

# **THE PANDEMIC, RESILIENCE AND A GREEN RECOVERY**

## Knowledge and Science for Diversified Responses Tailored to Canadian Realities

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Brief submitted by the Université du Québec network to the Standing Committee on Industry,  
Science and Technology

***Université du Québec***

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Table of Contents

Executive Summary.....iii

Introduction ..... 1

1. Taking urgent action: Overview of previously announced initiatives ..... 1

    1.1 More flexibility and extensions ..... 1

    1.2 Essential support for students and research staff ..... 2

    1.3 Work placements ..... 2

    1.4 Clearer communication..... 3

    1.5 Research support that does not concentrate resources at the expense of diversity ..... 3

    1.6 Consideration of the long-term impact on individuals and institutions ..... 4

2. Responding to the multidimensional crisis: Realizing universities’ full potential ..... 4

    2.1 A comprehensive health approach to mobilize all expertise available in Canadian universities ..... 4

    2.2 Making decisions based on diverse expertise and perspectives ..... 5

    2.3 Maintaining and increasing research collaborations with the communities ..... 6

    2.4 Mobilizing diverse knowledge in the post-crisis era ..... 6

3. Make society more resilient by mobilizing a strong, diverse nationwide university ecosystem  
8

    3.1 Recovering through the efforts of every person across the country ..... 8

    3.2 Cultivating homegrown talent by offering access to universities across the country ..... 8

    3.3 Increasing research spin-offs by rebalancing investments within the ecosystem ..... 9

Conclusion..... 10

Appendix 1. The Université du Québec network..... 11

## Executive Summary

This brief is being submitted to the Standing Committee on Industry, Science and Technology for its study on the Canadian response to the COVID-19 pandemic. As executives of the Université du Québec network of post-secondary institutions, we would like to testify to the solutions implemented in the university research ecosystem and this system's potential to support the recovery effort. Knowledge and science can offer diversified responses that are tailored to Canadian realities in order to confront and defeat the pandemic, support and improve resilience among Canadians and organizations, and contribute to a green recovery.

Overall, our proposals echo the recommendations issued by the Advisory Panel for the Review of Federal Support for Fundamental Science in its report *Investing in Canada's Future: Strengthening the Foundations of Canadian Research* (the Naylor Report). One of its recommendations emphasized reinvesting in scientific research throughout the entire university ecosystem. Our recommendations have four main thrusts:

- 1) The need for a diverse range of expertise to respond to the pandemic, necessitating a comprehensive approach based on health and resilience;
- 2) The need for explanations from experts who are sufficiently familiar with the reality on the ground to understand the territorial, regional or provincial differences in the spread of COVID-19 that underlie the different responses in each jurisdiction;
- 3) The duty to support the long-term nation-wide development of research communities at the intersection of teaching and research in order to produce the next generation of highly qualified personnel needed in such situations and, more broadly, in a knowledge-based economy and society; and
- 4) The importance of mobilizing the full potential of Canada's 100 or so universities over the short and longer terms, especially by ensuring a broad, balanced distribution of research funding.

Our recommendations are as follows:

- Implement measures (e.g. salary support) to cover all research projects, including those funded by government partners.
- Strengthen investment in work placement programs to improve the employability of all Canadian students, regardless of their field of study.
- Develop programs to promote student social engagement in communities of practice or student involvement in projects at organizations working on social or technological innovation.
- Ensure that grant programs implemented to support COVID-19 research activities leverage the diverse range of expertise available across all Canadian universities, including health research communities that are not connected to faculties of medicine (e.g. second COVID-19 rapid research funding competition).
- Adopt mechanisms for considering and correcting the pandemic's differentiated effects on careers (e.g. female and early-career researchers) and on university infrastructure.
- Diversify the composition of multidisciplinary scientific expert committees and panels created to advise the Prime Minister and the Government of Canada.
- Maintain and increase research collaborations with communities.
- Allocate a budget for each Canadian university institution to carry out knowledge mobilization activities in support of recovery efforts.
- Support massive, accelerated development of distance learning by providing financial support that is allocated based on each institution's student population and have it administered by the provinces.
- Develop innovation-oriented research programs with criteria that can consistently support both large, mature research teams and emerging teams.

# Introduction

The impact of the coronavirus pandemic is manifold. First, it is having a biological, psychological and sociological effect on human beings. It is also affecting the economic, political and public health foundations of society. This calls for a response that is informed by a diverse range of knowledge and expertise covering all of these aspects.

As executives of the Université du Québec network, we would like to start by commending the Government of Canada for its efforts in managing this crisis.<sup>1</sup> The government has undeniably taken swift action to unveil a series of initiatives and substantial funding to deal with the situation. We especially appreciate the government’s promptness in mobilizing the research community in the fight against COVID-19.

