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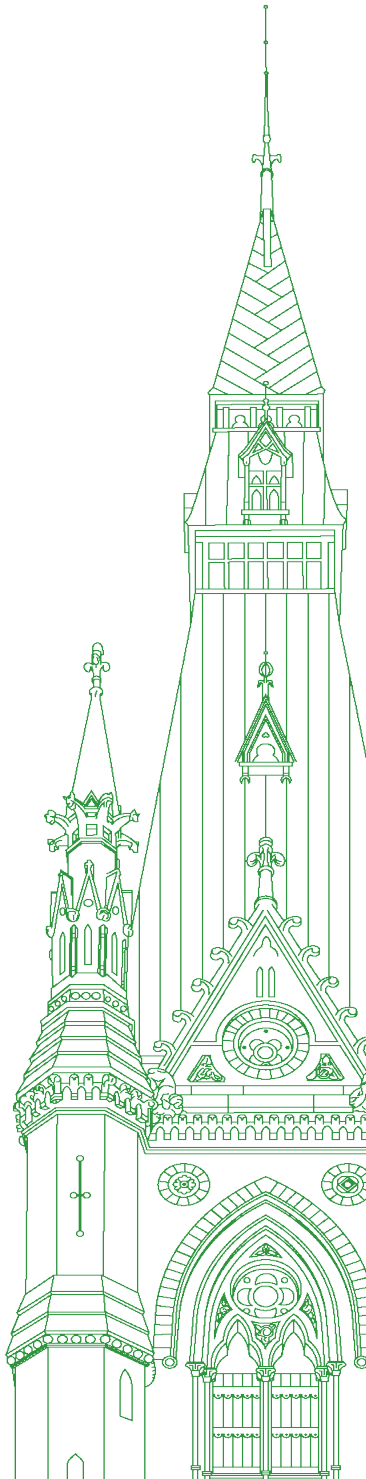

Chair: Mr. Tom Lukiwski

Standing Committee on Government Operations and Estimates

Friday, May 1, 2020

● (1105)

[*English*]

The Chair (Mr. Tom Lukiwski (Moose Jaw—Lake Centre—Lanigan, CPC)): I will call this meeting to order. Welcome to meeting number eight of the Standing Committee on Government Operations and Estimates. Pursuant to the order of reference of Saturday, April 11, 2020, we are studying the government's response to the COVID-19 pandemic.

Before we start, I'd like to announce the schedule for next week's meetings. Our first meeting will be on Monday, May 4, at 2 p.m. It will last for two hours. The second meeting next week will be on Friday, from 11 a.m. until 1 p.m. Those times are Eastern Standard Time.

I would like to make a few comments for the benefit of our witnesses and our committee members, although I'm sure most of the committee members are quite familiar with the procedures by now.

Before speaking, wait until I recognize your name. When you are ready to speak, you can either click on your microphone icon or activate your mike by holding down the space bar. If you lift the space bar up, you will be automatically muted. When speaking, please speak slowly and clearly, and enunciate clearly. It will help our interpreters greatly if you do so.

I would also like to explain some of the guidelines regarding the interpretation channels. I've gone over this several times in the past, but for the benefit of new members, if you are going to be speaking primarily in English, go to the interpretation icon at the bottom of your screen and click on “English”. If you are primarily speaking in French, click on “French”. If you are going to be alternating between English and French, before you alternate please pause for a beat to allow the interpreters to change their channels, and then proceed in the language of your choice.

Before we get started, I would like everybody to click on the grid icon at the top right of your screen and click on gallery view. That will show you everyone who is participating in today's meeting, and you can see their videos as well.

Right now I would ask Mr. Whalen, even though we are slightly behind, to please make his opening remarks. Try to keep your comments as brief and concise as possible to allow as much time as possible for questions from our committee members.

Mr. Whalen, the floor is yours.

Mr. Pat Whalen (Chairman and Chief Executive Officer, LuminUltra Technologies Ltd.): Thank you, Mr. Chair.

First of all, I want to thank all of the committee members for the opportunity to be here today to speak about LuminUltra's role in providing essential COVID-19 testing supplies.

I will aim to keep this brief so that we will have ample time for questions, but I do want to provide a bit of a backstory about LuminUltra.

We are a molecular biology diagnostic testing company that focuses primarily on testing for micro-organisms in water. Just like people, water systems can get sick. They can get infected with different types of microbes, and we provide tools to essential businesses around the world to apply treatments and management techniques without which there would be a global economic cost in the hundreds of billions of dollars per year.

We are proudly headquartered in New Brunswick, here in Fredericton. We have operations in six countries around the world, including the United States, the United Kingdom, France, the Netherlands and Australia.

We are 100% Canadian owned between me and XVP Water Partners based out of Toronto. We have been in business for about 20 years, but we span all the way back to 1995 when we got our early beginnings. I was lucky enough to be one of the three founders of the company as a laboratory technician while I was still in high school.

Today we have grown to nearly 100 staff, the vast majority of whom are actually here in Canada. I would say that up until recently we have been largely unknown to Canadians because our business has been very internationally focused so far. We sell primarily to private interests, more of a B2B kind of business, in over 80 countries around the world. Our customer base is largely made up of Fortune 500 companies. These types of businesses are in the business of providing essential services, and we have been committed to making sure that we're able to continue to meet their needs while maintaining the safety and security of our staff, which is important to us. We have a very innovative, very adept team that has grown accustomed to innovating over the years. It is actually that culture of innovation that made us able to step into the fight against COVID-19, which started on March 20 when the Prime Minister put out the call to action to industry. We responded very quickly through the front doors that were provided.

Knowing that we had certain expertise that could be brought to bear on the testing side, through those doors we were in contact with the Public Health Agency of Canada. We had some very detailed, in-depth discussions with the folks out in Winnipeg and realized that we could provide much-needed chemical reagents to allow testing to proceed across Canada. That has resulted in our commitment to the Government of Canada to provide reagents for 25 million COVID-19 tests over the next year. As of today, we have already shipped one million of those tests from our facility in Fredericton to all of the provincial health laboratories across Canada.

The next steps, though, as we always have an eye to the future, are that we are engaged with various government agencies, including ISED, NRC and ACOA, on scaling up this production even further and expanding beyond simply providing those chemical reagents to also being able to provide a more comprehensive solution for COVID-19 testing. We're also looking at the opportunities to deploy testing beyond the clinical setting into environmental settings as well, where we would be able to provide some assurances that the environments in which we all live, work and play are kept safe and secure as we begin to relax physical distancing in the future.

Overall, I just want to say how immensely proud I am of our team, and also of the team at the Public Health Agency of Canada, which has been incredibly hard-working with long hours and lots of conversations. It is a great team to work with and we have really gone through this together to be able to very rapidly shore up these bottlenecks through that collaboration.

Again, I appreciate the opportunity to be here today and look forward to any questions.

Thank you very much.

● (1110)

The Clerk of the Committee (Mr. Paul Cardegna): I believe you are muted, Mr. Chair.

The Chair: Hopefully, I'll get the hang of this before these meetings end.

Mr. Lem, the floor is yours.

● (1115)

Mr. Paul Lem (Chief Executive Officer, Spartan Bioscience Inc.): Thank you. I appreciate the invitation to attend today's meeting and talk about my company, Spartan Bioscience. It's an honour to address you, the members of Parliament on the government operations committee.

I am Spartan Bioscience's chief executive officer. I am responsible for setting the company's strategy and leading its implementation. I hold a medical degree from the University of Ottawa. My specialty lies in infectious disease and microbiology.

I started Spartan Bioscience 15 years ago, with a mission of bringing the power of DNA testing to everyone. I had a close family member who was diagnosed with leukemia. It took weeks to get DNA results back from the lab before he could start a life-saving drug. That gave me the idea of bringing these DNA analyzers out of the lab for everyone to use, in the same way that we take it for granted that we can test ourselves with blood glucose meters in our homes. Our vision is how to do the same with DNA testing.

Driven by our mission, Spartan has grown into a leading biotechnology company. We have developed the world's smallest DNA analyzer. Our technology has received FDA and Health Canada approval and has been validated by expert organizations such as the Centers for Disease Control and the Mayo Clinic. Our technology has also been published in prestigious medical journals, including The Lancet and the New England Journal of Medicine, one of the top medical journals. We believe that our fast, accurate, affordable and portable tests will make DNA testing accessible to everyone in fields as diverse as infectious disease, precision medicine, food and water safety testing and veterinary diagnostics.

Before the COVID-19 pandemic, we had applied our technology to a variety of fields. One of our first tests was a precision medicine test that is used by cardiologists for a drug called Plavix. It was the number two bestselling drug of all time after Lipitor. This drug is not activated properly by 30% of patients because they carry a mutation that prevents their liver from activating the prodrug and puts them at a much higher risk of cardiac complications. With our rapid test, cardiologists can help their patients avoid these side effects. Another one of our tests is for genetic pre-screening for Alzheimer's research that is able to identify the 20% of people who carry genetic risk mutations that increase their risk of developing Alzheimer's.

Finally, we've also applied our technology to environmental testing, specifically testing water systems in buildings for legionella bacteria. Legionella bacteria can contaminate water systems, including office buildings here in the Ottawa area. People who breathe in water contaminated by this bacteria are at risk of legionnaires' disease, a severe pneumonia that kills 10% of infected people. Our test is now one of the world-leading tests that's used by the CDC, the New York State Department of Health and Fortune 500 companies.

All of the tests I mentioned run on the same coffee-cup-sized device that we call the Spartan cube. The analogy I like using is that it's like a Keurig coffee machine: once you have the device, it can run different pods.

All of this experience in R and D over the last 15 years allowed us to answer the call for increased COVID-19 testing. With the support of the Government of Canada through the industrial research assistance program, we were quickly able to adapt the CDC's validated COVID-19 test and put it onto our validated platform.

