CorHealth Ontario
Advancing cardiac, stroke and vascular care

CorHealth COVID-19 Heart Failure Stakeholder Forum #4

April 22, 2020 6:00-7:00 pm

Teleconference: (647) 951-8467 / Toll Free: 1 (844) 304-7743

Conference ID: 822279661#

Agenda

Description	Presenter	Time
1. Welcome • Recap of April 8th Meeting • COVID-19 System Planning Updates • Meeting Objectives	Sheila Jarvis	18:00
2. Follow-up: Burinex Update	Karen Harkness	18:05
3. COVID-19 – Update on Current Data • Nature Publication & Other COVID-19 Data Updates	Dr. Heather Ross	18:10
4. COVID-19 – Learning from Clinical Cases • Discuss clinical case examples in HF during COVID-19 pandemic • Update on COVID treatment strategies	Dr. Heather Ross	18:15
5. Access to Care During COVID-Update • Transplant Activity	Dr. Stuart Smith	18:30
6. Open Forum Discussion • Outpatient heart failure patient activity • Share what is happening locally in the HF community during COVID-19 • Discuss provider level experience – successes and challenges	Dr. Heather Ross	18:40
7. Other Considerations & Next Steps	Dr. Heather Ross / Karen Harkness	18:55

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Welcome

SHEILA JARVIS

Recap of April 8th Meeting

- Key Themes Discussed:
  - An overview of the current global and provincial landscape of COVID-19
  - Virtual care for Heart Failure and the Cardiac Virtual Care Program in Ottawa (i.e., Telehome Monitoring Program & Interactive Voice Response)
  - Information on ambulatory IV Lasix was provided based on Southlake Regional Health Centre's experience
  - Local experiences in the HF community during COVID-19 were shared and discussed
- Meeting summary notes can be found on our website: https://www.corhealthontario.ca/CorHealth-Summary-Notes-Heart-Failure-Forum3-(April-8-2020).pdf

COVID-19 System Planning Updates

- **Surgical/Procedural Ramp Up Committee:** Chair Dr. Chris Simpson
  - CorHealth, Dr. Madhu Natarajan, Dr. Harindra Wijeysundera, Dr. Sudhir Nagpal are meeting with Dr. Simpson twice a week for the short-term
  - The Committee will be releasing a report in the coming weeks about an approach to ramping up procedures and surgeries

Meeting Objectives

1. Provide the opportunity for stakeholders to discuss and share what is happening locally in the Heart Failure Community, in the context of COVID-19.
2. Provide an update on COVID-19 provincial & global data.
3. Discuss clinical case examples of HF during COVID-19 and an update on COVID-19 treatment strategies.
4. Discuss access to care during COVID-19.

Bumetanide Update

- **Goal:** timely access to Bumetanide for patients who are refractory to oral furosemide
- **Challenge:** costly, access through Exceptional Access Program (EAP) at the MOH 4-6 weeks
- **MOH response to our request**:
  - ODB coverage request must come from the supplier - long process
  - In the setting of COVID, any EAP applications for patients with HF will be treated as Priority 1, with a turn around time of 3 days
  - Instructions for timely access, including sample verbiage for EAP application, will be posted on our website in the COVID-19 resource centre shortly
  - If there are any concerns or challenges with your application during COVID-19, please feel free to contact either Margaret Wong (margaret.s.wong@ontario.ca or Andrew Cornacchia (Andrew.Cornacchia@ontario.ca), co-managers in the EAP at the MOH.

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COVID-19: Update on Current Data

DR HEATHER ROSS

COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU)

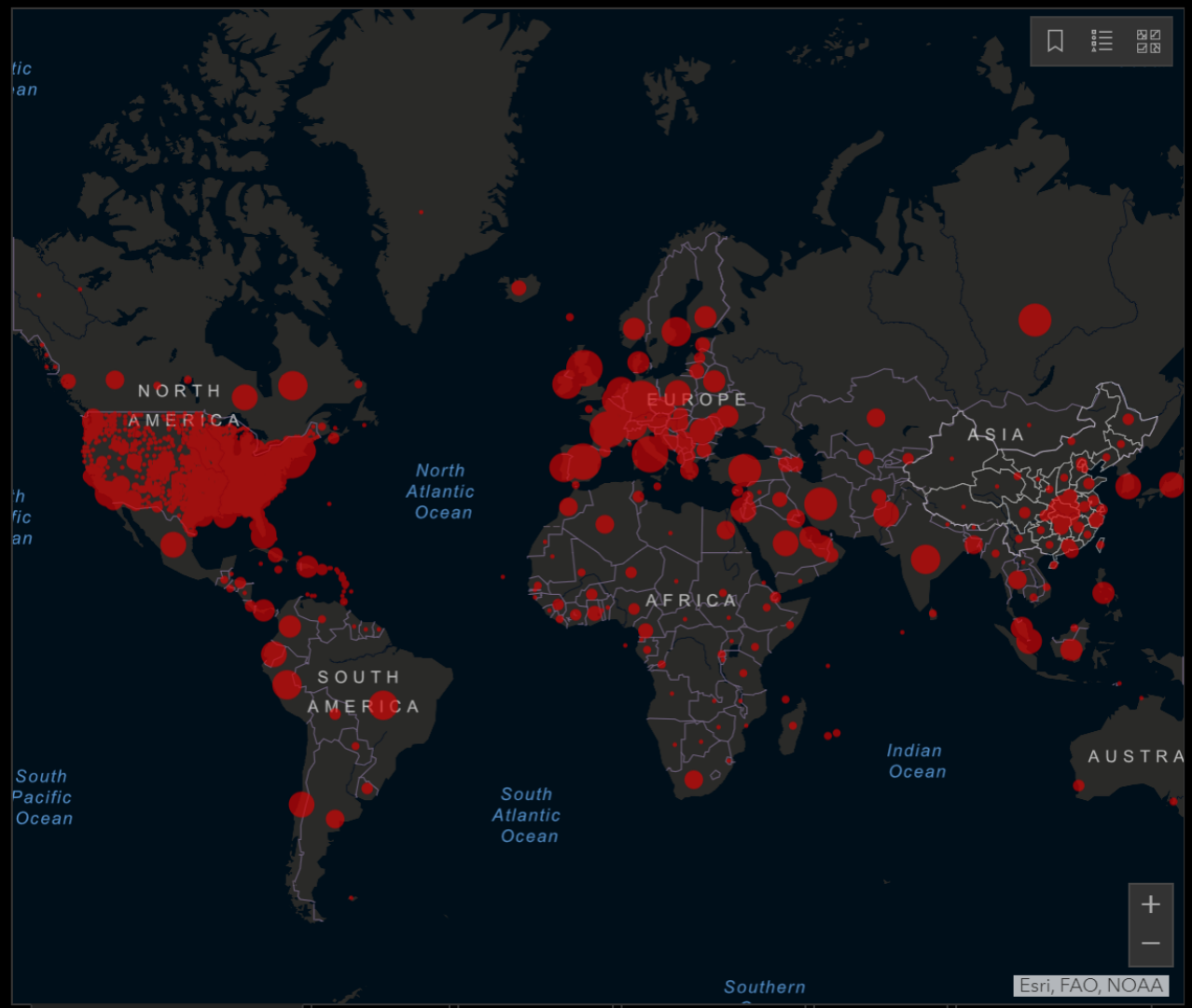
Total Confirmed
2,585,468

Confirmed Cases by Country/Region/Sovereignty

825,306	US
208,389	Spain
183,957	Italy
159,300	France
148,704	Germany
130,184	United Kingdom
95,591	Turkey
85,996	Iran
83,868	China
57,999	Russia
43,592	Brazil
41,889	Belgium
39,405	Canada
35,026	Netherlands
28,268	Switzerland
21,982	Portugal
20,178	India

Admin0

Last Updated at (M/D/YYYY)
4/22/2020, 8:39:28 AM



Cumulative Confirmed Cases | Active Cases | Incidence Rate | Case-Fatality Ratio | Testing Rate | Hospitalization Rate

185
countries/regions

Lancet Inf Dis Article: Here. Mobile Version: Here.
Lead by JHU CSSE. Automation Support: Esri Living Atlas team and JHU APL. Contact US. FAQ.

Data sources: WHO, CDC, ECDC, NHC, DXY, 1point3acres, Worldometers.info, BNO, the COVID Tracking Project (testing and hospitalizations), state and national government health departments, and

Total Deaths
178,845

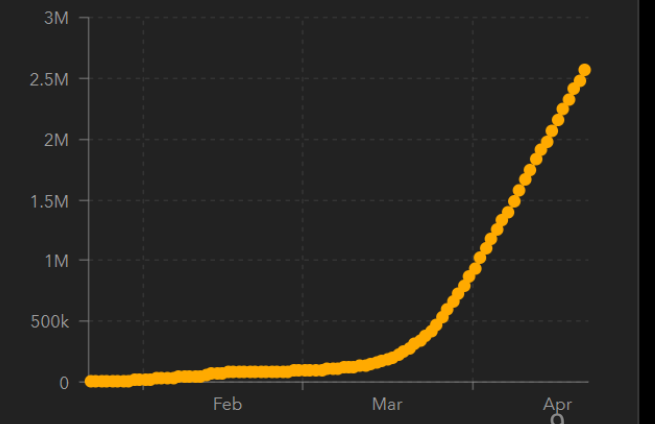
24,648 deaths	Italy
21,717 deaths	Spain
20,796 deaths	France
17,337 deaths	United Kingdom
14,887 deaths	New York City **New York** US
6,262 deaths	Belgium
5,391 deaths	Iran
5,100 deaths	Germany