In this brief, we hope to show the Standing Committee on Industry, Science and Technology (INDU) how universities, with their interrelated missions of education and research, are taking part in these efforts to support our collective future and how they are contributing to the resilience of our societies. We also provide recommendations on how to make the most of this contribution.

## 1. Taking urgent action: Overview of previously announced initiatives

A number of measures relating to universities have been announced (see Inset 1). Comments and recommendations are proposed for improving several of the measures that have been announced and for preventing some of the anticipated effects. The goal is to ensure that universities can play the role they are expected to fulfill in containing the pandemic and participating fully in the economic and social recovery.

### [1.1 More flexibility and extensions](#)

As in many sectors, the pandemic has slowed, and in some cases even halted, a large number of research activities. Measures that add flexibility to work timelines are deeply appreciated by the research community.

This type of measure makes it possible to **account for the pandemic’s differentiated effects** on the scientific community. Take, for instance, early-career researchers and individuals, especially women, whose research activities have been particularly affected by the situation owing to their family responsibilities. The adoption of equivalent measures by all the granting agencies would be a significant step forward.

#### Inset 1 – Key Announcements Regarding the Scientific and Student Community

- February 10 – First COVID-19 rapid research funding competition (phase I – \$54 million)
- March 23 – Canada’s plan to mobilize science to fight COVID-19 (\$275 million)
- April 20 – Creation of a COVID-19 expert panel
- April 23 – National medical research strategy to fight COVID-19 (\$1 billion)
- April 23 – Second COVID-19 rapid research funding competition (phase II – \$107.9 million)
- May 25 – Support for research staff (\$450 million)
- Support for grant-funded employees and research staff (\$292 million)
- Expanded student work placement programs (\$154 million)

<sup>1</sup> A brief overview of the Université du Québec network is provided in Appendix 1.

## [1.2 Essential support for students and research staff](#)

Many members of the university community are in precarious circumstances because of the pandemic. The measures taken to help them are welcome, but some improvements could be made.

As executives of the Université du Québec network, we were pleased with the announcement that \$450 million was being allocated to provide **wage support to universities and health research institutions** for up to four months so that they could avoid laying off research personnel whose salaries are funded by non-governmental sources. This measure was essential for preserving the lifeblood of research, which will be needed to respond rapidly during the recovery. However, there are a number of uncertainties and obstacles that could easily be addressed:

- Much of the work being done by research teams is funded by NSERC or SSHRC for projects conducted **in partnership with Crown corporations**, such as Hydro-Québec, or certain municipalities. For institutions in the Université du Québec network, this arrangement accounts for over \$700,000 in matching funding in 2020–2021. How will research personnel paid through this type of partnership be categorized? Can they count on the support of the Government of Canada?
- The support being offered excludes research projects funded by governmental partners. However, many research projects stem from funding awarded in the form of contracts or grants from **federal departments and agencies** to solve problems affecting key sectors of the economy and Canadian society. For researchers in the Université du Québec network, this type of funding amounts to more than \$4.5 million in 2020–2021.
- The support being offered does not cover the **wages of research office staff**, yet these staff members are especially crucial for the network's smaller institutions and likely for other Canadian universities. Retaining this staff is essential to ensuring that these universities can deploy their full support capabilities, which are already more modest than those of large universities, to apply for future competitions.
- Lastly, since the pandemic shows no signs of stopping, the limit of four months per funding year is grossly insufficient and is not enough to avert layoffs. This will destabilize existing research infrastructures, as they will lose the expertise they need to operate, which in turn will inevitably limit the role they can play in Canada's economic recovery.

Various programs have been announced for students, and they have met with a positive response. These programs can truly make the difference between staying in school and dropping out. For example, a budget of **\$40 million has been allocated to support a four-month extension of scholarships awarded by the three agencies** to master's and doctoral students and post-doctoral researchers whose funding was to end between March and August 2020. Furthermore, the decision to allocate an additional **\$250 million to support students and research staff who are paid out of federal grants** was also deeply appreciated by the scientific community.

## [1.3 Work placements](#)

Support for **paid work placements** is considered especially meaningful in the current context. It responds directly to the needs of a number of existing university programs that require work placements. However, the projected economic slowdown is likely to affect the availability of such placements. Employers will probably have fewer internship opportunities for students. This is already happening in Quebec in certain fields, such as engineering.

Under these circumstances, universities must ramp up their efforts to ensure that conditions are suitable for providing their students with hands-on learning and enhancing their employability. Government subsidies can make all the difference, which is why demand is high. This was seen with the **Student Work Placement Program**, whose funding some universities quickly seized upon. Our recommendations are as follows:

- Establish rules to ensure that funding is distributed equally in order to give all Canadian students, as well as businesses, an opportunity to benefit from these programs, regardless of where they are studying.

- During the economic recovery, in addition to work placement programs, develop other programs with different objectives in order to support student social engagement or involvement in projects with organizations working on social or technological innovation.