To give you a sense of how fast the timeline has been, on March 20, the Canadian government recognized our ability to help with the pandemic and signed a letter of intent with us. The following day, March 21, we reached an agreement with the Government of Ontario for a contract for 900,000 tests. Then on April 11, we received Health Canada approval for our COVID-19 test and immediately started shipping to our federal and provincial partners.

Without the government support we have received to date, both at the federal level and the provincial level from Premier Ford's government, we would not have been able to create our rapid tests, nor been in a position to ramp up production to help meet Canada's testing needs.

We are a proudly Canadian company. We are excited that our technology will be an important part of fighting the COVID-19 pandemic in Canada. This COVID-19 test that we've developed is going to be ideal for use in decentralized settings, such as remote communities, indigenous communities, and potentially airports, border crossings, doctors' offices, pharmacies and clinics.

Now that we have our test ready for use, we're working around the clock to ramp up production to make our tests more widely available to Canadians. Our suppliers have been putting in an extraordinary effort and we are fortunate that they are based here in the Ottawa area, so we're not subject to export bans or the shortage of things such as swabs. To date, we've already shipped out thousands of test kits, and we have plans in place to ship out hundreds of thousands of tests per week by July.

● (1120)

The last few weeks have been like nothing our company has ever experienced. The ramp has been incredible. I have to give a lot of credit to Prime Minister Trudeau, Minister Navdeep Bains, Premier Ford, Premier Legault and their officials for helping us ramp up so fast.

Thank you.

The Chair: Mr. McCauley, you're up for six minutes, please.

Mr. Kelly McCauley (Edmonton West, CPC): Thank you, Mr. Chair.

Gentlemen, thanks very much. It's fascinating work that you're doing.

Mr. Whalen, you answered a lot of the questions in advance, but there was a comment by Dr. Lem about his supply lines. He said that he procures everything in the Ottawa area. What about for your company? Are you running into issues from supply lines out of the United States, China or other areas?

Mr. Pat Whalen: Thank you for the question, Mr. McCauley.

Having been in business for the better part of 20 years, and with primarily an international focus to date, we have quite an extensive supply line all around the world. Traditionally, the vast majority of our supplies would come from North American sources, Canada and the United States, with some supplementation from parts of Asia and parts of Europe. We have not encountered any serious problems with that existing supply chain, but with a mind to the future, we are working with our government partners, such as ISED and NRC, to try to move as much as possible of that supply chain within Canadian borders. We have an active program with them right now on doing exactly that.

I guess to answer your question simply, we have not encountered any significant issues thus far as a result of our very extensive supply chain, but nobody has a crystal ball, which is why we're going to try to shore it up to try to be 100% within the borders.

Mr. Kelly McCauley: Walk me through, please, a "dummy's guide" to your product. You talked about reagents and then testing. What exactly is it that you are providing? Is it the chemicals that someone else is using for tests, or are you producing the whole test kit? Could you walk me through that?

Mr. Pat Whalen: At present, the focus is on the reagents. That has been the bottleneck. To perform these types of tests, you need to have, as has been mentioned, swabs. You need to have reagents. You need to have disposable plastic parts. You need to have equipment and you need to have trained personnel. Across Canada, within the provincial health laboratories, we have a very robust installed base of equipment and people, but there were bottlenecks up front in terms of the chemicals and in terms of swabs, which has been a big point in the media over the past several weeks.

We decided that our expertise could best be suited to helping with the reagent side of things, which had been the most unique and most critical bottleneck. That's where we focused our initial efforts, working with PHAC. As I mentioned, we're now looking at a larger, broader and more turnkey solution that provides all of those parts, which we have experience building. We have a lot of capacity and a lot of expertise on especially the reagent side.

Mr. Kelly McCauley: Is the Government of Canada procuring from you and then distributing to the provinces, or do you have separate contracts with separate provinces?

Mr. Pat Whalen: The federal government is doing the primary procurement and then the distribution of the products to the different provincial health laboratories. We do have some interface, simply by virtue of shipping product to those provincial health laboratories, but the contract is with Canada.

Mr. Kelly McCauley: Okay.

You mentioned that you're in six different countries. Are you doing the same ramp-up in those countries as well? They're all allied countries of ours, basically. Are you in the same ramping-up situation in those countries, or is it mostly just in Canada?

Mr. Pat Whalen: The vast majority of our production is actually in Canada, right here in Fredericton, and we intend to continue down that track. We're not currently ramping up anything in other countries. We're making Canada the focus. In fact, we're breaking ground on a brand new production facility that will increase our capacity by a couple of orders of magnitude to drive it even further.

Mr. Kelly McCauley: When will that come online?

● (1125)

Mr. Pat Whalen: At the end of June.

Mr. Kelly McCauley: Fantastic. Is there export potential for this once we get past Canadian needs?

Mr. Pat Whalen: Once we're absolutely 100% certain that we've met the needs of Canada, then we'll look at the potential for export, yes.

Mr. Kelly McCauley: Mr. Lem, that's a fascinating little cube. It reminds me of the Avengers' Tesseract cube.

Did the government reach out to you or did you reach out to them for this opportunity?

Mr. Paul Lem: It was the government that reached out to us. It was very apropos because we had already been developing our portable COVID-19 test in parallel. It was ready when the government called us.

Mr. Kelly McCauley: How fast can you ramp up to large-scale production and what's needed? Is it just money? Is it space? Is it more—

Mr. Paul Lem: It's really a function of money, actually. I'll show you the different components of our test. We actually make all of the components: the swab, the actual test cartridge and then the device.

Mr. Kelly McCauley: Mother's Day is coming up. I'm thinking of picking one up for my wife.

Mr. Paul Lem: That is our vision, to eventually get it into your bathroom.

In terms of ramping up the supply chain, what really helped was when we got the orders from the federal and provincial governments. I think we got about a 10% down payment. We immediately put that into our suppliers because there was a lead time of about 90 to 120 days to actually produce the moulds and then start spitting out those plastic parts that I showed you. We had—

The Chair: I'm sorry, Mr. McCauley. We're completely out of time. I know you had one more question. I hope we'll be able to get to it in the next round of questioning.

Mr. Kelly McCauley: Mr. Lem, thanks very much.

The Chair: We'll now go to Mr. MacKinnon for six minutes, please.

[*Translation*]

Mr. Steven MacKinnon (Gatineau, Lib.): Thank you, Mr Chair.

Good morning, everyone.

[*English*]

Welcome to our witnesses.

Mr. Whalen, I know that name to be a New Brunswick name, so it's good to see you and I thank you for joining us.

Mr. Lem, of course, we've had a couple of encounters over the last few years, and I appreciate your and your company's vigilance here.

At the risk, Mr. Chair, of eliciting a groan or two from my friends across the virtual aisle, I want to give a tip of the hat to our procurement professionals who have worked with folks like the two witnesses that we see here today and who I know have been working day and night to procure these vital supplies, things like swabs and chemicals for reagent for these testing regimes that we know have to become more aggressive and ramp up.

That will be the essence of my first question for both gentlemen. I would appreciate it if you could keep your responses short.

I'll go to Mr. Whalen first. What do you see now, as we sit here today, as the supply challenges with respect to ramping up testing?

Mr. Pat Whalen: I think it's some of the more basic materials, Mr. MacKinnon, things around having Canadian production facilities for swabs and some of the base chemicals that are required for reagents. Having that capacity, I think, will make a world of difference from the standpoint of preparedness moving forward.

Mr. Steven MacKinnon: Before we go to Mr. Lem, do you see that capacity ramping up?

Mr. Pat Whalen: Yes, I do. In discussions with ISED, PSPC, PHAC and NRC, they are already working to shore those things up.

Mr. Steven MacKinnon: Very good.

Mr. Lem.

Mr. Paul Lem: Thank you, Mr. MacKinnon. It's good to be in contact with you again.

In terms of supply chain, one of the things that we found Canada is very good at is that we have tier one contract manufacturers that have domestic capacity. A few weeks ago, we signed a major contract with Sanmina. They are a tier one contract manufacturer. We requested that they implement more manufacturing capacity for us at their facility in Mississauga. All we had to do was pay them and transfer over our designs. After 90 to 120 days later, we will be able to add capacity for 100,000 tests per week. It can be cloned simply with more capital, which is what we're doing in Canada.

Mr. Steven MacKinnon: Is that capital available to you?

Mr. Paul Lem: Yes, the government has been very good at working with us, not only with the down payments from the federal and provincial governments but also with BDC. They made a line of credit available to us, and that has allowed us to scale up extremely quickly.

Mr. Steven MacKinnon: Diversity in the supply chain is obviously very important. Diversity of testing modes of course is important, and each of you has highlighted the features of the different kinds of testing that you are involved with.

Perhaps I'll go to Mr. Whalen first. Can you highlight for the committee again the advantages of—if I'm getting this term right—lab-based testing?

Mr. Lem, of course you have a more instant-type testing regime. Perhaps you could outline the advantages of that.

Mr. Whalen.

● (1130)

Mr. Pat Whalen: As for the laboratory-based or centralized testing, the advantage is simply scale: being able to process a very large number of samples very quickly using large equipment that is typically automated or robotic. The backbone of that style of testing lies in the different provincial health laboratories and other private laboratories across Canada. The benefit there is scale, being able to do it in large numbers.

Mr. Steven MacKinnon: If we are going to achieve the kinds of testing numbers we will need on an ongoing basis, that will of course require significant and continued investment in lab-based testing.

Mr. Pat Whalen: Yes, absolutely, and investment not only in the equipment but also in the people, the trained professionals who can run these styles of tests. It's important to have that infrastructure, that backbone, so we can crank out a maximum number of tests.

