CanCOVID Issue Note

Epidemiology of COVID-19 and Canadian subpopulations

March 4, 2021

EXECUTIVE SUMMARY

Epidemiology of COVID-19 and Canadian subpopulations

Question: What is known about the epidemiology of COVID-19 in different Canadian sub-populations? How can we best leverage information to target COVID-19 interventions in different sub-populations?

Summary of Included Resources

Through our rapid search, we found 20 reports, of which five were at the national level, 15 were at the provincial and territorial levels, and one newspaper article. All resources involved analysis and reporting from established data repositories of national/provincial/regional patient information. The quality of these reports will vary depending on the methods used for data collection, epidemiological surveillance, and ways in which data were summarized.

What do we know?

Immigrants and refugees, people with a substance use disorder, and the homeless seem to be disproportionately affected by COVID-19. Risk factors for severe disease in Canada include age, male sex, and pre-existing medical conditions (i.e., diabetes, high blood pressure, chronic lung disease and obesity). People with a substance use disorder and the homeless were also at increased risk of severe outcomes. The highest proportion at risk of COVID-19 severe outcomes were those ages 80-years and older followed by the First Nations, Métis, and those living in low-income households. Rates of severe COVID-19 health outcomes were lower among visible minority groups as described in the reports as Arab/West Asian Canadians, East/Southeast Asian Canadians, and Black Canadians compared to those identified as White. By contrast, COVID-19 mortality rates are higher in Canadian neighbourhoods that have a higher proportion of visible minority groups. Neighbourhoods' ethno-cultural make-up were associated with COVID-19 mortality rates in Quebec, Ontario, Alberta, and British Columbia. However, these results should be interpreted cautiously given that they focus on sociodemographic characteristics.

What are the notable gaps?

There is a lack of high-level evidence (i.e., evidence from systematic reviews, meta-analysis, or rapid reviews) focused on the epidemiology of specific Canadian subpopulations. These include vulnerable and visible minority populations, high-risk populations, and ethno-cultural neighborhoods. Future high-level research may want to consider focusing on conducting syntheses restricted to countries with settings and contexts that share similar Canadian subpopulations – i.e., with focus on Organization for Economic Co-operation and Development (OECD) countries – as we wait for Canadian research to be completed. Further, there is a need for better standardized data collection, analysis, and written reports by Canada's provinces and territories related to sub-populations and risk factors identified during the SARS-CoV-2 testing (i.e., ethnicity, race, sex, language and culture, people with disability, and geography).

What is on the horizon? What are the studies that are underway to address the gaps?

Currently, there are eight ongoing cohort Canadian studies that have yet to publish results. There is one non-Canadian living systematic review focused on risk of infection in people living with asthma.
The upcoming studies in Canada are focused on:

- COVID-19 transmission in the Hutterites, children (Mark Loeb, McMaster University);
- Chinese immigrant communities in the Greater Toronto Area (Peizhong P. Wang, Memorial University of Newfoundland);
- healthy blood donors in most Canadian province (Darryl Leong, McMaster University); and
- Indigenous and First Nations populations living in Toronto, London and Thunder Bay, Ontario (Michael A. Rotondi, York University).

Concluding statement: From Canadian epidemiological and statistical reports, COVID-19 disproportionally affects visible minority groups and the elderly. Conducting higher-level Canadian research (i.e., systematic reviews, meta-analyses, or rapid reviews) may need to be considered to understand the extent to which COVID-19 is affecting our subpopulations from a Canadian perspective. One consideration is for Canadian provinces and territories to better collect, analyze, summarize, and standardize data related to subpopulations and risk factors identified through SARS-CoV-2 testing (i.e., ethnicity, race, sex, language, culture, people with disabilities, and geography). Another consideration is to utilize wastewater testing in Canadian neighbourhoods to deepen our understanding of the epidemiology of the COVID-19 pandemic.

What is known about the epidemiology of COVID-19 in different Canadian sub-populations? How can we best leverage information to target COVID-19 interventions in different sub-populations?