#### [1.4 Clearer communication](#)

Universities have encountered challenges such as unclear announcements, confusion about which sources of financial support are actually available and a lack of collaboration ahead of announcements, resulting in criteria that fail to reflect reality on the ground.<sup>2</sup> This has been a waste of energy for universities, and it could undermine their confidence in the opportunities announced.

While they recognize that the current situation is steeped in uncertainty, Université du Québec network officials would appreciate it if **clearer information could be provided when funding programs are announced.**

#### [1.5 Research support that does not concentrate resources at the expense of diversity](#)

We commend the Government of Canada for committing substantial funding to the rapid deployment of research to improve knowledge of the COVID-19 virus, develop treatments and vaccines, and conduct clinical trials.

Through the **first COVID-19 rapid research funding competition**, the government invested a total of \$54.2 million in 99 research projects between February and April 2020.

- It is worth noting that this competition was open for applications in two major areas (medical countermeasures and social or policy countermeasures) and that the CIHR made sure that **success rates were substantial and equivalent in both areas** (around 44% of applications were funded).
- However, we wish to point out to the Committee that the results of this competition once again showed a **concentration of research funding** in a handful of Canadian universities, generally the ones that are already the best funded, namely, those with a faculty of medicine. Of the 99 projects that received funding, 80 are led by a principal investigator from a U15 institution or an institution with a faculty of medicine. Of the 19 other principal investigators, 10 are from Ontario, 5 are from British Columbia, and 0 are from Quebec.
- The concentration of research funding in a handful of universities is not a new phenomenon. In the current context, it could be attributed to the fact that the very tight timelines between the announcement of a funding program and the deadline for applying benefit teams that are already well-established, well-equipped in terms of human resources, and well-apprised of the government's intentions.
- **Researchers at universities that do not have a faculty of medicine are being penalized**, despite having recognized health expertise, including in fields with direct relevance to the pandemic, such as virology. This expertise can take different forms. For instance, researchers from the École de technologie supérieure developed techniques for adapting a laryngoscope design to intubate intensive care patients and for using a contactless camera to measure vital signs. In addition, two researchers from the Institut national de recherche scientifique studied the feasibility of a vaccine targeting the carbohydrate layer on the surface of the S protein, in collaboration with a biopharmaceutical company.
- That is why we are drawing the granting agencies' attention to the importance of the **second competition**, which was launched on April 23, 2020. The \$107.9-million fund has clearly caught researchers' interest, given that over 1,500 applications have been submitted. The projects that are selected are expected to come from **a wider range of institutions** than those chosen during the first competition so that other health research communities across the country have a chance to contribute their knowledge to the effort to overcome the challenges of the pandemic.

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<sup>2</sup> For instance, a large number of grants were announced, but the final number was much lower.

We understand that the granting agencies are under urgent pressure to launch competitions. While we realize that responses may be imperfect, we recommend an **approach centred on upstream dialogue with diverse stakeholders** and **adjustments** made where needed downstream. Some agencies are aware of these issues and are working to address them. In particular, the CFI has decided to **temporarily suspend its Exceptional Opportunities Fund – COVID-19 in order to spend time listening to the needs of the research community so that it can adjust its program accordingly.**

#### [1.6 Consideration of the long-term impact on individuals and institutions](#)

The current competitions are important initiatives for the research community. Although we agree that these substantial investments are urgently needed, we feel it is **equally important not to overlook the medium-term impact that these choices will have on the capabilities of certain individuals and institutions.** The projects that receive funding will enable research to advance more quickly at the institutions that receive the accelerated funding. The expertise, grants and equipment secured through these exceptional competitions will add to the researchers' CVs and their university's legacy, enhancing their ability to attract future funding. Vigilance will be needed over the coming years in light of the following:

- As stated, many institutions lack the optimal conditions and resources to enable all teams to apply for these competitions.
- Furthermore, preliminary studies already show that female and early-career researchers are facing more challenges in the current context. The medium-term effects on their careers will need to be better understood.
- In keeping with efforts to promote equity, diversity and inclusion, the granting agencies should adopt appropriate mechanisms for considering the pandemic's differentiated effects on the abilities, careers and infrastructures of different groups and institutions.

## [2. Responding to the multidimensional crisis: Realizing universities' full potential](#)

This crisis requires a diverse response. We highlight three ways to harness even more of the resources available in universities.

### [2.1 Taking a comprehensive health approach to mobilize all the expertise at Canadian universities](#)

COVID-19 affects individuals and communities in different ways depending on their genetic traits, age, social and health profile, lifestyle, culture, gender, economic status, living environment, access to services, etc. It is therefore not enough to determine the genetic profile of the novel coronavirus. The situation demands responses and appropriate measures that address a variety of health-related issues using a comprehensive approach that is both individual and collective.

