

Appendices

Appendix Table 1. Patients enrolled by CCEDRRN site and time periods for data collection

Site (N patients contributed)	Mar 2020	Apr 2020	May 2020	Jun 2020	Jul 2020	Aug 2020	Sept 2020	Oct 2020	Total
Derivation Cohort	3217	4797	5493	3096	2232	1276	1266	366	21743
Abbotsford Regional Hospital		228	474	385	198				1285
Eagle Ridge Hospital	196	163							359
Foothills, Calgary	437	131							568
Halifax Infirmary/Dalhousie, Nova Scotia	17								17
Hants Community Hospital, Nova Scotia	1								1
Hôpital du Sacré-Coeur de Montreal	27	96	401						524
Hôtel-Dieu de Lévis	1	19	246						266
Jewish General Hospital	754	959	93						1806
Peter Lougheed Centre	321	1119	1169	605	638	552	616	215	5235
Royal Columbian Hospital	236	408	366						1010
Royal University, Saskatoon	132	275	357	296	340	265	193		1858
Saint John Regional Hospital, New Brunswick	98	102							200
South Campus, Calgary	367	598	612	526	586	459	457	151	3756
Sunnybrook Health Sciences Centre			473	593	470				1536
The Ottawa Hospital - Civic Campus	58	24	537						619
Vancouver General Hospital	572	675	765	691					2703
Validation Cohort	2082	2012	695	381	330		422		5922
Cobequid Community Health Centre	6								6
Dartmouth General College, Dartmouth Nova Scotia	7								7
Health Science North, Sudbury Ontario			295	381	330				1006

Hôpital de l'Enfant-Jésus, CHU de Québec-Université Laval	40	99	26						165
IUCPQ: Institut universitaire de cardiologie et de pneumologie de Québec	4	5	95						104
Lions Gate Hospital	294	220							514
Mount St Joseph's	236								236
Rockyview, Calgary	368	104							472
Saint Paul's Hospital	541								541
Saskatoon City Hospital, Saskatoon	33	53							86
Secondary Assessment Centers of Dartmouth General and Halifax Infirmary	3	70	66						139
St Paul's Hospital, Saskatoon	84	198							282
Surrey Memorial Hospital	404	927							1331
The Ottawa Hospital - General Campus	62	33	135						230
Toronto Western Hospital							422		422
University of Alberta Hospital		303	78						381

Appendix Table 2. Candidate variables for entry into regression model

Variable	Definition	N (%) Missing
Demographics		
Age	Age in years	0 (0)
Sex	Male, Female, Other	0 (0)
Arrival from	Home + other (not clearly documented)	0 (0)
	Single room + no fixed address + shelter	0 (0)
	Institutional living: long-term care/rehab + correctional	0 (0)
	Inter-hospital transfer	0 (0)
Infection risk		
Travel risk	Travel from country with known cases within 14 days	0 (0)
Institutional exposure	Possible exposure in institutional setting (e. g., Long-term care, prison)	0 (0)
Healthcare worker	Healthcare worker/Microbiology lab employee	0 (0)
Household/caregiver contact	Household contact /caregiver of known positive case	0 (0)
No documented risk	Documented absence of risk factors	0 (0)
Emergency department variables		
ED arrival mode		2 (0)
Ambulance:	arrived by ambulance	
Self/police	self-transported or transported to ED by police	
Arrival heart rate	beats/minute	452 (2.1)
Arrival respiratory rate	breaths/minute	732 (3.4)
Arrival oxygen saturation	%	517 (2.4)
Lowest recorded oxygen saturation in ED	%	445 (2.0)
Fever		847 (3.9)
Temperature <36.0	Temperature <36.0C AND no self-reported fever	
Temperature 36.0-37.4	Temperature 36.0-37.4C AND no self-reported fever	
Temperature ≥37.5 or fever	Temperature ≥37.5 OR self-reported fever	
Respiratory distress	Increased work of breathing documented by treating clinician	1(0)
Supplemental oxygen delivered in the ED	Yes/No	0 (0)
COVID symptoms		
Abdominal pain	Patient-reported symptom as documented by treating clinician	0 (0)
Altered consciousness/confusion	Patient-reported symptom as documented by treating clinician	0 (0)
Bleeding (hemorrhage)	Patient-reported symptom as documented by treating clinician	0 (0)
Chest pain (includes discomfort or tightness)	Patient-reported symptom as documented by treating clinician	0 (0)
Chills	Patient-reported symptom as documented by treating clinician	0 (0)
Conjunctivitis	Patient-reported symptom as documented by treating clinician	0 (0)
Cough	Patient-reported symptom as documented by treating clinician	0 (0)