The following presents the available evidence retrieved from a rapid scan of the published literature using trusted sources in response to the above question. We found 20 reports of which five were at the national level, 15 were at the provincial and territorial levels, and one newspaper article. All resources involved analysis and reporting from established data repositories of national/provincial/regional patient information. The comprehensiveness of this scan may be limited given the rapid timeline for our search and documents retrieved, and it is possible that we may have missed potentially relevant evidence. Links to the source documents are included. The short summaries for each resource listed below provide an overview of the main results, usually found in the abstract and key summary/messages section. This scan does not include any further analysis or integration of results.

Table 1:References and brief summaries

Type of Evidence	Author	Resource	Last Updated	Summary
National data/information				
Policy Briefing	Royal Society of Canada	The Epidemiology of COVID-19 in Canada in 2020: The Pre-Vaccine Era	February 2021	• "Residents of LTCHs have accounted for approximately 80% of all COVID-19 related deaths in Canada. Reasons for the frequency, size and scale of outbreaks are multifactorial and complex, but involve delays in preparation, longstanding system challenges in the sector, as well as underlying resident factors." • "Risk factors for severe disease in Canadians include age (> 60 years old), male sex, and the presence of pre-existing medical conditions (such as diabetes, high blood pressure, chronic lung disease and obesity). Risk factors for death mirroring those factors associated with severe disease–namely age and pre-existing medical conditions." • "People Who Use Drugs and the homeless population are at increased risk of acquiring COVID-19 and at risk of severe outcomes", and "immigrants, refugees and other newcomers appear to be disproportionately affected by COVID-19 in Canada."

				• "Correctional facilities are associated with high rates of respiratory virus transmission, including SARS-CoV-2." • There is limited of Canadian data on COVID-19 and people with disabilities, and data in relation to race and ethnicity.
Epi Report	The Government of Canada	Epidemiological summary of COVID-19 cases in First Nations communities	Dec 11, 2020	• Includes information regarding: 1) cumulative totals of reported and recovered COVID-19 cases; 2) active cases; and 3) newly reported COVID-19 cases in First Nations communities in provinces. • The total cumulative number of reported and recovered cases in First Nations communities from December 6-12th was 5731 and 3486 respectively. • The number of active cases of COVID-19 in First Nations communities from December 6-12th was 2196. • The number of newly reported cases between December 6-12th in Atlantic Canada (n=0), Quebec (n=8), Ontario (n=1), Manitoba (n=196), Saskatchewan (n=105), Alberta (n=37), British Columbia (n=105). • Confirmed female positive cases in First Nations community by ages 60+ (7.3%), 40-59 (12.4%), 20-39% (17.2%), 5-19 (12.2%) and 0-4 (2.9%). • Confirmed male positive cases in First Nations community by ages 60+ (6.6%), 40-59 (12.1%), 20-39% (14.4%), 5-19 (12.1%) and 0-4 (2.7%).

Epi Report	Statistics Canada	COVID-19 mortality rates in Canada's ethno-cultural neighbourhoods	Oct 28, 2020	• This study used Canadian Vital Statistics Death data released on October 28th 2020, and the objective was to examine whether COVID-19 mortality rates were higher during the first wave of the pandemic in neighborhoods with high number of visible minorities. • Visible minority groups include South Asian, Chinese, Black, Filipino, Latin American, Arab, Southeast Asian, west Asian, Korean, and Japanese. • COVID-19 mortality rates (age-standardized) per 100,000 were higher in Canadian neighbourhoods with a higher proportion of population groups designation as visible minorities. Areas with highest proportion (greater than 25% of the population are visible minorities), had a mortality rate of nearly two times higher compared to areas that have the lowest proportion (less than 1%) of visible minority groups • Neighbourhoods' ethno-cultural characteristics were associated with COVID-19 mortality rates in Quebec, Ontario, Alberta and British Columbia. • In Quebec, Ontario and Alberta, most cases and deaths were reported in the largest metropolitan areas with large proportion of visible minority groups are situated • Regional variation in COVID-19 related mortality rates was related to the concentration of specific groups designated as visible minorities. • There were noticeable differences in mortality rates when comparing the proportion of area population (1% vs. 1-10% vs. 10-<25%, and >/= 25%) that were black in Montreal and South Asian in Toronto

