PROTOCOL FOR A CANADIAN POPULATION-BASED REGISTRY OF SUSPECT AND CONFIRMED COVID-19 CASES FROM THE CANADIAN COVID-19 EMERGENCY DEPARTMENT RAPID RESPONSE NETWORK (CCEDRRN)

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on behalf of the CCEDRRN investigators

Competing Interests

Dr. Fok is a co-investigator in Coronavirus Outbreak affecting Variability of Important Diagnoses (CO-AVOID) and Coronavirus Outbreak affecting Variability of Important Diagnoses in Nova Scotia (CO-AVOID NS) and a shareholder of Hologic, Inc., Merck Pharmceuticals, Inc, and Moderna, Inc. Dr. Rowe is the Scientific Director of the Institute of Circulatory and Respiratory Health (ICRH) at CIHR and reports grants (SOP 168483) and salary from the CIHR outside the submitted work.

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ABSTRACT (242)

Background: Emergency physicians must make clinical management decisions in patients presenting to Emergency Departments (ED) with suspected COVID-19 infection. However, they lack high quality evidence on diagnosis and treatment. We created the Canadian COVID-19 ED Rapid Response Network (CCEDRRN https://canadiancovid19ednetwork.org/) to create a population-based registry of consecutive cases presenting to Canadian EDs during the COVID-19 pandemic. Our objective is to describe methods for harmonized data collection to create a national COVID-19 registry to increase research capacity.

Methods: This is a prospective observational cohort study enrolling patients from 50 EDs in 8 Canadian provinces with the highest COVID-19 burden during the first wave of the pandemic. We are enrolling patients who present to the ED and are suspected of or test positive for COVID-19, or present with COVID-19 related complications. The registry includes prospective data collection (some sites), retrospective medical record chart review (all sites) and follow-up telephone assessment to capture contextual, social and cultural variables, quality of life (VR-12), and the World Health Organization (WHO) clinical improvement scale at 30 and 60 days and 6 and 12 months (some sites).

Interpretation: The CCEDRRN is rapidly accruing high-quality data on consecutive eligible patients presenting to Canadian EDs with suspected or confirmed COVID-19. We will derive, validate and implement clinical decision rules, evaluate diagnostic tests, and complete cohort, case-control and quasi-experimental studies to inform the pandemic response. We will disseminate findings to decision-makers using national and international digital platforms and other knowledge translation strategies.

INTRODUCTION (2478)

Coronavirus Disease 2019 (COVID -19) is the largest public health crisis in over a century.[1] As of November 1, 2020, COVID-19 resulted in over 46 million infections and 1.2 million deaths globally.[2] Over 80% of diagnosed patients experience mild disease, while 15% require hospital admission. The global crude mortality rate among diagnosed cases is approximately 3%, but some countries report 3-fold higher mortality.[2,3] Factors explaining these variations include differences in demographics, health status, socioeconomics and system factors including testing availability, pandemic preparedness and response, with others to be uncovered.[4,5] There is an urgent need for high-quality population-level data to understand modifiable risks for disease severity, transmissibility, and to develop evidence-based prevention, treatment and resource allocation strategies.

The emergency department (ED) is often the first point-of-contact for patients with severe COVID-19 where critical management and disposition decisions are made.[6] These decisions impact downstream health resource use and transmissibility. Early in the pandemic, emergency physicians were encouraged to intubate hypoxic patients early in their presentation to reduce aerosols and transmission.[7] This and other strategies have evolved while maintaining good patient outcomes.[8] Similarly, early poor quality data indicated a possible benefit of hydroxycholoroquine, now proven ineffective.[9] We developed the Canadian COVID-19 ED Rapid Response Network (CCEDRRN) to harmonize data collection across geographically distributed sites to produce high-quality representative data and enhance research capacity.

METHODS

Study Design

This national multi-centre observational study enrolls population-based consecutive eligible patients presenting with suspected or confirmed COVID-19 to 50 EDs in eight Canadian provinces (Figure 1). Our website maintains a list of network investigators and hospitals (https://canadiancovid19registry.org/).[10] Most data are collected by retrospective chart review. Some sites collect prospective data and follow patients by phone. We endorse the central tenets of the World Health Organization (WHO) Knowledge Translation and Open Science Frameworks to ensure optimal collaboration within the network and with external scientists to optimize the utility and use of our data.[11,12]

Ethical Considerations

Given the lack of nationally harmonized ethics review in Canada, the Research Ethics Boards (REB) of participating sites or harmonized provincial review agencies approved the protocol with a waiver of informed consent for enrolment, retrospective and prospective data collection, and storage of Personal Health Information (PHI) for linkage with administrative data (Figure 2). We consent patients for telephone follow-up at first contact by phone in sites where ethics granted approval (UBC REB H20-01015).

Study Population

We enroll patients presenting to participating EDs with suspected and or confirmed COVID-19. This reflects the population in which ED treatment and management decisions are made. We define two periods for enrolment (Table 1). Research assistants use medical microbiology testing lists and discharge diagnosis lists to screen for potentially eligible patients (Table 2).

Inclusion and Exclusion Criteria for Full Data Collection Sites

In Period 1, when COVID-19 testing was restricted to specific patient populations (e.g., healthcare workers, admitted patients), we include patients meeting the WHO suspect COVID-19 criteria (*i.e.,* fever *and* a respiratory symptom such as shortness of breath) when they visit the ED, and those tested for COVID-19 in ED.[13] Early case series indicated that fever may be absent in many COVID-19 patients.[14] Therefore, we are liberal in our interpretation of fever, and include patients with self-reported or subjective fever. Period 1 has no exclusion criteria.

Period 2 starts on the date on which each province expanded testing criteria allowing clinicians to test patients based on clinical suspicion or policy. In Period 2, we include patients who are tested for COVID-19 in the ED or within 24 hours of arrival, and patients presenting with a confirmed COVID-19 test from the community or another facility and diagnosed with a COVID-19 related complication. We exclude patients tested for COVID-19 in the context of an elective admission (e.g., planned hip revision), and those seen in the ED directly by another service (e.g., trauma team activation).

Data Collection in Areas with Low COVID-19 Incidence

Only 4% of patients meeting inclusion criteria were testing positive for COVID-19 (Sept 21, 2020, unpublished data) providing the registry with a high-volume of COVID-19 negative controls. We thus redirected the network to accrue a larger sample of COVID-19 patients to provide us with greater power for longitudinal comparator studies, and enable clinical decision rule development to risk-stratify COVID-19 cases. We transitioned sites with high-volume data collection and low COVID-19 positivity

(<2% test positivity) to collecting data on consecutive COVID-19 positive cases only. These sites include consecutive COVID-19 cases based on an RT PCR specimen taken in ED, within 24h of arrival, or the first 14 days of hospitalization. They also capture patients presenting to the ED within 14 days of a positive test with clinical symptoms of COVID-19. We exclude patients tested for COVID-19 in the context of an elective admission (e.g., planned hip revision), and those seen in the ED directly by another service (e.g., trauma team activation).

Data Collection

Trained research assistants review patient records and abstract information into a central, web-based REDCap database (Vanderbilt University; Nashville, TN, USA) on 254 variables. The research assistants review the medical record at 30 days to capture ED revisits, hospitalizations and deaths. At sites with ethics approval for prospective data collection, physicians and nurses complete a data collection form with 32 variables. We keep updated data dictionaries on our website (https://canadiancovid19registry.org/).[10] At 30-days, we utilize the WHO Ordinal Outcome Scale to enable cross-study comparisons.[15] We engaged with patient partners to develop questions about contextual, cultural, racial, socioeconomic and gender variables, and questions about self-isolation. At 30 and 60 days, and at 6 and 12 months, we contact patients by telephone to ascertain quality of life using the Veterans Rand 12-item Health Survey (VR12).[16-18] If a site joined or received ethics approval after the first scheduled follow-up, the site follows up as soon as feasible, and at scheduled follow-up dates thereafter. We sample four COVID-19 negative patients for every COVID-19 patient for follow-up (Figures 3 and 4), and randomly select four COVID-19 negative patients as controls from the same institution and index ED visit date as COVID-19 positive case using a random number generator.

Iterative refinement & Data Quality

We optimize data collection and respond to operational and methodological challenges through iterative refinement. Research assistants and site investigators provide feedback in team meetings. We have embedded free text fields into data collection instruments when subjective assessments are needed or varying standards exist. A qualitative research assistant reviews free text data for recurrent themes to assist with refining work processes, data fields and data dictionaries, and develop explanatory notes in REDCap. Internal logic and error checks ensure that nonsensical values cannot be entered (e.g., an admission date preceding the ED visit). An analyst completes bi-weekly data quality checks to identify missing, incomplete, and outlying data. At inception of the registry, we measured the inter-rater agreement between variables collected prospectively and retrospectively (Table 3).

Privacy and Personal Health Transfer Considerations

We separate personal health information (PHI) from clinical data using different databases to adhere with provincial and institutional laws, and plan to use PHI to enable linkages with other registries (e.g., Critical Care and Public Health, specimens), randomized trials and national and provincial administrative databases (Figure 2).

Outcomes

We define ***suspect*** COVID-19 according to the WHO case definition published at the time the registry was created as a patient with (1) fever *and* at least one symptom or sign of respiratory illness (e.g., cough, shortness of breath or flu-like illness); and (2) an epidemiologic link to COVID-19 infection including travel to affected area within 14 days, local community spread or contact with a confirmed or probable COVID-19 case; and, (3) no alternative diagnosis that fully explained the clinical presentation.[19] We consider all jurisdictions in Canada to have had community spread by March 1, 2020.

We define ***confirmed*** COVID-19 as any patient in whom a biological specimen is positive for SARS-CoV-2 using reverse transcription polymerase chain reaction (RT PCR). The specimen had to be drawn within two weeks of the ED visit if the patient presented to the ED with a COVID-19-related complication. If the initial test was negative, the patient had to have a positive specimen within 14 days of the index visit.

Additional outcome variables include admission, mechanical ventilation, ED re-visits, re-admissions, death at 30 days, discharge from hospital, clinical recovery and quality of life. Each writing group will select the most appropriate outcome for its study question.

Statistical analysis

We will summarize data using means with standard deviations (SD), medians with interquartile ranges (IQR), and frequencies with 95% confidence intervals (CIs) in descriptive analyses. Each study will develop an analytic protocol for their study question. We used Cohen's kappa statistic to measure the inter-rater agreement between variables collected both prospectively and retrospectively.[20]

Sample Size

The sample size for the registry will depend on the availability of funding and evolution of the pandemic. We are collecting retrospective dataset on all COVID-19 negative controls to ensure a robust dataset for clinical decision rule development, validation and implementation.