Deaths | Recovered

Total Test Conducted in U.S.
4,163,464

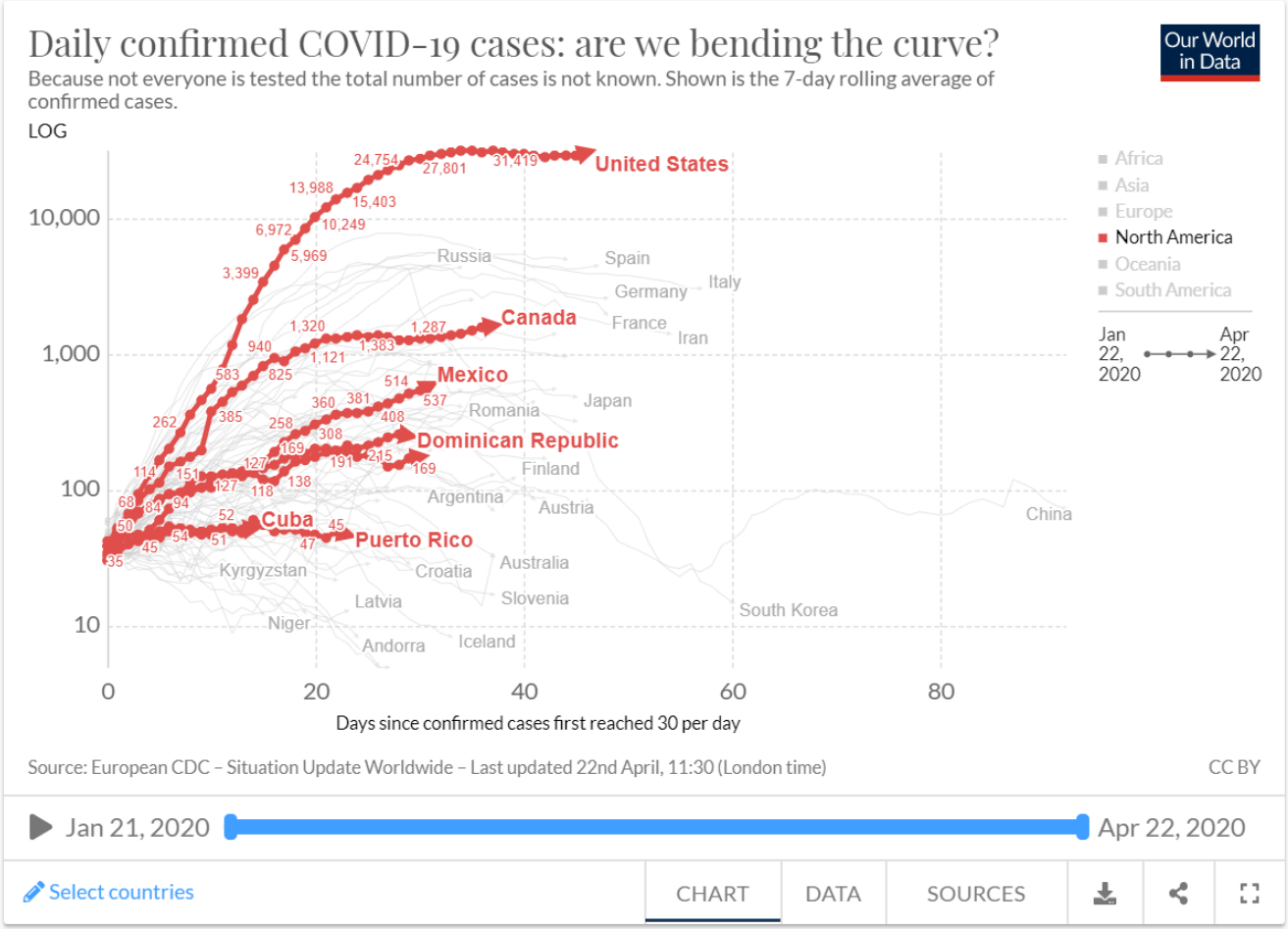
649,325 tested	New York US
292,906 tested	California US
282,340 tested	Florida US
205,399 tested	Texas US
184,826 tested	New Jersey US
175,372 tested	Massachusetts US
166,851 tested	Pennsylvania US
154,997 tested	Illinois US

US Tested



Confirmed | Logarithmic | Daily Cases

Daily confirmed cases: are we bending the curve?



To bring the pandemic to an end, **every country has to bring the curve of daily cases down to zero.**

This chart allows you to track whether countries are achieving this or not.

This chart shows the same data as before, but now adjusted for the size of the population – it shows **daily confirmed cases per million people**.

How you can interact with this chart

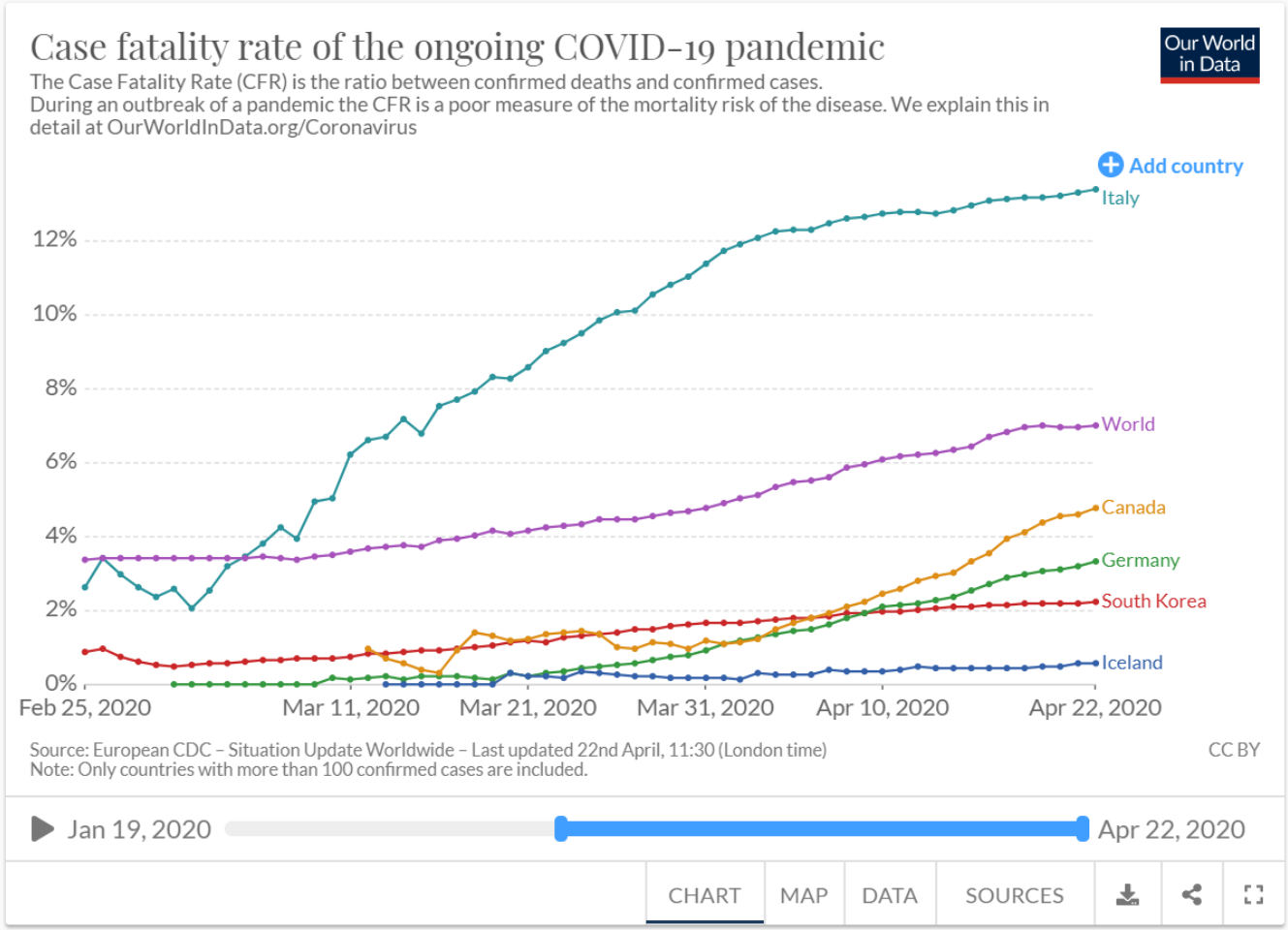
The default log view is helpful to compare the growth rates between countries: on a logarithmic scale the steepness of the line corresponds to the growth rate.

But in this chart, as in many of our charts, you can switch to a linear axis. Just click on 'LOG'.

Here is an explanation for how to read logarithmic axes.

Related chart: trajectories of daily confirmed cases (per capita)

The case fatality rate



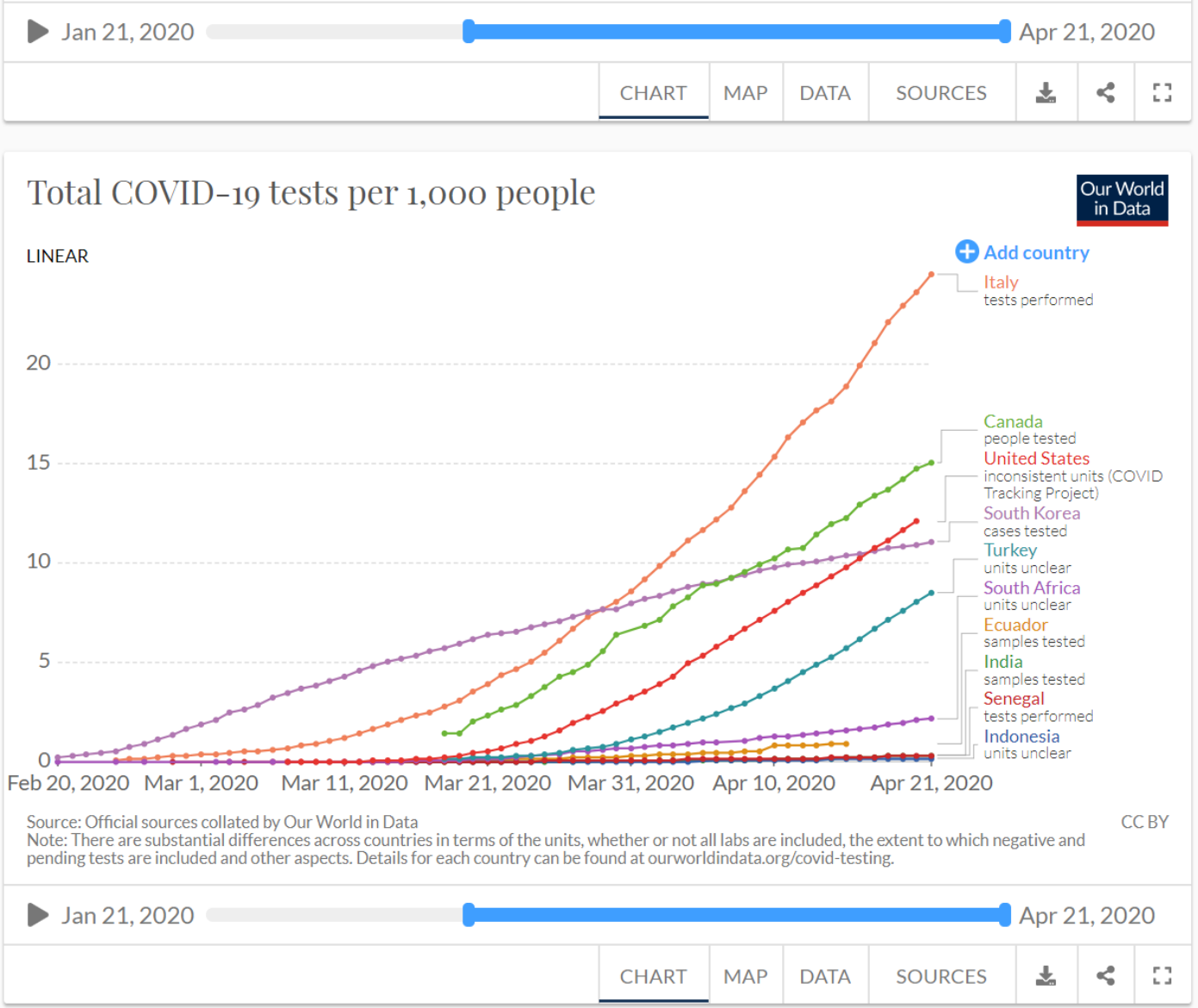
The case fatality rate is simply the ratio of the two metrics shown in the chart above.