Mr. Steven MacKinnon: For certainty of supply, there was a chemical we needed to import from China in significant quantities. Our folks on the ground in China, as well as folks at PSPC, were able to secure that material. Can you comment on that?

Mr. Pat Whalen: It was an interesting situation. It was a supplier we typically use that we know to be very reliable. It makes the highest quality product in the world.

Typically this material has to be shipped by boat. We had a shipment scheduled, but it would have taken 30 days to cross the Pacific and make its way across Canada to us. I floated an idea to the Public Health Agency of Canada: What if we put it on a plane? They put us in contact with the people at PSPC, and within a week and a half we had it landed here in Canada, in Fredericton, safe and secure. It was a true team effort involving PHAC, PSPC and the Embassy of Canada to China, in Beijing. There were a lot of people involved, and it's a great success story.

The Chair: Unfortunately, we're completely out of time for that round.

We'll now go to Madam Vignola.

[*Translation*]

Ms. Vignola, you have six minutes.

Mrs. Julie Vignola (Beauport—Limoilou, BQ): Good day, gentlemen.

My first questions will be for Mr. Whalen from LuminUltra.

Before obtaining this contract, had you ever made COVID-19 test kits?

[*English*]

Mr. Pat Whalen: The answer to that is no. We were making similar technologies and measuring similar things, bacteria and other viruses, but not COVID-19 specifically.

[*Translation*]

Mrs. Julie Vignola: I see.

You've never made these kits before, but now you're being asked to make 500,000 a week. What's the status of your weekly production, and when do you expect to reach the target of 500,000 kits?

[*English*]

Mr. Pat Whalen: We actually already have. Saying we have not produced this test for COVID before is perhaps a bit of a mistake on my side. We are producing the chemical reagents that are universal for measuring any virus, including the novel coronavirus, and we have produced them before.

We have ramped up from producing several tens of thousands of tests per week to 500,000 tests per week. In fact, we've gone beyond that. We just shipped our millionth test today, and we're already at a point where we will be shipping half a million tests per week moving forward.

[*Translation*]

Mrs. Julie Vignola: You mentioned reagents. Is there a possibility of obtaining these reagents from Canada or North America rather than China?

● (1135)

[*English*]

Mr. Pat Whalen: Yes, absolutely. In fact, in our work with the different government partners I've mentioned, they have already identified basic chemical manufacturers where many of these raw materials that are currently sourced outside of Canada can be synthesized and produced in large quantities within our borders. I think we are already on our way there.

[*Translation*]

Mrs. Julie Vignola: Over what period of time do you have an agreement with the Government of Canada and what is its total value?

[*English*]

Mr. Pat Whalen: The total value is approximately $102 million for these 25 million to 26 million tests over the next year. The span of the contract goes until March 31, 2021.

[*Translation*]

Mrs. Julie Vignola: Thank you very much.

Mr. Lem, your kit is very interesting to see. It would be nice to make these tests available at hot spots, such as borders, seniors' homes and other places. As I understand it, your aim is to make this a self-diagnostic test.

You've already answered one of my questions about whether you've ever done any such testing for COVID-19. I just want to make sure of one thing. Do you only do the kits or do you do the testing as well, whether it's for DNA or for COVID-19?

[*English*]

Mr. Paul Lem: It's a self-contained kit. Think of it like a blood glucose meter. This gives you everything you need, and you can plug it into a laptop or a tablet, and it will tell you your COVID-19 result. You need nothing else external. It's all self-contained.

[*Translation*]

Mrs. Julie Vignola: So your company doesn't do COVID-19 or DNA analysis.

[*English*]

Mr. Paul Lem: That's correct. The DNA analysis is automatically done by an on-board microprocessor with our special algorithms, so it does everything. This is why this is the future of diagnostics, because right now you have to ship those swabs off to a central lab and PHD has to analyze the results. That's why it takes days or even a week to get the results back.

We've seen with blood glucose meters and home pregnancy tests that eventually technology gets so affordable and easy to use that people can administer them themselves. That's the vision of our company.

[*Translation*]

Mrs. Julie Vignola: Does the kit you offer also allow for DNA analysis or does it only focus on the COVID-19 test?

[*English*]

Mr. Paul Lem: Yes, COVID-19 is a virus, and our test cartridge extracts the genetic material from the COVID-19 virus, amplifies it up a billion times and then detects it, analyzes it and gives the user what the result is automatically.

[*Translation*]

Mrs. Julie Vignola: Therefore, it does not analyze the DNA of the user, but only the DNA of COVID-19.

[*English*]

Mr. Paul Lem: That's correct, so there are no privacy concerns from analyzing the human DNA. It only looks for the presence or absence of the coronavirus genetic material.

The Chair: Thank you very much.

Unfortunately, we're out of time.

We'll now go to Mr. Green for six minutes, please.

Mr. Matthew Green (Hamilton Centre, NDP): Thank you very much, Mr. Chair.

This is certainly a fascinating glimpse into the supply chain and the federal government response to COVID. I want to echo and share my deep appreciation to both of you for your respective contributions in this time of crisis. It's significant, and I know Canadians who are tuning in are going to be watching with equal interest.

I can't, though, shake the future prospect of recurring epidemics like this, and I just want to explore something. We've heard today from Mr. Whalen about the order of magnitude in scaling up his business. We heard about the procurement of chemical reagents. I'm just wondering, for either of you, if you were previously contracted with the government in any way. Have you had government contracts before?

Mr. Pat Whalen: I'm answering first. Sorry, Dr. Lem.

The answer to that is no, not in Canada. We have had government contracts in other jurisdictions.

Mr. Matthew Green: Mr. Lem?

Mr. Paul Lem: For our company, we had a government contract for legionnaires' disease testing with the same small device and the same cartridges.

● (1140)

Mr. Matthew Green: I don't know the appropriateness, but I'm going to put the question anyway. Were these both single-source contracts in terms of your capabilities and this emergency protocol we have now?

Mr. Pat Whalen: I can't speak to whether the supply of reagents is a single source. There are other companies out there that provide similar things. I think we were simply able to provide a custom material that PHAC was looking for to be able to fuel the provincial health laboratories. As far as dealings with other parties, I can't speak to that.

Mr. Paul Lem: For us, to the best of our knowledge, there are only five FDA-approved portable DNA analyzer companies in the world. We're the only ones in Canada. There are two in the U.S. and two in Europe. What we heard from our provincial customers was that there are soft export bans on our competitors, so that their home countries are keeping all their supply for themselves. I think that's how we got the contracts with the federal and provincial governments.

Mr. Matthew Green: It's critically important, because there's been an ongoing conversation about the national emergency strategic stockpile supply. I heard Mr. Whalen talk about the term of his contract. I heard him talk about perhaps March 31, 2021.

In your modelling, have you started to envision what it would look like in terms of requirements to replenish domestic stockpiles before you start to shift into export? Has that been a condition or a feature in your contract with the federal government, that you do provide that support going forward into whatever phase of this comes next?

Mr. Pat Whalen: I would say it's something that we have certainly thought about on our side, which is why we're looking at a more permanent solution to scale up our production. We are thinking about that on our side. We have not yet engaged in any substantive discussions with anybody at PHAC or other agencies about a longer-term engagement, but we're very much open to it when and if the time comes.

Mr. Paul Lem: For our company, we've been highlighting to the government that we are facing overwhelming demand from foreign governments—I think there are over 20 of them—and foreign corporations that want to buy all of our supplies starting in the summer, once we have more. Right now, PHAC is creating a model regarding how much of their supply they're going to want. This is where I think it's going to be important that Canada establish some sort of stockpile or something like that, because otherwise, if we offered our supply right now, we could sell a billion dollars' worth worldwide within a week.

Mr. Matthew Green: I have to share that concern with you, in terms of basic economic supply and demand and where we are right now with this crisis.

I'm a little concerned about the ability to import the necessary chemicals, whatever the production inputs might be. Have you found volatility in that market? If so, in terms of shortages and costs, how has it put an upward pressure on the price per unit that you all are offering our government?

Mr. Pat Whalen: Speaking for our side, I can say that, based on that international supply chain we had already established and the supplier relationships that we had established, we were lucky to be able to get out in front of the supply chain aspect early on and be able to stockpile material ourselves. To date, we have not had any serious constraints in that regard, but things are changing daily, weekly, monthly and quarterly at this point. We are working around the clock on that supply chain challenge and, as I mentioned, working to try to get that Canadian domestic supply ramped up as well.

Mr. Paul Lem: Similar to what Mr. Whalen said, I think our big advantage is that we make our swabs and our cartridges here in Ottawa, and we own all the intellectual property and designs around them, so we can then bring on contract manufacturers like Sanmina and specify that we want them to actually manufacture, for example, in Mississauga.

Mr. Matthew Green: Have your per unit costs of your products changed since the pandemic began?

Mr. Paul Lem: They have, given the scale. I think starting in the summer our cost of goods is going to go down, and that's why we've already been negotiating with the government. For example, we will be dropping the price of our devices by 50% starting in mid-summer.

Mr. Matthew Green: Mr. Whalen.

Mr. Pat Whalen: Ours already started off fairly low, given the robustness of our existing infrastructure, so I would say they have not changed.

Mr. Matthew Green: I really appreciate having you both on today. Thank you for providing your expertise.

My last question is this. Are you anticipating additional hires as you scale up? What does that look like?

Mr. Pat Whalen: We're looking at somewhere between 25 and 30 people over the next two or three months, and probably accelerating beyond that.

Mr. Paul Lem: Similarly for us, it will probably be 20 to 30 people in the next two months and then that contract manufacturing in Mississauga will probably mean several hundred people, and then we'll probably add another 200 or 300 people over the next several years.

Mr. Matthew Green: Thank you.

The Chair: Thank you very much, gentlemen.