It would not have been feasible to follow-up all patients in the registry. We completed sample size calculations for means and proportions (Figure 3) and odds ratios for binary or continuous variables of interest (Figure 4) to ensure a sufficient sample of follow-up to enable comparator studies. Sample size calculations have 90% power and a Type I error (α) of 0.05. We considered sampling ratios of one case to one through five controls, and compared them with the full sample ratio of 24. We considered samples of 3,000 to 6,000 COVID-19 cases. We considered the effect of dropout of 10% at 60 days, 15% at 6 months, and 20% at 1-year follow-up for the comparison of means. We performed these calculations in PASS 2020 Power Analysis and Sample Size Software 2020 (Kaysville, Utah, USA, ncss.com/software/pass).

Study Governance

The CCEDRRN steering committee consists of a Chair, Vice Chair, a Site Investigator from each participating site and patient partners (Figure 5). The Scientific Advisory Committee provides access to methodological experts and senior scientists. The Executive Committee implements the day-to-day operations. The Protocol Review and Publication Committee reviews all submitted writing group proposals or new study protocols for their aims, importance, feasibility, methodological quality and duplication. A Data Access and Management Committee oversees data access. The Patient Engagement Committee provides a patient perspective to committee deliberations and protocols. The Integrated Knowledge Translation Committee has linkages with established knowledge brokers (i.e. https://canadiem.org/, https://emergencymedicinecases.com/podcasts/, https://caep.ca/covid-19-town-hall/).

DISCUSSION

This unique network of 50 Canadian EDs has harmonized data collection for suspected and confirmed COVID-19 cases to enhance research capacity in Canada. The CCEDRRN enables rapid accrual of high-quality representative data from across the country to answer priority research questions about COVID-19. We collect data on both suspected and confirmed COVID-19 cases allowing us to develop, validate and evaluate implementation of clinical decision rules and diagnostic tests. We will use the data to answer questions about discharged, hospitalized and critically ill patients. By collecting data on patients with respiratory syndromes not caused by COVID-19, we will limit attribution bias, which is a common problem in the evolving COVID-19 body of evidence in which there are many case series.

Our broad inclusion criteria and diversity of participating institutions enables the network to collect data on marginalized populations and those commonly excluded from clinical trials such as pregnant women or children. COVID-19 has affected vulnerable populations across the world, which has the potential to undermine containment, mitigation, and suppression efforts.[21] By collecting data on these patients we hope to provide evidence required to identify and address gaps in care and policy, and answer questions about COVID-19 in vulnerable patient groups.[22,23]

When COVID-19 appeared to slow during the summer months, provinces eased public health measures. With the onset of colder weather, and as people return to indoor activities, COVID-19 cases are on the rise. The CCEDRRN is poised to collect high quality data on this and further surges of COVID-19, alongside evolving diagnostic and treatment strategies. By introducing a novel ED-based framework to rapidly collect national population-level data, we have developed a model that may be applied in other countries and to other emerging infectious diseases.

Past efforts to mobilize an emergency medicine research network in Canada have fallen on principal investigators with funding for individual studies or a volunteer coalition of the willing. Other countries with existing funded networks demonstrated an ability to rapidly pivot into COVID-19 research. The CCEDRRN represents the largest collaborative research network in Emergency Medicine in Canada yet. Previously large national multi-centre studies in Emergency Medicine enrolled from 10-12 sites, and did not represent national data sets. ED cohorts using administrative data fail to provide the granular level of data needed for many studies. We believe recruiting this large network of sites was facilitated by the rapid mobilization of funding through CIHR and other agencies, our commitment to an open and fair governance structure enabling all investigators to participate in governing the network regardless of their seniority, and for all members to take authorship credit guided by the International Committee of Medical Journal Editor (ICJME) criteria. By adopting an Open Science Framework, we encourage external investigators to partner to use and leverage data. We hope that our collaborative network can serve as a model for future collaborations within emergency medicine, with other specialties and globally.

Limitations

Most of our data will arise from retrospective chart review, which can be limited in quality and quantity. While we have aimed to maximize data quality through standardized procedures, data quality and logic checks as data are being entered, some variability across the network will persist due to documentation and practice patterns. Our sites vary in their access to electronic medical and health records, both across and within jurisdictions. Paper-based charts are limited by legibility. We aim to mitigate sources of error

and bias through adherence to enrolment of consecutive cases, standardized data collection procedures, and case definitions, training, and quality checks. It may be difficult to collect follow-up data for some disadvantaged populations; however, we hope to mitigate this by having broad geographical coverage and linkage to provincial and national administrative databases to address gaps. Race and ethnicity are not captured in retrospective data, and will only be available on the cohort with follow up data. While our network does not include all Canadian provinces and territories, we have included academic and non-academic sites including rural and remote areas.

CONCLUSION

This protocol describes harmonized data collection for patients presenting to Canadian EDs with suspected and confirmed COVID-19, thereby enhancing research capacity during this pandemic. We will derive, validate and evaluate the implementation of clinical decision rules, evaluate diagnostic tests and complete observational studies. This represents the latest and largest collaborative Emergency Medicine network in Canada. It has the potential to generate scientific evidence to inform our pandemic response, and serve as a model to rapidly implement population-based data collection in future public health emergencies.

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And, finally, our most humble and sincere gratitude towards all of our colleagues in medicine, nursing, and all of the allied health professions who have been on the front lines of this pandemic from day one, staffing our ambulances, Emergency Departments, ICUs and hospitals, bravely facing the risks of COVID-19 in order to look after our fellow citizens and after one another. We dedicate this network to you.

Figure 1. Canadian Emergency Department COVID-19 Registry Participating Sites

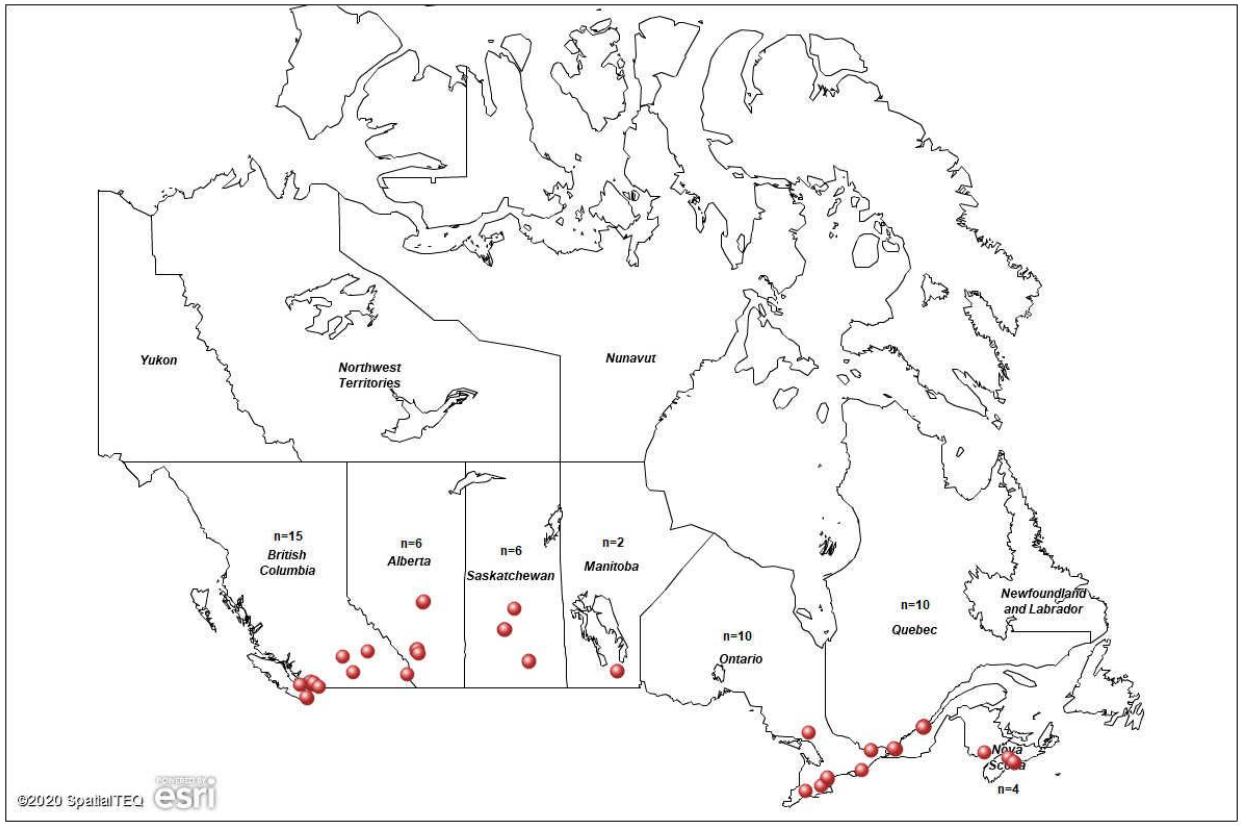
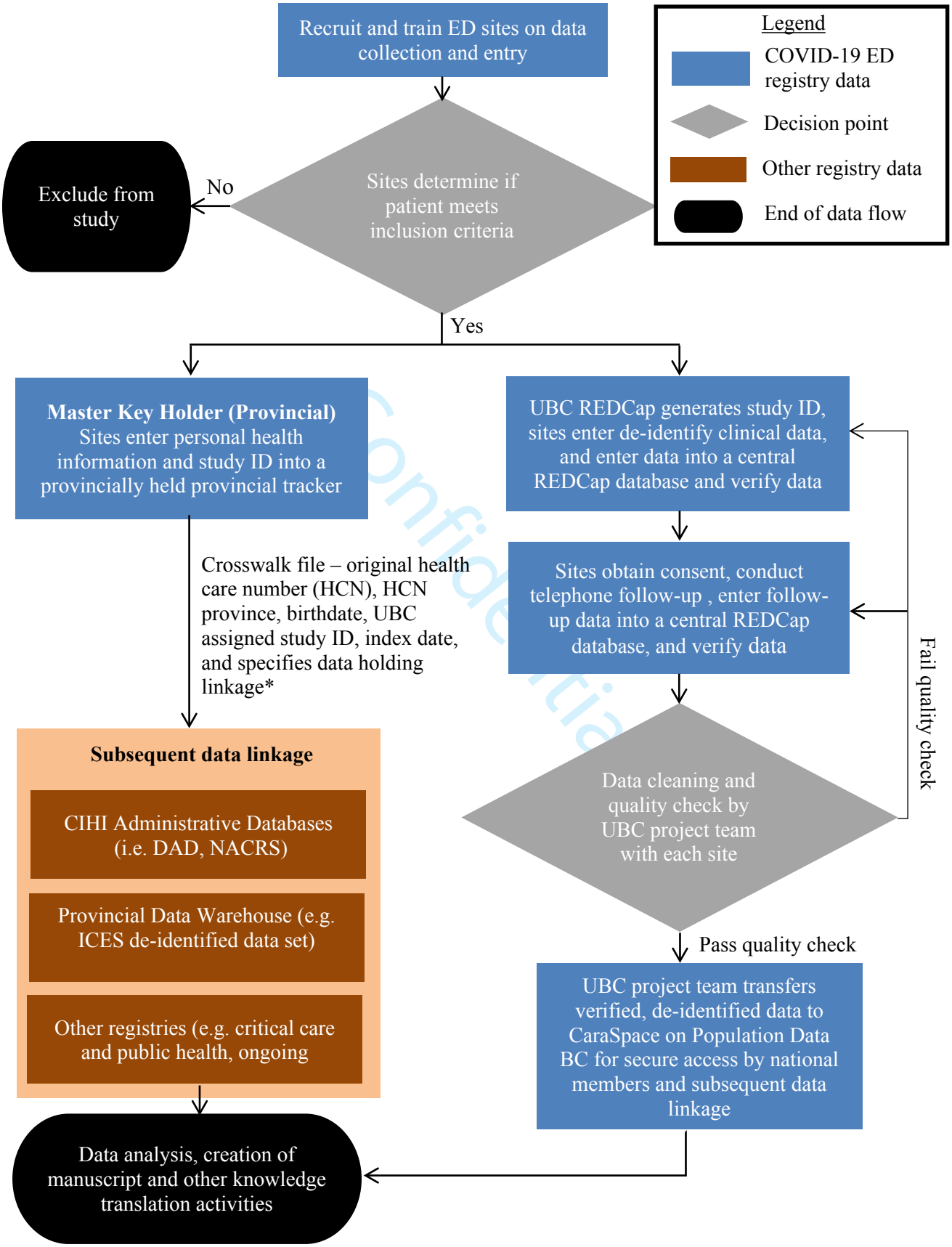


