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Advancing cardiac, stroke and vascular care

CorHealth COVID-19 Vascular Stakeholder Forum #4

April 29, 2020 9:00-10:00 am

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

Conference ID: 9295169#

Agenda

TIME	DISCUSSION	ACTION REQUIRED	LEAD
9:00	1. Welcome • System Planning Updates • Forum Objectives	Information	Sheila Jarvis
9:10	2. Vascular Patient Triage/ Prioritization • CorHealth COVID-19 Vascular Memo #2	Information & Discussion	Dr. Sudhir Nagpal
9:25	3. CORE (COvid-19 Resource Estimator) Model Methods • CORE modelling of COVID-19 impact on hospital resource utilization	Information & Discussion	Guest Speaker: Dr. Beate Sander Director of Health Modeling & Health Economics, THETA
9:40	4. OMA Discussion • OMA Vascular Section Leads: Provincial & Federal financial support for small businesses	Information & Discussion	Guest Speakers: Dr. Heather Cox Vascular Surgeon, OMA Vascular Section Lead Dr. Justin Clouthier Vascular Surgeon, OMA Vascular Section Lead
9:55	5. Next Steps	Discussion	Mike Setterfield

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Welcome

SHEILA JARVIS

COVID-19 System Planning Updates

1. **COVID Surgical Services Pandemic Advisory Panel** – *Chair Dr. Jon Irish*
   - CorHealth was actively participating in the COVID-19 Surgical Services Pandemic Advisory Panel
   - Recommendations have been submitted and will likely be aligned to the report Dr. Chris Simpson is developing (see below)

2. **Ontario Health COVID-19 Health System Response Oversight Table** – *Chair Dr. Chris Simpson*
   - CorHealth, Dr. Madhu Natarajan, Dr. Harindra Wijeysundera, Dr. Sudhir Nagpal and Dr. Thomas Forbes (who are not members of the Committee) are meeting with Dr. Simpson twice a week for the short-term to ensure alignment of activities
   - The Committee will be providing a report to the MOH and Ontario Health in the coming week(s) about an approach to ramping up procedures and surgeries

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Meeting Objectives

1. Review final CorHealth COVID-19 Vascular Memo #2 - *Recommendations for an Ontario Approach to Prioritization of Vascular Surgical and Endovascular Procedures in Response to Phases of COVID-19*

2. Review CORE modelling of COVID-19 impact on hospital resource utilization

3. Discuss updates from the OMA Vascular Section Leads: Provincial & Federal financial support for small businesses

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Vascular Patient Triage/ Prioritization

DR SUDHIR NAGPAL

Vascular Patient Triage/Prioritization

- On March 27, 2020 CorHealth released the first Vascular COVID-19 Memo, which provided guidance to help vascular specialists prioritize / manage vascular patients during the **ramp down** of all non-essential services, elective surgeries, and other non-emergent clinical activity in response to COVID-19
  - **CorHealth COVID-19 Vascular Memo #1 - Recommendations for an Ontario Approach to Managing Vascular Surgery During COVID-19 (March 27, 2020)**
- Given changes in hospital resource capacity over the last month, CorHealth has worked with vascular stakeholders to discuss how best to preserve care capacity for vascular patients, while the province gradually **restores** health care capacity in the context of COVID-19. These recommendations have been captured within the second Vascular COVID-19 Memo
  - **CorHealth COVID-19 Vascular Memo #2 - Recommendations for an Ontario Approach to Prioritization of Vascular Surgical and Endovascular Procedures in Response to Phases of COVID-19 (April 29, 2020)**

Vascular Memo #2 - Guiding Principles

1. Keeping front line health care providers healthy and patients protected is vital
2. Minimizing the impact of COVID-19 on the mortality and morbidity of patients with Vascular disease is a priority
3. Aligning with province- and hospital-specific infection prevention and control policies and protocols is important
4. Promoting clinical activities aimed at preserving hospital resources (i.e. health care human resources, personal protective equipment, procedure rooms, Intensive Care Units, Emergency Departments) is a priority

Vascular Memo #2 - Recommendations

PART 1: DECISION-MAKING TO SUPPORT ESSENTIAL VASCULAR SURGERY AND INTERVENTIONAL SERVICES

1. Medically-necessary, time-sensitive vascular surgery and endovascular procedures should be considered based on the patient's clinical status and risk factor profile, and on the available resources and capacity at the treating hospital (e.g. human resources, PPE, medications, bed availability).

