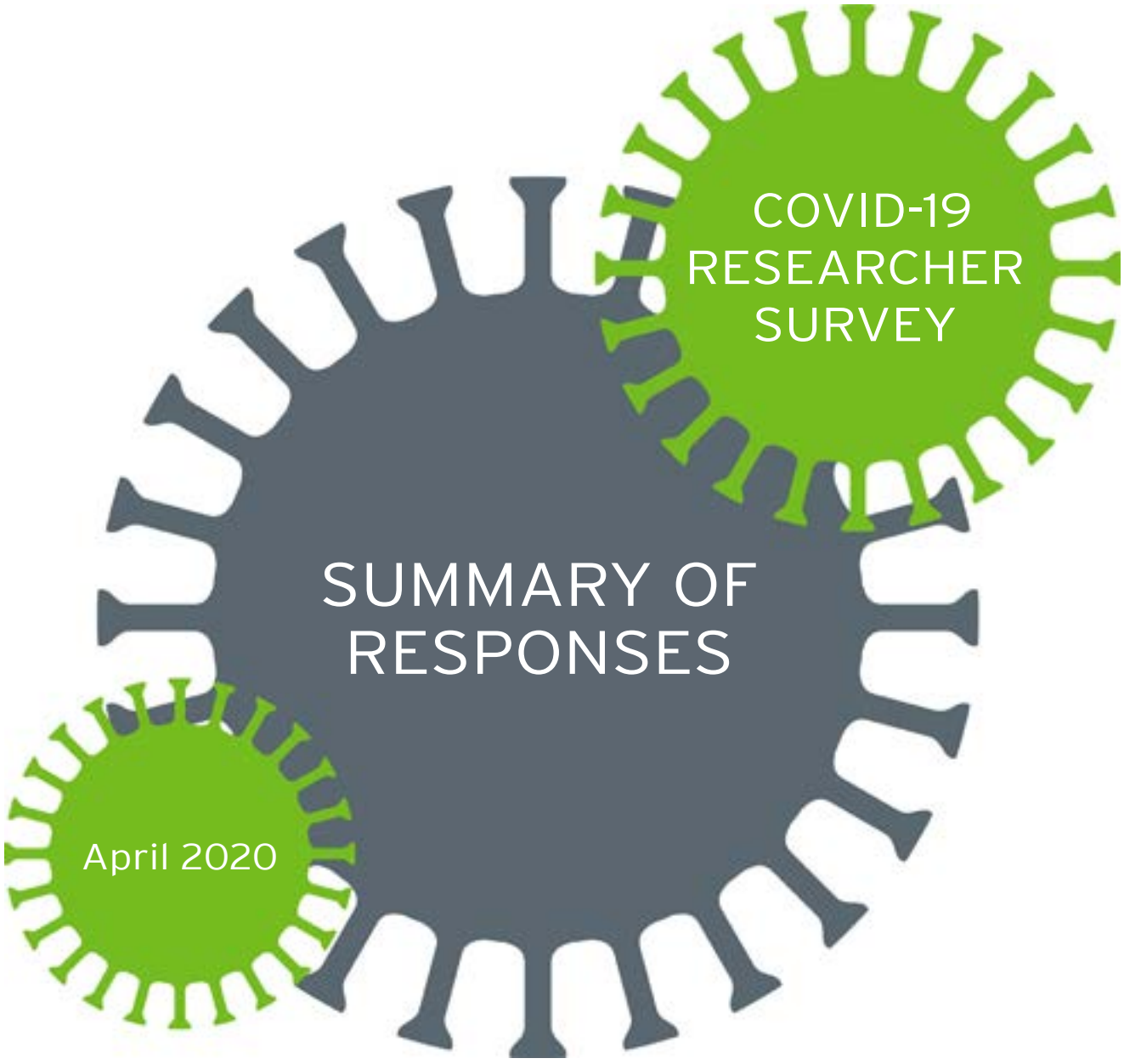
populationdata BC



Overview

More than 100 researchers responded to a survey soliciting COVID-19-related research ideas, and the data and other infrastructure needed to support those. Key needs identified by the research community include:

- Access to routinely-available research data, as well as to new data that are specifically related to COVID-19
- Supports for study design and analysis
- Supports for researchers to collaborate virtually

Background

There is excellent ongoing work by the BCCDC, PHSA more broadly, and the Ministry of Health to monitor and model the current spread of COVID-19 and to plan for system readiness, as well as biomedical research related to vaccine development. At the same time, it is clear that there are many excellent ideas for research that would complement and augment this existing work. There is also additional capacity for research because of the curtailment of some clinical activities. Many researchers fundamentally feel motivated to engage in research that is meaningful and could contribute in some way to the current situation.