Figure 2. Data Flow Diagram for registry data



* means Protocol Review and Publication Committee (PRPC) has reviewed the Registry Study manuscript proposal and recommended the Registry Executive Committee that (RE) it is in scope and Data Access and Management Committee has reviewed and recommended to the REC that all the necessary agreements/approvals are in place to access the data. The REC then approves all manuscripts and data access including linkage when it is required.

Table 1. Testing protocols by period and province.

Period 1	

• **AB:** March 1-April 7, 2020
• **BC:** March 1-April 19, 2020
• **MB:** March 1-April 27, 2020
• **NB:** March 1-April 12, 2020
• **NS:** March 1-April 5, 2020
• **ON:** March 1-May 13, 2020
• **QC:** March 1-May 3, 2020
• **SK:** March 1-April 2, 2020
	• Presenting to the ED meeting WHO Suspect clinical criteria:
	  ○ Fever *and*
	  ○ Respiratory syndrome, including flu-like illness, shortness of breath or cough
	• Presenting to the ED *and* tested for SARS-CoV-2 in the ED

Period 2	
• **AB:** April 8, 2020 onwards • **BC:** April 20, 2020 onwards • **MB:** April 28, 2020 onwards • **NS:** April 6, 2020 onwards • **NB:** April 13, 2020 onwards • **ON:** May 14, 2020 onwards • **QC:** May 4, 2020 onwards • **SK:** April 3, 2020 onwards	• Tested for SARS-CoV-2 in the ED or within 24h of ○ Elective, non-ED admissions excluded • Patient presenting to the ED within 14 days of a positive SARS-CoV-2 test and presenting with clinical symptoms of COVID-19.

Table 2: Clinical Screening Criteria

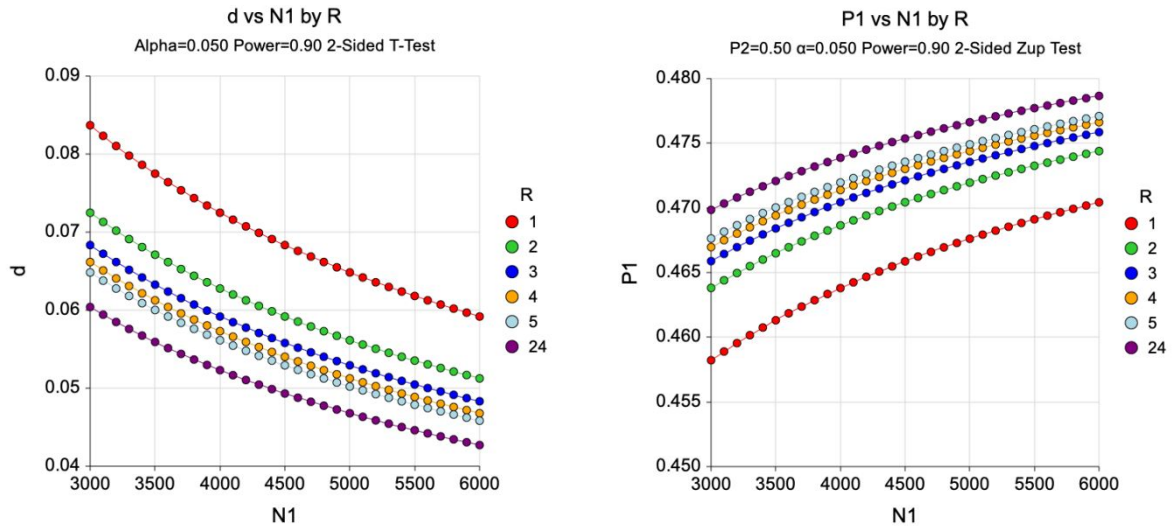
Clinical Screening Criteria	**Period 1**	**Period 2**
Complaints	• Fever • Shortness of breath • Respiratory distress • Respiratory symptoms • Cough • Influenza/Flu-like-illness	Not Applicable* **In period 2, screening by chief complaint should be avoided, unless the site cannot screen charts by discharge diagnosis.*
Discharge Diagnoses	1. Anosmia 2. ARDS Adult respiratory distress syndrome (ARDS) 3. Asthma 4. Bronchitis 5. Chronic obstructive lung disease 6. Confirmed case of COVID-19 7. Confirmed COVID-19 8. Coronavirus 9. Cough, NYD 10. COVID 11. COVID-19 12. Fever unknown origin (FUO) 13. Fever, NYD 14. Flu-like Illness 15. Influenza-like illness 16. Pharyngitis 17. Pneumonia 18. Pulmonary edema/congestive heart failure 19. Pulmonary embolism 20. Respiratory Distress 21. Respiratory Disease, NOS/NYD 22. Sepsis, NYD 23. SOB Shortness of breath (SOB) 24. Sinusitis 25. Suspected case of COVID-19 26. Suspected COVID-19 27. Upper Respiratory Infection 28. Upper Respiratory Tract Infection 29. Viral pneumonia	1. Anosmia 2. ARDS Adult respiratory distress syndrome (ARDS) 3. Confirmed case of COVID-19 4. Confirmed COVID-19 5. Coronavirus 6. Cough, NYD 7. COVID 8. COVID-19 9. Fever unknown origin (FUO) 10. Fever, NYD 11. Flu-like Illness 12. Influenza-like illness 13. Pneumonia 14. Respiratory Distress 15. Respiratory Disease, NOS 16. Sepsis, NYD 17. SOB Shortness of breath (SOB) 18. Viral pneumonia

Table 3. Inter-rater agreement between key variables collected prospectively and retrospectively

Variable	Cohen's Kappa Coefficient (95%CI)
Living Situation	
Home, long-term care, homeless, other*	0.76 (0.69, 0.84)
Symptoms	
Cough	0.63 (0.57, 0.68)
Shortness of breath	0.67 (0.61, 0.72)
Fever	0.65 (0.60, 0.71)
Headache	0.58 (0.51, 0.66)
Nausea/Vomiting	0.53 (0.45, 0.61)
Diarrhea	0.63 (0.55, 0.71)
Myalgias	0.40 (0.32, 0.49)
Dysgusia/Anosmia	0.37 (0.11, 0.64)
Infection Risk	
Travel	0.31 (0.04, 0.58)
Institutional Exposure	0.51 (0.36, 0.66)
Healthcare Worker	0.69 (0.59, 0.80)
Household/Caregiver Contact	0.37 (0.19, 0.56)
Other	0.24 (0.04, 0.44)
Comorbidities	
Congestive heart failure	0.71 (0.61,0.82)
Coronary artery disease	0.51 (0.39, 0.62)
Hypertension	0.70 (0.64, 0.76)
Asthma	0.80 (0.72, 0.87)
Pulmonary fibrosis	0.39 (-0.15, 0.94)
Chronic lung disease (not asthma/IPF)	0.72 (0.64, 0.80)
Chronic kidney disease	0.73 (0.63, 0.84)
Dialysis	0.58 (0.14, 0.30)
Diabetes	0.69 (0.61, 0.77)
Liver disease	0.43 (0.17, 0.68)
Organ transplant	0.77 (0.51, 1.00)
Chronic neuro disorder (not dementia)	0.17 (-0.01, 0.34)
Dementia	0.51 (0.26, 0.77)
Rheumatologic disorder	0.39 (0.18, 0.60)
Active malignant neoplasm	0.55 (0.41, 0.69)
Past malignant neoplasm	0.23 (0.07, 0.38)
Obesity (clinical impression)	0.22 (0.05, 0.39)
Respiratory Distress	
Respiratory distress	0.18 (0.12, 0.25)
Other Risk Factors	
Smoking (never, current, past use)*	0.73 (0.66, 0.80)
Alcohol Misuse (never, current, past use)	0.53 (0.43, 0.63)
Illicit Substance Use (never, current, past use)	0.82 (0.75, 0.89)

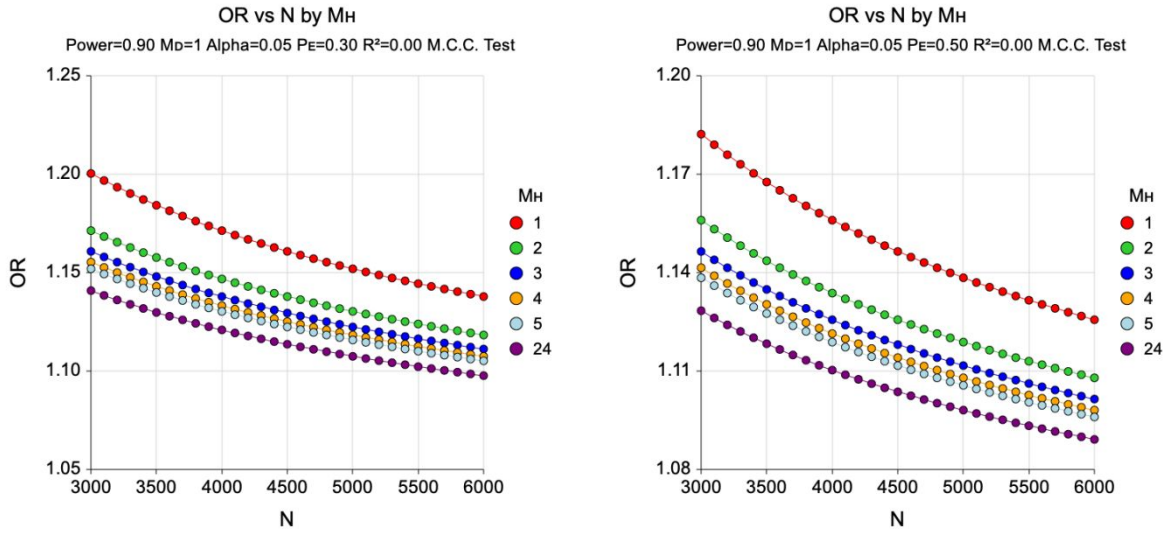
* non-binary variables with multiple categories

Figure 3. Sample size calculations to inform follow-up ratios to detect average effect size estimates and compare proportions.