Epi report	Statistics Canada	Economic impact of COVID-19 among visible minority groups	July 6, 2020	• This study reported the results of an online crowdsourced questionnaire completed by 36,000 Canadians from May 26 to June 8. • Lower-paid and young workers have faced disproportionate employment losses due to COVID-19. • The 2016 census data suggests most visible minorities had high poverty rates before COVID-19, 2-3 times the rate among the white population. • Recent immigrants (more of which were visible minorities than whites) were more likely to be in poverty than long-term migrants or Canadian-born people. • Higher poverty rates make visible minority groups more vulnerable to work disruptions such as job loss and reduced hours. • The financial impact of COVID-19 was particularly high amongst Filipinos and Koreans.
Epi Report	Statistics Canada	COVID-19 in Canada: A Six-month Update on Social and Economic Impacts (statcan.gc.ca)	October 20, 2020	• 11 million Canadians ages 18 years or older are at higher risk of severe COVID-19 outcomes given that they have at least one health condition. • Canadians at higher risk of COVID-19 include those ages 80 years and older (72% of the 11 million at higher risk), those living in low-income households (40% of those at higher risk), First Nations people (48% of those at higher risk), and Métis (41% of those at higher risk). • Rates of those who are at higher risk were lower among visible minority groups – 25% among Arab/West Asian Canadians, 26% among East/Southeast Asian Canadians, and 35% among Black Canadians compared to those identified as White (40%)
Provincial data/information				

Epi Report	Province of British Columbia	Week_50_BC_COVID-19_Situation_Report.pdf (bccdc.ca)	December 12, 2020	• Cumulatively, there have been 43, 628 COVID-19 cases 678 deaths and 224 case facility outbreaks in BC as of December 12, 2020. • Adults 70+ account for 10% of COVID-19 cases, 44% of hospitalizations and 89% of deaths and account of 13% of the BC population. • Adults 20-39 account for 41% of COVID-19 cases, 13% of hospitalizations and <1% of deaths and account for 28% of the BC population. • Children <20 years old account of 13% of COVID-19 cases, and 2% or less of severe outcomes and make up for 19% of the BC population.
Epi Report	Province of Alberta	COVID-19 Alberta statistics | alberta.ca	December 21, 2020	• The age group with the most cases per 100,000 are 20–29-year-old adults (2,877 per 100,000), 30–39-year-old adults (2,479 per 100,000) and 80+ year old adults (2,430 per 100,000). • As of December 21, 2020, 45,488 (50%) of cases were among males and 44,674 (50%) of cases were among females. • As of December 21, 2020, 5,550 healthcare workers had been infected by COVID-19 in Alberta, 925 are active infections and 4,625 are recovered infections.
Epi Report	Province of Saskatchewan	Cases and Risk of COVID-19 in Saskatchewan | COVID-19 | Government of Saskatchewan	December 20, 2020	• As of December 20, 2020, Saskatchewan has had 13,555 people with COVID-19, 123 inpatient/ICU hospitalizations, 9,557 people have recovered, 3,880 people who currently have COVID-19 and 118 people have died.

Epi Report	Province of Manitoba	Province of Manitoba | Cases and Risk of COVID-19 in Manitoba (gov.mb.ca)	December 20, 2020	• As of December 20, 2020, Manitoba has had 22,859 cases, 16,541 have recovered, 302 are currently hospitalized, 43 are currently in the ICU and 569 people have died. • As of December 20, 2020, the age group with the highest proportion of cases are 20-29 year old males (2.2K cases) and 20-29 year old females (2.1K cases), followed by 30-39 year old males (1.8K cases) and 30-39 year old females (1.7K cases).
Epi Report	Public Health Ontario	COVID-19 in Ontario – A Focus on Diversity	May 14, 2020	• This report includes most current information from the Public Health Information System (iPHIS) as of May 14th, 2020 at 4pm. • The most ethno-culturally diverse neighbourhoods in Ontario are experiencing disproportionately higher rates of COVID-19 and related deaths compared to neighbourhoods that are less diverse. • Individuals living in the most diverse neighbourhoods were also more likely to experience severe outcomes than those living in the least diverse neighbourhoods. • Hospitalization rates were four times higher; ICU admission rates were four times higher; death rates were twice as high.
Epi Report	Public Health Ontario	COVID-19 in Ontario: January 15, 2020 to December 19, 2020 (publichealthontario.ca)	December 19, 2020	• Data is from the Ontario COVID-19 Data Tool which includes information from the CCM and other case management systems as of December 19,2020. • There has been a cumulative COVID-19 case count of 155,930 – 76,515 cases are among males, and 78,446 cases among females. • Most cases were among the ages 20-39 followed by 40-59, 60-79, 19 years and under, and 80 and over. • The cumulative number of outbreaks in long-term care homes were 831, in retirement homes were 430, and in hospitals were 216.