Efforts are underway to create fast-track funding opportunities, both from federal agencies like CIHR and NRC and in BC through the Michael Smith Foundation for Health Research (MSFHR). Given this, and after consultation with many individuals and organizations in BC and across the country, Population Data BC conducted a short survey (Appendix A) to help understand the range of research ideas researchers believe are relevant to the current context, and the infrastructure necessary to support them.

This document provides a summary of the information provided through 108 responses to that survey received as of 7 April 2020. This summary is intended to complement efforts by the BC Ministry of Health, the BC Academic Health Science Network, MSFHR and others both in and outside BC to collect and organize research projects that are underway and to identify priorities for future research. Taken together, these efforts will enable a better understanding of research interests, align those with research priorities, enable collaboration where there are common interests, and ideally foster opportunities for cross-jurisdictional collaboration.

Summary

After only seven days being open, this survey generated 108 responses, which is a clear indication of researchers' interest in meaningful engagement in response to the COVID-19 pandemic. There are a broad range of research interests, some of which speak to more immediate priorities (e.g. clinical trials and vaccine development) and many more to ongoing clinical management of COVID-19 cases, care for non-COVID-19 patients, and health system policies, and broad population health implications of the crisis and its management.

There is enormous research expertise and research infrastructure in British Columbia. These resources can be used, and in some cases augmented, to support the research community to produce high-quality and relevant evidence that will inform both shorter and longer-term priorities related to COVID-19 and its effects on the health system and population health.

There are a broad range of COVID-19 research interests among BC researchers

The responses to the survey reflect COVID-19-related research ideas that cover all four CIHR pillars of biomedical, clinical, health services and policy, and population and public health, plus a few questions related to product development. Table 1 provides a summary of the types of questions proposed under each pillar, with the full set of research interests put forward listed in Appendix B.

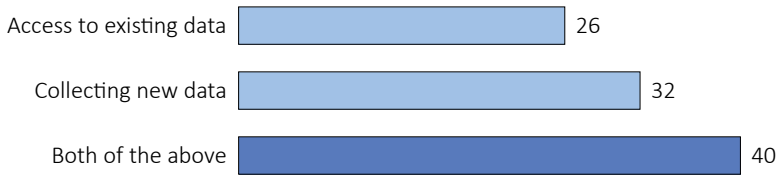
Table 1. Summary of types of questions proposed under each pillar

CIHR pillar	Research interests expressed in survey
Biomedical	Understanding more about the virus and its pathways of effects Potential drug therapies Genetic influences on susceptibility
Clinical	Epidemiological studies of virus transmission Optimizing diagnosis and treatment The influence of comorbidities on susceptibility and outcomes Development of decision support treatment and guidelines The experience of those affected after recovery Effects on clinical care for non-COVID-19 patients
Health services & policy	Health system capacity Responding to non-COVID-19 health care needs Health care service effects for specific populations Health care workforce
Population & public health	Development of public health measures in response to COVID-19 Effects of stay-at-home and physical distancing measures Effects on specific populations General population health outcomes

BC researchers expressed a need for data to advance COVID-19 related research

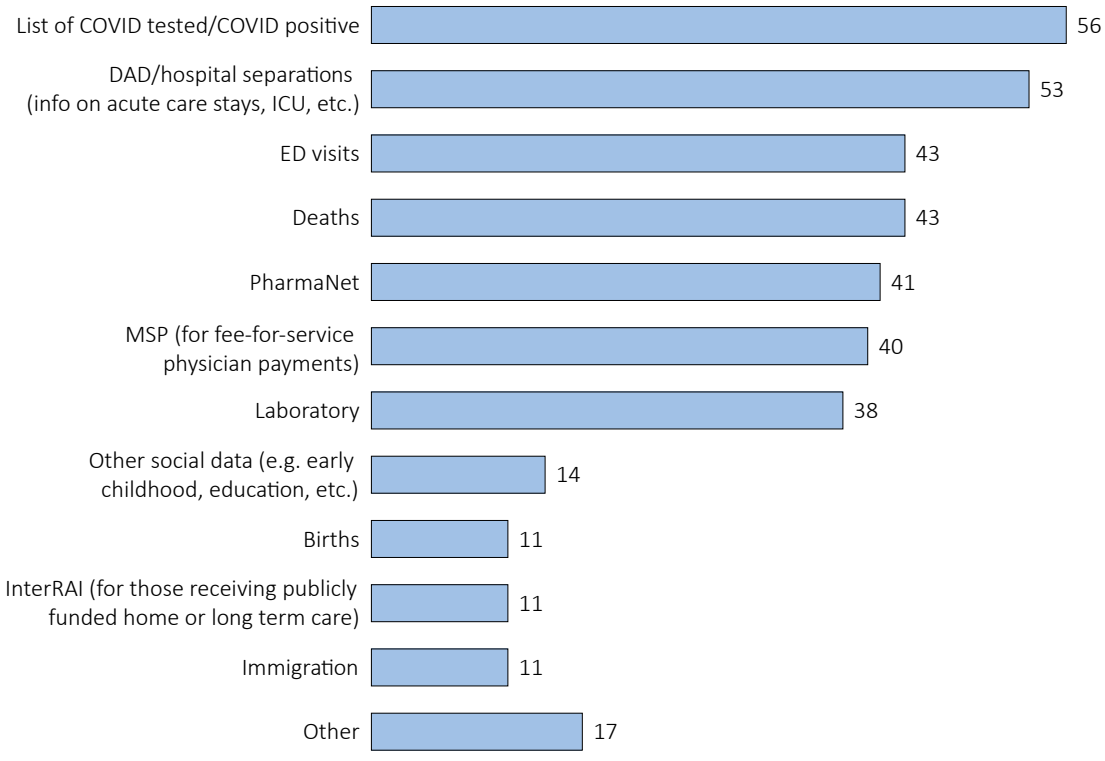
Over 70% of proposed research ideas would require access to existing data. Of the projects that require access to existing data, most (61%) also indicated they would need to augment existing data by collecting new data. The most common form of new data collection is in the form of surveys, with a few noting the need for new clinical data capture, chart review, and biological samples.