To that end, the diversity and scope of the challenges warrant **mobilizing all the expertise available in Canada's 100 or so universities, not just faculties of medicine.** The Université du Québec network has over 800 researchers studying health-related issues. Over the past few years, efforts have been made to consolidate the Université du Québec's top health talent in a new group known as the Réseau intersectoriel de recherche en santé de l'Université du Québec (RISUQ) (see inset in Appendix 1). At the national level, a great many institutions that do not have a faculty of medicine nevertheless focus much of their fundamental and applied research on health.

The work being done by RISUQ and other Quebec and Canadian groups that take a similar approach could yield solutions that would enable us to understand and address many of the effects of the pandemic. In fact, they are already doing this work. In addition to granting many interviews to media outlets and numerous other platforms, the researchers of the Université du Québec network have launched a number of research projects (see Inset 2). Additional financial resources would enable them to further leverage their capabilities. Detailed recommendations on this subject are provided in section 3.



## Inset 2 – Examples of COVID-19 Research Projects Led by and with Université du Québec Network Researchers

- *Portrait virologique et bactériologique de patients COVID-19.* Lionel Berthoux (UQTR) et al.
- *Détection et quantification de la toux pour un suivi à distance des problèmes respiratoires dûs à la COVID-19, CRSNG Alliance-COVID.* Neila Mezghani (TÉLUQ) et al.
- *DECOPA – Étudier la transmission asymptomatique de la COVID-19.* Julie Houde (UQTR) et al.
- *Création d'une biobanque québécoise COVID.* Catherine Laprise (UQAC) et al.
- *Inhibition of TMPRSS2 and 3CL Proteases by natural polyphenols to prevent SARS-CoV-2 infectivity and replication.* Charles Ramassamy (INRS) et al.
- *Development of single-pixel infrared imaging thermometry (SPIRIT) for fast and accurate COVID-19 fever screening.* Jinyang Liang (INRS) et al.
- *COVID-19 Prevention: Hybrid Polymer/Photoactive Ceramic Self-Disinfecting Coating.* Federico Rosei (INRS) et al.
- *Sensitive and specific electrochemical detection of COVID-19 (SARS-CoV2) based on isothermal amplification.* Jonathan Perreault (INRS) et al.
- *Fabrication of autonomous flexible hybrid electronic devices for patient-monitoring.* Sylvain Cloutier (ÉTS) et al.
- *High-volume electrospinning of high-performance cellulose membranes required for N95-grade mask fabrication.* Sylvain Cloutier (ÉTS) et al.
- *Antiviral graphene nanofiber nonwoven filter.* Nicole Demarquette (ÉTS) et al.
- *Design, characterize and validate a new multifunctional coating, with antiviral and antibacterial properties for COVID-19 pandemic.* Gelareh Momen (UQAC) et al.
- *Étude [iCare](#) (Évaluation internationale de la compréhension et des réactions par rapport à la COVID-19).* Kim Lavoie (UQAM) et al.
- *Déterminants et incidence des complications développées par les personnes souffrant de la COVID-19 ayant séjourné dans un hôpital régional: une étude observationnelle.* Jacinthe Leclerc (UQTR) et al.
- *Analyse de données cinématiques et physiologiques pour le suivi à distance de l'état de santé mentale dans le contexte de la pandémie COVID-19.* Neila Mezghani (TÉLUQ) et al.
- *Effet sur la santé psychosociale de la pandémie de la COVID-19 chez les femmes enceintes et en postnatales: Une étude longitudinale comparative entre les régions du Québec incluant Montréal.* Catherine Herba (UQAM); co-researchers: Stéphanie May-Ruchat (UQTR), Marie-Josée Martel (UQTR), Cathy Vaillancourt (INRS – Centre Armand Frappier).
- *Vigie-COVID : Optimisation de la prise en charge de la COVID-19 par des recommandations adaptées au citoyen.* Jean-Sébastien Paquette (Université Laval); co-researchers: Andrée-Anne Parent (UQAR), Caroline Rhéaume, Marie-Pierre Gagnon and France Légaré (Université Laval).
- *Perceptions d'adultes québécois de 70 ans et plus à l'égard du respect du confinement pendant la pandémie COVID-19.* Danielle Boucher (UQAR); co-researchers: Dominique Beaulieu (UQAR), Dominique Gagnon (UQAT), François Boudreau (UQTR), Nicole Ouellet (UQAR).
- *Marcher: une pratique au temps du coronavirus qui sera durable? Perception de la marche et de ses effets sur la santé physique et mentale des parents et des enfants et implications lors du retour à la normale.* Marie-Soleil Cloutier (INRS – Centre UCS); co-researchers: Marie-Christine Brault (UQAC), Martin Lavallière (UQAC), Carole Clavier (UQAM).
- *Impact of social vulnerability in older persons on mental health and health service use in Quebec during the COVID-19 crisis.* Nadia Sourial (Université de Montréal); co-researchers: Éric Tchouaket (UQO), Claire Godard-Sebillotte (McGill University), Svetlana Puzhko (McGill University), Amélie Quesnel-Vallée (McGill University).
- *Les conséquences à court, moyen et à long terme de la pandémie sur la santé bio-psycho-sociale et spirituelle des étudiants et employés œuvrant au sein des Universités du Québec.* Danielle Maltais (UQAC) et al.
- *La santé psychologique des adolescents en période de confinement.* Kristel Tardif-Grenier (UQO) et al.
- *Étude Réactions (Récits d'Enfants et d'Adolescents sur la COVID-19).* Christine Gervais, Isabel Côté, Vicky Lafantaisie and Francine de Montigny (UQO).
- *COVID-19, confinement et santé mentale.* Maude Boulet (ENAP) et al.
- *Le Grand Dialogue Régional pour la Transition Socio-Écologique.* Ian Segers (UQAC) et al.