2. Hospital capacity, in the context of COVID-19 will vary over time and across regions. Hospitals should consider strategies to preserve resources (e.g. OR, ICU beds, etc.) required for time sensitive vascular and other surgical and medical services, with frequent review of this strategy as health system circumstances change.

3. Maximizing safety of medical personnel while maintaining appropriate allocation of PPE may require a strategy of extensive pre-op testing and risk stratification of vascular patients. Additional guidance is found in the Ministry of Health COVID-19 Provincial Testing Guidance Update (April 15, 2020).

4. Vascular services require coordinated access to diagnostic imaging which is vital for timely quality care. These resources must be available to meet the need of vascular services.

5. In cases where an open surgical approach or an endovascular approach is clinically equivalent (e.g. open aortic aneurysm repair or EVAR), a less invasive approach with a shorter total and ICU length of hospitalization may be the preferred choice of therapy.

6. Regular and timely sharing between hospital vascular programs of information, experiences and learnings related to patient care and practice changes in the context of COVID-19 will support vascular stakeholders in Ontario (e.g. CorHealth Vascular COVID-19 Forum).

Vascular Memo #2 - Recommendations

PART 2: WAITLIST MANAGEMENT

1. Hospitals should ensure there is a process in place to assign accountability for the active management of the vascular procedure waitlist(s).
   - Mechanisms include ongoing review of patient priority, as well as the assessment of the centres' ability to provide vascular surgical and interventional services during the COVID-19 pandemic.
2. To support waitlist prioritization decisions, guidance is provided in appendix 1 for inpatients and outpatients who require vascular care.
   - **Patient hierarchy:** emergent (priority A) > urgent – inpatients (priority B) > urgent – outpatients (priority B) > booked outpatients (priority C-E); however, booked outpatients who have had an extended wait time require special consideration for prioritization of their procedure.
   - **Priority level** time-to-treat recommendations are: Priority A (< 24 hours), Priority B (<2 weeks), Priority C (2-4 weeks), Priority D (4-8 weeks), Priority E (≥8 weeks).
3. Considering regional variation of COVID-19 prevalence and hospital capacity, vascular programs and providers should emphasize collaborative efforts between hospitals to address waitlists and resource constraints to ensure continued access to vascular care.
4. Vascular specialists should consider a consistent approach to documenting patient triage decision-making.
   - In addition to documenting all triage decisions in a patient's medical record (i.e. the standard of care), teams may consider using additional decision documentation tools. A sample case review documentation template (created by CorHealth Ontario, Appendix 2), can be utilized or adapted by care providers and teams.

Vascular Memo #2 - Recommendations

PART 3: OTHER CONSIDERATIONS

1. To minimize the exposure to COVID-19, vascular specialists should consider the use of virtual care tools and resources (e.g. OTN, telephone) to assess new referrals, review patients on the waitlist and conduct follow up assessments.