Figure 1: Data needs (n=98)



Focusing on the use of existing data, there is interest in access to a broad range of sources. The most commonly-desired data sets are the COVID-19 testing data and hospital separations (DAD), followed closely by emergency department visits (NACRS), deaths (Vital Statistics), prescription pharmaceuticals (PharmaNet), physician payment information (MSP), and laboratory data. Other data sets desired include home and community care services (interRAI), immigration, and other social data such as geographic information and education data.

Figure 2: Data sets required



BC researchers need research support and are interested in collaborating with each other

Survey respondents were evenly split between those who indicated no need for help with study design or analysis, and those who would value assistance with one or the other, or both. The analytic software packages most commonly desired include SAS and R, with a few requesting STATA, python and SPSS. Qualitative researchers noted the need for NVivo. All of these software packages (except NVivo) are available on the PopData Secure Research Environment, or available to researchers in their existing analytic environments. Of the 81 respondents who provided an answer to the question about preferred file format, 15 indicated preference for a database structure and the rest indicated flat files (13) or no preference (53).

In terms of ongoing connections, the majority of respondents (81%) indicated interest in a Slack-type platform that will enable engagement across researchers and research groups, and 92% are interested in further communications.

Directions

Researchers in BC are ready to make contributions to the response to the COVID-19 pandemic. Key resources that will enable the most effective contributions include:

- Access to routinely-available research data, as well as to new data that are specifically related to COVID-19
- Supports for study design and analysis
- Supports for researchers to collaborate virtually

Acknowledgements

Thank you to researchers for taking the time to express your research ideas, to MSFHR and the Ministry of Health for support for this effort, and to all universities and other partners who helped to spread the survey invitation. Thanks in particular to Seles Yung, Dawn Mooney, Zena Sharman, Julia Langton, Megan Ahuja, Stephen van Gaal and Bryony Mander for their help with the survey and the production of this report.

APPENDIX A

Research ideas in a context of COVID-19

Thank you for responding to this survey. If you have more than one research idea, please feel free to provide multiple entries.

Please describe your research idea or question in 1-2 sentences.

_____

_____

Using CIHR pillars, would you describe this as biomedical, clinical, health services and policy, or population health research?

Biomedical Clinical Health services and policy Population health research

Answering this research question would require:

Collecting new data Access to existing data Both of the above

If collecting new data would be required, please provide a very brief summary of what that would be (e.g. a survey, social media information, private sector data) and whether you would require any infrastructure supports for this (e.g. privacy-sensitive space for data collection, etc.)

_____

_____

If you would require access to existing data, please note the relevant data sets.

MSP (for fee-for-service physician payments)
DAD / hospital separations (including information on acute care stays, ICU, etc.)
ED visits
PharmaNet
Births
Deaths
InterRAI (for people receiving publicly funded home care or living in publicly funded facilities)
Laboratory
Immigration
List of COVID tested / COVID positive
Other social data (e.g. early childhood, education, etc.). Please provide examples.
Other

If you selected "Other", please specify.

_____

Do you have existing researcher-collected data that you would like to link to other sources? If yes, please describe.

_____

_____

Would you need assistance with study design or data analysis?

Study design Data analysis Both Neither

What analytic tools (SAS, R, python etc.) would you need to complete your research?