The case fatality rate is the number of confirmed deaths divided by the number of confirmed cases.

This chart here plots the CFR calculated in just that way.

During an outbreak – and especially when the total number of cases is not known – **one has to be very careful in interpreting the CFR**. We wrote a detailed explainer on what can and can not be said based on current CFR figures.

Related chart: The **total** confirmed deaths and cases over time



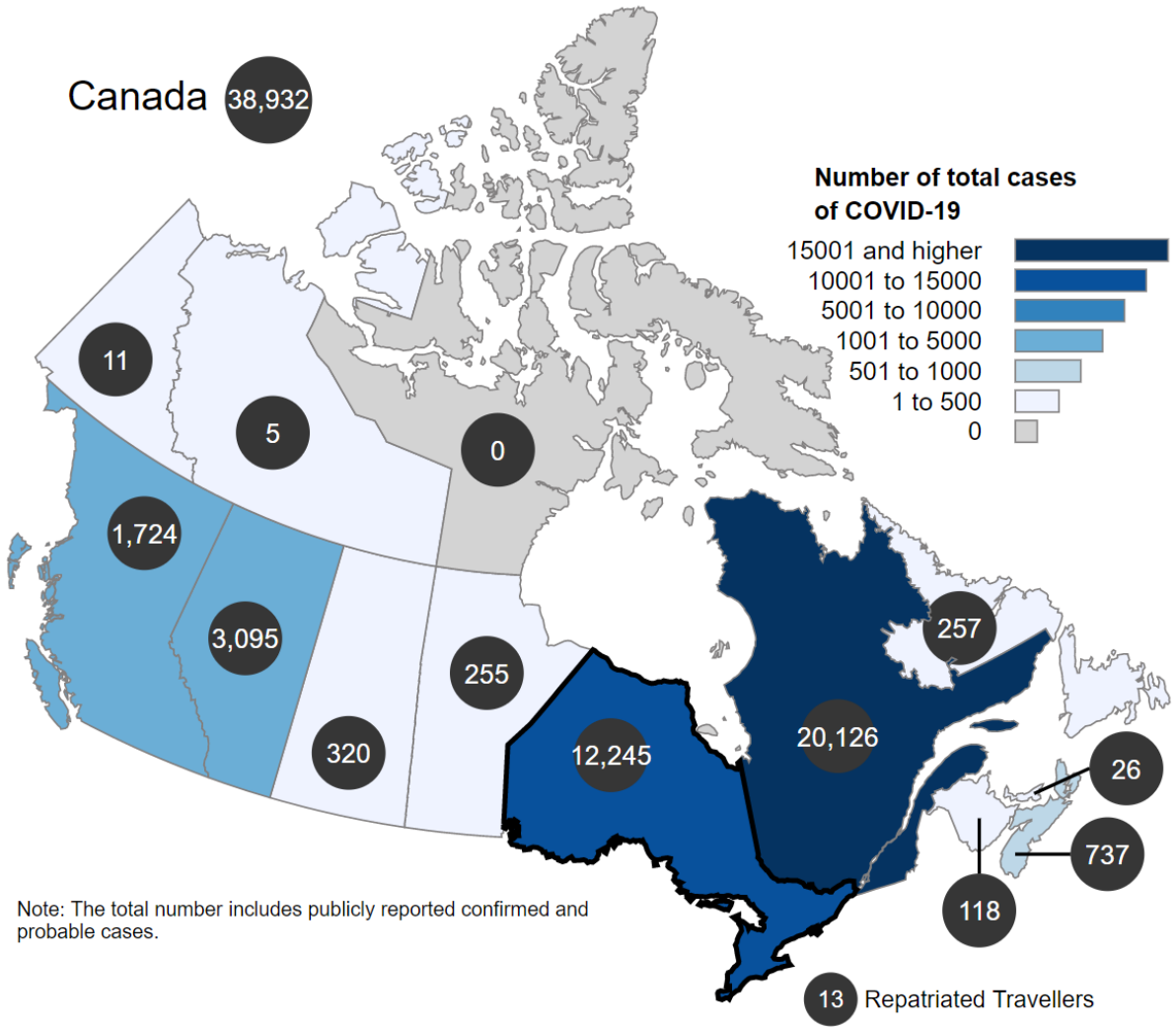
Tests per day

The two charts shown here show the *daily* number of tests, or people tested, in absolute terms and per thousand people respectively.

Number of COVID-19 Total Cases in Canada on April 22nd, 2020

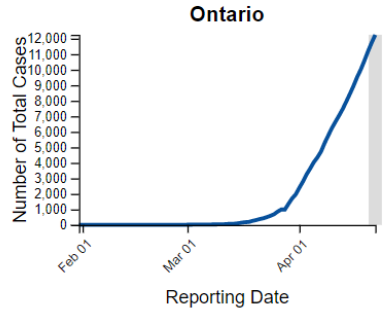
Last Data Update 2020-04-22 11:00 EDT

Hover over provinces and territories to see cases over time or hit the play button to animate the map.



Note: The total number includes publicly reported confirmed and probable cases.

The number of COVID-19 total cases in **Ontario** was **12,245** as of April 22nd, 2020.



Play .csv

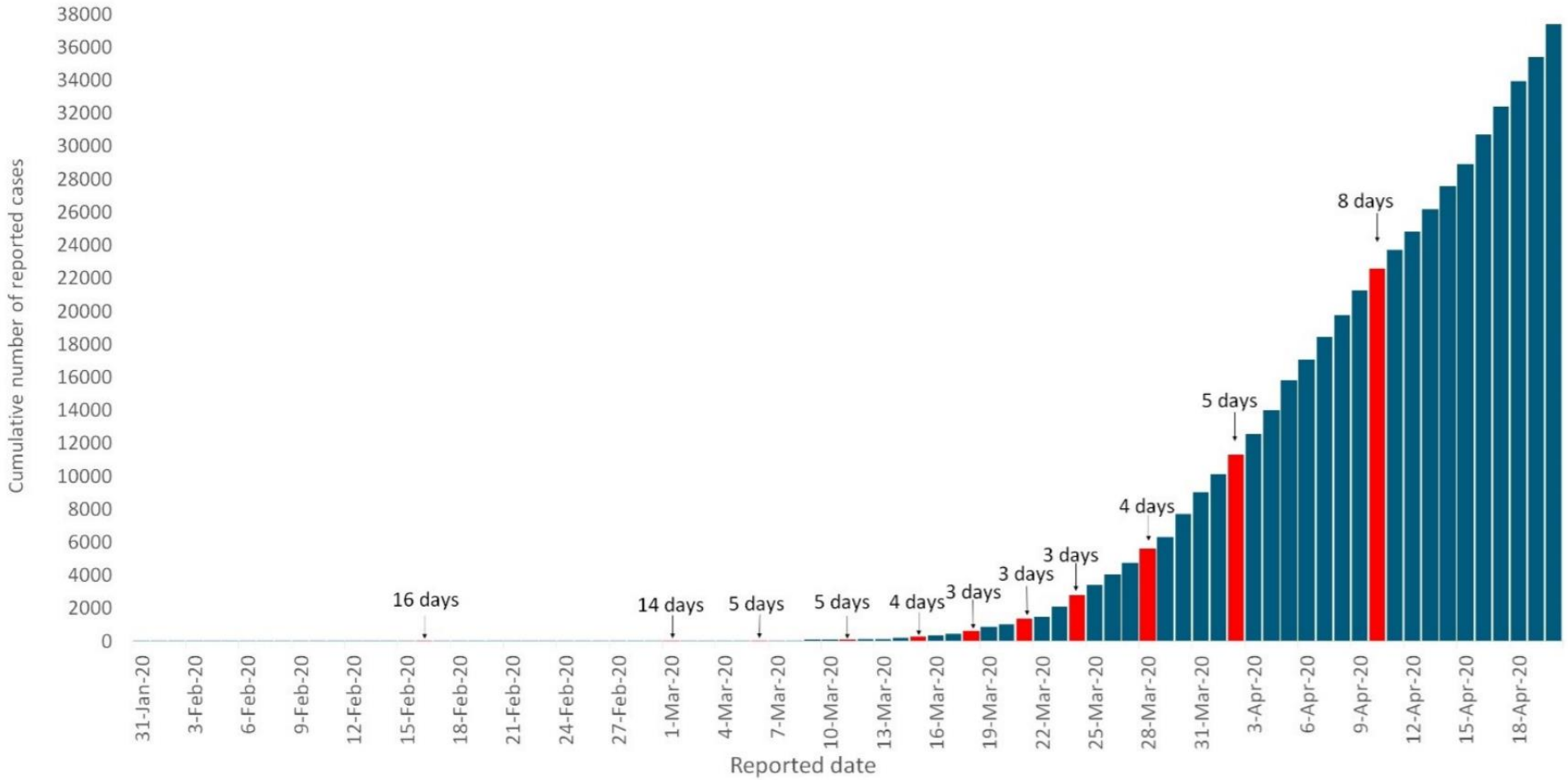
▶ Map - Total Number of COVID-19 Cases in Canada - Text Description

COVID-19 Virtual Assistant

The epidemic doubling period of COVID-19 cases in Canada defined as the number of days between doubling of cumulative case counts is marked with red bars.