Appendix 1: Guide to Vascular Procedure Prioritization

VASCULAR CONDITION	PRIORITY
ANEURYSM	
Note: AAA below include fusiform aneurysms. Saccular, or rapidly expanding AAA require individual clinical assessment for surgical acuity due to higher rupture risk.	
AAA ruptured	A
AAA symptomatic	A
Infected prosthetic graft removal and revascularization	B
AAA Men >7cm, Women >6.5cm	B
AAA Men 6-7cm, Women 5.5-6.5cm	C
AAA Men 5.5-6.0cm, Women 5.0-5.5cm	E
TAAA >7cm	C
TAAA 6-7cm	D
AORTIC DISSECTION	
Type B dissection with malperfusion/ rupture	A
Type B dissection with high risk features	D
CAROTID STENOSIS	
Carotid symptomatic (CEA or CAS)	B
Carotid asymptomatic >80 (CEA or CAS)	E
PERIPHERAL ARTERY DISEASE	
Acute limb ischemia	A
Arterial lysis for graft or artery	A
Lower extremity gangrene/ulcer	B
Lower extremity rest pain	B
Infected prosthetic graft removal and revascularization	B
Severe re-stenosis of previous graft (revision of failing graft)	B
Femoral or popliteal aneurysm, symptomatic or with high-risk features	B
Femoral or popliteal aneurysm, asymptomatic	E
Claudication	E
AV ACCESS	
Fistula/ graft thrombectomy	A
Fistula revision for malfunction/steal	B
Fistula revision for ulceration/pseudoaneurysm	B
Fistula creation, on HD	D
Endovascular fistula creation	D
Fistula creation, not on HD	E
DEBRIDEMENT AND AMPUTATION	
Septic extremity - debridement or amputation	A
Non-septic extremity - debridement or amputation	B
VISCERAL ISCHEMIA	
Acute mesenteric ischemia	A
Chronic mesenteric ischemia	B
Renal angioplasty with symptomatic hypertension/worsening renal dysfunction or flash pulmonary edema	B
THORACIC OUTLET SYNDROME	
Thoracic outlet syndrome, arterial with thrombosis	A
Thoracic outlet syndrome, venous with thrombosis	B
Thoracic outlet syndrome, neurogenic	E
Thoracic outlet syndrome, venous otherwise	E
VENOUS	
IVC filter placement	A
Lysis for DVT	A
Stripping for ulcers or uncomplicated varicose vein procedures	D

PRIORITY	TIME TO TREAT
A	<24 hours (Emergent)
B	<2 weeks
C	2-4 weeks
D	4- 8 weeks
E	≥8 weeks

DISCLAIMER: The information in this document provides guidance to vascular specialists and administrators for prioritization of patients receiving vascular surgical or endovascular procedures during the unprecedented period that hospitals and providers are facing **in the context of the COVID-19** pandemic. The document was developed by provincial vascular clinical experts and reflected best knowledge and consensus at the time of writing. This information is intended to be "**guidance rather than directive**," and is not meant to replace clinical judgment. In the context of the COVID-19 pandemic, medically necessary, time-sensitive vascular surgery and endovascular procedures should be considered based on the patient's clinical status and risk factor profile, and on the available resources and capacity at the treating hospital. **The vascular condition priority list can be considered for use during periods of increase or decrease in hospital procedural activity necessitated by fluctuations in COVID-19 infected patient volumes.**