### 2.2 Making decisions based on diverse expertise and perspectives

Multidisciplinary scientific expert committees and panels have been created to provide regular advice to the Prime Minister and the Government of Canada on COVID-19 developments. Examples include the immunity task force and CanCOVID, the Canada-wide network of health, science and policy researchers.

These panels can inform public policy development. However, their capacity is directly tied to their membership. Can they cover the entire scientific community working in health research?



So far, almost all the university researchers invited to join the panels come from universities with a faculty of medicine.<sup>3</sup> Consequently, the potential available in Canada's 85 or so other universities is being overlooked. We recommend **diversifying the composition of these panels**.

### [2.3 Maintaining and increasing research collaborations with communities](#)

Of the many different research traditions, the tradition of collaborating with community stakeholders is increasingly widespread and supported by the granting agencies. Collaborative research is especially valuable in the current context, where ongoing interactions between the research community and user communities can accelerate understanding of the changes under way, the issues and possible responses.

Thanks to longstanding ties with diverse private-sector, public-sector and community stakeholders, the researchers of the Université du Québec network are particularly well positioned to collaborate with numerous relevant areas of activity in many different communities. They are involved in both research programs and the dissemination of their results and transfer to innovation. Take, for example, the Centech business incubator at the École de technologie supérieure (ÉTS). This kind of infrastructure, which capitalizes on proximity to companies like Haxio, Prevu3D and GRAD4, offers the ability to respond rapidly to the issues facing the community and to help the economy recover during or after COVID-19.

However, universities' deployment capabilities are limited by new constraints imposed by the pandemic. For example, many organizations and companies that are partners in university research programs are experiencing financial challenges that could prevent them from continuing to contribute to ongoing research or initiating new research, however essential. The costs of some activities (during collaborative or other research) are also higher (e.g. social distancing in laboratories or travelling to carry out field activities). Measures should be taken to achieve the following:

- the government replaces the funding normally provided by the organizations (partner matching funding) for ongoing partnership research programs;
- any additional costs needed to carry out research activities in accordance with the new public health requirements are covered by additional funding; and
- initiatives and infrastructure supporting collaborative research are fostered by new programs.

### [2.4 Mobilizing diverse knowledge in the post-crisis era](#)

The knowledge created in universities is well worth knowing, and researchers are open to transferring that knowledge, as they have shown during the COVID-19 pandemic. From the very first weeks, these individuals have been speaking out publicly to explain the latest knowledge that could help address the many emerging challenges. In doing so, they have demonstrated the relevance of their work. Their contributions have enhanced response capabilities in a wide variety of sectors affected by the pandemic, such as health, education, communications, economics, transport and agriculture.

The increased visibility of science and scientists in the public sphere on a national scale is a testament to the wealth of knowledge and expertise that is available to help Canadian society tackle the pandemic. The select number of examples given below (see Inset 3) also attest to researchers' ability to use a wide variety of channels and media to reach knowledge users quickly. In fact, the first discussions took place before the country officially went on lockdown. **The research community is proving that it is proactive, capable of anticipating problems and ready to contribute to finding solutions.**

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<sup>3</sup> 1) List of scientific experts: list of 18 members, 11 of whom are from universities (10 from U15 universities, one from a non-U15 university (Simon Fraser); three doctors from hospitals affiliated with the University of Toronto; and four members representing federal agencies and one firm); 2) immunity task force: leadership group includes 18 professors, all from U15 universities; 3) sectors represented on CanCOVID: U15, federal and provincial governments, non-profit organizations, Indigenous communities, hospitals, clinics, the Chief Science Advisor, Health Canada and the Public Health Agency of Canada.