Diarrhea	Patient-reported symptom as documented by treating clinician	0 (0)
Dizziness/Vertigo	Patient-reported symptom as documented by treating clinician	0 (0)
Dysgeusia/anosmia	Patient-reported symptom as documented by treating clinician	0 (0)
Ear pain	Patient-reported symptom as documented by treating clinician	0 (0)
Fatigue/malaise	Patient-reported symptom as documented by treating clinician	0 (0)
Headache	Patient-reported symptom as documented by treating clinician	0 (0)
Hemoptysis (bloody sputum)	Patient-reported symptom as documented by treating clinician	0 (0)
Joint pain (arthralgia)	Patient-reported symptom as documented by treating clinician	0 (0)
Lymphadenopathy	Patient-reported symptom as documented by treating clinician	0 (0)
Muscle aches (myalgia)	Patient-reported symptom as documented by treating clinician	0 (0)
Nausea/vomiting	Patient-reported symptom as documented by treating clinician	0 (0)
No reported symptoms	Patient-reported symptom as documented by treating clinician	0 (0)
Runny nose (rhinorrhea)	Patient-reported symptom as documented by treating clinician	0 (0)
Seizures	Patient-reported symptom as documented by treating clinician	0 (0)
Shortness of breath (dyspnea)	Patient-reported symptom as documented by treating clinician	0 (0)
Skin rash	Patient-reported symptom as documented by treating clinician	0 (0)
Sore throat	Patient-reported symptom as documented by treating clinician	0 (0)
Sputum production	Patient-reported symptom as documented by treating clinician	0 (0)
Wheezing	Patient-reported symptom as documented by treating clinician	0 (0)
Current tobacco user	Documented current tobacco use	6 (0)
Current illicit user	Documented methamphetamine, opioid or other illicit drug use	6 (0)
7-day average incident COVID-19 cases	Daily reported incidence of new cases in health region, averaged over the seven days preceding hospital arrival. Reported in units of new cases/100,000 population	32 (0.1)

Appendix Table 3. Performance metrics for the CCEDRN COVID-19 Infection Score for ruling in or ruling out SARS-CoV-2 infection at different score cut-off values in the derivation cohort

Score	n (%)	Sensitivity (%, 95% CI)	Specificity (%, 95% CI)	LR+	LR-	COVID+ n (%)
Rule out:						
≤-2	51 (0.2)	100 (99.6–100)	0.25 (0.2–0.3)	1.0	NA	0 (0)
≤-1	937 (4.3)	99.89 (99.4–100)	4.5 (4.2–4.8)	1.1	<0.1	1 (0.1)
≤0	5996 (27.6)	96.6 (95.2–97.7)	28.67 (28.1–29.3)	1.4	0.1	32 (0.5)
≤1	13114 (60.3)	86.6 (84.3–88.7)	62.43 (61.8–63.1)	2.3	0.2	126 (1.0)
≤2	18041 (83.0)	67.34 (64.2–70.3)	85.25 (84.8–85.7)	4.6	0.4	307 (1.7)
≤3	20405 (93.9)	45.11 (41.9–48.4)	95.61 (95.3–95.9)	10.3	0.6	516 (2.5)
Rule in:						
≥3	3702 (17.0)	67.34 (64.2–70.3)	85.25 (84.8–85.7)	4.6	0.4	633 (17.1)
≥4	1338 (6.2)	45.11 (41.9–48.4)	95.61 (95.3–95.9)	10.3	0.6	424 (31.7)
≥5	440 (2.0)	23.51 (20.8–26.4)	98.95 (98.8–99.1)	22.3	0.8	221 (50.2)
≥6	122 (0.6)	9.68 (7.9–11.8)	99.85 (99.8–99.9)	65.0	0.9	91 (74.6)
≥7	31 (0.1)	2.77 (1.8–4.0)	99.98 (99.9–100.0)	115.1	1.0	26 (83.9)
≥8	12 (0.1)	1.17 (0.6–2.1)	100 (100.0–100.0)	243.4	1.0	11 (91.7)
≥9	2 (<0.1)	0.21 (<0.1–0.8)	100 (100.0–100.0)	NA	1.0	2 (100)

LR+: Positive Likelihood Ratio; LR-: Negative Likelihood Ratio

Appendix Table 4. Performance metrics for CCEDRRN COVID Infection Score for ruling in or ruling out SARS-CoV-2 infection at different score cut-off values in the combined cohort