_____

_____

Do you prefer working with a database structure or flat, linkable files?

Database structure Flat, linkable files Either

Would you like to be added to a Slack or similar platform to enable cross-provincial collaboration? If yes, please provide your email below.

Yes _____ No

Would you like to be added to a list for ongoing communications? If yes, please provide your email below.

Yes _____ No

Thank you for this information. Please feel free to share the survey link with other BC-based academic researchers.

Are there any final comments or suggestions you would like to offer?

_____

_____

APPENDIX B

Contents

BIOMEDICAL

Virus effects / pathways

Determining the mechanisms by COVID-19 (SARS-Cov2) attacks people with pre-existing cardiovascular diseases.

Role of Natural Killer cells in immunity against covid-19: study population health care providers with positive and/or negative test for covid-19 with or without severity of disease.

Develop an assay to determine the cellular immune response to inactivated SARS-CoV-2 in people who have recovered from COVID-19. The goal is to develop an assay to see who is susceptible to reinfection.

I am interested in two aspects of COVID-19 situation: 1) Visualization and analysis of data related to infections and 2) Disease modelling.

Can Anterior Nares and/or Nasopharyngeal Photodynamic therapy (with methylene blue and UV light) reduce COVID-19 viral load in an infected patient?

I am a Human Geneticist with an idea about asymptomatic carriers and why men seem to do worse than women with COVID-19. I have looked into genetic variation in the human ACE2 protein, which binds directly to the virus, and found several rare variants that affect men differently from women.

1. Looking at different receptors for COVID 19 binding in addition to ACE2 receptors, and distribution of receptors on the upper and lower respiratory tracts.
2. Does COVID 19 infection cause a secondary bacterial infection by expressing bacterial receptors?
3. Testing COVID 19 from air samplings (hospital patient waiting area, crowded grocery shops, public transports).

Potential drugs therapies

"Based on the fact that the COVID-19 virus is single-stranded RNA virus and Naproxen has an antiviral activity via inhibiting nucleoprotein (NP) binding to RNA in the replication process of RNA-viruses like influenza A/B, the use of Naproxen as a probable agent for control of widespread novel coronavirus infection may be assumed."

https://www.bmj.com/content/368/bmj.m406/rr-9

"naproxen blocks the RNA binding groove of the nucleoprotein, preventing formation of the ribonucleoprotein complex"

https://www.sciencedaily.com/releases/2013/03/130321151926.htm

Structure-Based Discovery of the Novel Antiviral Properties of Naproxen against the Nucleoprotein of Influenza A Virus.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3632891/

Indomethacin has a potent antiviral activity against SARS coronavirus.

https://www.ncbi.nlm.nih.gov/m/pubmed/17302372/

Evaluate safety of COVID19 vaccines

Determine whether cannabidiol is a useful adjuvant to the potential hydroxychloroquine/azithromycin therapeutic treatment of COVID-19. Cannabidiol rescues the biophysical substrates underlying LONG QT syndrome, which is a side effect of both hydroxychloroquine and azithromycin, limiting their usefulness in the most vulnerable patients.

Genetic influences

Why do people respond so differently to COVID-19 infection - how does genetic variation in the COVID-19 human receptor ACE2 affect its interaction with viral protein? We are developing a large library of ACE2 gene variants to answer this question while also providing a platform to test drug inhibitors to block this interaction as potential therapeutics.

I'd like to infect airway epithelial cells (preferably primary cultures, though it may be difficult at this time to obtain samples given the shutdown) with CoV, then isolate these cells and perform single-cell RNA-sequencing to observe gene expression changes over a time course.

Genetics of host response to viral infection, determining immunity and those with severe disease addition to MSP/DAD] to assess COVID19 [and its impact] in this special population.

CLINICAL

Virus transmission

Epidemiological study - I was wondering about the exhaust from the hospital rooms in which coronavirus patients are isolated. I don't think our hospital treats the exhaust gases (with UV light or filtration) at all before they are spewed into the atmosphere. The study would correlate the incidence of coronavirus in those people living in close proximity to hospitals, compared to controls. Hospitals might be acting as a very efficient source for spreading disease, and I assume most hospitals are the same.

Naproxen to prevent COVID infection.

Building gender analysis into economic models to evaluate the control and spread of pandemic infections.

Network analysis of disease spread.

Are asymptomatic healthcare workers a vector of COVID 19 disease?

Optimizing diagnosis and treatment

Combine EHR data and pharmacy information systems with various streams of available public health and research data in order to understand and optimize COVID-19 treatment. Use a dynamic and responsive analytic platform.

Develop methods to perform COVID19 diagnoses over phone to support services such as virtual health care, 811, etc.