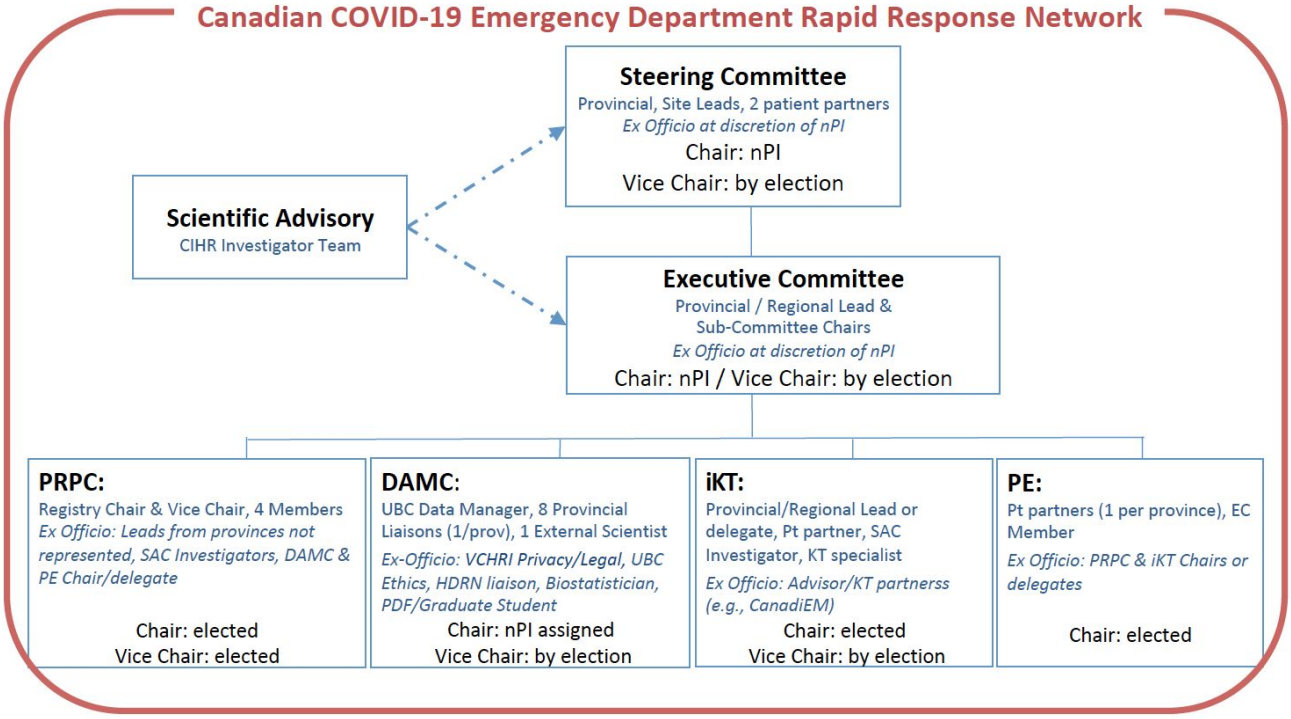
The left chart shows the detectable effect size ($d = (\mu 1 - \mu 2) / \sigma$) for each number of cases (N1) and each sampling ratio (R). These would be the detectable effect sizes if all of the sample was available for analysis at the relevant follow-up time. The sampling ratio (R)=24 line shows the detectable effect size if all of the COVID-19 negative patients were included in follow-up. The chart on the right shows the detectable proportion (P1) compared to the assumed proportion of 0.5 for each number of cases (N1) and each sampling ratio (R). The sampling ratio (R)=24 line shows the proportion compared to 0.5 if all COVID-19 negative patients were included. Any other option demonstrates the loss of detectable effect size for choosing a sample of controls from COVID-19 negative patients. Small differences are seen in going from R=3, 4, or 5, suggesting little benefit for R>4 given the costs of follow-up. If not all patients are available for analysis at the final follow-up time because of dropout, the detectable effect size will be smaller for the same power, or the power would be smaller for the same detectable effect size.

Figure 4. Sample size calculations to inform follow-up ratios for odds ratios.



The chart shows the detectable odds ratio (OR) when the continuous variable has a standard deviation of 1 for each number of cases (N) and each sampling ratio (MH). The sampling ratio (MH)=24 line shows the detectable OR if all of the COVID-19 negative patients were included. Thus any other option demonstrates the loss of detectable OR for choosing a sample of controls from COVID-19 negative patients. Small differences are seen in going from MH=3, 4, or 5 suggesting that there is not much additional benefit for MH>4 given the costs. If not all patients are available for analysis at the final follow-up time because of dropout, then the detectable OR would be smaller for the same power or the power would be smaller for the same OR proportion.

Figure 5. Network Governance



REFERENCE

1. Faust S, Lin Z, del Rio C. Comparison of Estimated Excess Deaths in NewYork City During the COVID-19 and 1918 Influenza Pandemics. *JAMA Network Open.* 2020;3.
2. World Health Organization. WHO Coronavirus Disease (COVID-19) Dashboard. 2020; https://covid19.who.int/?gclid=CjwKCAjw5Kv7BRBSEiwAXGDEle_dyJCA3TPMvUjiKBkpY-74Ilp0Nx5ES1iXIGCGfkTnRg8i9YgKhhoCAZIQAvD_BwE. Accessed September 24, 2020.
3. Johns Hopkins Center for Systems Science and Engineering. COVID-19 Tracking Global Dashboard 2020; https://systems.jhu.edu/research/public-health/2019-ncov-map-faqs/. Accessed March 30, 2020.
4. Goyal P CJ, Pinheiro LC, et al. . Clinical Characteristics of Covid-19 in New York City. *New England Journal of Medicine* 2020;382:2372-4.
5. Botly LCP M-RM, Kasiban A, et al. . COVID-19 Pandemic: Global Impact and Potential Implications for Cardiovascular Disease in Canada. *CJC Open.* 2020;2:265-72.
6. Berlin D, Gulick R, FJ M. Severe Covid-19. *NEJM.* 2020.
7. Yao W, Wang T, Jiang B, et al. Emergency tracheal intubation in 202 patients with COVID-19 in Wuhan, China: lessons learnt and international expert recommendations. *British Journal of Anaesthesia.* 2020;125:E28-E37.
8. Mitra A, Fergusson N, Lloyd-Smith E, et al. Baseline characteristics and outcomes of patients with COVID-19 admitted to intensive care units in Vancouver, Canada: a case series. *CMAJ.* 2020;192:E694-701.
9. The RECOVERY Collaborative Group. Effect of Hydroxychloroquine in Hospitalized Patients with Covid-19. *NEJM.* 2020:1-11.
10. Canadian COVID-19 Rapid Response Network (CCEDRRN). Canadian COVID-19 ED Network. ED COVID-19 Registry. 2020; https://canadiancovid19registry.org. Accessed October 19, 2020.
11. Foster ED, Deardorff A. Open Science Framework. *Journal of the Medical Library Association.* 2017;105.
12. Wellcome Trust. Sharing research data and findings relevant to the novel coronavirus (COVID-19) outbreak2020.
13. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report - 66. 2020; https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200326-sitrep-66-covid-19.pdf?sfvrsn=9e5b8b48_2. Accessed March 27, 2020.
14. Guan W, Ni Z, Hu Y, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *NEJM.* 2020;382:1708-20.
15. World Health Organization. WHO R&D Blueprint novel Coronavirus COVID-19 Therapeutic Trial Synopsis. 2020; https://www.who.int/blueprint/priority-diseases/key-action/COVID-19_Treatment_Trial_Design_Master_Protocol_synopsis_Final_18022020.pdf.
16. Code Technology. The Veterans RAND 12 Item Health Survey (VR-12) is a patient-reported global health measure that is used to assess a patient's overall perspective of their health. 2020; https://www.codetechnology.com/vr-12-general-health-pro-tool/.
17. Iqbal U, Rogers S, Selim A, al. e. The Veterans Rand 12 Item Health Survey (Vr-12): What it is and how it is used. 2007; https://www.bu.edu/sph/files/2015/01/veterans_rand_12_item_health_survey_vr-12_2007.pdf. Accessed July 17, 2020.
18. Selim A, Rogers W, Fleishman J, al e. Updated U.S. population standard for the Veterans RAND 12-item Health Survey (VR-12). *Quality of life research.* 2009;18:43-52.

19. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report – 88. 2020; https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200417-sitrep-88-covid-191b6cccd94f8b4f219377bff55719a6ed.pdf?sfvrsn=ebe78315_6. Accessed April 18, 2020.
20. Cohen J. A Coefficient of Agreement for Nominal Scales. *Educational and Psychological Measurement.* 1960;20:37-46.
21. DR W, LA C. COVID-19 and Health Equity—A New Kind of "Herd Immunity". *JAMA* 2020;323:2478-80.
22. Haynes N CL, Albert MA. At the Heart of the Matter. *Circulation.* 2020;142:105-7.
23. Berger ZD EN, Phelan AL, Silverman RD. Covid-19: control measures must be equitable and inclusive. *BMJ.* 2020;368:m1141.