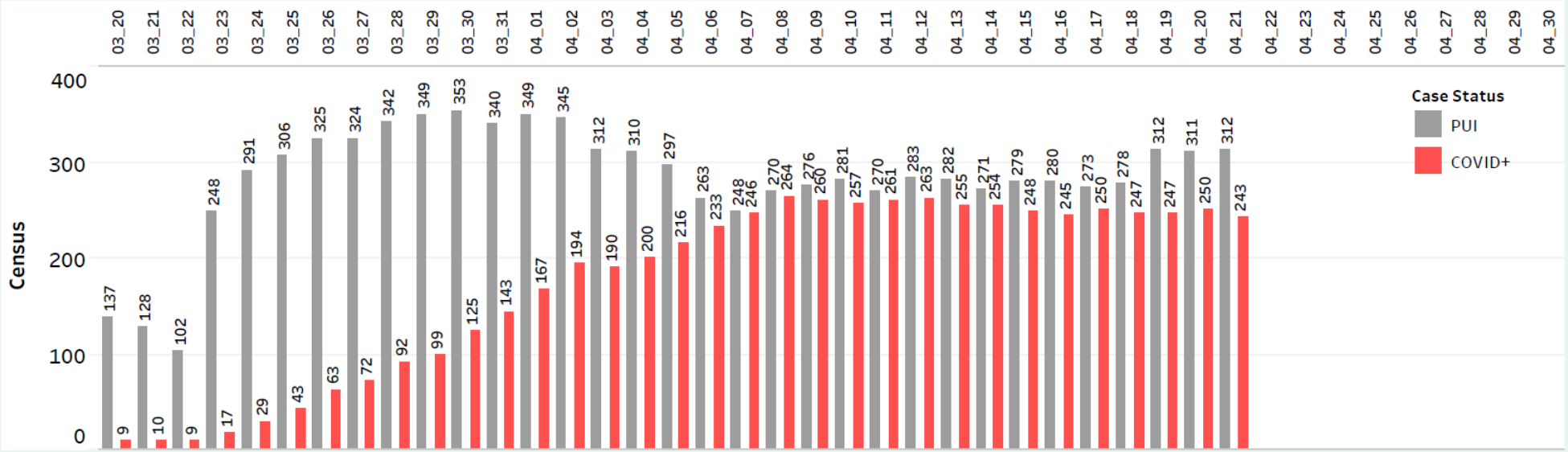
- The rate of doubling of reported cases in Canada has changed from doubling about every 3-4 days in the period March 12 to 28 to doubling approximately every 5-8 days during the period March 29 to April 10.

Figure 2. Doubling time of cumulative number of reported COVID-19 cases in Canada by date of report

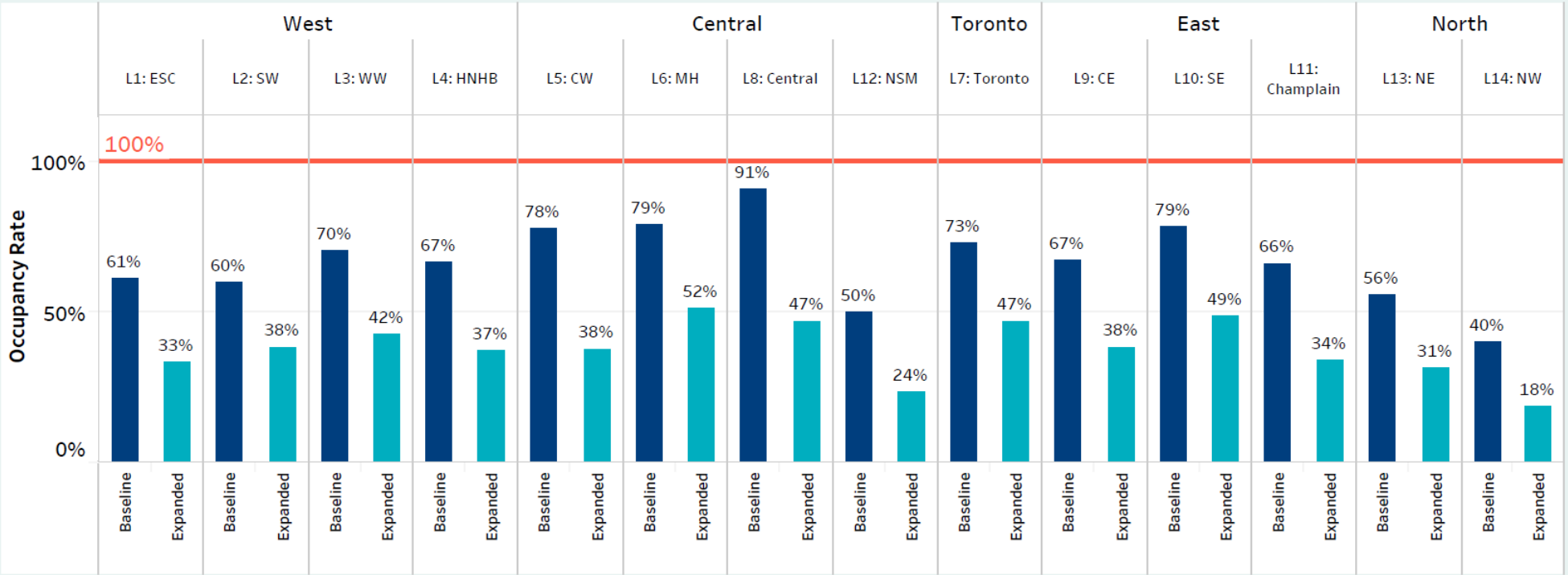


ICU's

Daily Trend of Critical Care COVID+ and PUI Census



Critical Care Bed Occupancy Rate for Baseline Capacity and Expanded ICU Capacity



Summary of cases of COVID19 Ontario		
	number	%
Number tested	184,531	
Number of cases	12,245	4.3% ↑
Test done previous day	10,361	
Resolved	6221	
Deceased	659	
In hosp	878	

CORE model projections for COVID resources

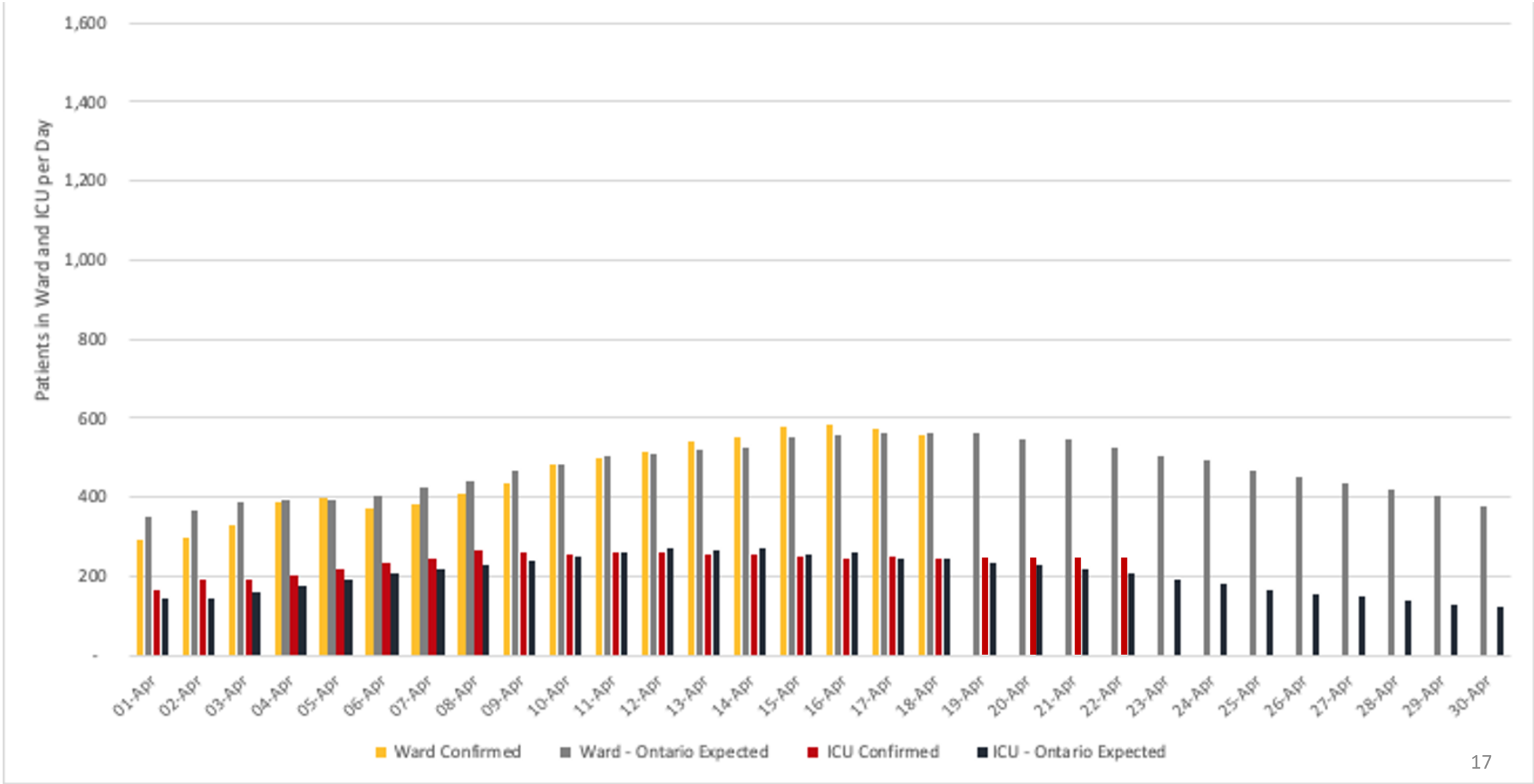


Table 1. Cumulative incidence of mortality (case-fatality risk) from individual-level data, with recovery as competing risk, among COVID-19 confirmed positive cases in Ontario as of April 15, by age, and case-fatality ratio from aggregate data on cases and deaths

Age group	No. at risk	Cumulative incidence, %	Case-fatality ratio, %
<20	8394	0	0
20-29	8203	0	0
30-39	7257	0	0.1
40-49	6212	0.2	0.6
50-59	4971	0.6	1.0
60-69	3426	1.4	2.4
70-79	2238	4.5	10.7
80-89	1444	10.5	15.5
90+	571	18.7	18.9
Total	---	3.1	4.5

Cumulative incidence is estimated controlling for patients' gender.