Can we develop a risk score to predict: 1) the need for critical care support, 2) the need for ventilation, and 3) mortality among patients with positive nasopharyngeal swabs for COVID-19 (after stratifying by code status/ ICU eligibility)?

The purpose of this study is to characterize the population of critically ill Coronavirus disease (Covid-19) patients in the Vancouver area. Specifically, we hope to determine baseline demographic information (age, sex, comorbidities etc.), management protocols, and clinical outcomes.

Non-contact imaging to identify patients at risk of COVID-19 infection. Use imaging of the back of the throat using auto fluorescence imaging and conventional white light imaging to differentiate respiratory illness patients with bacterial infections from viral infections. Could be used in an ER setting to rapidly separate out patients with bacterial based infections from those with stratified viral infections. Would combine the data from the two imaging modes in a Deep Learning model (along with patient symptoms) to differentiate bacterial from viral infections (evidence already exists that this is clinically feasible) and to attempt to stratify the viral infections with as much granularity as possible (possibly identifying a limited viral infected subset that include COVID-19 infected patients).

Using Deep Learning on standardized (thermally calibrated) infrared images to identify individuals with elevated temperatures in an emergency room setting. Alternatively, visiting patients that are self isolated to check their vitals and thermally image them in their isolation setting and other individuals sharing the residence.

Neurological complications of COVID19.

Effects of Comorbidities

Risk of Covid hospitalization and severe disease for patients with hypertension, conditioned on drug classes prescribed. Theoretical reason why ACE / ARB might increase or decrease risk of severe disease, several opinion / guideline statements, but no primary evidence.

We have a CIHR grant to evaluate the safety and effectiveness of angiotensin II type 1 receptor blockers (ARBs) in COVID-19 because prior studies showed possible benefit in prior influenza infection - both influenza and COVID-19 use the same receptor ACE2. ARBs are used in 30-60% of patients with hypertension, heart failure, diabetes and kidney disease. We need to examine databases w drug use (ARBs and ACE inhibitors) and clinical characteristics and outcomes.

Nutritional Status and severity of Covid 19 clinical disease. As severity is often linked with other comorbidities micro nutrient depleted or deficient patients may have more severe disease. Both Zinc and Vit D depletion can affect the immune status. This is seen in undernutrition, obesity and those with inappropriate diets. Vit D depletion common in the winter. A correlative study with other clinical and demographic date could be undertaken.

Understanding Covid disease severity in respect to disease (hypertension, diabetes etc) and the types of medication taken (ACE, NSAIDs etc) by various patients and clinical outcomes.

What is the outcome of patients with rheumatic diseases on immunosuppressive drugs and COVID-19?

What is the incidence on COVID-19 in people with HIV on HIV meds?

Multiple sclerosis & COVID19.

A study of male vs female differences in risk factors, comorbidity, serious complications and health outcomes among Covid-19 positive patients requiring hospitalization. On a larger scale, this can also include male vs female comparisons

among Covid-19 non-positive patients hospitalized with any acute respiratory diagnoses over the same period and prior to Covid epidemic. Outcomes would also include resource use (e.g., ventilator days).

We would like to investigate how immunocompromised patients are affected by COVID-19 by looking at provincial health data on transplant patients. This could help us tailor how this patient population is managed until a vaccine is developed for COVID-19.

Our team of cardiac and respiratory physicians and researchers are interested in validating whether the comorbidities that lead to poorer outcomes in COVID-19 patients, as described in the current literature, have the same effect on our local patients. Particularly, we would like to know if hypertension, diabetes, cardiovascular diseases, and respiratory diseases lead to higher rate of COVID-19 infection and more severe disease.

Effects on clinical care for non-COVID patients

Understanding changes in prescribing practices for people living with substance use disorders in the context of the COVID-19 epidemic.

Clozapine is an antipsychotic drug for patients with treatment resistant schizophrenia that requires laboratory and clinical monitoring in the community. Lack of a centralized program in BC for monitoring and coordination, rigid requirements for laboratory testing, and restrictions on mobility could adversely impact on patient access to this critical medication.

Decision support / treatment guidelines

We want to develop clinical decision support for Covid, in terms of making personalized treatment (and screening recommendation).

Post-covid experience for affected individuals

Neurocognitive morbidity in survivors of Covid-19 acute respiratory distress syndrome

1) Is there a difference in the prevalence of COVID-19 by sex/gender or is the difference in the risks, having become infected, of severe respiratory disease? 2) What are the immune, hormonal, BMI, medication, blood pressure and environmental differences between older men and older women who are infected with COVID-19 and develop pneumonia leading to the higher death rate in older men?

Follow-up on recovered patients to examine possible health effects on their existing chronic health problems e.g. COPD, heart failures, etc.