CORE (COvid-19 Resource Estimator) Model Methods

COVID-19-ModCollab

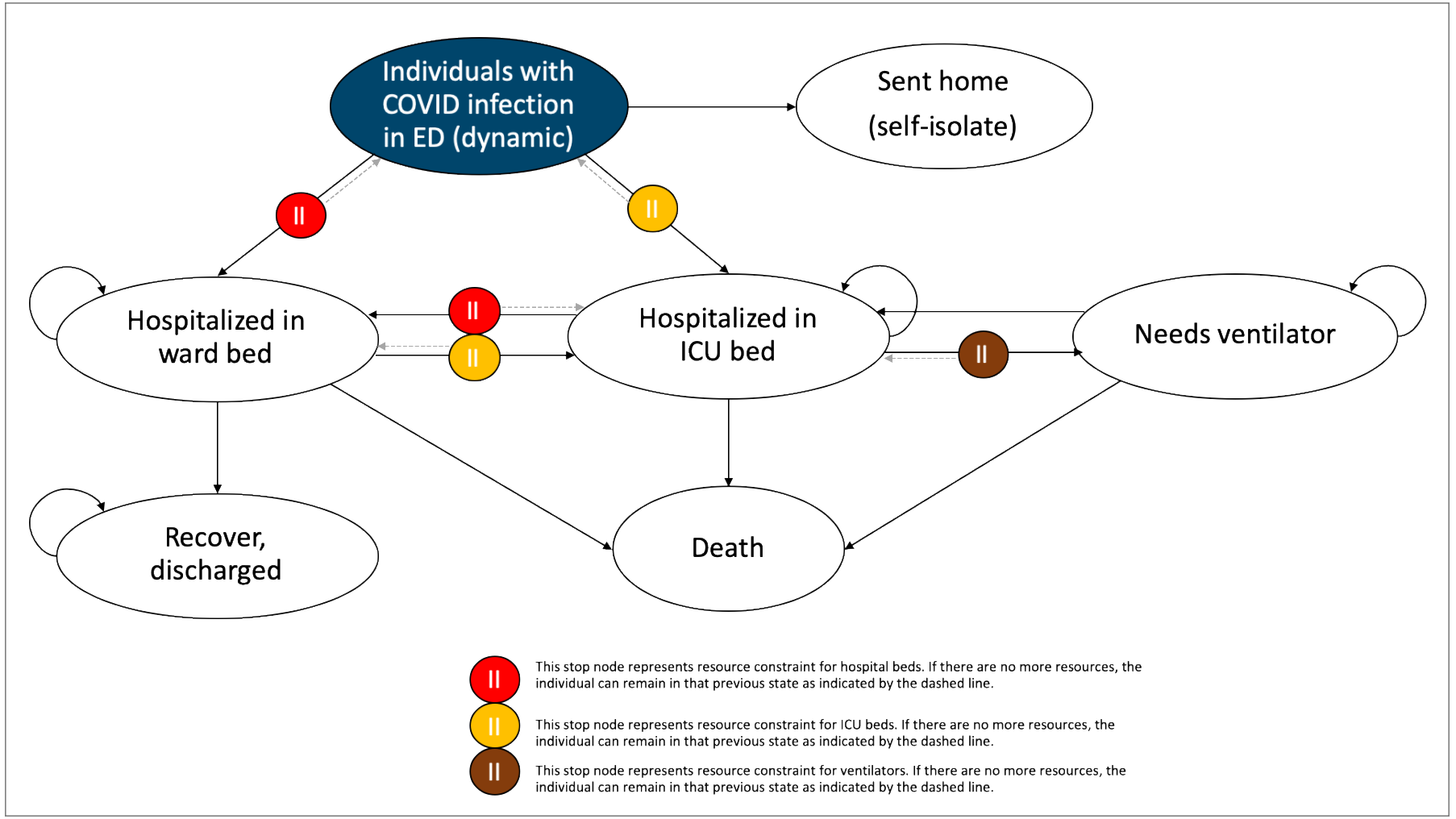
Kali Barrett, Yasin Khan, Stephen Mac, Raphael Ximenes, David Naimark, Beate Sander

(All team member contributed equally.)

Model Characteristics

Characteristic	Description
Model Type	Discrete-time, individual-level, health state transition to determine cases of COVID-19 and patient trajectory in hospital
Population	Adults with symptomatic COVID-19 illness presenting to the hospital in Ontario
Time Horizon	30-60 days forecasting; daily time steps
Perspective	Ontario healthcare system
Outcomes	**1. Number of hospitalization and ICU admissions per day** **2. Days until resource depletion (Ward beds, ICU beds, Ventilators)** 3. Number of patients waiting for resource per day 4. Mortality (stratified by receiving appropriate care or not) 5. Estimated demand for personal protective equipment