Data dictionary for retrospectively collected variables

Data Element	Definition	Specifications
Demographics		
Hospital site	Hospital where the patient was arrived at.	Field type: Categorical (select one only) Field length: 3 digits assigned to each participating hospital site Valid data: 101 - 907
ED arrival date and time	Date and time the patient arrived to the ED (before triage).	Field type: Date time Field length 14 Valid data: YYYY-MM-DD HH:MM:SS
Sex	The sex of the patient.	Field type: Categorical (select one only) Field length: 1 digit Valid data: 0, 1, 2 0 = Male 1 = Female 2 = Intersex
Arrival from	The origin of the patient prior to arriving to the ED.	Field type: Categorical (select one only) Field length 1 digit Valid data: 0-6 0 = Home (community) 1 = No fixed address 2 = Long-term care/Rehab (includes assisted living) 3 = Shelter 4 = Single room occupancy 5 = Inter-hospital transfer 6 = Other
Provide detail around 'Other' arrival	If the origin of the patient prior to arriving to the ED is 'Other', use free text to provide further details.	Field type: Free-text Valid data: Free text or blank
Postal code	First 3 characters of the postal code of where the patient lives prior to arriving at the ED.	Field type: Character Field length: 3 characters Valid data: ANA or XXX XXX = patients originated outside of Canada
Calculated age (in years)	Calculated difference between arrival date and time and data of birth.	Field type: Numeric Field length: 3 digits Valid data: 0 to 150

Data Element	Definition	Specifications
Age (in months)	Age in months as per recorded in the medical chart if the patient is between 2 to 12 months.	Field type: Numeric Field length: 2 digits Valid data: 2 to 12
Age (in days) for individuals under 2 months	Age in days as per recorded in the medical chart if the patient is less than 2 months old.	Field type: Numeric Field length: 2 digits Valid data: 0 to 70
Risk for infection	The state in which the patient was at risk to be infected by SARS-CoV2.	Field type: Categorical (with option to select more than one category) Field length: 1 digit Valid data: 0 to 8 1 = Travel from country with known cases within 14 days 2 = Institutional exposure (e.g. LTC, prison), 3 = Healthcare worker 4 = Microbiology lab 5 = Household/caregiver contact 6 = Other 7 = Unknown (Nothing documented in charts on risk of infection 8 = No documented risk for infection (Documented no risk of infection)
Other risk of infection	For the state in which the patient was at risk to be infected by SARS-CoV2 is 'Other', use free text to provide further details.	Field type: Free-text Valid data: Free text or blank
Institutional type	For patient who had institutional exposure (e.g. LTC, prison), indicate the kind of institutional exposure.	Field type: Categorical (with option to select more than one category) Field length: 1 digit Valid data: 0 to 5 1 = Correctional Facility 2 = Hospital 3 = Shelter 4 = Long-term care/rehab 5 = Other
Other institutional type	For patient who had 'Other' kind of institutional exposures, use the free text to provide further details.	Field type: Free-text Valid data: Free text or blank

Data Element Comorbidities	Definition	Specifications
Comorbid conditions	The diagnosis, conditions, problem or circumstances for the patient's ED visit that is in addition to the main diagnosis.	Field type: Categorical (with option to select more than one category) Field length: 2 digits Valid data: 1 to 23 1 = Congestive heart failure 2 = Coronary artery disease 3 = Hypertension 4 = Asthma 5 = Pulmonary fibrosis 6 = Chronic lung disease 7 = Chronic kidney 8 = Dialysis 9 = Diabetes 10 = Mild liver disease 11 = Moderate/severe 12 = Organ transplant 13 = Chronic neuro 14 = Dementia 15 = Rheumatologic disorder 16 = Active malignant neoplasm 17 = Past malignant neoplasm 18 = Obesity (clinical impression) 19 = Other 20 = Atrial Fibrillation, 21= Psychiatric Condition/Mental Health Diagnosis 22 = Dyslipidemia 23 = Hypothyroidism Moderate or severe liver disease is defined as cirrhosis with portal hypertension, with or without bleeding or a history of variceal bleeding. Mild liver disease is defined as cirrhosis without portal hypertension or chronic hepatitis.
Other Comorbidity *Up to 5 other comorbidities is collected	If the comorbidity is 'Other', use the free text to provide further details.	Field type: Free-text Valid data: Free text or blank

Data Element	Definition	Specifications
Breastfeeding	For female or intersex patient, indicate if patient was breastfeeding prior to arrival to the ED.	Field type: Categorical (select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = No 1 = Yes 9 = Uncertain
Outpatient Medications		
Medications use pre-ED	Medications use by the patient prior to arriving to the ED.	Field type: Categorical (select one only) Field length: 1 digit Valid data: 0 to 2 0 = I confirm that I have no access to the patient's pre-ED medication list 1 = I have reviewed the patient's pre-ED medication list and the patient is not on any medications. 2 = Yes, the medications are listed below
Prescription medication pre-ED *Up to 20 medications is recorded*	Medications prescribed to the patient prior to arriving to the ED.	Field type: Categorical (with option to select more than one category) Field length: 2 digits Valid data: 0001 to 1100 For the full drug list, refer to https://canadiancovid19registry.org/.
Other medications pre-ED	Medications prescribed to the patient prior to arriving to the ED that is not indicated in the dropdown list.	Field type: Free-text or blank
Over the counter medication	Over the counter medications the patient used prior to arriving to the ED.	Field type: Free-text or blank
ED Arrival Mode	The mode by which the patient arrived to the ED.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 2 0 = Self 1 = Ambulance 2 = Police
Treating physician(s)	The physicians who attended to the patient at the ED.	Field type: Free-text Valid data: Text or blank

Data Element	Definition	Specifications
CTAS	The CTAS assigned to the patient. The CTAS (Canadian Triage and Acuity Scale) is a 5 point scale that emergency rooms (ERs) use to evaluate a patient's acuity level to more accurately define the patient's needs and allow for timely care.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 1-5 1 = requires resuscitation. It includes conditions that are threats to life or imminent risk of deterioration, requiring immediate aggressive interventions (e.g., cardiac arrest, major trauma or shock states). 2 = requires emergent care. It includes conditions that are a potential threat to life or limb function requiring rapid medical intervention or delegated acts (e.g., head injury, chest pain, gastrointestinal bleeding, abdominal pain with visceral symptoms, or neonates with hyperbilirubinemia). 3 = requires urgent care. It includes conditions that could potentially progress to a serious problem requiring emergency intervention (e.g., mild moderate asthma or dyspnea, moderate trauma, or vomiting and diarrhea in patients younger than 2 years). 4 = requires less urgent care. It includes conditions related to patient age, distress, or potential for deterioration or complications that would benefit from intervention or reassurance within 1 to 2 hours (e.g., such as urinary symptoms, mild abdominal pain, or earache). 5 = requires non-urgent care. It includes conditions in which investigations or interventions could be delayed or referred to other areas of the hospital or health care system (e.g., a sore throat, menses, conditions related to chronic problems, or psychiatric complaints with no suicidal ideation or attempts).

Data Element	Definition	Specifications
Presenting complaint	The main reason the patient went to the ED. Presenting complaints differ from diagnoses in that the patient may initially present with vague symptoms such as chest pain or swelling, and the clinician later determines the formal diagnosis (e.g., acute myocardial infarction, anaphylactic shock) after examination of the patient. This examination might include laboratory tests or diagnostic interventions. The clinician's diagnosis is not listed on the ED visit record.	Field type: Free-text Valid data: Text
Arrival heart rate	The heart rate (in beats per minute) of the patient upon arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 - 300
Arrival systolic blood pressure	The systolic blood pressure (in mmHg) of the patient upon arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 30 - 300
Arrival diastolic blood pressure	The diastolic blood pressure (in mmHg) of the patient upon arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 20 - 200
Arrival respiratory rate	The respiratory rate (in number of breaths per minute) of the patient upon arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 0 - 80
Arrival oxygen saturation	The oxygen saturation (in percent) of the patient upon arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 - 100
Lowest oxygen saturation	The lowest recorded oxygen saturation (in percent) of the patient upon arrival to the ED.	Field type: Numeric Field length: 1 - 3 digits Valid data: 0 - 100
Arrival temperature	The body temperature of the patient (in Celcius) upon arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 25 - 44
Arrival/triage Glasgow Coma Score (GCS)	The GCS of the patient upon arrival to the ED or at triage.	Field type: Numeric Field length: 2 digits Valid data: 3 – 15

Data Element	Definition	Specifications
Respiratory distress/ increased work of breathing	Indicate if the patient had respiratory distress/increased work of breathing in ED.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = No 1 = Yes 9 = Not Documented
Symptoms	Symptoms presented by the patient upon arrival to an ED.	Field type: Categorical (with option to select more than one category) Field length: 2 digits Valid date: 1 - 29 1 = Cough 2 = Shortness of breath 3 = Fever 4 = Chills 5 = Headache 6 = Nausea/vomiting 7 = Diarrhea 8 = Dysgeusia/anosmia 9 = Sputum production 10 = Hemoptysis (bloody sputum) 11 = Sore throat 12 = Runny nose (rhinorrhea) 13 = Ear pain 14 = Wheezing 15 = Chest pain 16 = Muscle aches (myalgia) 17 = Joint pain (arthralgia) 18 = Fatigue/malaise 19 = Lower chest wall indrawing 20 = Altered consciousness/confusion 21 = Seizures 22 = Abdominal pain 23 = Conjunctivitis 24 = Skin rash 25 = Skin ulcers 26 = Lymphadenopathy 27 = Bleeding (hemorrhage) 28 = Dizziness/Vertigo 29 = None of the above
Bleeding site	For patient with bleeding (hemorrhage) as a symptom, use free text to provide details.	Field type: Free-text Valid data: Text or blank

Data Element	Definition	Specifications
Other symptoms *Up to 3 other symptoms are recorded*	If symptoms presented by the patient is not included in the dropdown list, indicated up to three additional symptoms using free text.	Field type: Free-text Valid data: Text or blank
Date of onset for earliest symptom	The date of the onset of the first symptom.	Field type: Date Field length: 8 Valid data: YYYY-MM-DD and dates ED arrival date
Tobacco Use	Patient's history of tobacco use prior to arrival to the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 2, 9 0 = Never 1 = Past user 2 = Current user 9 = Unknown
Vaping	Patient's history of vaping prior to arrival to the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 2, 9 0 = Never 1 = Past user 2 = Current user 9 = Unknown
Alcohol misuse	Patient's history of alcohol misuse prior to arrival to the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 2, 9 0 = Never 1 = Past user 2 = Current user 9 = Unknown
Illicit substances use	Patient's history of using illicit substances prior to arrival to the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 2, 9 0 = Never 1 = Past user 2 = Current user 9 = Unknown

Data Element	Definition	Specifications
Type of illicit substances	For patient with past or current usage of illicit substances prior to arrival to the ED, provide details on the type of illicit substance that used.	Field type: Categorical (with option to select more than one category) Field length: 1 digit Valid data: 1, 2, 3 1 = Opioids 2 = Stimulants 3 = Cannabis
Other type of illicit substances	For patient with past or current usage of illicit substances prior to arrival to the ED and the type of illicit substances is not listed in the dropdown menu, use free text to provide details.	Field type: Free-text or blank
Code status pre-ED	The type of resuscitation procedures (if any) the patient would receive if her/his heart or breathing were to stop before arriving to the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 2, 3 0 = Full code 1 = Not documented 2 = Do not resuscitate 3 = Level of care
Level of care pre-ED	If the code status pre-ED is 3 (level of care), use free text to provide details.	Field type: Free-text or blank
Code status in ED	The type of resuscitation procedures (if any) the patient would receive if her/his heart or breathing were to stop after admitted to the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 2, 3 0 = Full code 1 = Not documented 2 = Do not resuscitate 3 = Level of care (describe in free text below)
Level of care in ED	If the code status pre-ED is 3 (level of care), use free text to provide details.	Field type: Free-text or blank
Oxygen delivered	Indicate if oxygen was delivered to patient in the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1 0 = No 1 = Yes

