# BACKGROUNDER: COVID-19 Program

## *Expanding detection of COVID-19 and Caring for Patients Through Digital Technologies*

The Digital Technology Supercluster (Supercluster) is investing $60 million to work with Canadian companies, post-secondary institutions and not-for-profit organizations to improve the health and safety of Canadians by supporting Canada's commitment to address the COVID-19 outbreak while building expertise and capacity to respond to future urgent situations.

The Supercluster's COVID-19 Program confirms our commitment to support 'Team Canada' to address COVID-19. Our Supercluster Members and Associates have collaborated to create over 400 ideas and proposals focused on COVID-19. Organizations involved in these proposals represent a broad cross-section of the Canadian economy including healthcare organizations, software companies, industry associations and tech innovators from sectors as diverse as precision health, manufacturing, and data analytics.

By investing in projects that align with the critical needs identified by the Government of Canada and Provincial governments across the country, the Supercluster supports Canada's Plan to Mobilize Industry to fight COVID-19. We work with our Members and Associates to deliver digital solutions that solve problems created by this, and potentially future pandemics.

Supercluster COVID-19 Projects targeting the detection of COVID-19 and delivery of virtual health care include:

**Protecting Canadians by Predicting the Evolution of COVID-19**
Lead organization: Terramera
Partners: D-Wave, Menten AI, Microsoft, University of British Columbia, ProMIS Biosciences, bioLytical Laboratories

Canada will need to prepare for inevitable future "waves" of COVID-19 as new strains are likely to evolve. The ability to predict virus variations even before they emerge will be essential to stopping future pandemics. This project brings together a select group of world-class artificial intelligence, computer modelling, and structural biology researchers to forecast changes to the virus so we can pre-design tests, therapies and vaccines to manage future outbreaks. These models can significantly reduce the response time to deploy new diagnostics and medicines to help protect Canadians.

**Thunderbird: Rapid Antibody Design using AI**
Lead organizations: Variational AI Inc., Zymeworks Inc.
Partners: University of Victoria

This project will use artificial intelligence to fast-track the complex task of developing antibodies required for effective treatments for COVID-19, saving time and money. Working with Zymeworks Inc., a global leader in the design of antibody-based therapeutics, this artificial intelligence-powered platform has the potential to quickly identify new and more effective treatments to protect Canadians against COVID-19 and other diseases.

**xrAI** *(pronounced 'x-ray')*
Lead organization: 1Qbit
Partners: First Nations Health Authority, Fraser Health Authority, Saskatchewan Health Authority, Trillium Health Partners, the University of British Columbia's Faculty of Medicine, the Vancouver Coastal Health Authority, Red Cross

X-rays are a critical tool in identifying patients with COVID-19. This project uses artificial intelligence to identify lung abnormalities on chest x-rays in real-time, enabling clinicians at the 'front line' in emergency rooms and rural hospitals to better identify COVID-19 and other lung-related illnesses. In the hands of clinicians, this tool can improve patient outcomes and save lives.

**Improving ICU Capacity During COVID-19 Outbreaks**
Lead organization: Altis Labs
Partners: Bayer AG, Trillium Health Partners, QIPCM, University Health Network

Hospital intensive care units (ICUs) cater to patients with severe illnesses requiring constant monitoring and specialized treatment including ventilation. Pandemics like COVID-19 significantly increase the risk of ICU overcrowding given the surge in patients, which negatively impacts the quality of care. This project will develop software that predicts patients' risk of ICU admission and expected length of ICU stay based on patients' medical imaging. The software will enable hospitals to better manage and predict ICU capacity leading to better care and outcomes for patients.

**Providing Safe and Effective Home Care During COVID-19**
Lead Organization: AlayaCare
Partners: Acclaim Health, AceAg, Bayshore, Careteam Technologies, e-Cobalt, PICN, University of Victoria

Home care patients and their caregivers are at risk of being squarely in the next wave of COVID-19 victims. Preventing the spread of COVID-19 within this vulnerable population is essential to reduce hospitalizations and prevent avoidable burden on the healthcare system. However, traditional home care provides a significant challenge with respect to COVID-19 due

to the multiple visits many patients receive from various care workers. To combat these challenges, this project will significantly increase the functionality of AlayaCare's existing digital toolkit and accelerate the ability to deliver the COVID-19 specific functionality, including scheduling algorithms, employee and patient pre-screening, and alerting service providers in real-time about symptomatic employees or patients.