Model Schematic



Key Data

Variables	Base-case Value	Sources
Probability needing hospitalization	0.18	Public Health Agency of Canada estimate
Probability of needing ICU level care given hospitalization	0.48	Calibrated based on Public Health Agency of Canada estimate
Probability of ICU patients needing ventilation	0.78	Critical Care Services Ontario (CCSO) estimate on April 13, 2020
Probability that patients on the ward deteriorate and need ICU	0	Assumption
Length of stay, ward (no ICU admission)	17 days	Bellani 2016
Length of stay, ICU (with/without ventilation)	11 days	Bellani 2016
Length of stay, ward post-ICU	6 days	Bellani 2016
Probability of death ward patients	0	Wu 2020
Probability of death, ICU-patients	0.35	Bellani 2016
Probability of death, ventilated patients	0.35	Bellani 2016
Probability of death, patients waiting for vent	1.0	Assumption
Probability needing hospitalization	0.18	Public Health Agency of Canada estimate (21)

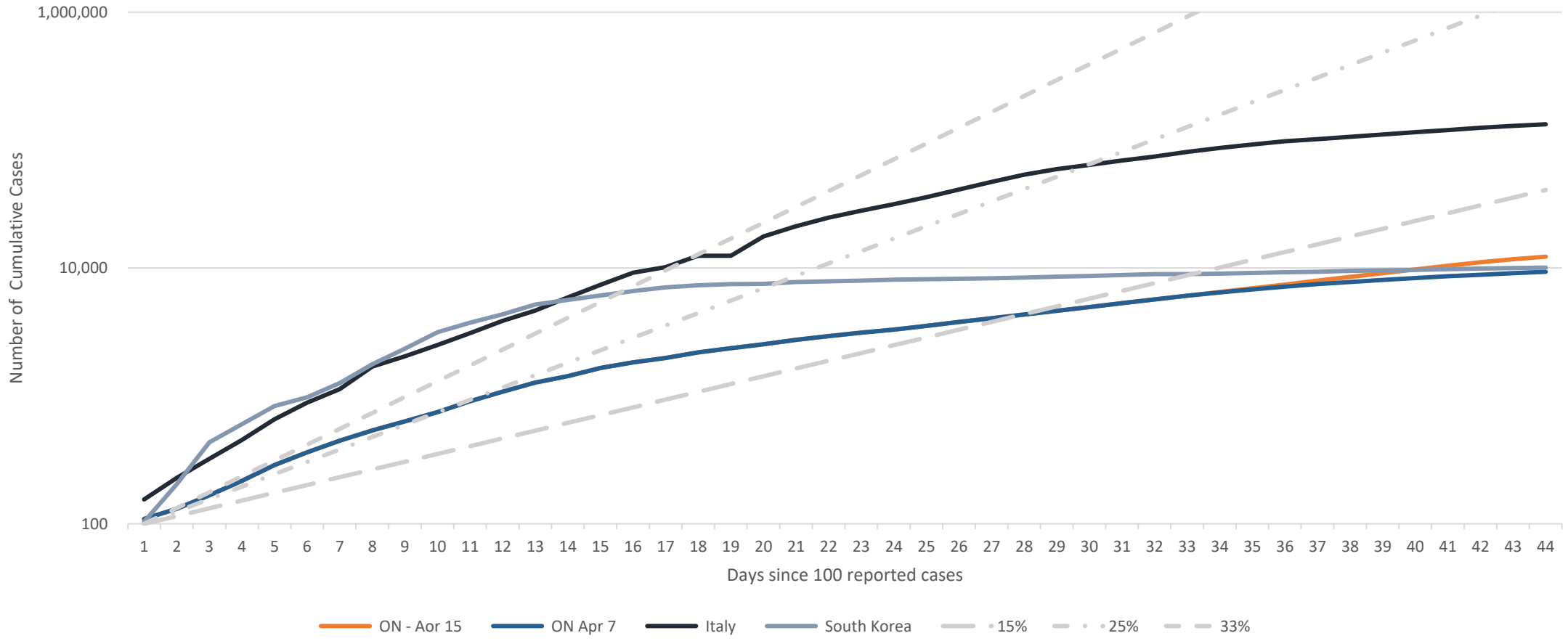
Assumptions

- Patients entering ward do not deteriorate (i.e., needing ICU or ventilation)
- Patients waiting for ICU bed have same mortality rate as a patient in the ICU, and patients waiting for ventilators cannot survive