Data up to April 15, 2020

Bignami-Van Assche et al, https://www.medrxiv.org/content/10.1101/2020.04.16.20067751v1 on line accessed April 22nd, 2020

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COVID-19: Learning From Clinical Case

DR. HEATHER ROSS

49 yo man
Admitted April 16th with shortness of breath
Longstanding DCM – known to HF program
Shortness of breath, no fever
BNP on admission 2980!!

CXR – as shown

2DE – LV severely dilated. EF <20%. No LV thrombus is seen.

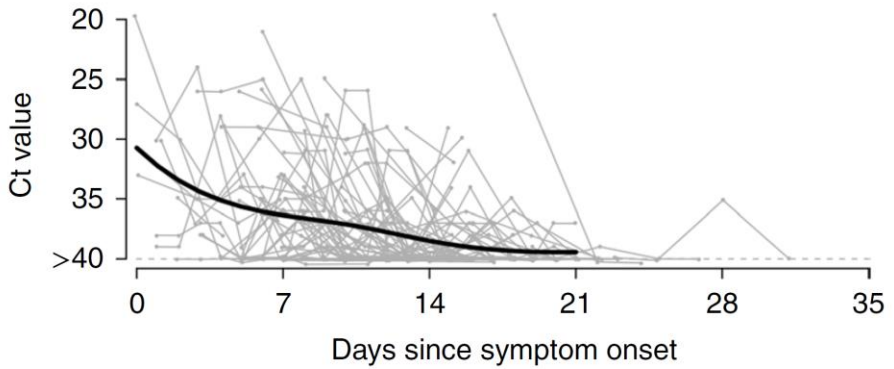
NP swab done April 20th + COVID19

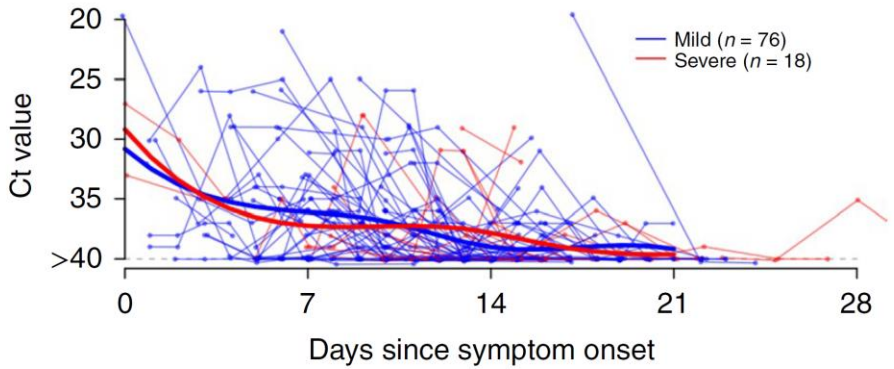
49 yo man
Admitted April 16th with shortness of breath
Longstanding DCM – known to HF program
Shortness of breath, no fever
BNP on admission 2980!!

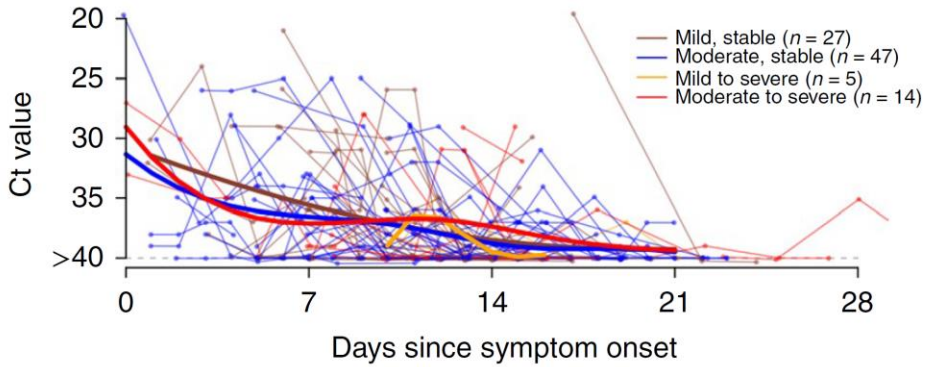
CXR – as shown

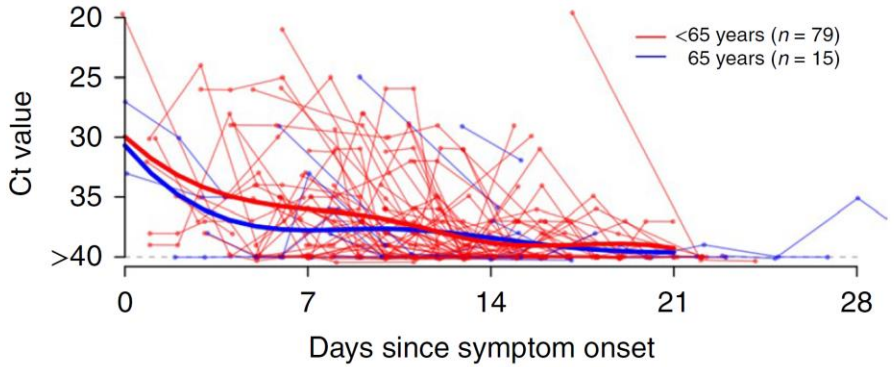
2DE – LV severely dilated. EF <20%. No LV thrombus is seen.

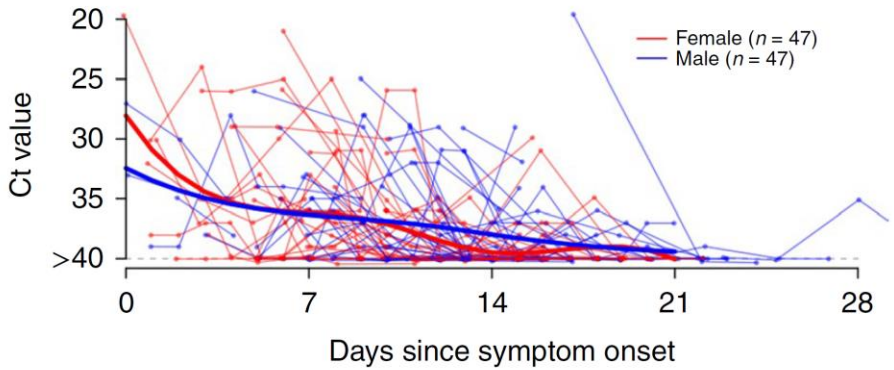
Temporal patterns of viral shedding

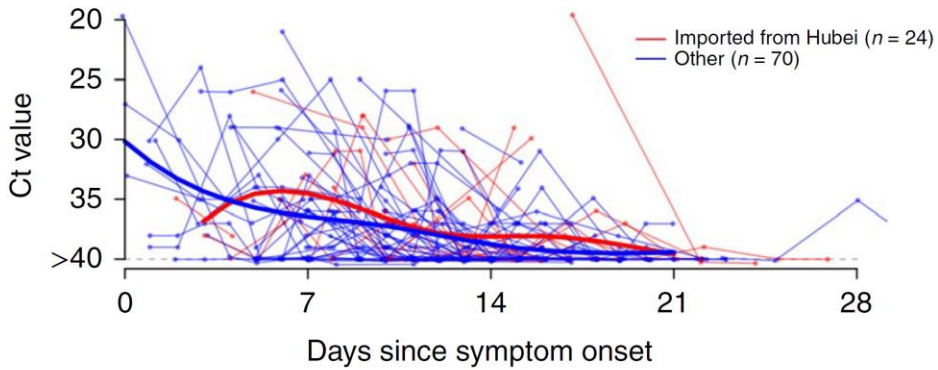












N = 94 lab-confirmed C19

Highest viral load in throat swabs at the **time of symptom onset**

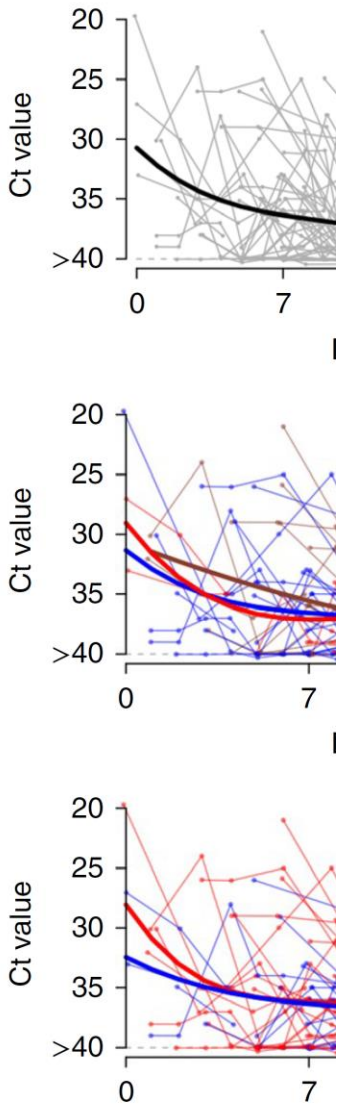
inferred that infectiousness peaked on or before symptom onset.

We estimated that 44% (95% CI, 25–69%) of secondary cases were infected during the index cases' **presymptomatic stage**, in settings with substantial household clustering, active case finding and quarantine outside the home.