Epi Report	City of Toronto	COVID-19: Status of Cases in Toronto - Ethno-Racial Group, Income & Infection	Dec 18, 2020	• Toronto Public Health reports the proportions and rates of COVID-19 infections among different racial and income groups. • As of December 18, 2020, the cumulative number of cases in Toronto has been 52,888 – 50,777 confirmed cases, and 2,111 probable cases. • Newly reported cases since December 17th, 2020 was +747 – +702 confirmed cases and +45 probable cases. • As of December 18, 2020, there has been a cumulative total of 928 outbreaks in Toronto – 337 from healthcare institutions, 110 from shelters & congregate settings, 146 from schools, 54 from childcare centres and 281 from the community and workplaces. • As of December 12, 2020, majority of the cases have been between the 20-29, followed by age groups 30-39, 40-49, 50-59, and 60-69. • Cases were slightly higher in females (50.6%) than males (48.5%) and about <0.1% of cases were among the transgender community.
Epi Report	City of Toronto	COVID-19: Status of Cases in Toronto - Daily Status of Cases	December 21, 2020	• Toronto Public Health reports the daily and cumulative cases, their outcomes and outbreaks. • As of December 21, 2020, there has been 51,264 confirmed cases and 2,128 probable cases since the start of the pandemic. • On December 21, 2020, 511 confirmed cases and 37 probable cases were reported since the previous day. • Of the 53,392 cumulative cases to date, 45,809 have recovered, 1,791 have died, and 5,792 cases remain active. • As of December 21, 2020, 299 people are currently hospitalized, 85 are in the ICU and 51 are intubated.

				• Five more Toronto schools confirmed outbreaks of COVID-19 since the previous day.
Epi Report	Province of Québec	Data on COVID-19 in Québec | Gouvernement du Québec (quebec.ca)	December 21, 2020	• As of December 21, 2020, 179,093 people in Quebec had been infected by COVID-19; 152,869 have recovered and 7,766 have died. • As of December 21, 2020, the largest proportion of cases came from those aged 20-29 years old (15.4%) and 40-49 years old (14.8%). Those aged 70-79 years old accounted for 5.8% of cases, 80-89 accounted for 7.1% of cases and 90 years or more accounted for 4.6% of cases. • As of December 21, 2020, 18.5% of deaths were in those aged 70-79, 39.9% of deaths were in those aged 80-89 years old and 32.9% of cases were among those aged 90 years or older.
Epi Report	Province of Newfoundland and Labrador	Covid-19 Newfoundland and Labrador - HUB (arcgis.com)	December 20, 2020	• As of December 20, 2020, there have been a total of 382 cases: 344 have recovered, 4 have died and 31 remain active. One person is hospitalized, and 70,180 tests have been completed. • As of December 20, 2020, 33 cases have been among those under 20, 84 cases among those 20-39 years old, 66 cases among those 40-49 years old, 78 cases among those 50-59, 69 cases among those 60-69 and 52 cases among those 70+.
Epi Report	Province of Nova Scotia	Coronavirus (COVID-19): case data - Government of Nova Scotia, Canada	December 21, 2020	• As of December 21, 2020, there have been 1,447 total confirmed cases, 1,344 have been resolved, 65 people have died, and 38 cases remain active. • As of December 21, 2020, 56% of cases have been among females and 44% among males. • As of December 21, 2020, 9% of cases have been among those 0-19 years old, 35% have been among those 20-39 years old, 25% of cases have been among those 40-59 years old, 18% among those 60-79 years old and 12% of cases among those 80+.