Before we go to the next round, Mr. Whalen and Mr. Lem, I know you both indicated that you would have to be leaving at 12 noon. Is that still your plan or do you have an opportunity to stay slightly longer than that?

● (1145)

Mr. Pat Whalen: I could certainly extend by another 10 or 15 minutes if required, Mr. Chair.

Mr. Paul Lem: Unfortunately, I have a board meeting that starts right at 12, so I cannot extend.

The Chair: Thank you very much.

Colleagues, we will go on to our next round of five-minute interventions; however, we will not be able to conclude it. Mr. Whalen has indicated that he will stay for the second round, but we have to conclude at 12 noon to allow our next witness ample opportunity to present testimony and answer questions.

We will go to our second round of five-minute interventions, starting with Mr. Aboultaif.

Mr. Ziad Aboultaif (Edmonton Manning, CPC): Thank you.

Good morning, Mr. Whalen and Mr. Lem. Those were beautiful presentations.

We have 36 million or 37 million Canadians, and we know this is an ongoing process. As long as we live, we're probably going to have to have that testing equipment.

What do you anticipate are the quantities needed to be able to serve Canada, at least for the time being, in terms of equipment and kits?

Mr. Pat Whalen: From the equipment side of things, as Dr. Lem pointed out, we certainly need to have equipment available that can go into more places than just large laboratory settings. That is something we're working on as well, having smaller-scale, multiple sample processing equipment that can go in different places like clinics and smaller hospitals, things of that nature.

As for the testing demand, yes, we need many, many more tests. There are different forms of tests. Dr. Lem and I are both focused on nucleic acid testing or RNA testing. There is other testing that has to do with serology that we will see coming on the market, but it still needs to go up by at least an order of magnitude, and that's what we are planning around in our—

Mr. Ziad Aboultaif: Will you be able to provide specific quantities then? How many units are you looking for?

Mr. Pat Whalen: We are ramping up our production to be able to provide 20 million to 30 million tests per week. That's the number we're shooting for.

Mr. Ziad Aboultaif: What about Mr. Lem?

Mr. Paul Lem: We're ramping up our production to over 10 million tests per year, because we believe that in the foreseeable future we're going to be a complement to tests like Mr. Whalen's.

High-throughput testing will be done at the lab and then remote communities will be done with us.

Mr. Ziad Aboultaif: My understanding, Mr. Lem, is that most of your raw material needed to produce the equipment is from within Canada. That is good news.

Mr. Whalen, I understand that we don't have some of the chemicals in Canada. Why?

Mr. Pat Whalen: Well, there are certain chemicals that are shared between both what we do and what Dr. Lem does. We have similar base materials of very sophisticated enzymes and other base chemicals that are primarily manufactured in the United States.

With regard to why those have not been manufactured in Canada, I'm not the best person to speak to on that. I suspect it's because the border has been so open and fluid over the years that a domestic supply wasn't really necessary. There's such a large manufacturing...and it's all based in the United States that it was simply easier to get it there.

Mr. Ziad Aboultaif: We know that when we're in a crisis such as the one we're going through right now, every country wants to look after its own citizens. We see what has happened with the 3M masks.

Do you know for sure that we don't have the ability to produce that chemical in Canada? Is that an area we need to explore further to make sure we can do it, that we can have self-sufficiency? When it comes to the lives of our people, I think we need to have that.

Mr. Pat Whalen: Yes, absolutely, and as I commented previously, we are already doing that.

The good news is that the capabilities are absolutely available here in Canada. It's simply a matter of putting the right people and the right equipment to bear on the right things, and we're going to be able to do it.

Mr. Ziad Aboultaif: I have one final question.

For both companies, Spartan and LuminUltra, how are you doing on human resources? By the way, those are beautiful company names, both of them.

How are we doing on human resources? Do we have enough human resources in Canada to upscale the production and to be able to serve our markets?

Mr. Paul Lem: Thanks, Mr. Aboultaif.

One of the great advantages of Ottawa is that Ottawa is the global hub of excellence for point-of-care blood chemistry analyzers. There are two companies, Abbott i-STAT and Alere Epocal, which have generated billions of dollars in sales over the last decade. They have that deep personnel expertise we've been hiring from to complement our scale-up.

● (1150)

Mr. Ziad Aboultaif: Mr. Whalen.

Mr. Pat Whalen: Speaking for Atlantic Canada, it is one of the best-kept secrets, of course, in that we have some of the friendliest and hardest-working people in North America, if not the world. We also have some of the smartest people in the world.

We believe we can scale up effectively through the population here in Atlantic Canada, as well as with Atlantic Canadians who would like to repatriate from other parts of the country.

The Chair: Thank you very much, Mr. Whalen and Mr. Lem.

We'll now go to Mr. Weiler, for five minutes, please.

Mr. Patrick Weiler (West Vancouver—Sunshine Coast—Sea to Sky Country, Lib.): Thank you, Mr. Chair.

Thank you, Mr. Whalen and Mr. Lem, for joining our committee today.

Whereabouts throughout Canada are your tests going, by province?

Mr. Pat Whalen: There are 10 different provincial health laboratories, one in each province, and then there's the National Microbiology Laboratory in Winnipeg, and we are shipping to those 11 specific locations.

Mr. Paul Lem: For our company, it's the same. The federal government goes to the National Microbiology Laboratory, and we have separate contracts with the provincial governments and also with the territories.

Mr. Patrick Weiler: You mentioned that some of your tests are going to be dropping in the per test cost. I'm wondering what the cost of your tests are right now and where you see those going in the future.

Mr. Pat Whalen: From our side, we are providing one component of the overall test regime, and the per test cost for us is around $3.50. Then there are some other components that are sourced from other locations, and we're currently looking at shoring up those supply lines as well.

Mr. Paul Lem: For our product, our device cost $8,000 Canadian and our per test cost, which includes everything—swab, cartridge, obviously everything we use to test—is $73 Canadian.

Mr. Patrick Weiler: You both mentioned earlier looking into the future as we're getting to another stage in recovering from this pandemic. You mentioned potential change of your production to focus more on environmental testing. I'm curious what exactly that would look like for both of your technologies.

Mr. Pat Whalen: For us, similar to Dr. Lem's company, our traditional business is providing more of a complete test kit where we provide the swabs, the equipment and all of the reagents as well, so we already have a version of this style of test that would also be used for testing surfaces, air, water and sewage, all of the vectors of potential point-to-point contamination for COVID-19 and other pathogenic diseases. The way it would work would be identical to the way it's used for testing people. The only difference is where you take the sample from.

Mr. Paul Lem: Our environmental testing is a relatively small part of our business. What we are now moving towards is driving the cost of the devices down and also increasing what we call the test menu. In addition to offering COVID-19, we can offer strep, flu, chlamydia, gonorrhea, and then, for future variants of COVID for other seasons, we will be able to rapidly release a test for, let's say, COVID-20 or COVID-21. We already have that installed base ready to run these different cartridges as we release them.

Mr. Patrick Weiler: One of the big challenges we're going to have going forward is being able to trace all the different cases. I'm wondering if your products can incorporate contact tracing in their software. Once you test positive, would it be possible to, in some way, connect to some type of contact tracing? How can we ensure that the data that's produced from your test best gets to the different health agencies in Canada?

Mr. Pat Whalen: That is something we are investigating, as we do have a very large cloud-based software infrastructure. We're just getting into understanding the possibilities of that right now, but we're following the old adage at the moment of focusing on the things you need to focus on now and leaving the other stuff to the future. We haven't gotten too far in the software discussion, but there would absolutely be a lot of potential there.

Mr. Paul Lem: We just hired a VP of software and data who used to be a top person at Shopify. That person is going to be building out this contact tracing implementation. For example, Tobi Lutke, the CEO of Shopify, is actually leading the team to develop this software. There's another team that just got approved by Health Canada called Thrive, and we're also working with NML and the provincial lab information systems for how we're going to do this.

● (1155)

Mr. Patrick Weiler: Last, because I'm running out of time, what measures are you taking within your company to protect your workers?

The Chair: That's a very difficult question, but give a very quick answer, if you could, please.

Mr. Pat Whalen: We have strict physical distancing procedures, shift work, and a maximum number of people who can be on site at a given time, and most of our staff are working from home.

The Chair: Thank you very much.

Our final five-minute intervention in this round will be by Mr. Redekopp.

Mr. Redekopp, you have five minutes, please.

Mr. Brad Redekopp (Saskatoon West, CPC): Thank you, guys, for being here.

Mr. Lem, I want to pursue a little bit the price of these units. You indicated they were about $8,000 currently.

Can you give us an indication of where you see them coming to? If Mr. McCauley, for example, wants to buy one for his wife for the bathroom, that's a fairly expensive Mother's Day present.

Mr. Paul Lem: Yes, and so we've already agreed with the government that as of, I believe, July, the price will come down by 50%, and so it would go down to about $4,000 Canadian. As well, we're about to launch a redesign effort that, hopefully, within six to nine months, will drive that further down, probably to the $1,000 to $2,000 mark.

Our ultimate goal is to get this to the several hundred dollar mark so, as is the case with a blood glucose meter, no one will have to think twice about purchasing one of these things.

Mr. Brad Redekopp: Right, and there's probably a large market for that.

You mentioned also that if you were to put this on the market right now, you would have no trouble selling all of your inventory to whomever, and you were looking to the government to provide some guidelines. How do you see that moving forward so that you are able to sell those to Canadians, as Canadians need them, and not send them overseas or to other countries?

Mr. Paul Lem: The way we're planning internally is that we're giving the government the first shot at all of our future supply. Once they tell us they don't want any more, our second phase will be to give it to Canadian corporations. After we've satisfied that domestic demand, then we'll open it up to foreign governments.

We're also in discussion with foreign governments to potentially set up manufacturing within their country and basically give them some sort of licence whereby we would give them our designs and intellectual property, and that wouldn't affect our supply in Canada.