Data Element	Definition	Specifications
Mode of oxygen delivery	Mode of oxygen delivery in ED prior to induction sequence initiated.	Field type: Categorical (with option to select more than one category) Field length 1 digit Valid data: 1, 2, 3, 4, 5, 6, 7 1 = Nasal prongs 2 = Facemask 3 = Simple rebreather 4 = Non-rebreather 5 = High-flow nasal oxygen (e.g., Optiflow, Airvo) 6 = Bilevel pressure vent 7 = Continuous pressure vent
Nasal prong duration	For patient who received oxygen by nasal prongs, the direction of nasal prong used (in hours) in ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 48
Nasal prong max oxygen	For patient who received oxygen by nasal prongs, the maximum oxygen delivered (in L/min) in ED.	Field type: Free text Valid data: Text
Face mask duration	For patient who received oxygen by face mark, the direction of face mask used (in hours) in ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 48
Face mask max oxygen	For patient who received oxygen by Face mask, the maximum oxygen delivered (in L/min) in ED.	Field type: Free text Valid data: Text
Simple rebreather duration	For patient who received oxygen by simple rebreather, the direction of face mask used (in hours) in ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 48
Simple rebreather max oxygen	For patient who received oxygen by simple rebreather, the maximum oxygen delivered (in L/min) in ED.	Field type: Free text Valid data: Text
Non-rebreather duration	For patient who received oxygen by non-rebreather, the direction of face mask used (in hours) in ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 48
Non-rebreather max oxygen	For patient who received oxygen by non-rebreather, the maximum oxygen delivered (in L/min) in ED.	Field type: Free text Valid data: Text
High-flow nasal oxygen duration	For patient who received oxygen by high-flow nasal, the direction of face mask used (in hours) in ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 48
High-flow nasal max oxygen	For patient who received oxygen by high-flow nasal, the maximum oxygen delivered (in L/min) in ED.	Field type: Free text Valid data: Text

Data Element	Definition	Specifications
Bilevel pressure vent duration	For patient who received oxygen by bilevel pressure vent, the direction of face mask used (in hours) in ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 48
Bilevel pressure vent max oxygen	For patient who received oxygen by bilevel pressure vent, the maximum oxygen delivered (in L/min) in ED.	Field type: Free text Valid data: Text
Continuous pressure vent duration	For patient who received oxygen by continuous pressure vent, the direction of face mask used (in hours) in ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 48
Continuous pressure vent duration max oxygen	For patient who received oxygen by continuous pressure vent, the maximum oxygen delivered (in L/min) in ED.	Field type: Free text Valid data: Text
ED/Pre-hospital Intubation	Indicate if patient received intubation in the ED or prior to arrival to the ED.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1 0 = No 1 = Yes
Pre-oxygenation method	For patient who received intubation, indicate the method of pre-oxygenation immediately before intubation in ED.	Field type: Categorical (with option to select more than one category) Field length 1 digit Valid data: 0 to 9 0 = Bag-mask valve 1 = Nasal prongs 2 = Face mask 3 = Simple rebreather 4 = Non-rebreather 5 = Optiflow 6 = Bilevel pressure vent 7 = Continuous pressure vent 8 = None 9 = Unknown
Bagged	Patient was bagged during intubation in ED.	Field length: Categorical (Select one only) Valid data: 0, 1, 9 0 = No 1 = Yes 2 = Unknown

Data Element	Definition	Specifications
Paralytic	Paralytic agent used in ED.	Field length: Categorical (with option to select more than one category) Valid data: 1 to 5 1 = Rocuronium 2 = Succinylcholine 3 = Other 4 = None 5 = Unknown
Other Paralytic	If patient received 'Other' type of paralytic agent in the ED, use free text to provide details.	Field length: Free text Valid data: Text or blank
Sedative	Sedative agent used in ED.	Field length: Categorical (with option to select more than one category) Valid data: 1 to 6 1 = Ketamine 2 = Propofol 3 = Midazolam 4 = Etomidate 5 = Dexmedatomidine 6 = Other
Other sedative	If patient received 'Other' type of sedative agent in the ED, use free text to provide details.	Field length: Free text Valid data: Text or blank
Intubation technique	Intubation technique used in the ED.	Field length: Categorical (with option to select more than one category) Valid data: 1 to 5 1 = Video laryngoscope 2 = Fiberoptic intubation 3 = Direct laryngoscopy 4 = Blind nasotracheal 5 = Other
Other intubation technique	If patient received 'Other' intubation technique, use free text to provide details.	Field length: Free text Valid data: Text or blank

Data Element	Definition	Specifications
Intubation outcome	Outcome of the intubation in the ED.	Field length: Categorical (Select one only) Valid data: 0 to 5 0 = First pass success 1 = Second pass success 2 = Third pass success 3 = Rescue device 4 = Surgical airway 5 = Unable to establish airway
Other intubation outcome	If patient had 'Other' intubation outcome, use free text to provide details.	Field length: Free text Valid data: Text or blank
Adverse events	Adverse events observed during intubation.	Field length: Categorical (with option to select more than one category) Valid data: 1 to 7 1 = Desaturation < 80% 2 = Desaturation < 70% 3 = Vomiting 4 = Arrhythmia 5 = Cardiac arrest 6 = Intubation awareness 7 = Dental trauma

Data Element	Definition	Specifications
Medication administered in ED	Medications that the patient was administered in the ED.	Field type: Categorical (with option to select more than one category) Field length 2 digits Valid data: 1 to 40 1 = Acyclovir 2 = Amoxicillin 3 = Amoxicillin / Clavulanate 4 = Apixaban / Edoxaban / Rivaroxaban / Dabigatran 5 = Azithromycin / Clarithromycin 6 = Cefazolin 7= Cefotaxime 8 = Ceftazidime 9 = Ceftriaxone 10 = Chloroquine 11 = Cisatracurium 12 = Dexamethasone 13 = Dexmedetomidine 14 = Doxycycline 15 = Enoxaparin / Tinzaparin / Dalteparin 16 = Epinephrine 17 = Etomidate 18 = Furosemide 19 = Heparin 20 = Hydrocortisone 21 = Hydroxychloroquine 22 = Ipratropium bromide 23 = Ketamine 24 = Levofloxacin 25 = Lopinivir / Ritonavir 26 = Meropenem 27 = Methylprednisolone 28 = Metronidazole 29 = Moxifloxacin 30 = Norepinephrine 31 = Oseltamivir 32 = Piperacillin 33 = Prednisone 34 = Propofol 35 = Rocuronium 36 = Salbutamol 37 = Succinylcholine 38 = Valacyclovir 39 = Vancomycin 40 = Warfarin

Data Element	Definition	Specifications
No medications	Indicate reason for "No medications" being entered into the database.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1 0 = I was unable to obtain this patient's ED medication information 1 = Confirm that after reviewing patient's chart information, this patient was not given any of the above medications in the ED.
ED Discharge Diagnosis	The patient's diagnosis at the time of discharged from the ED.	Field type: Categorical (with option to select more than one category) Field length: 2 digits 0 = Respiratory disease 1 = Suspect COVID-19 2 = Confirmed COVID-19 3 = Influenza/Flu-like illness 4 = Upper Respiratory Tract Infection 5 = Pneumonia 6 = Viral pneumonia 7 = COPD exacerbation 8 = Asthma exacerbation 9 = Congestive heart failure/pulmonary edema 10 = Shortness of Breath, NYD 11 = Cough,NYD 12 = Fever, NYD 13 = Other
Other ED Discharge Diagnosis	If patient's diagnosis at the time of discharged from the ED was 'Other", use free text to provide details.	Field type: Free-text Valid data: Text
ED Alternate Diagnosis	Any other ED discharge diagnoses listed	Field type: Free-text or blank
ED Disposition	Patient's type of separation from the ambulatory care services after registration.	Field type: Categorical (Select one only) Field length: 1 digit 0 = Discharged home 1 = Admitted 2 = Left AMA 3 = Transferred to other hospital 4 = Transfer to LTC/Rehab 5 = Death 6 = Other
Other ED disposition	If patient's type of separation from the ambulatory care services after registration is 'Other', use free text to provide details.	Field type: Free-text Valid data: Text

Data Element	Definition	Specifications
ED Disposition date/time	Date and time the decision was made about the patient's disposition.	Field type: Date time Field length 14 Valid data: YYYY-MM-DD HH:MM:SS and date time is after ED arrive date/time.
Diagnostic Variables		
COVID test pre-ED	Patient received COVID testing done prior to ED visit in the past 14 days.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 9 0 = No 1 = Yes 9 = Unknown
Source of swab	The type of swab that was done if patient received COVID testing prior to ED visit in the past 14 days.	Field type: Categorical (Select one only) Field length: 2 digits Valid data: 0 - 12 0 = Nasopharyngeal swab 1 = Mouth swab/saliva 2 = Sputum 3 = Broncho-alveolar lavage 4 = Tracheal aspirate 5 = Feces 6 = Urine 7 = Blood test 8 = Bronchial brush 9 = Nasal wash 10 = Cerebrospinal fluid 11 = Other 12 = Mid-Turbinate swab
Other swab collection	If the type of swab is 'Other', use free text to provide details.	Field type: Free-text or blank
COVID test results pre-ED	Results of COVID testing for patient who received testing prior to ED visit in the past 14 days.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 2, 9 0 = Negative 1 = Positive 2 = Indeterminate 9 = Unknown

Data Element	Definition	Specifications
COVID test date pre-ED	Date of the most recent COVID testing done prior to the ED visit	Field type: Date Field length 8 Valid data: YYYY-MM-DD or blank
COVID test in ED or hospital	Patient received COVID testing in ED/hospital.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1 0 = No 1 = Yes
Method of sample collection *Up to 20 sample collection entries are recorded*	Sample collection method for patient who received COVID testing in ED/hospital.	Field type: Categorical (Select one only) Field length: 2 digits Valid data: 0 - 12 0 = Nasopharyngeal swab 1 = Mouth swab/saliva 2 = Sputum 3 = Broncho-alveolar lavage 4 = Tracheal aspirate 5 = Feces 6 = Urine 7 = Blood test 8 = Bronchial brush 9 = Nasal wash 10 = Cerebrospinal fluid 11 = Other 12 = Mid-Turbinate swab
Other method of sample collection *Up to 20 other sample collection entries are recorded*	For sample collection method indicated as 'Other', use free text to provide details.	Field type: Free-text or blank
COVID test results in ED/hospital *Up to 20 COVID test results are recorded*	Results of patient's COVID testing in ED/hospital.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 2, 9 0 = Negative 1 = Positive 2 = Indeterminate 9 = Unknown

Data Element	Definition	Specifications
COVID test date in ED/hospital *Up to 20 COVID test dates are recorded*	Date of patient's COVID testing in ED/hospital	Field type: Date Field length 8 digits Valid data: YYYY-MM-DD or blank
Serology testing	Serology testing for SARS-CoV-2 was done on patient in ED/hospital.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 2, 9 0 = No 1 = Yes 9 = Unknown
Serology testing date	Date of patient's SARS-CoV-2 serology test in ED/hospital.	Field type: Date Field length 8 digits Valid data: YYYY-MM-DD or blank
Serological test type	Type of serological test used for the patient in ED/hospital.	Field type: Categorical (Select one only) Field length: 2 digits Valid data: 0, 1, 2, 9, 11 0 = Enzyme linked immunosorbent assays (ELISAs) 1 = Lateral flow immunoassays (LFIAs) 2 = Chemiluminescent immunoassays (CLIAs) 9 = Unknown 11 = Other
Other serological test	If the type of serological test used for the patient is 'Other', use free text to provide details.	Field type: Free-text or blank
COVID-19 IgG test result	Patient's COVID-19 IgG test result in mg/dL.	Field type: Numeric Field length: 3 digits
COVID-19 IgM test result	Patient's COVID-19 IgM test result in mg/dL.	Field type: Numeric Field length: 3 digits