Epi Report	Province of Prince Edward Island	PEI COVID-19 Case Data | Government of Prince Edward Island	December 17, 2020	• As of December 17, 2020, 90 cases have been reported in PEI and 73 cases have been recovered. • Of the 90 cases, 34 (37.8%) cases have been among females and 56 (62.2%) cases have been in males. • Seven (7.8%) cases have been among those <20 years old, 51 (56.7%) of cases have been in those aged 20-39, 22 (24.4%) of cases have been in those aged 40-59, 9 (10.0%) of cases have been in those aged 60-79 and 1 (1.1%) of cases have been in those aged 80 and over.
Epi Report	Yukon Territory	Case counts: COVID-19 | Government of Yukon	December 18, 2020	• As of December 18, 2020, there have been 59 confirmed cases in the Yukon, including 57 recovered cases, 1 deceased and 1 active case. • As of December 18, 2020, 5,822 people have been tested, including 5,738 negative results and 25 pending results.
Epi Report	Nunavut territory	COVID-19 (Novel Coronavirus) | Government of Nunavut	December 21, 2020	• As of December 21, 2020, there have been 262 confirmed cases in Nunavut, including 243 recovered cases, 1 death and 19 active cases. • To date, 1,705 people have tested negative and 262 have tested positive.
News Article	Dominik Kurek	Racialized people make up 79 per cent of COVID-19 cases in Toronto, city says	November 6, 2020	• As of November 6, 2020, 24% of coronavirus infections were among Black people, while Census Canada's 2016 data shows that 8.8% of Toronto's population is Black. • As of November 6, 2020, 79% of Toronto's COVID-19 cases were among racialized individuals, while 50.7% of the city's population are visible minorities.

Table 2: Upcoming CIHR funded research and non-CIHR funded research related to epidemiology and subpopulations

Author (Institution/Country	Title	ABSTRACT / Description	Source
CIHR Funded Research			
Leong, Darryl; Chifamba, Jephat; Dans, Antonio L; Lop√©z, Jose P; Maha Lakshmi, Pinnaka V; Mony, Prem K; Nyakunga, Gissela B; Viswanathan, Mohan (McMaster University)	PURE SARS-CoV-2: A Prospective Urban Rural Epidemiology (PURE) Substudy	In this study, we aim to find answers to 2 important unknowns about COVID-19: 1) We do not know if there are factors that increase the risk of people getting infected by COVID-19 or that protect against infection; 2) What are the long-term health effects of getting infected by COVID-19. Specifically, we want to know whether having had COVID-19 infection - even if symptoms were not severe - can lead to long-term lung damage and other complications, like pneumonia, heart attacks, heart failure, stroke. We will find these answers by studying 40,000 adults from 30 communities in 13 high-, middle- and low-income countries. These individuals have already agreed to participate in an ongoing study called the PURE study. They have already provided us with a lot of information about their health, behaviours and medications and we have performed physical measurements and tested their lung function. In this study, we propose testing the blood of these individuals for signs of COVID-19 infection. We can then see if people who had COVID-19 exhibited particular characteristics, such as smoking, alcohol use or low physical activity that increased their risk of getting COVID-19. Because people with bad COVID-19 infection often get damaged lungs, we will test the lung function of participants to see if silent or mild infection lead to injured lungs as well. Finally, we will follow the study participants up for 3 years more to see whether people who had COVID-19 infection develop late complications such as lung disease, heart or circulatory problems more often than people who did not get COVID-19. This unique study will provide information to guide us as individuals and as communities on how best to avoid getting COVID-19 and on potential harmful long-term consequences of infection that we need to prepare for.	Covid19 Resources Canada
Gantt, Soren M (University of British Columbia)	Household transmission of SARS-CoV-2 in a	COVID-19 poses unique risks to communities in resource-limited regions of sub-Saharan Africa (SSA). So far, little is known about the incidence, risk factors or outcomes of COVID-19 in SSA, or how these might differ from other areas with different resources,	Covid19 Resources Canada