He et al, Nat Med 2020

Temporal patterns of viral shedding

N = 94 lab-confirmed C19

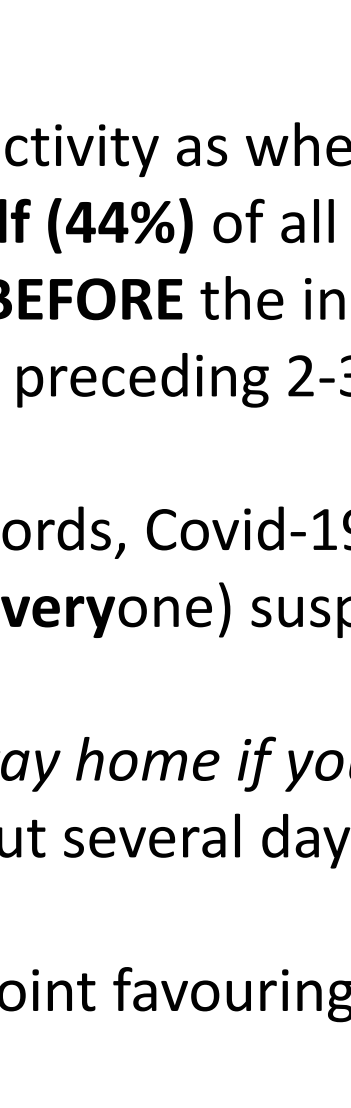


‘peak’ infectivity as when symptoms first begin, and suggest that **almost half (44%)** of all traceable cases of Covid-19 transmission occurred **BEFORE** the index case became symptomatic… typically within the preceding 2-3 days.

In other words, Covid-19 transmission can occur before anyone (actually **every**one) suspects they are infected.

So, the “*stay home if you are sick*” guidance is great and obviously logical – but several days too late.

Another point favouring MORE TESTING.



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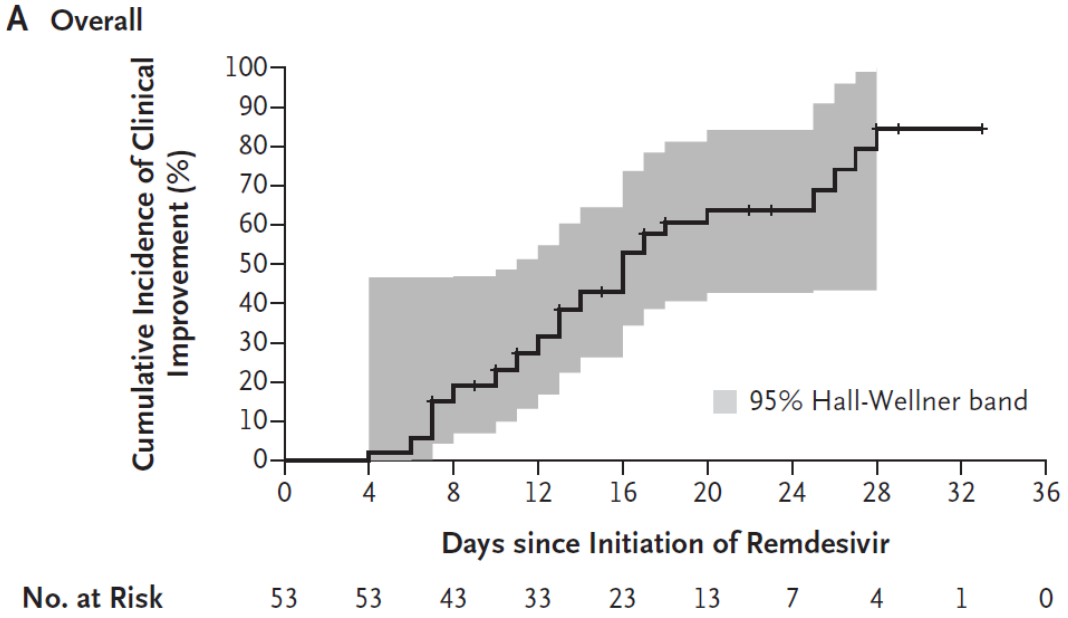
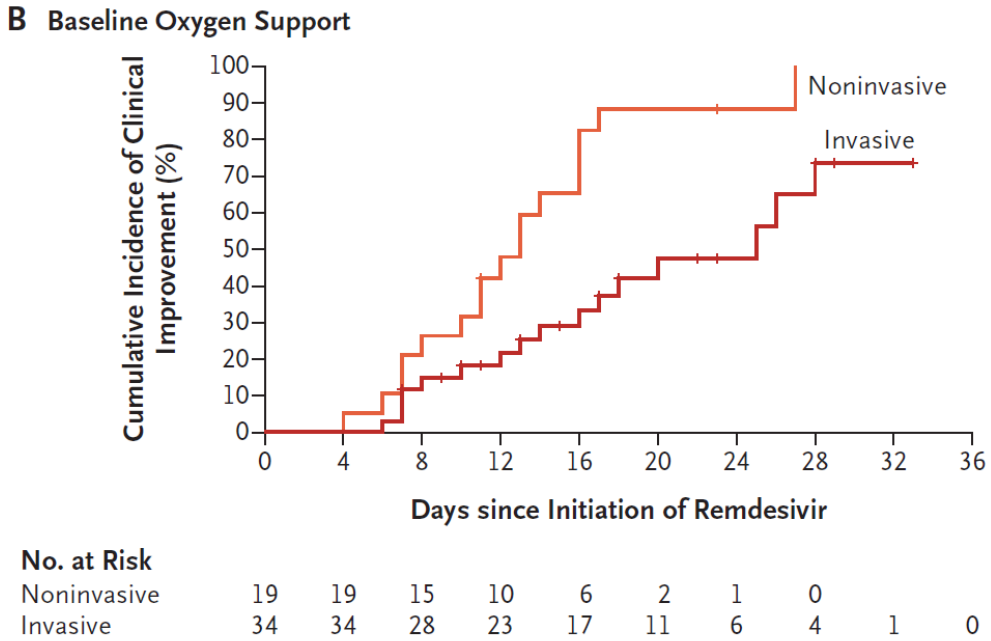
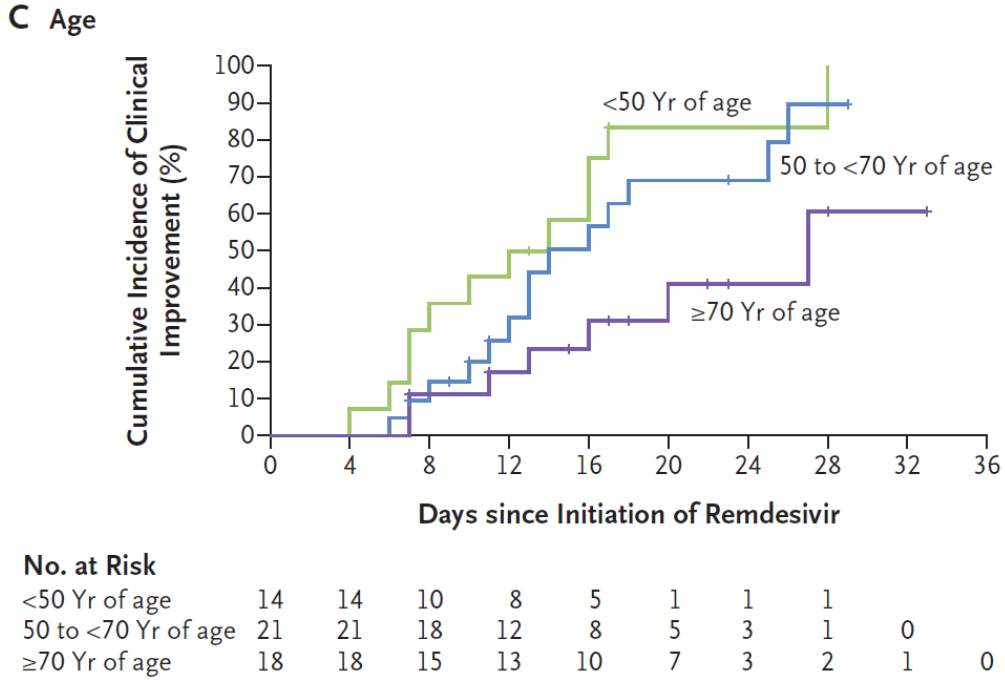
He et al, Nat Med 2020

Remdesivir

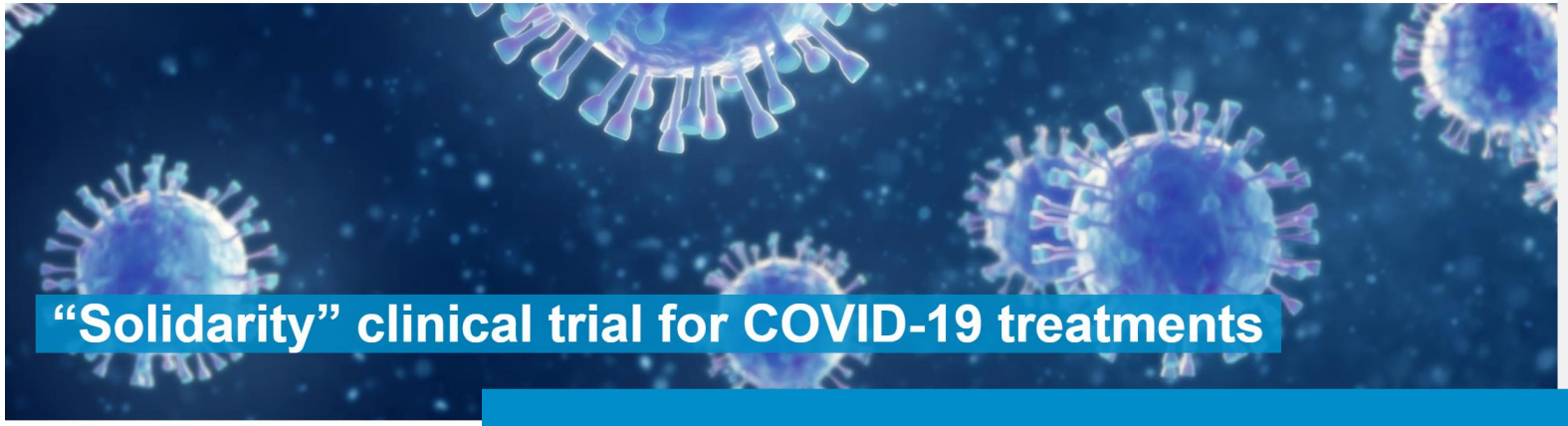
Inhibits viral RNA polymerases
Compassionate use study
61 patients
O2 sat <94%
10d course of remdesivir
Clinical improvement in 36 of 53 patients treated







DOI: 10.1056/NEJMoa2007016



“Solidarity” clinical trial for COVID-19 treatments

Treatment options under study

Based on evidence from laboratory, animal and clinical studies, the following treatment options were selected: Remdesivir; Lopinavir/Ritonavir; Lopinavir/Ritonavir with Interferon beta-1a; and Chloroquine or Hydroxychloroquine.