Score cutoff	n (%)	Sensitivity (95% CI)	Specificity (95% CI)	LR+	LR-	COVID+ n (%)
Rule out:						
≤-2	70 (0.3)	100 (99.7,100)	0.3 (0.2,0.3)	1	0	0 (0)
≤-1	1257 (4.5)	99.8 (99.4,100)	4.7 (4.5,5)	1.1	<0.1	2 (0.2)
≤0	7872 (28.5)	96.1 (94.8,97.1)	29.5 (29.0,30.1)	1.4	0.1	46 (0.6)
≤1	16962 (61.3)	85 (82.8,87.0)	63.4 (62.8,63.9)	2.3	0.2	175 (1.0)
≤2	23243 (84.0)	64.8 (62.0,67.5)	86.2 (85.7,86.6)	4.7	0.4	411 (1.8)
≤3	26169 (94.6)	40.3 (37.4,43.2)	96.1 (95.9,96.4)	10.4	0.6	697 (2.7)
Rule in:						
≥3	4422 (16.0)	64.8 (62.0,67.5)	86.2 (85.7,86.6)	4.7	0.4	756 (17.1)
≥4	1496 (5.4)	40.3 (37.4,43.2)	96.1 (95.9,96.4)	10.4	0.6	470 (31.4)
≥5	476 (1.7)	20.2 (18.0,22.6)	99.1 (99.0,99.2)	22.3	0.8	236 (49.6)
≥6	128 (0.5)	8 (6.5,9.7)	99.9 (99.8,99.9)	60.3	0.9	93 (72.7)
≥7	32 (0.1)	2.2 (1.5,3.2)	100 (100,100)	98.4	1.0	26 (81.3)
≥8	12 (<0.1)	0.9 (0.5,1.7)	100 (100,100)	249.8	1.0	11 (91.7)

LR+: Positive likelihood ratio; LR-: Negative likelihood ratio

Appendix Table 5. Performance metrics for the CORC score (race and ethnicity variables removed) for ruling in or ruling out SARS-CoV-2 infection at different score cut-off values in the combined cohort

Score	n (%)	Sensitivity (95% CI)	Specificity (95% CI)	LR+	LR-	COVID+ n (%)
Rule out:						
≤-2	202 (0.7)	99.9 (99.5–100)	0.8 (0.7–0.9)	1.01	0.11	1 (0.5)
≤-1	2715 (9.8)	97.4 (96.4–98.3)	10.1 (9.8–10.5)	1.08	0.25	30 (1.1)
≤0	9089 (32.9)	90.1 (88.2–91.7)	33.9 (33.3–34.4)	1.36	0.29	116 (1.3)
≤1	17582 (63.9)	72.8 (70.2–75.4)	65.2 (64.6–65.7)	2.09	0.42	317 (1.8)
≤2	23421 (84.7)	51.2 (48.3–54.1)	86.2 (85.8–86.7)	3.72	0.57	569 (2.4)
≤3	26224 (94.8)	27.7 (25.1–30.3)	95.8 (95.5–96)	6.56	0.76	844 (3.2)
Rule in:						
≥3	4244 (15.3)	51.2 (48.3–54.1)	86.2 (85.8–86.7)	3.72	0.57	598 (14.1)
≥4	1441 (5.2)	27.7 (25.1–30.3)	95.8 (95.5–96)	6.56	0.76	323 (22.4)
≥5	358 (1.3)	11.1 (9.3–13)	99.1 (99–99.2)	12.79	0.9	129 (36.0)
≥6	54 (0.2)	3.1 (2.2–4.2)	99.9 (99.9–100)	45.41	0.97	36 (66.7)

LR+: Positive likelihood ratio; LR-: Negative likelihood ratio

Appendix Table 6. Net Reclassification Improvement of the CCEDRRN COVID-19 Infection Score compared to the CORC Score (race and ethnicity variables removed)

Primary Outcome : Covid Positive					
CORC risk category		CCIS risk category			Total
		Low	Medium	High	
	Low	12	18	0	30
	Medium	34	539	241	814
	High	0	94	229	323
	Total	46	651	470	1167
Primary Outcome: Covid Negative					
CORC risk category		CCIS risk category			Total
		Low	Medium	High	
	Low	1593	1092	0	2685
	Medium	6233	15756	706	22695
	High	0	798	320	1118
	Total	7826	17646	1026	26498

<u>COVID Positive</u>		<u>COVID Negative</u>	
Number of outcomes	1167	Number of outcomes	26498
Correct reclassification	259	Correct reclassification	7031
Incorrect reclassification	128	Incorrect reclassification	1798
Net reclassification	131	Net reclassification	5233
Net reclassification improvement (Event)	0.112	Net reclassification improvement (Non-event)	0.197
Total net reclassification improvement			0.310

Appendix Figure 1. Receiver operating characteristic curves for the CCEDRRN COVID Infection Score (CCIS) and the CORC score (race and ethnicity variables removed) in the combined study cohort