Data Element	Definition	Specifications
Bloodwork completion	Completed bloodwork on patient in ED or first bloodwork in hospital.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1 0 = No 1 = Yes
Arrival haemoglobin	Patient's haemoglobin level (in grams per liter) at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 200
Arrival white blood cells	Patient's white blood cells (in 10^9 cells per liter) count per at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 300
Arrival neutrophils	Patient's neutrophils count (in cells/ microliter) at arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 50
Arrival lymphocytes	Patient's lymphocytes count (in 10^9 cells per liter) at arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 50
Arrival platelets	Patient's platelets count (in 10^9 cells per liter) at arrival to the ED.	Field type: Numeric Field length: 4 digits Valid data: 0 to 1000
Arrival sodium	Patient's sodium level (in mmol/L) at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 250
Arrival potassium	Patient's potassium level (in mmol/L) at arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 10
Arrival creatinine	Patient's creatinine level (in µmol/L) at arrival to the ED.	Field type: Numeric Field length: 4 digits Valid data: 0 to 1000
Arrival alanine aminotransferase (ALT)	Patient's ALT level (in U/L) at arrival to the ED.	Field type: Numeric Field length: 5 digits Valid data: 0 to 10000

Data Element	Definition	Specifications
Arrival bilirubin	Patient's bilirubin level (in µmol/L) at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 300
Arrival lactate	Patient's lactate level (in mmol/L) at arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 20
International normalised ratio (INR)	Patient's INR at arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 0 to 10
D-dimer	Patient's D-dimer level (in µg FEU/L) at arrival to the ED.	Field type: Free-text or blank
Procalcitonin	Patient's procalcitonin level (in ng/mL) at arrival to the ED.	Field type: Free-text or blank
C-Reactive Protein (CRP)	Patient's CRP level (in mg/L) at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 500
Troponin	Patient's test result for troponin.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1 0 = Negative 1 = Positive
Troponin I	The level of troponin I (in ng/mL) for patient with a positive test result for troponin.	Field type: Numeric Field length: 3 digits Valid data: 0 to 300
Troponin T	The level of troponin T (in ng/mL) for patient with a positive test result for troponin.	Field type: Numeric Field length: 3 digits Valid data: 0 to 300
Other troponin results	Patient's troponin results not otherwise entered.	Field type: Free-text or blank
First blood gas	Type of patient's first blood gas at arrival to the ED. If arterial blood gas and venous blood gas are available, enter arterial blood gas.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 2, 3 0 = None 1 = Venous 2 = Arterial 3 = Capillary

Data Element	Definition	Specifications
Date first blood gas drawn	Date of patient's first blood gas at arrival to the ED.	Field type: Categorical Field length 8 digits Valid data: YYYY-MM-DD or blank
pH	pH (acidity) measured from patient's first blood gas at arrival to the ED.	Field type: Numeric Field length: 2 digits Valid data: 6.5 to 7.7
pCO2	Partial pressure of carbon dioxide (torr) measured from patient's first blood gas at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 100
pO2	Partial pressure of oxygen (torr) measured from patient's first blood gas at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 500
Oxygen saturation	The percent of hemoglobin fully combined with oxygen measured from patient's first blood gas at arrival to the ED.	Field type: Numeric Field length: 3 digits Valid data: 0 to 100
Other viral swab	Patient received other viral swab.	Field type: Categorical (Select one only) Field length: 2 digits Valid data: 0, 1 0 = No 1 = Yes
RSV	For patient who received other viral swab test, the patient's result for RSV.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = Negative 1 = Positive 9 = Unknown
Parainfluenza	For patient who received other viral swab test, the patient's result for parainfluenza.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = Negative 1 = Positive 9 = Unknown

Data Element	Definition	Specifications
Rhinovirus	For patient who received other viral swab test, the patient's result for rhinovirus.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = Negative 1 = Positive 9 = Unknown
Metapneumovirus	For patient who received other viral swab test, the patient's result for metapneumovirus.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = Negative 1 = Positive 9 = Unknown
Influenza	For patient who received other viral swab test, the patient's result for influenza.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = Negative 1 = Positive 9 = Unknown
Chest X-Ray *Up to 5 Chest X-Ray results are recorded*	Patient's chest X-ray result in ED/hospital.	Field type: Categorical (with option to select more than one category) Field length: 2 digits Valid data: 0 to 13 0 = CXR not performed 1 = Focal consolidation 2 = Multi-lobal consolidation 3 = Interstitial pneumonia 4 = Ground glass opacity 5 = Local patchy shadowing 6 = Bilateral patchy shadowing 7 = Interstitial abnormalities 8 = No acute findings 9 = Other 10 = Atelectasis 11 = Pleural effusion 12 = Pulmonary fibrosis 13 = COPD findings

Data Element	Definition	Specifications
Other Chest X-Ray findings *A maximum of 5 Chest X-Ray results are collected.	If chest X-ray finding is 'Other', use free text to provide details.	Field type: Free-text or blank
CT Chest	Patient's CT chest result in ED/hospital.	Field type: Categorical (with option to select more than one category) Field length: 2 digits Valid data: 0 to 14 0 = CT not performed 1 = Focal consolidation 2 = Multi-lobal consolidation 3 = Interstitial pneumonia 4 = Ground glass opacity 5 = Local patchy shadowing 6 = Bilateral patchy shadowing 7 = Interstitial abnormalities 8 = No acute findings 9 = Other 10 = Atelectasis 11 = Pleural effusion 12 = Pulmonary fibrosis 13 = COPD findings 14 = Pulmonary embolism
Other CT Chest	If CT chest finding is 'Other', use free text to provide details.	Field type: Free-text or blank
Hospital Variables		
Patient admit	Patient was admitted to the hospital.	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1 0 = No 1 = Yes

Data Element	Definition	Specifications
Level of care after ED *Up to 5 level of care after admitted to the ED are recorded*	The level of care provided to the patient after admitted to the ED.	Field type: Categorical (Select one only) Field length: 1 digit 0 = Regular room 1 = Isolation room 2 = High acuity/step down 3 = ICU 4 = Hallway 5 = Operating room (without going for surgery) 6 = Room but unable to determine isolation status 7 = Transferred to another hospital
Transfer hospital name	The name of hospital the patient was transferred to.	Field type: Free-text or blank
Date of transfer into level of care	Date of patient submitted to the level of care.	Field type: Date Field length 8 Valid data: YYYY-MM-DD or blank

Data Element	Definition	Specifications
New medications	New medications administered in ED/hospital.	Field type: Categorical (with option to select more than one category) Field length 2 digits Valid data: 1 to 40 1 = Acyclovir 2 = Amoxicillin 3 = Amoxicillin / Clavulanate 4 = Apixaban / Edoxaban / Rivaroxaban / Dabigatran 5 = Azithromycin / Clarithromycin 6 = Cefazolin 7 = Cefotaxime 8 = Ceftazidime 9 = Ceftriaxone 10 = Chloroquine 11 = Cisatracurium 12 = Dexamethasone 13 = Dexmedetomidine 14 = Doxycycline 15 = Enoxaparin / Tinzaparin / Dalteparin 16 = Epinephrine 17 = Etomidate 18 = Furosemide 19 = Heparin 20 = Hydrocortisone 21 = Hydroxychloroquine 22 = Ipratropium bromide 23 = Ketamine 24 = Levofloxacin 25 = Lopinivir / Ritonavir 26 = Meropenem 27 = Methylprednisolone 28 = Metronidazole 29 = Moxifloxacin 30 = Norepinephrine 31 = Oseltamivir 32 = Piperacillin 33 = Prednisone 34 = Propofol 35 = Rocuronium 36 = Salbutamol 37 = Succinylcholine 38 = Valacyclovir 39 = Vancomycin 40 = Warfarin

Data Element	Definition	Specifications
No new medications	Indicate reason for no options selected for "New medications in hospital" field.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1 0 = I was unable to obtain this patient's hospital medication information 1 = I confirm that after reviewing patient's chart information, this patient was not given any of the above medications in hospital
Intubation on ward/in ICU	For patient admitted to the hospital, patient was intubated on ward or in ICU.	Field type: Categorical (Select one only) Field length 1 digit Valid data: 0, 1, 9 0 = No 1 = Yes 9 = Unknown
Date hospital intubation	Date the patient was intubated.	Field type: Date Field length: 8 Valid data: YYYY-MM-DD or blank
Date hospital extubation	Date the patient was extubated	Field type: Date Field length: 8 Valid data: YYYY-MM-DD or blank
Re-intubation on ward/ICU	For patient admitted to the hospital, patient was re-intubated on ward or in ICU	Field type: Categorical (Select one only) Field length: 1 digit Valid data: 0, 1, 9 0 = No 1 = Yes 9 = Unknown
Date hospital re-intubation	Date the patient was re-intubated.	Field type: Date Field length: 8 Valid data: YYYY-MM-DD or blank
Date hospital re-extubation	Date the patient was re-extubated	Field type: Date Field length: 8 Valid data: YYYY-MM-DD or blank

Data Element	Definition	Specifications
In-hospital death	In-hospital death is defined death in ED or hospital by any cause.	Yes/No
Date hospital death	Date the patient died in hospital.	Field type: Date Field length: 8 Valid data: YYYY-MM-DD or blank
Hospital discharge diagnosis *Up to 5 hospital discharge diagnosis are recorded*	The patient's diagnosis at the time of discharge from the hospital.	Field type: Categorical (Select one only) Field length 2 digits Valid data: 1 to 22 1 = Suspected case of COVID-19 2 = Confirmed case of COVID-19 3 = Upper Respiratory Tract Infection 4 = Pneumonia 5 = Viral pneumonia 6 = Cough = NYD 7 = Fever = NYD 8 = Sinusitis 9 = Pharyngitis 10 = Flu-like Illness 11 = Bronchitis 12 = Chronic obstructive lung disease 13 = Asthma 14 = ARDS Adult respiratory distress syndrome 15 = Pulmonary edema/congestive heart failure 16 = Pulmonary embolism 17 = SOB Shortness of breath 18 = Viral pneumonia 19 = FUO Fever unknown origin 20 = Sepsis = NYD 21 = Chest pain = NYD 22 = Other
Other hospital discharge diagnosis	If chart indicates hospital discharge diagnosis is 'Other', use free text to provide details.	Field type: Free-text or blank
Comment on discharge diagnosis	Use free text to provide additional information about the patient's diagnosis at the time of discharge from the hospital.	Field type: Free-text or blank
Hospital discharge date	The date patient was discharged from the hospital.	Field type: Date Field length 8 Valid data: YYYY-MM-DD or blank