Remdesivir was previously tested as an Ebola treatment. It has generated promising results in animal studies for Middle East Respiratory Syndrome (MERS-CoV) and severe acute respiratory syndrome (SARS), which are also caused by coronaviruses, suggesting it may have some effect in patients with COVID-19.

Lopinavir/Ritonavir is a licensed treatment for HIV. Evidence for COVID-19, MERS and SARS is yet to show it can improve clinical outcomes or prevent infection. This trial aims to identify and confirm any benefit for COVID-19 patients. While there are indications from laboratory experiments that this combination may be effective against COVID-19, studies done so far in COVID-19 patients have been inconclusive.

Interferon beta-1a is used to treat multiple sclerosis.

Chloroquine and **hydroxychloroquine** are very closely related and used to treat malaria and rheumatology conditions respectively. In China and France, small studies provided some indications of possible benefit of chloroquine phosphate against pneumonia caused by COVID-19 but need confirmation through randomized trials.

World Health Organization

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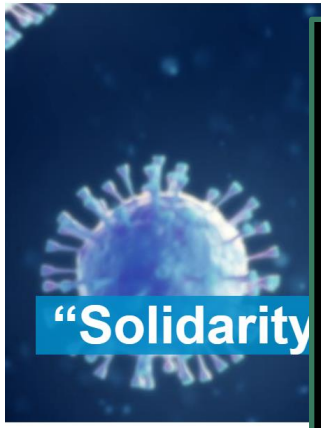
Home / Emergencies / Diseases / Coronavirus disease 2019 / Global research on coronavirus disease (COVID-19) / "Solidarity" clinical trial for COVID-19 treatments

Sanders et al, JAMA doi:10.1001/jama.2020.6019



No proven effective therapies for this virus currently exist.

The most promising therapy is **remdesivir**. currently being tested in ongoing randomized trials.

Oseltamivir has not been shown to have efficacy
Corticosteroids are currently not recommended.

Current clinical evidence does not support stopping angiotensin-converting enzyme inhibitors or angiotensin receptor blockers in patients with COVID-19.

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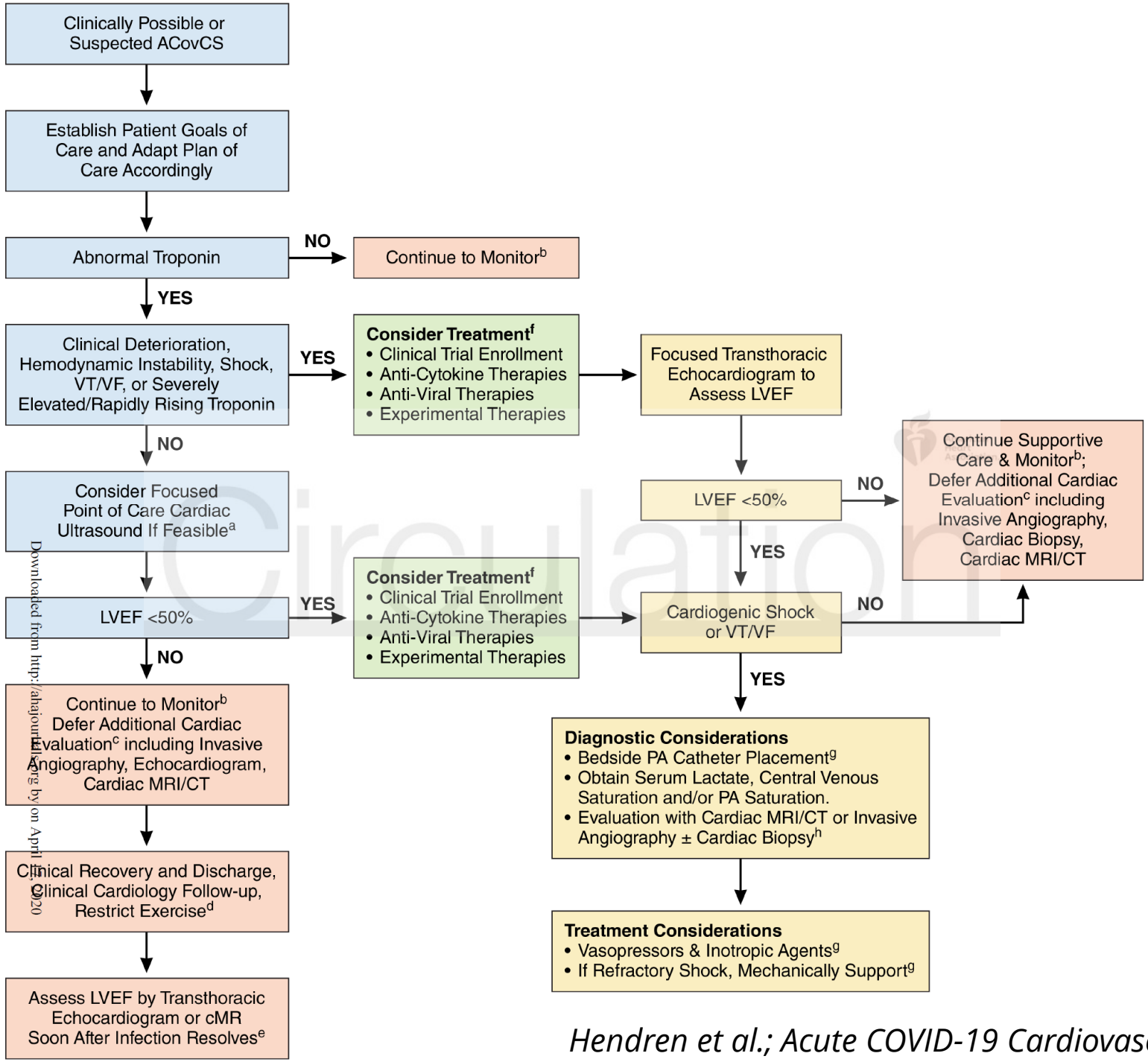

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Hendren et al.; Acute COVID-19 Cardiovascular Syndrome. Circ 2020

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Access to Care Beyond the Surge - Looking Ahead

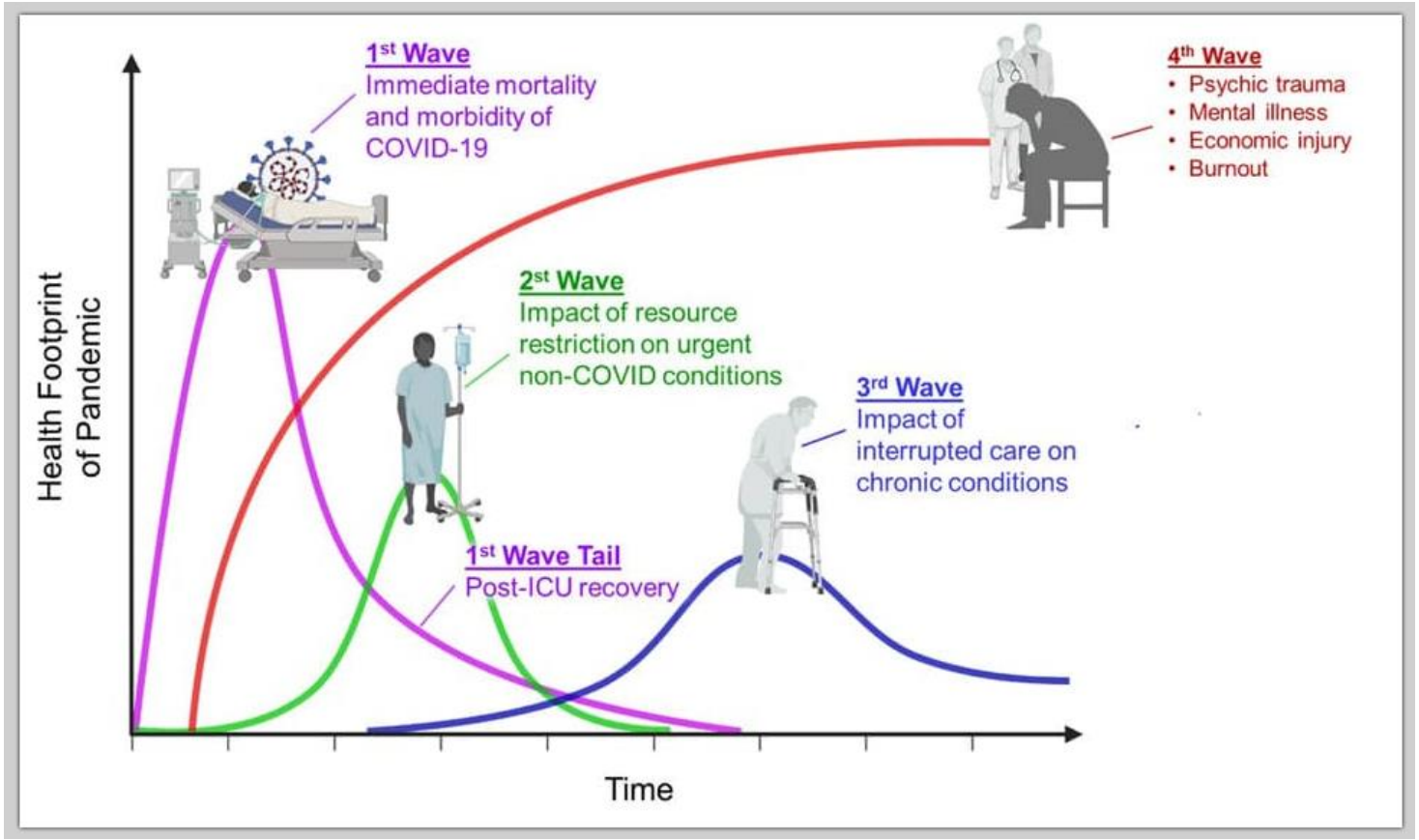
Transplant Activity

DR. HEATHER ROSS

DR. STUART SMITH

The impact of COVID-19 on care needs

- Planning must continue to address the ongoing care needs beyond the initial demand for immediate, acute care resources during a COVID-19 surge



Source: Dr. Victor Sun, Atlanta

CorHealth Ontario

Guiding principles

	Low risk	Medium risk	Medium risk	High risk
NYHA FC	1	2-3	2-3	3-4
GDMT	yes	optimized	Still titrating	
Symptoms	none	No orthopnea, PND or syncope	No orthopnea, PND or syncope	Recent or new syncope, ICD shock,
Other		Stable/low BNP	Stable/low BNP	Home iv inotropes Requiring iv diuretics High and/or increasing BNP Worsening cardiorenal syndrome Multiple admissions in last 6 mo Recent (<30d) hospital discharge for ADHF Worsening volume overload Work up for advanced therapies (HTx, VAD)
Follow up	Defer follow up 6 mo	As per usual	More frequent for titration Medly enabled	Early follow-up
Mode of Follow up	standard	Medly/telephone/OTN	Medly/telephone/OTN	On board Medly/OTN/*in person

*Note: in-person visits should be limited to patients for whom critical volume assessment is required, or for those with high likelihood of requiring admission and/or IV therapies

Caveat: chronic HF patients with worsening cough, breathlessness should be considered for COVID19 testing

Trillium Gift of Life Network

Trillium Gift of Life Network (TGLN)

Provincial Guidance to Phased Approach

Adult Cardiac Transplant Restart

Ontario

I. Canadian Cardiac Transplant Network Status Criteria for Adult Cardiac Transplantation

Status 4

1) Mechanically ventilated patient on high-dose single or multiple inotropes ± mechanical support (eg. Intra-aortic balloon pump, extra-corporeal membrane oxygenation (ECMO), abiomed BVS5000, or biomedicus), excluding long-term ventricular assist devices (VAD).