### Inset 3 – Some Examples of Knowledge Mobilization by Université du Québec Network Researchers During the Pandemic

- **Expertise:** Sustained media presence of professors to explain new knowledge about COVID-19 and health issues, including Cathy Vaillancourt (INRS – Centre Armand Frappier), Benoit Barbeau and Tatiana Scorza of UQAM’s Department of Biological Sciences.
- **Guidance:** Publication of a guide for explaining COVID-19 to children and dealing with the psychological impact of lockdown (UQAM).
- **Advice:** Development of a website to help parents find relevant resources to ensure their children continue to learn by UQAM’s UNESCO Chair in Curriculum Development.
- **Medical equipment:** Production of 3,000 3D-printed face shields by the École de technologie supérieure (ÉTS) and a network of citizens, delivered to the Centre hospitalier de l’Université de Montréal (CHUM) as part of the Covi3D project.
- **Well-being:** Investment in digital platforms by organizations including the Galerie de l’UQAM and professors of art and the creative arts, to offer performances and access to art and other activities in order to mitigate isolation and provide stimulation during lockdown.
- **Education:** “Adapter, réorganiser ses activités et innover dans un contexte de crise,” a 44-hour continuing education course offered online by UQAC, custom-designed by a multidisciplinary team to respond to organizations’ current needs in relation to workflows and productivity; digital marketing, sales and communication; business intelligence and industry 4.0; employee health and well-being.
- **Tool:** Development of a tool by a UQAT and UQTR research team that offers ideas for fun, creative activities to encourage teachers to make classroom learning enjoyable, available to all preschool teachers in the province.
- **Education:** New short program on digital integration in the classroom offered by UQAM’s Faculty of Education to teachers, educational advisors and education students.
- **Guidance:** Development of two webinars on managing the return to work after lockdown, presented by a lecturer and offered free of charge by UQAR to address a major issue for local businesses and organizations.
- **Education:** Development of an accredited online training course for the Ordre des Psychologues du Québec, entitled “Psychothérapie par vidéoconférence,” by the Canada Research Chair in Clinical Cyberpsychology and UQO’s cyberpsychology lab.
- **Support:** Development and ongoing maintenance of a list of frequently asked questions about employment law in the COVID-19 era, aimed at non-unionized workers, by a team of UQAM professors and legal experts.
- **Debate:** Publication of a “call for a resilient society” signed by 80 individuals from universities and civil society, urging a rethink of the economy and the green transition.
- **Education:** Agreement with the Quebec Department of Education and Higher Education (MÉES) to offer free training to help elementary, secondary, college and university instructors explore or expand their knowledge of distance learning. (TÉLUQ)
- **Education:** Training sessions on psychological first aid to reduce psychological distress among the general public during a pandemic (inspired by practices used during natural disasters, such as floods). Lily Lessard (UQAR).
- **Support:** A post-disaster recovery plan for municipalities developed by ENAP’s Cité-ID LivingLab, in collaboration with the Association de la sécurité civile du Québec (ASCQ). It was adapted for the COVID-19 pandemic by the City of Quebec and offered as a template for the province’s municipalities.
- **Evidence:** Dissemination of research findings on the future of youth in care in Quebec in relation to the needs of youth leaving care during the COVID-19 pandemic as part of the EDJeP partnership (longitudinal study on the future of youth in care) led by the Canada Research Chair in Evaluating Public Actions Related to Young People and Vulnerable Populations at ENAP.
- **Publication:** Special issue of the A+ bulletin entitled “Les administrations publiques au front” dedicated to our experts’ analyses and useful resources for dealing with the COVID-19 pandemic (ENAP).

It is also worth noting that scientists have demonstrated their willingness to engage in dialogue with various stakeholders to jointly resolve complex problems. At this stage, one question becomes essential: how can we continue this dialogue to support the recovery and, in the longer term, strengthen the resilience of organizations, communities and Canadian society?

Answers to this question about transferring and mobilizing knowledge already exist and deserve to be reinforced. These answers take a variety of forms, depending on the realities of university institutions and the communities with which they collaborate. Aside from research offices, there are also liaison and transfer bodies such as UQAM’s service to communities, the innovative territories in social and solidarity economy (TIESS) organization associated with the Chantier de l’économie sociale and UQO’s Outaouais development observatory. These initiatives all

recognize the need to deploy specific expertise that complements the researchers' expertise. The professionals in these organizations act as "knowledge brokers," providing an essential link between researchers, decision makers and communities of practice.

Accordingly, to support efforts to address challenges presented by the pandemic and the recovery, we suggest that the government do the following:

- Reserve a \$20-million budget to provide approximately \$200,000 in funding per Canadian university. This funding will enable each university to carry out knowledge mobilization activities in order to support the recovery efforts of the communities with which its researchers collaborate.

### 3. Making society more resilient by mobilizing a strong, diverse national university ecosystem

The final section of this brief looks at a longer time horizon, focusing on the capabilities and resilience of our societies.