Mr. Brad Redekopp: Where are you with the federal government on those negotiations, and what sort of responses are you getting from them?

Mr. Paul Lem: We've had excellent interaction with ISED, PSPC and also PHAC. Right now PHAC is creating a model as to how many Canadians will have to be tested in order to get back to work. Once they have those numbers, we will, hopefully, be negotiating a contract to increase that supply to meet that demand.

Mr. Brad Redekopp: In my riding, and in many others, different companies have been contacting the government about supplying products. I think there have been 26,000 inquiries to the government to this point.

Can both of you comment on your experience working with the government? Was the process smooth? Were there glitches that you had with that? What sorts of experiences did you have?

I'll start with Mr. Whalen.

Mr. Pat Whalen: I would say, in these crazy times that we live in, that the experience was exemplary. I mentioned in my opening statement that we started on March 20, after the call to action by the Prime Minister, and within only a couple of days, we had gotten in touch with the people we knew could help the most, who were those at PHAC. It has been, literally, nights, weekends, whatever it took as far as engagement goes with the people out in Winnipeg, with people at PSPC in Ottawa, NRC and ACOA—all over the place. It has been very fast and very strong communication.

Mr. Paul Lem: I agree with Mr. Whalen as to the sense of timing. I think the Prime Minister announced a letter of intent with our company on March 20, and by March 25, PSPC had a contract with us. Similarly on the Health Canada side, because ours is a regulatory-approved device, they had a team standing by evenings and weekends. As soon as we submitted data, they reviewed it immediately.

Mr. Brad Redekopp: How are you guys operating in this new environment regarding PPE specifically? Has that been an issue for you in terms of providing procedures and guidelines for your staff and PPE in your actual workplaces?

Mr. Pat Whalen: We haven't had any limitations ourselves. We already use substantial amounts of PPE in our manufacturing facilities, and so we had gloves, N95 masks, face shields and all of these things already on hand. We haven't had any kind of interruption in that supply chain just based on its maturity.

● (1200)

Mr. Paul Lem: I think our added advantage, in addition to what Mr. Whalen said, is that we have that equipment too, but we actually test our employees every three days, because we have all of these portable COVID-19 tests.

Mr. Brad Redekopp: Yes, I guess that's an advantage you have.

How much time do I have, Tom?

The Chair: You have very little, Mr. Redekopp. I would like to suggest that we shut off your questioning now so that I can thank both of our witnesses.

Mr. Whalen and Mr. Lem, your testimony has been fascinating and extremely helpful to our committee.

Mr. Lem, I understand that you have to leave right now for a meeting.

Mr. Whalen, you indicated you would be willing to stay for an extra 10 or 15 minutes. Please stay connected, Mr. Whalen. I'm not sure whether there will be time for any questions for you, but you can certainly leave the meeting when you have to.

With that, colleagues, we're going to suspend for just a moment while we set up for our next witness.

● (1200)

_____(Pause)_____

● (1210)

The Chair: Colleagues, we will reconvene.

Our first witness is Dr. Kevin Smith from the University Health Network.

Dr. Smith, I would ask you to please keep your remarks as concise as possible. We lost a little bit of time due to technology problems, and we must adjourn at one o'clock sharp.

The floor is yours.

Dr. Kevin Smith (President and Chief Executive Officer, University Health Network): Thank you, Mr. Chairman. It's a pleasure for me to be before your committee today.

I want to first recognize the Government of Canada's quick motion on the development of programs during this unprecedented time of COVID-19. This pandemic has been devastating to those infected and of course their families, and debilitating economically to many, both individuals and businesses.

I would also like to talk a bit today about how much it has affected our research enterprise. It's a stark and shocking reality to civil society about our most vulnerable citizens, particularly our frail seniors in long-term care. In my humble opinion, it's critical for this committee and all Canadians to learn from this global pandemic and better prepare for the future with COVID and other infectious diseases that will indeed visit us in the future.

I do want to mention that Health Canada, the Public Health Agency of Canada, the Deputy Prime Minister's office, many ministers, staff and the entire public service, including the Canadian Armed Forces in the case of our long-term care community, have been accessible and available and reactive, at least to those outreaches that University Health Network has been fortunate to make, as have our local MPs and their staff.

Our focus, in my view, has to be on protecting the most at-risk populations as well as protecting providers, who have struggled, as we know, with personal protective equipment and the very fragile supply chain and research ecosystem. No doubt there will be a new world order for health care and health after this pandemic. That does call us to look at a new model of funding and the structure to fund health care from coast to coast to coast. Health care costs have outstripped funding for a number of years. In costs to the continuum of care, nowhere has this been more obvious in this pandemic than for our frail and those living in sheltered environments.

We also want to look at a new social contract, in my view, between Ottawa and the provinces and territories as we move to a pan-Canadian approach post pandemic. We know that this pandemic is likely to revisit us in other waves in the not-so-distant future. I would encourage the committee to engage providers and, more importantly, consumers and families, as well as the three levels of government that we have worked with throughout this pandemic, including the municipalities, which have been so essential to public health. Long-term care and congregate care must receive a deep dive and a better understanding of where we go from here.

I would also encourage a look at asking what problems we are trying to solve that are clearly defined, and why they are being solved, in this order. For me, number one is looking at frail and vulnerable Canadians and their subpopulations. Number two is looking at the supply chain and the lack of Canadian production of PPE, drugs, ventilators and a number of other issues related to access as well as a healthy stockpile. It surprised me to discover that one of the things keeping me up at night during this pandemic, as the CEO of Canada's largest and most research-intensive hospital, the University Health Network, is actually the production and reception of swabs. It's not our highest technology, but it's an incredibly important one in a pandemic.

I will close by focusing on the very fragile hospital-based research ecosystem and the vulnerability of the people who make that up. These are all people who live very fragile.... I don't mean the principal investigators but their staff, research assistants, graduate students, research nurses and post-doctoral fellows. The funding for this work is even more fragile. Most of it has been funded by third party dollars and foundations and industry, all of whom have been decimated in many ways by this. The research tap has been firmly turned off for this population, which could result in the loss of a highly skilled workforce at a time when we need research colleagues more than ever.

Thank you, Mr. Chairman and members of the committee.

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

We will now go into our first six-minute round.

We'll start with Mr. Redekopp.

Mr. Brad Redekopp: Thank you, Dr. Smith, for being here today. It's good to have you. I appreciate all the work that you and your hospitals are doing in this pandemic.

Let's pick up with where you ended, on research funding. Have you noticed any changes since this pandemic started, or is it too soon to say what you're seeing out there for funding?

● (1215)

Dr. Kevin Smith: Yes, we have noticed a great deal of change. A number of organizations, private agencies and foundations, have indicated that they would not be able to continue to meet their research funding commitments. Others have asked for a pause, as they don't know what their fiscal position is.

For all of our hospital-based foundations and university-related fundraising, the returns on investment are obviously very threatened. This is often concluded by looking at investment revenue, which we know has been dramatically affected and much more so than in 2008, when we saw the last very significant shock to research funding.

In addition, we continue to work with the tri-councils and CFI, which is encouraging. However, again, in the population that is related to industrial-sponsored research, with the impact on industry's funding and industry's revenue streams, we are also seeing a pause.

In the very near future, within the next two weeks, if we don't find a better structure and strategy, there is capacity for approximately 10,000 to 15,000 layoffs in the research community nationally.

Mr. Brad Redekopp: Wow. Is Thornhill Medical one of the organizations associated with your health network? I read that they do ventilator production.

Dr. Kevin Smith: Yes. One of the founders, who is one of the scientific directors, Dr. Joe Fisher, is a member of the medical staff and a distinguished member and researcher at the University Health Network. Thornhill Medical was a spinoff, actually, of some of the research done some 25 years ago at UHN.

During this process, through procurement with the Government of Ontario and the Government of Canada, we have secured a number of ventilators and what I think the company markets as an ICU in a box, a very impressive product often deployed to military installations for field hospitals.

Mr. Brad Redekopp: Did you approach them or did they approach you, and was that a sole-source contract?

Dr. Kevin Smith: We approached them and we sourced on behalf of the Province of Ontario. Ontario health actually requested the support of UHN's procurement division, because we were set up in a large enterprise to do so. We then worked closely with two ministries, the Ministry of Health and the Ministry of Economic Development. The Government of Ontario made the decision to select them as a vendor and then instructed us to purchase.

Mr. Brad Redekopp: I assume there are patents involved in this. Was there any talk or provision for outsourcing production of this to other manufacturers?

Dr. Kevin Smith: Yes. Under one of my other hats, I was asked to lead the command table for critical care in Ontario during this pandemic. The premier and his colleagues had us convene with a number of large production facilities—large enterprises, particularly in auto manufacturing—about converting those environments to manufacture ventilators. Because of the urgent need, the time frame for converting an auto manufacturing environment to a medical supply company has been significant and not without challenge.

The other piece, which members of this committee will appreciate, is that many of the parts and source materials for ventilators and other products cross our borders multiple times before a final product is realized. That has introduced some challenge into a very rapid time frame of production and then distribution, so the numbers produced in the short term have been modest.

Mr. Brad Redekopp: How do you protect yourself, from a patent perspective, when you're allowing other people to build your products?

Dr. Kevin Smith: I should be clear: It is not our product any longer. A spinoff from UHN, Thornhill Medical, has done so, as I understand it, with the purchasers.

Also, there are a number of open source ventilators, for example, from a number of vendors. I'll speak to one that I know of, although I am sure there are many more.

There is a project in Ireland that has provided open source plans. Many of you will have heard that Medtronic, a multinational company that produces ventilators, has taken one of their older, simpler machines and made it open source and waived any patent issue for production during the pandemic period.