2) Patient with VAD malfunction or complication, such as thromboembolism, systemic device-related infection, mechanical failure, or life-threatening arrhythmia

3) Patient should be recertified every 7 days as a Status 4 by a qualified physician, if still medically appropriate.

Status 4S

1) High PRA (>80%)

Status 3.5

1) High-dose or multiple inotropes in hospital, and patients not candidates for VAD therapy or no VAD available.
2) Acute refractory ventricular arrhythmias.

II. Canadian Cardiac Transplant Network Status Criteria for Adult Cardiac Transplantation

Status 3

1) VAD not meeting Status 4 criteria.
2) Patients on inotropes in hospital, not meeting above criteria.
3) Heart/Lung recipient candidates.
4) Cyanotic congenital heart disease with resting saturation <65%.
5) Congenital heart disease – arterial-shunt-dependent.
6) Adult-sized complex congenital heart disease with increasing dysrhythmic or systemic ventricular decline.

Status 2

1) In-hospital patient, or patient on outpatient inotropic therapy not meeting the above criteria.
2) Adult with cyanotic CHD: resting 0_2 saturation 65–75% or prolonged desaturation to less than 60% with modest activity (i.e., walking).
3) Adult with Fontan palliation with protein-losing enteropathy.
4) Patients listed for multiple organ transplantation (other than heart-lung).

Status 1. All other out-of-hospital patients.

Current Level of Activity (RAMP DOWN PHASE)

Transplant Restart Level	Description of Conditions	Local Critical Care Tier	Description of Cardiac Transplant Activity
Current level In Ramp Down Phase	Ongoing increases in COVID activity within the community and ongoing increased ICU/ward bed utilization across the Province (no or minimal flattening of the curve is observed).	Tier O – 1 (< 100 – 110% capacity) Normal to Minor Surge	Offer ADULT hearts to status 4 and 4s Ontario/National programs and then to status 3.5 and 3 in Ontario. No Status 3 - LVAD If no suitable patients in Ontario, offer heart Nationally for 1 ,2, 3 and 3.5. If no suitable patients Nationally, the heart could be considered for a status 1 or 2 patient in Ontario if Ontario institution is able to accommodate

I. Key Principals

- Understood : Cardiac transplantation requires the utilization of critical care beds for periods ≥ 5 days

- Cardiac transplant activity during the COVID-19 Pandemic has been significantly curtailed for two primary reasons:

1. ***To preserve hospital infrastructure and resources to allow treatment of potential COVID19 patients***

2. ***To avoid iatrogenic immunosuppression during a time where community or hospital exposure to the transplant recipient is a possibility.***

II . Key Principals

- In restarting transplant activity , local circumstances may “green light” certain regions while others remain “yellow” or “red light

- Transplant activity resumption will depend additionally on MOH, OH, local hospital approval (hence even greater need for a cohesive plan from Transplant Programs)

- During the COVID- 19 pandemic , any decision to proceed with a given potential transplant will require a joint discussion between Transplant Cardiology , CV Surgery , and Critical Care .

Heart Transplant Restart COVID Conditions

Each Heart Transplant Restart Phase is described using the following COVID conditions:

Phase 1 : A significant flattening of the pandemic curve is observed in Ontario. This includes a stable number of new cases.

Phase 2: The number of new COVID cases in Ontario is flat or decreasing for a period of time (>2 weeks).

Phase 3: Prolonged stability and /or decreases in COVID activity.

Phase 4: Clear evidence of stable low COVID activity.

I . Conditions to Restart Transplant Activity

- Ensure risk of iatrogenic COVID-exposure minimized by developing local COVID-free pathways
- Ensure a sustainable, safe set of essential transplant specific processes (personnel, diagnostic imaging, lab testing, outpatient clinics)
- Donor / Recipient pre-transplant COVID screening
- Processes in place to protect procurement teams and TGLN personnel . Where possible, “Local” procurement teams should be considered to mitigate risk to the procurement team.

II . Conditions to Restart Transplant Activity

- Individual patient risk-benefit assessment and appropriate informed consent
- Imperative to consider OTHER FACTORS that may influence ability to start – up eg . Availability of PPE , Availability of critical care medication such as propofol , midazolam , inotropes, vasodilators , etc

Tiers of Ontario Critical Care Resource Allocation

- The Critical Care COVID Pandemic Plans are similar between UHN , Ottawa Heart Institute and London Health Sciences but not identical . All appear to be based upon the Ontario Health Clinical Protocol for Major Surge of COVID-19 .

- The most objective and generalizable criterion to base the decision to restart cardiac transplant activity appears to be “ % surge activity”.

COVID Care Tier	ICU Surge Level	ICU Surge %	Description of Heart Transplant Activity
0	Normal **Green**	< 100%	Usual transplant activity (assuming Ontario institution is able to accommodate)
1	Minor **Yellow**	100 - 110%	• Status 4 and 4s Ontario/National programs and then to status 3.5 and 3 in Ontario. • No Status 3 – LVAD • If no suitable patients in Ontario, offer heart Nationally for 1 ,2, 3 and 3.5. • If no suitable patients nationally, the heart could be considered for a status 1 or 2 patient in Ontario (if Ontario institution is able to accommodate)
2	Moderate **Orange**	111 - 135%	• Status 4 and 4s • Ontario/National programs and then to status 3.5 and 3 in Ontario • No Status 3 – LVAD
3	Severe **Red**	136 - 175%	• Status 4 cardiac transplant only (if Ontario institution is able to accommodate)
4	Massive	> 175%	• No cardiac transplantation

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Open Forum Discussion

Open Discussion

- **How is your hospital reacting to and interpreting the cautious optimism towards a potential increase in hospital-based activity, and the current capacity of beds?**
  - Has anything changed in the last 1-2 weeks?
  - What are you currently doing to manage new referrals to HF outpatient clinical services?
- **Can you share your experiences, and/or challenges/successes using any telemedicine, telemonitoring, or virtual care resources during this time?**
- **From the provider level experience perspective:**
  - Are there any challenges/successes you would like to share?
  - How can we best support provider-level wellness during this time?
  - Are there any supports that you are finding useful at this time/would recommend?

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Next Steps

DR. HEATHER ROSS / KAREN HARKNESS

Next Steps & Wrap Up

- Next **COVID-19 Heart Failure Stakeholder Forum Meeting**
- CorHealth activities

- Are there other issues we should be considering / discussing?
- Are these meetings still helpful? How could they be more helpful?

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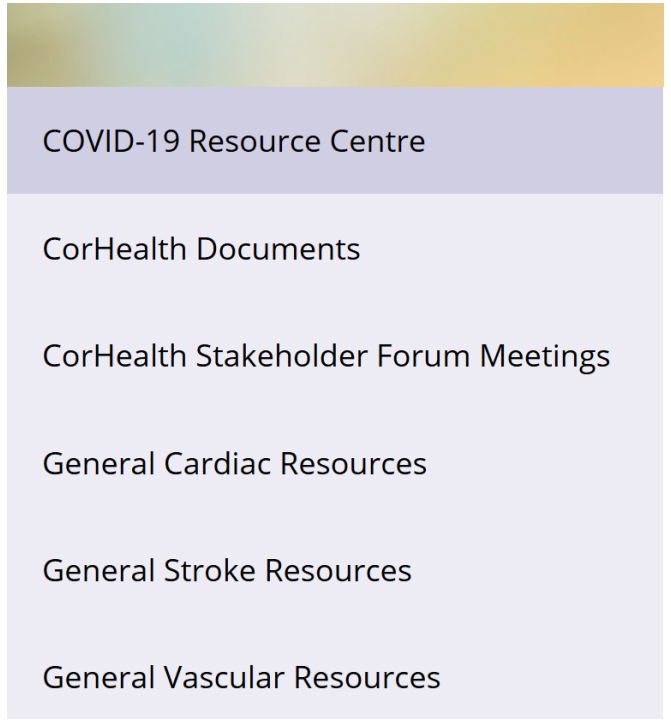
Appendix

CorHealth COVID-19 Resource Centre

- Accessible from the CorHealth homepage
- Updated twice a day at 10:30am and 5:30pm
- Includes:
  - General COVID-19-related documents
  - CorHealth Guidance Documents
  - Presentations & Summary notes from Cardiac, Stroke, and Vascular Forums
  - Cardiac-, Stroke-, and Vascular-specific COVID-19-related documents
- Organized from most recent resources at the top to oldest at the bottom of each page

COVID-19 Resource Centre Sections



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Note: the documents are being made available for sharing purposes only to support organizations as they navigate the challenges presented by COVID-19. If you have resources or tools you would like to share on this site, please send them to service@corhealthontario.ca.

Cardiac Procedures

CorHealth provides weekly reports to the 20 cardiac centres which reflect cardiac procedures volumes and wait lists

Work is underway to model (CORE Cardiac Module) different scenarios on the impact of health care resources related to the effect of cautiously resuming some procedures for high risk patients.

Information is shared weekly with cardiac centres and key findings are presented at the CorHealth Stakeholder Cardiac Forums.

Refer to the Stakeholder Cardiac Forum meetings section on the CorHealth COVID-19 resource centre for more information.