**Rapid Deployment of Emergency Case Management**
Lead organization: Careteam Technologies
Partners: AlayaCare, Caredove, CognisantMD

Over 50% of Canadians are considered at increased risk due to COVID-19, including seniors and those with underlying health conditions. The health system needs to manage COVID-19 patients and monitor the health of people at-risk from pre-existing conditions. This project will provide remote monitoring and virtual care, including rapid referral to required services. Patients can receive the care they need virtually, in the safety of their home, and avoid overwhelming hospitals and the health system.

**Point-of-Care Ultrasound for COVID-19**
Lead organization: Providence Health Care
Partners: Change Healthcare, Clarius, Faculty of Applied Science (University of British Columbia), St. Paul's Foundation, Rural Coordination Centre of B.C., Vancouver Coastal Health Authority

Rapid, accurate diagnosis of potential COVID-19 patients is critical for patient care and to better understand community infection and spread. This project aims to use a handheld ultrasound device powered by artificial intelligence to provide real-time diagnosis of patients with pneumonia, potentially caused by COVID-19. This new tool will initially focus on rural and remote communities, and long-term care homes for seniors.

**Beacon - Realtime Global Data Sharing Network***
Lead organization: DNAstack
Collaborators: Global Alliance for Genomics & Health, Hospital for Sick Children, Microsoft

Securely sharing data and knowledge about the genetics of the COVID-19 virus in real time over a cloud-based global network is critical to the rapid development of treatments and therapies. This project allows scientists and researchers to do just that - improving our knowledge at a speed and scale that isn't otherwise possible.

**Feeding our Front Lines***
Lead organization: Food-X Technologies
Partners: Spud, Adaptech, 1QBit, ETG Consulting, Microsoft

Across B.C. and Canada, as the volume of online orders for groceries and pharmacy has

spiked, there is a growing problem in the time it takes to fulfil and deliver these essentials to those that need it most. What was once same day delivery, now can take upwards of a week. Getting fresh, high quality groceries to essential workers, patients diverted from the hospital system to make room for COVID cases, and citizens in quarantine, requires hyper-efficiency from farm to table. This project provides an e-Grocery management system that manages food quality and freshness and optimizes packing and deliveries to provide fresh food delivery to our frontline workers and patients, while simultaneously ensuring food security for Canadians throughout the COVID crisis. Food-X is also leading the way in hiring displaced and recently unemployed workers as part of the packing and delivery process as a way of ensuring pathways to new employment.

**Rapid Repurposing of Drugs for COVID-19***
Lead organization: Varitional AI Inc.
Partners: adMare BioInnovations

It takes decades and costs millions to develop and deploy new drugs to treat disease. Doctors are looking at repurposing already approved drugs in an attempt to quickly identify effective, safe treatments for patients. This project uses artificial intelligence to rapidly establish links between drugs that have the potential to combat the effects of COVID-19 and fast-track life-saving treatment for patients.

**Lifesaver - Predicting emerging pandemics***
Lead organization: Finger Food Advanced Technology Group
Partners: Red Cross and Team Rubicon with support from Federal Emergency Management Agency (FEMA), Microsoft, and the University of British Columbia's Faculty of Medicine and Data Science Institute.

Finger Food Advanced Technology Group, which specializes in offering technology solutions to emerging problems, is leading the development of a new tool to better forecast emerging pandemics. This platform will enable decision-makers to better predict emergencies and regional needs, thus allowing for effective planning and deployment of resources. There is currently no publicly available source of predictive data suitable for rapidly changing crises such as this pandemic. Using a dataset optimized for predictive modelling, this collaborative project can aggregate data from public sources, health authorities and medical institutions, in addition to incorporating weather and travel conditions.

**Previously announced projects*

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