Scenarios – Epi Trajectory

- "Expected scenario": forecasted for ON (and 5 HRs) based on
  - Reported cases up to Mar 30
  - Mean growth rate Mar 24 – Mar 30
  - Assuming peak (Apr 7 or Apr 15), 5% decline in new cases per day thereafter
- "Best case": reported cases in South Korea
- "Worst case": reported cases in Italy

Scenarios – Epi Trajectory



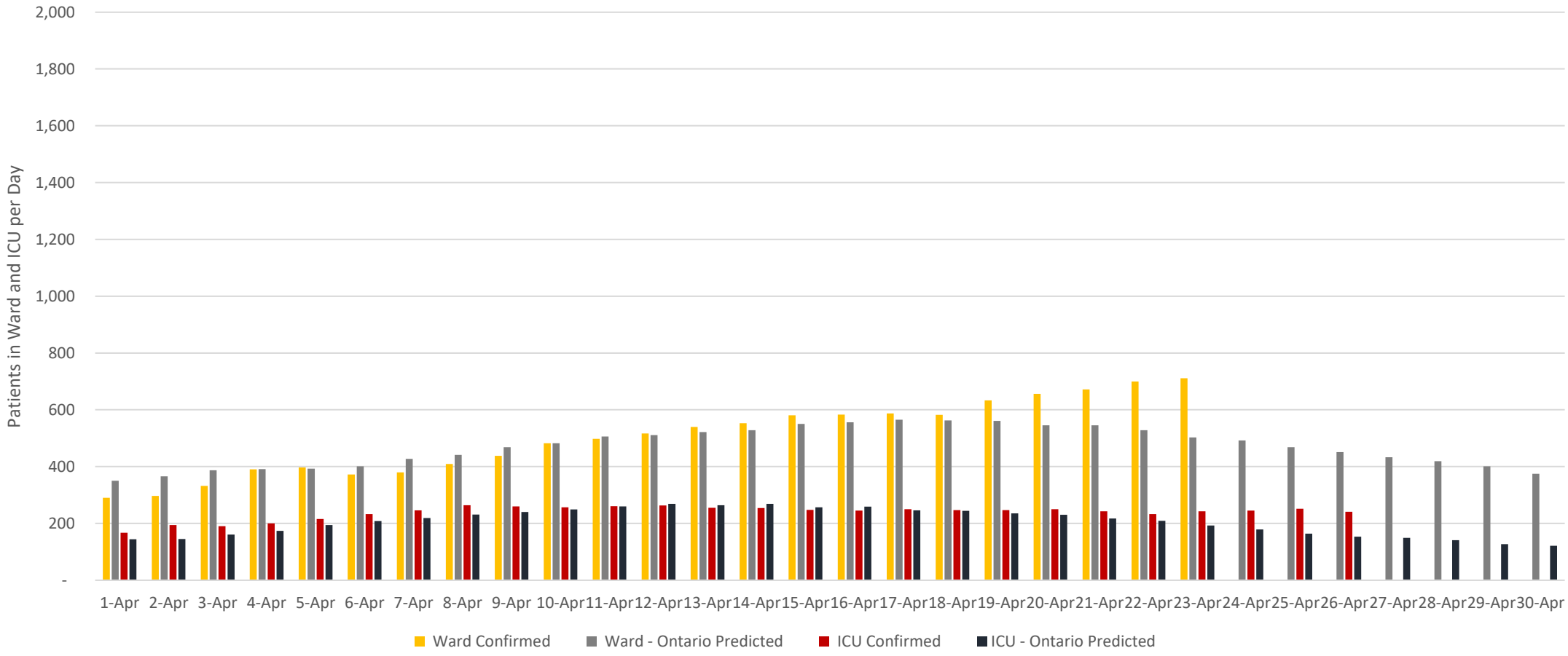
Scenarios – Capacity

- Base case: 25% of existing ICU resources (including ventilators) and 20% of ward beds are available for COVID-19 patients (e.g., through reduction in non-COVID-19 clinical activity.
- Expanded: As Base case + additional 500 ventilated ICU beds, 350 non-ventilated ICU beds, and 1,500 acute care ward beds.