Mr. Brad Redekopp: Switching over to PPE, I noticed that you have a standard of ethics on purchasing. In this environment, has that made it challenging to get PPE, to source it first of all and to have good-quality PPE?

Dr. Kevin Smith: It has been very challenging. As we know, very few of the more common materials have continued to be made in North America, so we have attempted to source most of them internationally at the same time as the world is sourcing those materials.

In working with the Government of Canada, we were the purchasing agent for a very large number of masks and other supplies, which unfortunately did not come to fruition, in the order of 100 million masks.

Unfortunately we have not seen the large international orders realized and landed on the ground. This was complicated slightly, I think, by transport through the continental United States. There was an expectation that orders would be shipped to Canada, but at one point the United States government made some changes in what they were willing to ship outside of the country.

● (1220)

The Chair: Thank you very much.

We'll now go to our next intervenor.

Mr. MacKinnon, you have six minutes, please.

Mr. Steven MacKinnon: Are you sure it's me? I thought it was Mr. Drouin.

The Chair: It can be anyone you wish. I had you down on our list, but it you wish to cede your time to one of your colleagues, go right ahead.

Do you wish to cede your time to one of your colleagues?

Mr. Francis Drouin (Glengarry—Prescott—Russell, Lib.): It's Mr. Kusmierczyk who is up.

The Chair: Okay. That's fine. I had Mr. MacKinnon on my list.

Mr. Kusmierczyk, six minutes go to you.

Mr. Irek Kusmierczyk (Windsor—Tecumseh, Lib.): Thank you very much, Chair.

Dr. Smith, thank you very much for your presentation. Happy National Physicians' Day, today, to you and all your colleagues, who are doing tremendous work all across our country in these critical times. Please do pass that along from all of us.

The Government of Canada, or Prime Minister Trudeau, announced last week a $1.1-billion pledge for funding towards vaccine development, clinical trials and country-wide testing. Have you had an opportunity yet to speak with officials about that announcement and how that funding will be making its way to organizations such as UHN?

Dr. Kevin Smith: Yes, I have had a chance, both through our elected officials and through the tri-councils and other research officials with the Government of Canada. A number of our investigators have already been fortunate to receive awards from the Government of Canada for COVID-related research. We actually had to cease the majority of research when COVID occurred, and immediately ramped up again so that we could undertake COVID research during the epidemic.

At the same time, our researchers, always industrious people, have come up with important scientific questions from both an applied and a curiosity-driven level. Since then, one of the more pressing issues with our virology and immunology group is the creation of a vaccine.

I'm very encouraged by the investment, but also by the degree of partnership I'm seeing across the country. Research can often be seen as a solitary enterprise. I would say I have never seen our nation, or frankly our scientific world, more united in asking important questions and collaborating across the country and the world with literally the very best minds of their disciplines in an open source science, collaborating in real time.

Mr. Irek Kusmierczyk: That's wonderful. Thank you very much for that response.

Our previous witnesses, Mr. Lem and Mr. Whalen, talked about exemplary collaboration and co-operation with the federal government, in particular with PHAC, ISED and PSPC.

Are you able to speak to how you've been able to work with those particular departments or ministries? Are you able to speak to how helpful they've been in the work you're doing right now and in the work you're doing in collaboration with third party private sector companies especially?

Dr. Kevin Smith: Yes, there has been a very rapid response. I'll quote our in-house legal counsel, who said, “In all of my career, I have never seen things done more quickly on any issue between multiple levels of government and the private sector.” People have truly rolled up their sleeves and really done their very best, both in research and in attempting to crack the supply chain challenges.

PHAC as well has been very accessible and available. Much of that has come through our chief medical officers of health, but also direct outreach. I know PHAC has been very active in the reagent pursuit, particularly for testing.

Personally, based on the expertise of my colleagues in virology and immunology, I think we will be looking at a massive testing and tracing strategy going forward. I know Dr. Naylor is chairing a committee nationally that will be looking more broadly at this.

I was heartened today to see in South Korea that this is their first day with zero new cases. I think there is much to be learned internationally by looking at, first, those countries where the pandemic struck earlier, and second, those countries that are now coming out of it and what has been most effective.

I think PHAC has also been openly available for consultation with our infectious disease experts.

Regarding Health Canada, I want to give a special shout-out to the deputy minister, who has been available, accessible and readily reaching out to the field.

I have to say, while hospitals can be places where we're quick to be critical about things during difficult times, or maybe not so difficult times, the response and the collaboration across multiple levels of government, including, in our case, the City of Toronto, have really been second to none in terms of the ability to roll up our sleeves and get going.

However, we are very frustrated by some of those things that don't happen quickly, that are beyond the control of any level of government, particularly the international supply of personal protective equipment and testing equipment. I suspect we run the risk of that being true in vaccine production when, hopefully not if but when, a vaccine becomes rapidly available.

● (1225)

Mr. Irek Kusmierczyk: You had mentioned on social media, and I saw that you applauded, the City of Los Angeles' decision to make testing free of charge to anyone who wants it there. What do you see as the major obstacles for us to be able to have widespread testing capacity across Canada?

The Chair: In about a 30-second answer, if possible, Doctor.

Dr. Kevin Smith: Yes, Mr. Chair.

There are two quick issues. First, I would say, is the availability of supplies, which we'll crack the back of in the fullness of time.

Second, I would say there is a divide sometimes between public health professionals and infectious disease specialists and epidemiologists about the value of testing large populations. I would err on the side of more data allowing us to answer questions better in the long term with a dataset that will allow future investigators to understand this pandemic better than most. I would also love to see Canada as the place with the most robust dataset.

Mr. Irek Kusmierczyk: Thank you, Doctor.

The Chair: We'll now go to our Bloc intervenor.

Madame Vignola, did you wish to take this round or to cede your time to Mr. Barsalou-Duval?

[*Translation*]

Mrs. Julie Vignola: I would like to give my time to Mr. Barsalou-Duval, although I have many questions.

The Chair: So, the floor is yours, Mr. Barsalou-Duval. You have six minutes.

Mr. Xavier Barsalou-Duval (Pierre-Boucher—Les Patriotes—Verchères, BQ): Thank you, Mr. Chair.

Mr. Smith, thank you for being with us. Earlier, during your introduction, I heard you say that there is a need for a new social contract between Ottawa and the provinces on health care. Could you clarify what you were referring to when you said that?

[*English*]

Dr. Kevin Smith: I'm sorry, I didn't hear the translation.

[*Translation*]

Mr. Xavier Barsalou-Duval: I don't know, I can't hear you talking right now. Is there a problem with the interpretation or is it a problem with the sound?

[*English*]

Dr. Kevin Smith: I'll ask Mr. Clerk if there's translation for that.

The Chair: Dr. Smith, we'll try to see if we can get this resolved.

Mr. Brad Redekopp: Dr. Smith, if you go up to the three dots on your iPad, there might be something called “interpretation” and then you can select “English”.

Dr. Kevin Smith: Ah, very good. Thank you, sir.

[*Translation*]

Mr. Xavier Barsalou-Duval: Would you like me to ask the question again, since you haven't heard the interpretation?

[*English*]

Dr. Kevin Smith: That would be helpful, yes, thank you.

[*Translation*]

Mr. Xavier Barsalou-Duval: I was saying that, in your introductory remarks, you mentioned that there would have to be a new social contract between Ottawa and the provinces with respect to health, and I would have liked you to be a little more specific, that is, to elaborate on what you meant by that exactly.

[*English*]

Dr. Kevin Smith: When I look at some of the areas that have fallen through the cracks, particularly seniors care and congregate-living environments, I don't really like to always start with money. I recognize that money is the start tool, but over the last number of years what was once a fifty-fity split between Ottawa and the provinces has, for probably a very good reason, shifted. There is a great debate about what the number is today. Some would say it's 30¢, some others would say it's 22¢. I would leave the debate to the experts.

I do think that we see the consequences of costs increasing beyond funding. In most health care systems in the world, we're seeing a 4% to 5% increase per year, and I'll just give you an example. At the University Health Network in the last year, we saw a 0.3% increase, meaning that every year we're looking for approximately 3% savings in the system, at the same time the population is growing and aging at 1.9%.

Unless we revisit how we're going to cost-share these programs, I believe we will continue to run the risk of their being further eroded. My great worry, of course, is that those with the least-loud voice—shelter dwellers, the homeless and seniors—will do least well in a system where resources are scarce.

● (1230)

[*Translation*]

Mrs. Julie Vignola: I'm going to have to take over, since my colleague lost his connection.

In the wake of SARS in 2003, what research has been done in Canada on COVID?

[*English*]

Dr. Kevin Smith: Following SARS, there was a very significant report, as you know, again done by Dr. Naylor and a group of very distinguished Canadians and scientists who reacted to it. I would say that COVID-type viruses have been researched for a long time. They're a complex virus defined by their shape. I think there has been a significant amount of virology research undertaken, but there's been such a rapid uptake of this illness and concern about being able to create vaccines that I think my colleagues in immunology would say that research funding in this domain has not kept pace with the risk.

Many of those who've blown the whistle in science have said quite loudly that the basic sciences, particularly the science of immunology and virology, have not kept pace with the superbugs that we're seeing develop in places like intensive care units and beyond. Their prediction that the next global pandemic was likely to be related to viruses that are difficult to control and, because of the nature of travel today, spread virulently and aggressively was sadly correct.

[*Translation*]

Mrs. Julie Vignola: You've anticipated my next question.

If memory serves me right, polio took 22 years of research at a time when we didn't have the technology we have today, and five trials that led to more or less pleasant effects.

Since SARS in 2003, scientists have been warning us that something was going to blow up in our faces, as you said. Nevertheless, there have been cutbacks in science around the world. Is Canada one of the countries that cut research drastically?