1. What are the rehabilitation-related health care needs of BCs COVID19 survivors (with a specific-emphasis on those who were in ICU or acute care settings)?

2. What is the capacity of BC to support the rehabilitation of these patients?

3. What is the rehab needs of COVID19 patients with other comorbidities especially COPD?

AI / ML approaches to clinical questions

We aim to use artificial intelligence approach to big data to profile COVID positive patients and determine both risk factors and prognostic variables for clinical outcomes.

My primary research area is in medical imaging, specifically ultrasound imaging, empowered with machine learning for point-of-care applications. We are also investigating new advancements in combining imaging with PopData BC.

Application of Radiomics and Deep Learning on chest CT images of COVID-19 patients for predicting outcomes including mortality and long-term lung damage.

HEALTH SERVICES AND POLICY / HEALTH SYSTEM PLANNING

Health system capacity

The guiding research question is: 'What is the capacity of rural ED's with GPAs to respond to the COVID-19 pandemic?' The core data request is:

1. What is the volume of daily ED visits?

2. How many visit were the ED suspect COVID-19?

3. What is the draw on GPA resources (number of call-backs, length of time in hospital, procedural care).

Hypotheses: (1) There is currently low volume of rural ED visits as per recommendations for social distancing and supporting anticipated high acuity care, and anticipated increase in the need for care reflective of the spread of COVID-19. (2) The availability of rural GP Anesthetists will reduce the need for transfers to larger centres, thereby minimizing a draw on regional resources.

Responding to non-covid-19 health care needs

It is unclear how the healthcare system is dealing with emergent non-COVID musculoskeletal care that could lead to significant mobility disability. For example, follow-up and rehabilitation for persons that had a recent surgery, care for persons that are severely disabled and require surgery but whom have had surgery delayed indefinitely, persons in acute flare-ups of arthritis conditions and other musculoskeletal conditions such as low back pain and neck pain).

To develop and assess a Covid-19 emergency transfer network for surgical oncology patients.

What has the impact of the loss of primary care and loss in income for many families had on their ability to afford prescription drugs (both for ongoing conditions as well as new ones)? What role do Fair Pharmacare rules play in mitigating / exacerbating these challenges?

We have five projects we are developing for part of a pan-Canadian program of health services research related to COVID-19, as well as COVID-19 and cancer patients and survivors. 1. A cost of illness study with ON and BC calculating the costs of COVID-19 to the health system using linkable admin data sets in both provinces. 2. Cost of COVID-19 to cancer systems in ON and BC - using before and after admin data cohorts to estimate costs borne by cancer systems pre and post COVID-19 3. A national prospective cohort study of cancer patients with COVID-19 tracking health service use, drugs,PROMs etc. 4. A pan-Canadian qualitative interview project interviewing cancer patients experiences, challenges, acceptability, gender issues etc. with the overnight shift to virtual health outpatient consultations in cancer clinics - the aim is to inform wider spread long term roll out of virtual health models of care for cancer patients and survivors 5. BC and ON/pan-Can linkable Admin data analysis of quality of cancer care, adherence, pharmaceutical use, wait times, delays in surgery etc. We need to use up to date COVID-19 data for BC and through the new National Network large scale spatial and non-spatial analysis using neural networks and development of large scale data rapid analysis pipelines with FHA/Safe software/UBC/SFU collaboration - 10 + abstracts currently per year using BC Cancer registry data

A large pan-Canadian mixed methods program exploring the impacts of the COVID-19 pandemic on cancer patients and cancer survivors in terms of patient-reported outcomes, access, and quality of care.

Understanding immunology/transmission related to COVID and vaccine trials.

In collaboration with Cardiac Services BC we are aiming to evaluate the impact of COVID-19 on deferrals/cancellations of cardiac procedures and visits on the subsequent HCU and outcomes in large defined or prognostically significant cardiac populations.

Social dynamics of healthcare.

Covid-19 measures rearranged hospitals' capacity to treat non-emergency patients in BC. What is the impact of these measures on the volume and access for the procedures that previously have been given benchmarks for the timing of their provision?

The research aims to characterize the impact of a pandemic on the care of trauma patients in the province. Our focus will be on case volumes, and on the uptake of telehealth and its impact on care delivery in provincial hospitals, to better inform future events.

Health care service effects for specific populations

What is the impact of the COVID-19 pandemic on healthcare-seeking and needs of children and families with pre-existing mental illness or chronic conditions (particularly in populations vulnerable to the effects of isolation and frequent media messaging about health-related concerns, such as those with somatic symptom disorders and/or health anxiety)?