#### [3.1 Recovering with the help of every person across the country](#)

Millions of workers have lost their jobs as a result of the recent economic crisis. With the global economy so weak, the OECD expects unemployment to remain high for years to come. The pandemic is highlighting the need to increase resilience in every nation.

From an economic standpoint, one lesson that has emerged from the crisis is the importance of skills in today's work world. **Job losses are much lower among skilled workers than among unskilled workers.**<sup>4</sup> However, only 36% of young Canadians aged 25 to 34 have a university degree (bachelor's, master's or doctoral degree). This percentage is below the OECD average and well below the figures for leading countries, where more than 50% of people in this age group have a university degree. This is too low to ensure a recovery and a promising future for Canada.

Now more than ever, when we picture the future of the post-COVID-19 economy, Canada is facing dual challenges: how to generate an economic recovery that fosters a green transition and centres on the knowledge economy, and how to guarantee that all Canadians have equal opportunities to participate in this new knowledge-based society.

#### [3.2 Cultivating homegrown talent by offering access to universities across the country](#)

Higher education is crucial to the resilience of Canadian society. Unlocking the full potential of homegrown talent needs to be a national priority. To achieve this goal, research funding will have to be rebalanced to better support the training of highly qualified personnel (HQP) and boost Canada's scientific impact.

Canada is fortunate to have over 100 universities with physical campuses across the country. The 10 Université du Québec institutions alone offer service points in 60 municipalities across the province, as well as distance learning.

- Universities are currently making substantial investments in distance learning. We endorse Universities Canada's call for the Canadian government to contribute significant financial support to the field of distance learning. We propose that the funding be allocated based on each university's student population and that it be administered by the provinces.

Furthermore, over the longer term, given that the skills that drive innovation are acquired in settings where research and education are intertwined, it is vital to ensure that all Canadian students have access to a high-quality environment, regardless of where they live. Canada needs to leverage its strategic asset: implementing research programs that involve students across the country. Grants are an essential tool for training the next generation: in many programs, more than 50% of the funding is used to provide fellowships or salaries for students participating in the research teams' work.

- However, despite the geographic distribution of its universities, Canada's students do not have equal access to these resources. In fact, **56% of Canada's university students are**

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<sup>4</sup> <http://www.oecd.org/innovation/research/>

**enrolled at universities that collectively receive just 26% of funding** for scientific research.

- Since the current context could impede the government’s ability to increase its investment in research, **rebalancing investments is crucial**. This will require diverting part of the funding that concentrates resources within a limited number of institutions, research teams or individual researchers toward less well funded institutions, teams or researchers across the country.

### 3.3 Increasing research spin-offs by rebalancing investments within the ecosystem

The Government of Canada needs to rebalance the distribution of research and research support funding to universities. This funding is indispensable to innovation, HQP training and the economic recovery. The programs offered by the **three federal granting agencies, the CFI and TIPS** should be adjusted to increase participation (proportion of applications and awards) by other groups, including female researchers, early-career researchers and researchers from universities of all sizes and all regions of Canada (see Appendix 3).<sup>5</sup>

In addition to being justifiable from a public funding standpoint, this rebalancing approach is supported by **the evidence**. Scientific studies have demonstrated that rebalancing funding **would increase the impact and productivity of research across Canada**. Here are just two key pieces of the evidence:

- The potential for generating transformative discoveries increases in proportion to the number of researchers at work.
- Funding more researchers increases the diversity of the scientific fields being explored and enhances the country’s resilience to future uncertainty.

It is therefore important to continue efforts aimed at introducing **new criteria**, particularly related to the **principles of equity, diversity and inclusion**, that also take into account the sizes of universities and the communities they serve. We commend early efforts to, for example, design **new programs, but the results are still mixed**.<sup>6</sup>

- In order to have a decisive impact on the research ecosystem, **bold approaches** need to be proposed.
  - For instance, why not design an innovation program with two streams? Part of the funding would go to support larger, more mature teams, and the rest would support emerging teams, whose members are often early in their careers or fewer in number.<sup>7</sup>
  - This approach has proven its worth in other competitions. The introduction of two separate **streams** in the SSHRC Insight Grants program, depending on whether applicants were seeking either \$7,000 to \$100,000 or \$100,000 to \$400,000, is a practice that should be expanded. Once it was introduced, non-U15 participation and success rates rose.

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<sup>5</sup> From 2014 to 2018, early-career researchers from small universities applying to the NSERC Discovery Grants Program were on average 24% less successful than early-career researchers at large universities.

<sup>6</sup> Take, for example, the New Frontiers in Research Fund. By incorporating the principles of equity, diversity and inclusion, the inaugural 2018 competition offered early-career researchers an opportunity to carry out high-risk, high-reward interdisciplinary research by submitting their applications to an “inclusion” evaluation stream. While the funded projects were highly inclusive, the competition actually reaffirmed the unbalanced model of funding concentration by awarding 75% of the grant funds to early-career researchers affiliated with U15 universities.