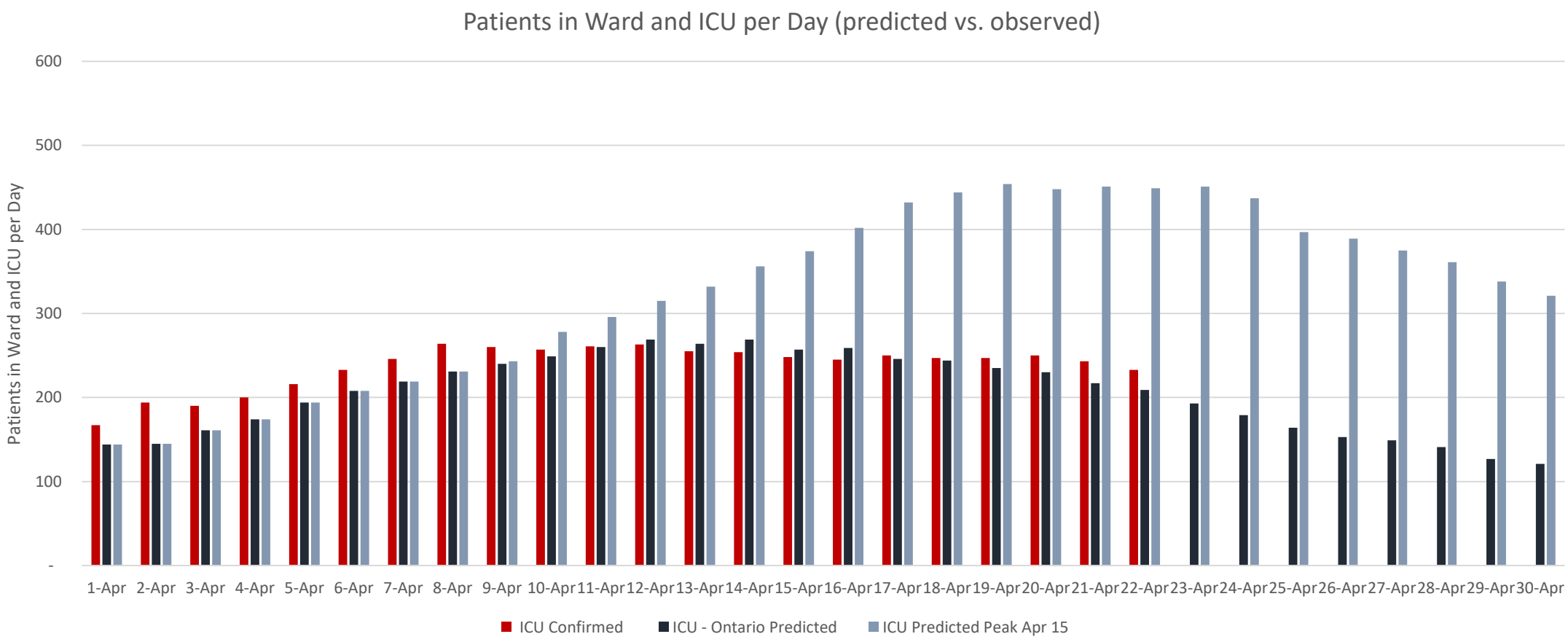
Scenarios

		Predicted Number of Cases	
		Expected Peak Apr 7	**Expected Peak Apr 15**
Capacity	**Base Case (BC)** · 350 ventilator ICU beds · 200 non-ventilator ICU beds · 4,000 ward beds	ON (Central, East, North, Toronto, West)	ON (Central, East, North, Toronto, West)
	Expanded · 850 ventilator ICU beds · 550 non-ventilator ICU beds · 5,500 ward beds	ON (Central, East, North, Toronto, West)	ON (Central, East, North, Toronto, West)

