keep protecting workers. You don't lie to people about what the science says.

● (1430)

**The Chair:** Thank you.

That winds up round two. I thank everybody for their participation and their time, and certainly the witnesses for their time and expertise.

I apologize to the crew who have to turn this room around. We're a little over our time, but thank you for all your hard work, everybody.

With that, we are adjourned.