	well-characterized African cohort	household structures and cultural practices. Elsewhere, COVID-19 is strongly associated with increasing age, male sex, and medical problems. Unexpectedly, children rarely get severe COVD-19 and do not appear to major contributors to spreading the infection, unlike with other respiratory viruses. Detailed household transmission studies of SARS-CoV-2 have the potential to reveal invaluable insights into how SARS-CoV-2 is transmitted, and have been recommended by the World Health Organization. We will take advantage of a CIHR-funded prospective cohort of 210 households in Nairobi, Kenya, which began in early 2019 and was designed to study the transmission of other viruses, to determine the local patterns of SARS-CoV-2 transmission among children and adults. Serum samples were collected from women (half of whom have HIV) who were enrolled during pregnancy, their newborn infants, and all other household members (895 people total), before the pandemic began. Blood collected every 3 months will be tested by different methods to detect SARS-CoV-2 antibodies to see how often infection occurred. Weekly saliva, urine and stool samples are also collected from 100 of the households, which will be tested for SARS-CoV-2 to see how the virus is spread. Because we have all the approvals to do the work and the cohort is already being followed, this study is a highly efficient way to study SARS-CoV-2 transmission in an African setting, where age-structure, household and community practices, and rates of HIV and other co-infections differ from other parts of the world. Thus, this work will provide timely insight into the global COVID-19 pandemic, and guide public health interventions in resource-limited settings.	
Loeb, Mark B (McMaster University)	Determinants of Community COVID Transmission: Learning from the Hutterites	Synopsis Achieving a better understanding of the determinants of community transmission of COVID-19 is one of the most important challenges facing governments both in Canada and worldwide. This is best studied in actual communities. To do this, it is critical to understand factors such as the role of children and herd effect in community transmission, the role of pre-existing immunity, and the role of physical distancing. Filling these gaps will go far towards reducing the burden of disease to Canadians and others worldwide. Data and Methods Prospective cohort studies where members of multiple entire cities or towns are enrolled are usually not feasible. To this end, we propose a unique Canadian model. Hutterites, along with the Mennonites, were founded as Protestant sects in the 16th century	Covid19 Resources Canada

		Anabaptist movement of Switzerland. The majority of Hutterites live in Alberta, Saskatchewan, and Manitoba where they practice communal farming on small colonies relatively isolated from towns and cities. Within these homogeneous, moderately sized colonies, regular respiratory virus transmission is facilitated by a communal lifestyle. We propose to conduct a cohort study on COVID-19 in Hutterite colonies to understand community determinants of COVID-19 transmission. We will examine the role that children play in transmitting COVID-19, the role of physical distancing, the role of co-infection with influenza, and the role of virus strain variation. Impact Findings from this cohort study will inform policy makers about the determinants of community transmission. The study will also give vital information about the role of children in creating herd immunity as well as data on diagnosis, the impact of influenza, and SARS-Co-V-2 strain circulation in communities.	
Freedman, Stephen B; Florin, Todd A; Funk, Anna; Kuppermann, Nathan (University of Calgary)	Household Transmission Dynamics and Vial Load among Asymptomatic SARS-CoV-2 Infected Children	Children have milder disease than adults and many have no symptoms even when infected by SARS-CoV-2. At present, we do not know how likely asymptomatic-infected children are to transmit the infection. Gaining an understanding of this issue is crucial to determining the role children play in transmission and what the risks will be to other children and adults when children return to school. To answer these questions we will enroll children who are brought for care due to non-infectious reasons (e.g. fall, cut, injury, pain) to 20 emergency departments across Canada and the United States. These sites are participating in the CIHR-funded, 57-site, Pediatric Emergency Research Network (PERN)-COVID-19 study, and currently perform screening of select asymptomatic children for SARS-CoV-2. Participating sites will enroll 400 asymptomatic SARS-CoV-2 positive children and 1,200 uninfected children (3:1 ratio of uninfected to infected child). Study aims: 1) Household Transmission Dynamics: Data will be collected regarding exposures and symptoms at baseline and again at 14 days for enrolled children (infected and uninfected) and their household members. Household members who develop symptoms of COVID-19 will be encouraged to have SARS-CoV-2 testing done (if not already) and the results will be obtained. Analyzing and modeling this information, comparing households with transmission versus those without, will help us understand the transmission risk posed by asymptomatic SARS-CoV-2 infected children. In particular this information will inform social distancing	Covid19 Resources Canada