Prospective data collection sheet

CCEDRRN **Prospective Data Collection Form**

Patient Study ID _____ [Affix Patient Chart Label Here]

Complete for patients swabbed for COVID, OR patients presenting after a positive test and COVID symptoms

Hospital: _____ **Arrival Time**(hh:mm)___:___

Your Name: _____

□ Physician □Nurse

PATIENT CHARACTERISTICS

Arrival from:

□ Home □ Long-term care/rehab

□ Shelter □ Single room occupancy

□ No fixed address □ Inter-hospital transfer

□ Other _____

EMS INFORMATION

Maximum oxygen delivered by EMS: _____

Mode of oxygen delivery by EMS:

□ Nasal prongs □ Simple rebreather □ BiPAP

□ Facemask □ Non-rebreather □ CPAP

HISTORY

Date of First Symptoms: _____ (YYYY-MM-DD)

Symptoms (check all that apply):

□ Cough

□ Shortness of breath

□ Fever

□ Headache

□ Nausea/Vomiting

□ Diarrhea

□ Myalgias

□ Dysgusia/Anosmia

COVID Swab administered Prior to ED Arrival within 14 days:

□ Yes □No □Unknown

Results of Prior COVID Testing:

□Positive □ Negative □Indeterminate □Unknown

Risk for Infection (check all that apply):

□ Travel from country with known cases within 14d

□ Institutional exposure: _____

□ Healthcare worker

□ Microbiology lab

□ Household/caregiver contact

COMORBID CONDITIONS

□ Congestive heart failure	□ Coronary artery disease	□ Hypertension
□ Asthma	□ Pulmonary fibrosis	□ Chronic lung disease (not asthma/IPF)
□ Chronic kidney disease	□ Dialysis	□ Diabetes
□ Mild liver disease	□ Moderate/severe liver disease	□ Organ transplant
□ Chronic neuro disorder (not dementia)	□ Dementia	□ Rheumatologic disorder
□ Active malignant neoplasm	□ Past malignant neoplasm	□ Obesity (clinical impression)

ED PROVIDER IMPRESSION: Is the patient in respiratory distress? □ Yes □No □Unknown

OTHER RISK FACTORS

ACE Inhibitors: □ Yes □ No □ Unknown

ACE Receptor Blocker: □ Yes □ No □ Unknown

Non-ACEI/ Non-ARB Antihypertensives: □ Yes □ No □ Unknown

NSAIDs: □ Reg □ Prn □ No □ Unknown

Tobacco Smoking: □ Never □ Past □ Current

Vaping: □ Never □ Past □ Current

Alcohol Misuse: □ Never □ Past □ Current

Illicit Substance Use: □ Never □ Past □ Current

Describe illicit substance use:

_____

Contributing study sites and investigators

Table 1. Scientific Advisory Committee (SAC)

Name of SAC Members	Affiliations
Corinne Hohl (nominated principal applicant and SAC chair)	Department of Emergency Medicine, University of British Columbia; Vancouver General Hospital.
Braden Manns	Department of Medicine, Department of Community Health Sciences, and Libin Cardiovascular Institute and Institute of Public Health, University of Calgary.
Clare Atzema	Division of Emergency Medicine, Department of Medicine, University of Toronto, Sunnybrook Health Sciences Centre, Institute for Clinical Evaluative Sciences.
David Patrick	Centre for Disease Control, University of British Columbia.
Eddy Lang	Department of Emergency Medicine, Cumming School of Medicine, University of Calgary; Rockyview General Hospital.
Élyse Berger Pelletier	Research Center of the Centre Hospitalier Universitaire (CHU) de Québec, Axe Santé des populations et pratiques optimales en santé (Population Health and Optimal health practices Research Unit), Traumatologie - Urgence - Soins Intensifs (Trauma - Emergency - Critical Care Medicine), CHU de Québec (Hôpital de l'Enfant-Jésus), Université Laval; Department of Family and Emergency Medicine, Université Laval.
Grant Innes	Department of Emergency Medicine, Cumming School of Medicine, University of Calgary.
Holly Longstaff	National Core for Neuroethics, Division of Neurology, Department of Medicine, The University of British Columbia and Engage Associates.
Jennifer Grant	Division of Medical Microbiology, Department of Pathology and Laboratory Medicine, Vancouver Coastal Health, British Columbia; Faculty of Medicine, University of British Columbia.
Kieran Moore	Department of Emergency and Family Medicine, Queen's University; Kingston, Frontenac and Lennox & Addington Public Health.
Laurie Morrison	Division of Emergency Medicine, Department of Medicine, Faculty of Medicine, University of Toronto
Rhonda Rosychuk	Department of Pediatrics, Edmonton Clinic Health Academy (ECHA), University of Alberta; Women & Children's Health Research Institute.
Samuel Vaillancourt	Li Ka Shing Knowledge Institute, Department of Emergency Medicine, St. Michael's Hospital; Department of Medicine, Division of Emergency Medicine, University of Toronto.

Table 2. Contributing Study Sites and Investigators

Provincial Representative		Study Sites		
Lead Investigator Maritime	**Lead Research Coordinator**	**Contributing Site / Code**	**Site Type**	**Member Investigators**
Patrick Fok				
Nova Scotia				
Hana Wiemer	Corinne DeMone	Halifax Infirmary/ 902	Urban, Teaching	Patrick Fok
		Dartmouth General Hospital/ 903	Urban, Non-teaching	Hana Wiemer
		Hants Community Hospital/ 904	Rural, Non-teaching	Samuel Campbell
		Cobequid Community Health Centre/ 905	Rural, Non-teaching	Kory Arsenault
		Secondary Assessment Centers of Dartmouth General and Halifax Infirmary/ 908	Urban, Teaching (mixed teaching and community)	Tara Dahn
New Brunswick				
Kavish Chandra	Jacqueline Fraser	Saint John Regional Hospital/ 901	Urban, Teaching	Kavish Chandra
Quebec				
Patrick Archambault	Véronique Gélinas	Hotel-Dieu de Lévis/ 701	Urban, Non-teaching	Patrick Archambault
		Jewish General Hospital/ 702	Urban, Teaching	Joel Turner
		Centre Hospitalier de l'Université Laval (CHU de Québec)/ 703	Urban, Teaching	Éric Mercier
		L'hôpital Royal Victoria - Royal Victoria Hospital/ 705	Urban, Teaching	Greg Clark
		Hôpital de l'Enfant-Jésus,CHU de Québec/ 706	Urban, Teaching	Éric Mercier
		Hôpital du Saint-Sacrement, CHU de Québec/ 707	Urban, Teaching	Éric Mercier
		Hôpital Saint-François d'Assise, CHU de Québec/ 708	Urban, Teaching	Éric Mercier
		Hôtel-Dieu de Québec,CHU de Québec/ 709	Urban, Teaching	Éric Mercier
		IUCPQ: Institut universitaire de cardiologie et de pneumologie de Québec/ 710	Urban, Teaching	Sébastien Robert
		Hôpital du Sacré-Coeur de Montreal/ 711	Urban, Teaching	Raoul Daoust

Lead Investigator Ontario	Lead Research Coordinator	Contributing Site / Code	Site Type	Member Investigators
Laurie Morrison and Steven Brooks	Lindsay O'Donnell	Sunnybrook/ 401	Urban, Teaching	Ivy Cheng
		The Ottawa Hospital - Civic Campus/ 403	Urban, Teaching Urban, Teaching	Krishan Yadav
		The Ottawa Hospital - General Campus/ 404	Urban, Teaching	Krishan Yadav
		Kingston/Queens/ 406	Urban, Teaching	Steven Brooks
		Hamilton General Hospital/ 407	Urban, Teaching	Michelle Welsford
		Health Science North, Sudbury Ontario/ 408	Urban, Non-teaching	Rob Ohle
		University Hospital – LHSC/ 409	Urban, Teaching	Justin Yan
		North York General Hospital, Toronto/ 410	Urban, Non-teaching	Rohit Mohindra
		Victoria Hospital – LHSC/ 412	Urban, Teaching	Justin Yan
		Toronto Western Hospital/ 414	Urban, Teaching	Megan Landes
Manitoba				
Tomislav Jelic	TBD	St. Boniface Hospital/ 307	Urban, Teaching	Tomislav Jelic
		Health Sciences Centre/ 307	Urban, Teaching	Tomislav Jelic
Saskatchewan				
Phil Davis	Aimee Goss	Pasqua Hospital, Regina/ 301	Urban, Teaching	Ankit Kapur
		Regina General Hospital, Regina/ 302	Urban, Teaching	Ankit Kapur
		St Paul's Hospital, Saskatoon/ 303	Urban, Teaching	Phil Davis
		Royal University, Saskatoon/ 304	Urban, Teaching	Phil Davis
		Saskatoon City Hospital, Saskatoon/ 305	Urban, Teaching	Phil Davis
Alberta				
Andrew McRae	Hina Walia	University of Alberta Hospital, Edmonton/ 201	Urban, Teaching	Brian Rowe
		Foothills, Calgary/ 202	Urban, Teaching	Andrew McRae
		Rockyview, Calgary/ 203	Urban, Teaching	
		Peter Lougheed Centre/ 204	Urban, Teaching	Andrew McRae
		South Campus, Calgary/ 205	Urban, Teaching	Andrew McRae
		Northeast Community Health Centre, Edmonton/ 206	Urban, Non-teaching	Andrew McRae
		Royal Alexandra Hospital, Edmonton/ 306	Urban, Teaching	Jake Hayward, Jaspreet Khangura

Lead Investigator British Columbia	Lead Research Coordinator	Contributing Site / Code	Site Type	Member Investigators
Corinne Hohl	Rajan Bola	Vancouver General Hospital/ 101	Urban, Teaching	Daniel Ting
		Lions Gate Hospital/ 102	Urban, Non-teaching	Maja Stachura
		Saint Paul's Hospital/ 103	Urban, Teaching	Frank Scheuermeyer
		Mount St Joseph's/ 104	Urban, Non-teaching	Frank Scheuermeyer
		Surrey Memorial Hospital/ 105	Urban, Teaching	Balijeet Braar/ Craig Murray
		Royal Columbian Hospital/ 106	Urban, Teaching	John Taylor
		Abbotsford Regional Hospital/ 107	Rural, Non-teaching	Ian Martin
		Eagle Ridge Hospital/ 108	Urban, Non-teaching	Sean Wormsbecker
		Victoria General Hospital/ 109	Urban, Teaching	Matt Bouchard
		Royal Jubilee Hospital/ 110	Urban, Teaching	Matt Bouchard
		Nanaimo General Hospital/ 111	Urban, Non-teaching	Matt Bouchard
		Royal Inland Hospital/ 112	Urban, Non-teaching	Ian Martin
		Kelowna General / Hospital/ 115	Urban, Teaching	Lee Graham

It was not possible for us to recruit Members from Newfoundland and Labrador, Northwest Territories, Nunavut, Prince Edward Island and Yukon at the time of the inception of the registry.