[*English*]

Dr. Kevin Smith: I have to confess that I haven't fully looked at the data from SARS from 17 years ago until the present. My impression is that while research funding has increased in dollar value every year, it's not unlike the hospital story, in that the costs of research have massively outstripped those increases.

The second piece is that we're a little bit of a victim of our success. If you look at the increasing volume of funding and research, but then cross-reference that with the number of Ph.D. scientists being prepared, while the dollar amount has gone up, the dollar per scientist—because we actually have invested well in the training of future scientists—has gone down. We haven't actually done a fabulous job in matching the output of young scientists with a clear career path and the operating grant dollars to be effective—

● (1235)

The Chair: Thank you very much.

We'll now go to Mr. Green for six minutes, please.

Mr. Matthew Green: I'd like to begin by acknowledging the fantastic Dr. Kevin Smith, who, although he is in Toronto currently, we still claim in Hamilton for his 25 years of service at St. Joseph's hospital. Of course, Dr. Smith, you led the way there through some very significant strategic partnerships. We now know that in your new role, you're also creating health networks in the Toronto area.

My first and most obvious question, coming from Hamilton Centre, is what types of collaborations are you seeing with, for instance, McMaster University, or Hamilton Health Sciences, or the other world-class health research bodies across the country?

Dr. Kevin Smith: It's nice to see you again, Mr. Green, and thank you for your service. It's nice to see a leader from Hamilton back in the Government of Canada. I would say that is a great question and great collaboration.

At the clinical level, Hamilton Health Sciences and St. Joseph's Health System are both very actively involved at the provincial table and the federal table. As we know, with health being a provincial delivery responsibility, it has been more focused there. In looking at the coordination of care, Hamilton has been leading the way in creating an integrated care system, from primary care right through to hospice and palliative care. I think much of what this disease will show us and has shown us is the lack of concentration on the latter parts for frail citizens and under-housed citizens, an area that Hamilton has thrived in championing.

I think the other piece of this is collaboration and research. Just as an example, the laboratories at University Health Network and the Hamilton regional laboratory medicine program, which operates through both of the hospitals under Hamilton's supervision, are already collaborating. They are coming up with very creative ideas, such as the idea that perhaps through our laboratory system we should be coming up with our own swabs, our own medium, and a number of other technologies and testing analyses that would allow us not to be dependent on the international marketplace where, frankly, Canada is a small player and we don't always get to the trough first. Those who buy the most product often are those who get the quickest response. Unfortunately, the response has not been as rapid as we'd like in a number of key diagnostic areas.

Mr. Matthew Green: Why do you think that is?

Dr. Kevin Smith: I think literally everyone around the world is looking for the same products at the same time. That's number one.

Number two, I think, is stockpile management. We probably could do a better job of ensuring that we're swapping out stockpiles. As we went to the stockpile, I think many people, not only in Canada or Ontario, found stale-dated activities, stale-dated masks and other things.

That said, in inventory management, we might be wiser to think about how we renew and swap out products within stockpiles. The same would be true for things as complicated as ventilators. For example, those that we bought after SARS, 17 years ago, are not the state-of-the-art material of today.

I think there is a whole opportunity for us to re-evaluate how inventory management occurs and certainly how supply chains occur.

Mr. Matthew Green: I couldn't agree more. If you happened to tune in to previous sessions of this committee, you'll know that I've been talking ad nauseam about the national emergency strategic stockpile supply, and I'll continue to do that.

As it relates to the grey area, I'll call it, between the hypercompetitive world of research within post-secondary and the private sector, you've referenced Thornhill Medical as a technology corporation that is affiliated with the UHN. It has received some support from the government, or at least letters of intent.

In this phase—this crisis, this emergency—how is the data that's being produced publicly by publicly funded institutions like our universities and hospitals being shared in an open source way across all private sectors as well as public research bodies? My concern is that the proprietary nature of publicly funded research might slow down the process of getting things to the marketplace. Can you share your thoughts on that?

Dr. Kevin Smith: Sure. I would say that at the moment the focus of research has really been rapid results and rapid sharing of information.

As you know, science is a self-organizing enterprise. People get grants, publish results and share them openly. There's always this debate about whether we should publish our work or not publish it so that it can be patented and result in economic prosperity for the inventor as well as the nation.

At this point in time, I see no investigators who are not fully and completely divulging information rapidly and with massive uptake, as you can see in the Twittersphere, which I've [*Inaudible—Editor*], literally within hours of results, we're seeing people share that information. The challenge—

● (1240)

Mr. Matthew Green: I'm sorry to interrupt, Dr. Smith. Are there any policy directives or anything when you're dealing with the hundreds of millions of dollars going out in funding for clinical trials, start-ups and innovation? Do you know of anything that is actually within the policies or the contracts of the federal government that require it, in this time of emergency, to be shared broadly? Or is there still the opportunity for proprietary use of the technology?

Dr. Kevin Smith: I believe, to my knowledge, that I can't think of a single federally funded or supported clinical trial that doesn't encourage rapid sharing. That is different for research funded by the private sector. The majority of clinical trials are, frankly, funded by the private sector.

On the open source side, where government is funding the research, I think it is rapid dissemination. Where it's truly contract research, the company is hiring our investigators to enrol subjects and then gather the information. We are governed by statutes that require us to report information, particularly erroneous, challenging, or negative outcomes, but that remains within the proprietary relationship of the company and the investigator.

The Chair: Thank you very much.

We'll now go to five-minute rounds, starting with Mr. McCauley, please.

Mr. Kelly McCauley: Dr. Smith, thanks very much. This is very informative.

I was very encouraged by your earlier comment that you've never seen so much co-operation between the levels and also the speed at which everyone is acting. Is this sustainable? One of the things we've seen in this committee is the slow, slow pace of purchasing with the amount of regulation and with hurdles thrown in front of every organization.

I'm glad that we're getting past that. Is this a new dawn that we're waking up to and seeing how much time we're wasting? Or is this a short-term thing, and as soon as we're past this crisis, we'll perhaps go back to the old ways?

Dr. Kevin Smith: I'm an optimist by nature. I hope I've conveyed that in my comments today.

Mr. Kelly McCauley: Very much so.

Dr. Kevin Smith: I'd love to hope the latter is true, but I do fear the former might be true, and here's why. I think that when we take outcomes that are sometimes less than desirable—when events occur that have made, for example, a purchasing process less than fair, or questionable in terms of ethics—we put new processes in place to correct those. Those have now mutated and culminated to sometimes make the process more important than the outcome.

Mr. Kelly McCauley: At a time like this....

Dr. Kevin Smith: Yes, sadly. At a time like this, I think everyone has parked that and said, “We know there are some things we need like swabs, ventilators, reagents and personal protective equipment. Go and get them, and we will figure out the best process and follow it solidly."

I recognize why the previous model existed and that it was often risk mitigated, but I would certainly encourage us, as this completes, to go back and ask, does the complexity of our process warrant the outcome we're trying to achieve or waste a tremendous amount of time and taxpayer dollars for the illusion of fairness? At times, frankly, this is frustrating to the purchaser, the provider community and to the end user. I'm not suggesting for a minute that we should walk away from it.

Mr. Kelly McCauley: Yes, it's not really fair in the end.

There is the opportunity, months or years from now, to perhaps build a new template based on what we're doing now.

Dr. Kevin Smith: Especially if we're thinking about trying to encourage Canadian production of materials that are essential during times like these.

Mr. Kelly McCauley: Great. Thanks very much.

You talked about the need for a healthy stockpile for the NESS. Mr. Green talked about the strategic stockpile and, obviously, we've seen that it hasn't served us well federally. Some of the provinces have done very well. Alberta has been exemplary on this. Should it all be shifted to the provinces, do you think? What should the federal role be?

As a follow-up question, I've been getting a bit of feedback that we were focusing on the viral issues and not the PPE as such. All of the pandemic plans I've read are more focused on vaccines and that. Where best should we go forward so that we don't run into this again?

Dr. Kevin Smith: First of all, when one looks back, there was no error of commission. There may have been some errors of omission. People, with the best of intentions, I think, in retrospect, would ask, “Was there good enough communication between those various levels of government and the private sector around stockpiling?" I don't think anyone intentionally said, “Let's make this not work better.”

● (1245)

Mr. Kelly McCauley: No, I don't think anyone ever does.

Dr. Kevin Smith: No, I agree.

I think if health is to continue to be mostly operated provincially, then I think there has to be a collaboration between the federal government and the provinces, but I suspect that the stockpile is advantaged by being weighted to the provinces. While I recognize that the Government of Canada does also have responsibility for indigenous persons and persons within the military, one would need to ensure that that could be appropriately managed, be it federally or provincially. While it is the responsibility of the Government of Canada, it's often still delivered by the provinces.

I think it's one of those ones where you could do a dive, and people more knowledgeable than I on both procurement and pandemic stockpiling should come back. I would encourage us to look around the world at who did this best during this outbreak and what we may do differently to mirror that in future.

The Chair: You only have about 15 seconds, Mr. McCauley.

Mr. Kelly McCauley: Okay, I'll just say thanks for your time then.

The Chair: We'll now go for five minutes to Monsieur Drouin.

Mr. Francis Drouin: I want to thank Dr. Smith for appearing before the committee today.

I have a couple of questions with regard to the state of clinical trials in Canada, and perhaps you could speak to UHN's own experience and how it relates to COVID-19. Are you seeing that collaboration that you spoke about in the way that clinical trials could eventually work in Canada without compromising, obviously, patient safety? Do you see innovation within that system that could get to a vaccine faster?

Dr. Kevin Smith: Monsieur Drouin, with apologies, I'm not hearing any translation. I'm still awaiting that, but as soon as I get it, I will try to answer your learned question. It didn't come through on my mike, I'm afraid. I'm sorry about that.

Mr. Francis Drouin: Okay, I just selected English, so it should be working now.