		policies (e.g. school re-opening) 2) Viral Load Quantification: All SARS-CoV-2 positive specimens will have viral load quantification performed. These results will be analyzed alongside those from aim #1 to determine the relationship with household transmission. Viral load quantification data will also be analyzed alongside symptom evolution data to inform our understanding of the presymptomatic state.	
Awadalla, Philip; Abelson, Sagi; Bhatti, Parveen; broet, philippe; Cheung, Angela M; Dick, John E; Dummer, Trevor J; Lettre, Guillaume; Mclaughlin, John R; Simpson, Jared T; Sweeney, Ellen; Turner, Donna C; Vena, Jennifer E (Ontario Institute for Cancer Research)	SUrveilling Prospective Population cOhorts for COVID19 pRevalence and ouTcomes in Canada (SUPPORT-Canada)	The ability to assess the spread and severity of the COVID-19 pandemic is central to our ability to inform a targeted and proportional public health response, both now and in the future. Here, we will leverage major prior investments into Canadian health platforms to enable the rapid development of a Canadian COVID-19 cohort and research resource that will enable the real-time assessment of population susceptibility and prevalence and act as a critical resource to support both population and clinical-level research at a national scale. The initiative titled SUrveilling Prospective Population cOhorts for COVID19 pRevalence and ouTcomes in Canada (SUPPORT-Canada) aims to capture data and biologics to enable population-level surveillance, and enable researchers and clinicians to find factors contributing to COVID-19 susceptibility and severity, thus identifying high risk individuals or communities across Canada. Building on partnerships between the Canadian Partnership for Tomorrow's Health, Canada's largest population cohort, the University Hospital Network, and regional partners, SUPPORT-Canada is a collaborative effort, with both national and global partners, that will and capture critical short- and long-term COVID-19 clinical features from affected and unaffected Canadians. Our platform has been designed to integrate with national and global research efforts to support clinical, immunological and genetic studies of COVID19. Our integrated approach will enable rapid data sharing and translation of findings to the public health and research community. The identification of diagnosed and symptomatic participants within the Canadian population will enable rapid surveillance that can support our public health agencies at the community and the individual level. Capturing COVID-19-specific information will enable us to provide the research community timely data to support surveillance, prevention and risk factor research.	CIHR Funded Projects

Wang, Peizhong P; Yang, Lixia (Memorial University of Newfoundland)	Mobilizing the Chinese Immigrant Community and Battling the Potential COVID-19 outbreak in the Greater Toronto Area: Gathering essential information, creating a mutual support quarantine network and assessing psychological impacts	The COVID-19 outbreak is raging in China and spreading across the globe. The situation is getting worse and may last longer than anyone can expect. Despite of only eight confirmed cases, Canada is now shrouded in fear and worry in face of uncertainty. The Greater Toronto Area (GTA) has one of the largest Chinese communities in the world and thus bears the brunt of the fear, anxiety, and panic. This, coupled with English language obstacles, has enabled rumors and misinformation to explode on social media. It has been suggested that the Toronto Chinese community is the most vulnerable, yet least prepared population for the potential COVID-19 outbreak. There is an urgent need to prepare and mobilize the GTA Chinese community to fight against the possible outbreak. In this context, the overarching goal of the proposed work is to assess the knowledge, develop effective epidemic control practice, and identify the psychological impacts of the disease. This will be achieved through coordinated efforts across communities, professionals, and local residents, to address three specific and inter-related objectives: 1) assessing GTA Chinese immigrants' knowledge, attitudes/beliefs, and protection practices toward COVID-19; 2) developing, evaluating, and optimizing a mutual-support quarantine network to contain COVID-19 from further spreading; and 3) assessing the psychological impacts and the associated predictors of the potential COVID-19 outbreak. The proposed project is culturally relevant, practical, and community-based. The research team is comprised of multidisciplinary researchers from the related fields of public health (epidemiology), psychology, sociology, and health policy. As part of the ongoing effort, the team has been closely working with the GTA Chinese community in various ways. This project will benefit not only the target population but also other communities in Canada.	CIHR Funded Projects
Lee, Douglas S; Mcalister, Finlay A (University Health Network)	Improving Canadian Outcomes Research On the Novel SARS-CoV-2 using Analytics: the CORONA Consortium	Despite the major impacts of Covid-19 on all of society and medicine, relatively little is known about this disease. Early reports indicated that those with cardiovascular disease and its risk factors, may be at higher risk of Covid-19 infection. However, there have been few studies of populations of people who are at risk of, or have developed, Covid-19. In this proposal, we will study people living in Ontario and Alberta, and examine the following important questions. First, we will determine who in the population is at risk of developing Covid-19 infection. We will also determine the factors that influence prognosis, among those who have developed a positive test for the	CIHR Funded Projects