We would like to understand the health care outcomes of neonates exposed to or have acquired COVID-19, in terms of diagnoses, procedures and hospitalisation within the first 6 months after discharge. We would also like to understand the discrepancies in health care outcomes among different geographical regions in BC using postal codes.

What are the social and behavioural adaptations of racialized ("Asian") Canadians in midsized city centres during the period of COVID-19? How did/do they navigate the Canadian health care system in the context of midsized city centres during the social landscape of the COVID-19 pandemic?

I am interested to look at the health care outcomes of infants born to mothers with confirmed COVID-19, in their early childhood. Outcomes include hospitalization, respiratory and infectious outcomes, from both the diagnostic codes and medication consumption perspectives, in their first 2 years and 5 years of life.

Pediatric multiple sclerosis, disease-modifying drug use and health outcomes. This is a grant already under review. I would like to expand the aims and include Life labs data [in addition to MSP/DAD] to assess COVID19 [and its impact] in this special population.

Linked health data to study maternal mental health before during and following pregnancy related to C-19 and infant/child outcomes. This would be a combination of questionnaire data linked to individual specific population admin data.

In response to the COVID-19 pandemic, the BC government has recently implemented changes in MSP coverage that may have particular impacts on coverage and outcomes for immigrants, including temporary workers and other precarious im/migrants (e.g., undocumented) in BC. At the same time, the unique impacts of the COVID-19 pandemic and access to needed emergency and ongoing care for these groups remain poorly understood, despite emerging evidence of disproportionate impacts due to social determinants such as precarious working and living conditions, and

barriers to healthcare access.

In response to the COVID-19 pandemic primary care service delivery models have changed at an unprecedented pace. There have been rapid changes in team function and transitions to virtual delivery models. While these changes may increase accessibility for many, there are growing reports of more marginalized populations (including recent im/ migrants to Canada, people who do not speak English fluently, and people with limited access to online resources) facing additional barriers. We seek to explore the impact of changes in primary care delivery on equity-seeking populations.

Health care workforce

Examining the needs and conditions of the healthcare workforce during public health emergencies. Qualitative rapid evaluation of the social and structural factors shaping the ongoing ability and willingness of BC's health system workers to remain in the frontline during a communicable disease pandemic.

A qualitative study of providers, care coordinators, patients and support people about how COVID19 affected their experience of medical assistance in dying (MAiD).

POPULATION and PUBLIC HEALTH

Effects of stay-at-home and social distancing measures

Technology use among children with Autism Spectrum Disorder (ASD) is much debated given their tendency of dependency on technology and the impact of technology on reduced social skills. During the COVID-19 pandemic families are stranded at home. We would like to investigate the impact of social isolation on technology use among children with ASD.

The impact of distancing measures from Covid-19 on intimate partner violence in Northern BC. To explore how distancing measures impact the health and well-being of women and children in rural, remote, and Indigenous communities in Northern BC. A qualitative design using interviews/key informants to document the lived experiences of those residing in the north and inform policy and practice moving forward.

Impact of COVID-19 physical distancing protocols on pregnant families' experiences of prenatal, antenatal, and postpartum care.

We aim to investigate the role of physical inactivity and social isolation on the physical and mental health of older adults. Specifically, we adapted an effective community-based health promoting intervention for older adults to be delivered remotely in the home environment. Our objective is to investigate the effect (benefit) of home-based and virtual group activities on social isolation, social connectedness, physical activity and mobility in older adults (>65y).

Identifying what parents think and do during the pandemic - a survey of parents arriving to a pediatric emergency department.

To examine the short- and long-term effects of the physical distancing measures put in place for the COVID-19 pandemic on outcomes for children and youth (injury rates, school achievement, mental health, adherence to movement guidelines).

I have noticed that physical distancing is extremely difficult for people who live alone, in particular younger adults. Q: What is the relationship between depressed and anxious mood and adherence to physical distancing recommendations

among people who live alone and those who live with others? Is this relationship mediated by age, pre-existing mental health difficulties and risk perception?

Effects on specific populations or communities

Title: "Blood memory" in response to a pandemic: Impacts of provincial health responses on Indigenous communities in the COVID-19 public health emergency.

incidence of covid 19 in our homeless community and our indigenous communities

1. What are the experiences of a) homelessness service users and b) homelessness service providers in light of Covid19;
2. what are innovative Covid19 practices in the homelessness health and social service sectors;
3. how might these be scaled to other homelessness serving settings.

BCCDC and BCCSU are working together with government and other partners to evaluate the implications of the guidelines for safer supply in the context of COVID. Qualitative analysis of the social, structural and individual impacts of COVID-19 and COVID-19-related policies on health and well-being among people who use illegal drugs (including negotiating access to harm reduction services and opioid agonist treatment).

To examine changes in drug use patterns and drug-related harm amidst the COVID crisis among people who inject drugs.