I was just asking about the clinical trials, the impact of COVID-19 and whether or not you're seeing innovation within the system of going through phase one, phase two, and phase three, and whether you're seeing a more rapid system within the clinical trials without compromising, obviously, patient safety.

Dr. Kevin Smith: I am seeing a more rapid enrolment of clients. I would say we're not yet at the point where there are many clinical trials—phase one, phase two, phase three—but we're more into the trials of testing. There are few Canadian studies I'm aware of that are currently under way in randomized controlled trials with interventions that would look at vaccine-like status or serum conversion. There is much more testing going on, and I'd like us to go even further than that.

Yes, it has been easy, for example, in my own institution, with our own research ethics board. There's something called the Respect study, looking at the uptake of the disease and the disease in health care workers, and very rapid movement through an REB, very rapid deployment, very rapid enrolment, very rapid engagement of the laboratory system for testing.

One of the challenges I do believe we have at the moment, particularly for randomized control trials, is access to supplies, so again swabs and reagents. There are usually, with RCTs, significant amounts of laboratory testing and data collection, and there is a yin and yang or a bit of worry at the moment whether we have enough for our clinical needs so that we don't allow our research need to take it away from Canadians who need the test for clinical purposes.

Increasingly, we're trying to look at the overlap, where those who need the test for clinical purposes can also be enrolled in research studies, with their consent.

Mr. Francis Drouin: Before I pass it on to my colleague Majid, I just have a question with regard to something you mentioned. Canada is a small player relative to other bigger nations when it does purchasing, but at the same time, if the private sector does find a vaccine and chooses a market, it will be more attracted, by default, to countries such as, for instance, the U.S., because it has 330 million people versus Canada's with 36 million people. Is there any regulatory change that you would advise Canada to undergo to ensure we become an attractive market for those potential clinical trials or for the miracle vaccine that everybody is working on?

● (1250)

Dr. Kevin Smith: Unquestionably, for the multinational drug companies, much of this does come down to the quality of science, where Canada punches well above its weight. Canada truly outstrips others, despite our size, when it comes to both leadership in and conducting of clinical trials. Where we unfortunately haven't seen that conversion is into the manufacturing of products and services, and those who are much more expert than I am in the econometrics of drug companies and what makes pharma choose a nation to be in. It usually comes down to labour costs, taxation and the attractiveness that jurisdictions can offer.

We know that in the United States, for example, state governments make it very, very attractive in certain parts of the country to come and locate, particularly for early start-ups, and often this is the case with those reagents and actions that are found that we wish to have taken to phase-one clinical trials.

It's often a group of remarkable investigators who discover something. They are then wooed by jurisdictions where perhaps more ambitiously there is the waiving of, for example, municipal, provincial and federal levels of taxation for a period of time. In terms of labour supports, they have made it very economically attractive. If we think backwards, many years ago the Province of Quebec made a concerted effort around—

The Chair: Unfortunately, Doctor, we are out of time.

My apologies for interrupting, but we have to get to our next intervenor.

Mr. Aboultaif, go ahead for five minutes, please.

Mr. Ziad Aboultaif: Thank you, Dr. Smith, for a very informative session today.

I go back to Mr. Barsalou's question about the social contract. If I gather correctly from your response, you're talking about a financial issue, funding specifically. If that is a problem and new social contracts are needed between the federal government and the rest of the provinces, why are we talking about this now, if, as you say, this has been going on for a long time? Can you please explain that?

Dr. Kevin Smith: I would say a number of us have raised that. I can't remember the date, but I'd be happy to share with you an oped piece I published before the pandemic, in The Globe and Mail, that talked about this very topic. A number of us have been talking about this for a long time as we've seen, for example, pre-pandemic occupancy rates in hospitals of over 110%, and individual front-line providers have given us feedback about the conditions. Frankly, we've been very fortunate in this pandemic to be able to take that occupancy down so dramatically. That kind of occupancy rate, in and of itself, presents an infectious disease risk that greatly diminishes our effectiveness outside of COVID and with any other infectious disease as well.

This is not a new topic. It's a topic that has been undertaken for some period of time by a number of us. However, this has made it all the more obvious. I believe I heard the Prime Minister, in one of his daily updates, also recognize that we will need to revisit how these services are delivered. I would suggest that if that's the case, one has to look at the resources to do so.

Mr. Ziad Aboultaif: How optimistic are you of achieving that, given that now, unfortunately, is the perfect time to talk about it? It's a shame we are not going to be able to implement something or solve a problem that is happening right now and has been going on for a long time.

How optimistic have been getting anyone to listen in the government or governments in general?

Dr. Kevin Smith: I would be very optimistic about people willing to engage in the discussion. I recognize there is an opportunity cost for all these initiatives and the question comes up: Is this not right, or what do we not do in order to do more of another initiative?

I think this has pointed out to us that we can any longer believe that Canada is immune to this.

I think the other piece of this we will and should hear loudly: the risks for those, not only patients and families who are most important to us, but also our front-line providers who have been very frightened during this pandemic. As always, evidence catches up; it doesn't always lead.

I feel bad that many people working in the health care system today are saying they know they're being told that the science doesn't say they need an N95 respirator, but they'd like a belt-and-suspenders model in case they do, so they're not putting themselves at risk in caring for another Canadian in desperate need of their support. In addition to that, they need to know that the infrastructure is there behind them, not only those who provide direct service, but equally important—and sometimes more so—are the unsung heroes: the housekeepers, porters, food service workers. These are all essential to high infection control standards in Canadian hospitals.

I think it has to be there, and I have every confidence that Canadians will demand this discussion, especially as it relates to the frailest of Canadians, our seniors in long-term care—70% of our current deaths are those individuals who built our nation. We can do better.

● (1255)

Mr. Ziad Aboultaif: How much time do I have, Mr. Chair?

The Chair: You have about 30 seconds.

Mr. Ziad Aboultaif: I want to thank Dr. Smith for a very informative session. I hope to see you again.

Dr. Kevin Smith: Thank you, sir.

The Chair: For my final intervention I have Mr. MacKinnon, but I'm not sure whether Mr. MacKinnon or Mr. Jowhari wants to take this five-minute round.

Mr. Majid Jowhari (Richmond Hill, Lib.): In the interest of time, I'm ready to take it if Mr. MacKinnon wants to share his time with me.

Thank you, Dr. Smith.

Over the last month or so we've heard about the development of a vaccine, and then its going through the tests, as well as mass manufacturing, distribution and the administration of it. The timeline that's being discussed is anywhere from a year to 18 months.

I'd like you to shed some light on the overall timeline. Where are we in that process in your view, and how long do you think the clinical trial—phase one, phase two and phase three—is going to take?

Dr. Kevin Smith: I truly wish I had a crystal ball on this one. It's a very difficult question, although I am somewhat encouraged.

As you know, recently there has been a clinical trial out of Oxford University, and from all I can understand from the popular press, they have produced over one million trial drug samples. That encourages me to the degree that someone who is producing that large a sample population probably, I hope, has some indication of the effectiveness in preclinical trials of the intervention.

I recognize that 12 to 18 months is the estimate, but again, trying to be on the eternal optimist's side, the world scientific community has literally paused and is focused on COVID-19. I've never seen anything like this in my life, and rightly so. It should be focused on it when we look at the devastation it's wreaked, not only on individuals and families but on our economies, and we know that health is directly related to wealth.

I believe we will see protracted opportunities. I also think there may be some opportunities to consider whether or not some of those traditional phase one, two and three trials need to go sequentially, or that with some early data, we might think about concurrent runs after phase one, to ensure that we're not harming individuals, of course.

That being the case, I think the latter part of this discussion has to be around the ownership and intellectual property of a vaccine, as Mr. Green mentioned. I'll leave it to ethicists and business consultants who are more scholarly than I on the ethics of that being true, or opening up that production to international productivity to address a pandemic of the proportion we've never seen. I think that would be the desired outcome.

In preparation for that, I think all countries should be thinking about whether we are able to quickly stand up a production facility that would serve our nation, as I heard from the previous speakers. Each nation wishes to produce for itself first, and I hope Canada is thinking about how we would produce a successful vaccine, whether invented elsewhere or not, to ensure that Canadians can be among the first to receive it.

Mr. Majid Jowhari: Thank you.

I think that brings us to one o'clock.

The Chair: Yes, it does, Mr. Jowhari. Thank you very much for being so prompt with your time.

Colleagues, thank you all for a great discussion today.

Dr. Smith, I want to thank you particularly for being available to us on such short notice.

Dr. Kevin Smith: Thank you.

The Chair: Colleagues, we will resume our next discussion on Monday at 2 p.m. Eastern Standard Time.

I hope everyone has a great weekend. Stay safe.

Yes, Mr. McCauley.

● (1300)

Mr. Kelly McCauley: Before we break, Mr. MacKinnon and Mr. Drouin, I'm just sending you both something to your P9s. I just need a call back.

I'm sorry to interrupt, but it's somewhat important.

Mr. Matthew Green: Mr. Chair, could I also just raise a point here for the official record? On both occasions in both rounds, because of technical difficulties, both the Bloc and I were cut out from the rounds. I just want to put on the record that these technical difficulties are coming at our expense, to our ability to intervene a second time, because of the speaker rotation by the chair.

The Chair: Yes, I understand that, Mr. Green. Unfortunately, because of our tight timelines, we have to adjourn at one o'clock.

For individual interventions, when there have been technical difficulties, I have extended extra time to the individual intervenor, but the block of time we had was only two hours.

Hopefully over the course of the next few meetings in the next few weeks, we'll get all our technical difficulties straightened out. I take your point.

Mr. Matthew Green: It's not the block of time; it's the allocation I'm critiquing.

The Chair: Understood.

Colleagues, thank you very much.

We are adjourned.