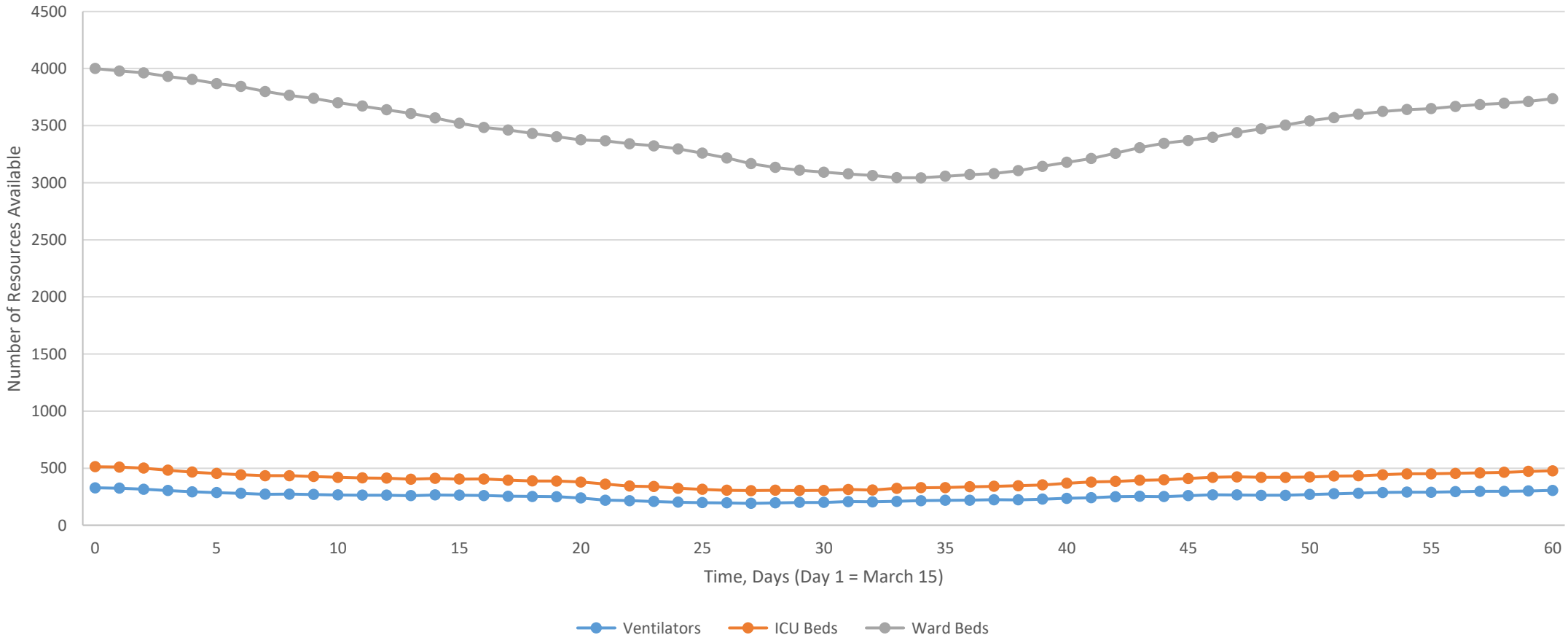
Results – Ward and ICU Bed Occupancy (ON)



Results – ICU Bed Occupancy (ON)



Results – Capacity BC, Peak Apr 7 - Ontario



Discussion

No capacity shortage across all ON “expected” epi scenarios, for all health regions

Shortage in Italy scenario (not shown), but highly unlikely as long as we continue physical distancing measures

Consider COVID-19 ICU/ward occupancy levels that can be maintained for extended period of time

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OMA Discussion

DR HEATHER COX & DR JUSTIN CLOUTHIER

OMA Discussion

- OMA Vascular Section Leads: Provincial & Federal financial support for small businesses

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Wrap Up & Next Steps

MIKE SETTERFIELD

Wrap Up & Nest Steps

- Next COVID-19 Vascular Forum Meeting: TBD

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