Building on an ongoing prospective cohort study of more than 1,000 HIV-positive people who use illicit drugs, we seek to investigate the effects of the COVID-19 pandemic, including public health-based containment and health support strategies, on people who use illicit drugs living with HIV in Vancouver's Downtown Eastside neighbourhood.

We plan to conduct an email survey of all BCCH patients and families. It will capture individual and parent impacts of COVID-19 in addition to mental health domains (using standardized PROMIS measures).

Among an established prospective cohort of street-involved youth in Vancouver, BC (the At-Risk Youth Cohort, ARYS), we are seeking to evaluate knowledge, and impacts of COVID for street involved youth who use illicit substances. Specifically, we will be assessing: COVID knowledge, including knowledge of public health messages; ability to follow public health precautions; changes in access to illicit drugs; changes in drug use patterns and risks including opioid overdose; changes in access to health and social services including hospitals, addiction treatment, and harm reduction; and uptake of safe drug supply guidelines.

Understand the experiences of young people with mental illness, age 12-24 years, with COVID-19 (mixed methods).

I am quite concerned about the mental health difficulties that young adults living alone are experiencing. I'm concerned both for their mental health and how this may undermine physical distancing efforts if these young people come to feel they can no longer "take it".

General population and population health influences and effects

Exploring the social determinants of health and the impact on patient experience of COVID.

Measure the impact of COVID-19 pandemic on Mental Health Service utilization.

Measure the impact of COVID-19 pandemic on suicide rates and geolocation.

Understanding the mental health impacts of COVID-19 on children and youth in BC.

Network analysis of misinformation spread.

Consolidating the gains that we have made during this pandemic remains an urgent issue. How can we maintain momentum on climate justice and a kind and caring society--two of the many positive elements of this crisis?

Public health measures in response to covid-19

In light of the Covid-19 outbreak we wrote a short brief on the potential role of feedback and control in the design of policies such as social distancing. Specifically considering the goals of increasing population recovery rate, respecting healthcare capacity, while being robust to the inevitable uncertainty in epidemiological model parameters. We hope for and encourage collaboration between the epidemiology and control communities in approaching this very critical and urgent global challenge.

Simplified autopsy examination for COVID19 patients.

I am engaged in designing public policy to maximize population recovery and respect healthcare capacity constraints, while being robust to uncertainty in modeling. To encourage community involvement our preliminary work has been expedited and placed online here:

https://medium.com/@greg.stewart555/coronavirus-policy-design-for-stable-population-recovery-d3eab0a95064.

Grocery stores are now using one way aisles to reduce crossings between their customers. This simple system could be deployed on sidewalks, so people are not randomly crossing each others paths. One sidewalk would be in one direction, the other side of the road for the other direction. Could we model this change and see how interactions drop?

Examine effects of public health measures.

PRODUCT or SERVICE DEVELOPMENT

in the view of hand sanitizers shortage, our research group is interested to develop a novel formulation for a hand sanitizer and test it on a small population (150 people).

The Primary Care Innovation Support Unit has a number of primary care planning tools to support changing already happening in primary care (e.g. PMH and PCN development). We are adapting these on the fly to help teams and communities with COVID-19 pandemic planning.

BioBanking COVID19 samples.

Current screening of suspected COVID-19 patients that is primarily based on the patient's history, clinical features and measuring the body surface temperature can be late and nonspecific with limited ability to impact transmission of the infection. On the other hand, when COVID-19 infection is confirmed, monitoring of the pathogenesis is mostly based on clinical observations, and routine vital signs monitoring that are limited in scope.

In this project, we aim to develop a novel, noninvasive, sensitive and accurate biosensing device and simple-to-operate method for screening, early diagnosis, and monitoring COVID-19 patients. Real-time and continuous monitoring of several physiological parameters related to respiratory function, body oxygenation and body response to infection during the pathogenesis and recovery period will enable clinicians to optimize treatment options and assess the prognosis of the disease in each individual.

The BCCH BioBank would like to work with Dr. Goldfarb and the C&W clinical lab (Medical Microbiology) to streamline COVID-19 data collection to an online REDCap platform, collect leftover swab samples, and ask their permission to contact for future research opportunities. We are hoping to combine clinical and research initiatives to reduce patient and staff burden, and bank samples and data for future COVID/non-COVID/population health research purposes.

I am coordinating a national ED COVID-19 registry. Linkage of those clinical variables with health outcome data will be very valuable. The national ED COVID-registry is designed to answer questions about the course of the disease, diagnostic test characteristics of different diagnostic modalities, risk factors for severe disease and derive decision-making aids to assist in clinical decision making.

Visualization of covid-19 related data for mass consumption.