		virus. We will do this by using methods of artificial intelligence, called machine learning, and sophisticated statistical techniques to consider the very large electronic datasets that have accumulated over each person's lifetime. Second, we will evaluate if medications that have been used to treat people with conditions such as hypertension or diabetes can predispose to the development of Covid-19 infection. Alternatively, we will determine if some medications may potentially reduce the risks associated with Covid-19 infection. These analyses will be performed by linking the large databases described above with prescription drugs that have been prescribed to people in Ontario and Alberta. Finally, we will determine the impacts of the major changes in healthcare that were instituted as a response to the pandemic. Specifically, we will determine if the changes to healthcare had unintended collateral effects on those living with chronic cardiovascular conditions, such as hypertension, coronary artery disease, and heart failure. We will focus on whether there was an increase in death rates and concomitant changes in hospital visits in people living with these conditions.	
Rotondi, Michael A; Bourgeois, Cheryllee; Smylie, Janet K (York University)	Indigenous Health Counts in Urban Homelands: Estimating COVID-19 Incidence and Mortality among Indigenous Populations Living in Ontario Cities	First Nations, Inuit, and Métis peoples face many challenges as a result of the COVID-19 pandemic. Due to existing social factors such as poor quality, overcrowded housing, homelessness, and lack of clean running water, infections like COVID-19 can spread quickly. There are also big gaps in data about how COVID-19 is spreading among Indigenous peoples, especially in cities. To address this, we will use information from existing studies about the health of Indigenous peoples living in cities to learn more about COVID-19 spread and it's impacts. The Our Health Counts Toronto, London and Thunder Bay studies used social networks to find Indigenous community members living in these cities. These studies were done by the Indigenous community for the Indigenous community. Our methods allowed us to gather information about the needs of the entire Indigenous populations in these cities, even those who don't use services regularly. By linking the Our Health Counts studies to the provincial COVID-19 database at the Institute for Clinical Evaluative Sciences (ICES), our team will use new statistical methods to accurately estimate the rate of COVID-19 transmission for Indigenous peoples in these cities. We will also check for increases in mortality rates, due both to COVID-19 itself and gaps in access to health care for acute (e.g. heart attack) and chronic (e.g.	CIHR Funded Projects

		diabetes) health conditions. In partnership with Indigenous community health services, our research team will improve statistical methods and produce currently unavailable information regarding the burden of COVID-19 and its rate of spreading through the urban Indigenous communities living in Toronto, London and Thunder Bay, Ontario. This information is important as Indigenous Peoples are highly mobile between urban areas and First Nations reserves, and rural and remote Métis and Inuit communities. Improving our understanding of COVID-19 in urban centres can reduce its risk of spreading within and from these cities.	
External from CIHR Funding			
Anthony Paulo Sunjaya, Sabine Allida, Gian Luca Di Tanna, Christine Jenkins (The George Institute for Global Health and University of New South Wales, Sydney)	A living systematic review and meta-analysis of COVID-19 risk among people with asthma	Review question: Are people with asthma at a higher risk of being infected, hospitalised or of poor clinical outcomes due to COVID-19 infection?	PROSPERO