<sup>7</sup> The defunct Canada First program can be used as an illustration. In its two inaugural competitions in 2015 and 2016, \$1.25 billion was invested in 18 groups of researchers, each of which received an average of \$70 million. If each of the groups funded by Canada First had been offered \$35 million “on average” (rather than \$70 million), 1,260 more teams could each have received \$500,000 in funding.

- Another initiative that is having an impact is the Exceptional Opportunities Fund – COVID-19. Through this competition, the CFI is covering 100% of the eligible costs of projects on an exceptional basis. This is a major gain for boosting participation among less well funded universities that have fewer partners with very different financial resources.

## Conclusion

More than any other global phenomenon, the worldwide COVID-19 pandemic has underscored the invaluable contribution that science and university researchers can make to the implementation of a coordinated, efficient response to a threat of this magnitude. Canada's participation in this international effort and its success in sparking a recovery depend largely on its ability to produce relevant data and analyses in a timely way and mobilize them quickly for decision-making. This is true at all levels of government and management in every setting. The quality of the scientific training received by workers in many different sectors of society is a key factor for addressing the current crisis and beginning the recovery.

Universities have mobilized to tackle these tremendous challenges. They hope to remain long-term partners so that they can contribute to a better future for everyone.

## Appendix 1: The Université du Québec network

As a crucible of new scientific knowledge and a training ground for the experts of tomorrow, the Université du Québec network is involved in the scientific, economic, social and cultural development of Quebec and Canada, including the current issues raised by the pandemic and the requirements of economic recovery.

The 10 institutions in the Université du Québec network are key players in addressing these issues: the Université du Québec à Montréal (UQAM); Université du Québec à Trois-Rivières (UQTR); Université du Québec à Chicoutimi (UQAC); Université du Québec à Rimouski (UQAR); Université du Québec en Outaouais (UQO); Université du Québec en Abitibi-Témiscamingue (UQAT); Institut national de la recherche scientifique (INRS); École nationale d’administration publique (ENAP); École de technologie supérieure (ÉTS); and Télé-université (TÉLUQ).

Together, they are already making several major contributions:

- A vital contribution to training highly qualified personnel in all regions of Quebec, given that over a quarter of students enrolled at universities in the regions would not have pursued a post-secondary education if their university had not existed, that a significant proportion of Université du Québec students are the first in their family to go to university, and that most graduates choose to stay in the same area where they studied.<sup>8</sup> Thanks to the dedication of the 7,400 professors and lecturers, 95,000 students, or nearly one in three university students in Quebec, are enrolled in a Université du Québec network institution.
- Leading-edge research and educational capabilities deployed in nearly 60 cities in Quebec, thanks to the 2,800 research professors in all fields who developed new knowledge niches that have become critically important, assisted by more than 20,000 graduate students.
- Research strength in health, despite having no faculty of medicine, with more than 800 researchers studying health-related issues, including 185 in RISUQ (see inset below).
- More than 1,500 diverse partnerships (with businesses, non-profit organizations and public-sector organizations), fostering the creation of knowledge on crucial issues for our collective future and expediting dissemination to communities of practice.
- Direct spin-offs of more than \$5.7 billion for our economies, through operating expenditures, students and visitors (\$2.3 billion), increased productivity generated by enhanced training of university-educated workers (\$2.7 billion) or research and knowledge transfer (\$0.7 billion).

### The Réseau intersectoriel de recherche en santé de l’Université du Québec (RISUQ)

RISUQ brings together 185 researchers affiliated with Université du Québec institutions.

**Four key areas:** Biomedical science; cognitive neuroscience and mental health; movement and lifestyle; health care and social services organization.

**Mission:**

To contribute to community well-being from an interdisciplinary and intersectoral perspective where research, innovation and knowledge mobilization are used to address the priority health and social services issues of communities across Quebec. RISUQ researchers, post-doctoral fellows and students are working to initiate an evidence-based transformation in health administration strategies that combines intersectoral intervention with outreach to and education of individuals and communities.

**Objectives:**

1. To promote health and well-being for the various urban and rural populations of Quebec, with special consideration for vulnerable persons and gender equity;
2. To offer an intersectoral education that combines the fundamental, social and clinical approaches, with an emphasis on retaining the next generation of health and social services workers trained in Quebec’s outlying regions;
3. To develop interdisciplinary and intersectoral research focused on regional concerns about and priorities for health and social services;
4. To develop innovative tools while promoting responsible use of financial, social and environmental resources; and
5. To create interregional communication channels that give communities a voice and a reference point for two-way communication between researchers and political (scientific panel), social and financial stakeholders in health and social services research in Quebec.

<sup>8</sup> 2016 ICOPE survey.