

## COVID-19: Where we are. Considerations for next steps.

- Prepared for BC Ministry of Health
- April 17, 2020



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[gov.bc.ca/Covid-19](https://gov.bc.ca/Covid-19) | [bccdc.ca](https://bccdc.ca) | 1-888-COVID19

Symptom Self-Assessment:  
[covid19.thrive.health](https://covid19.thrive.health)

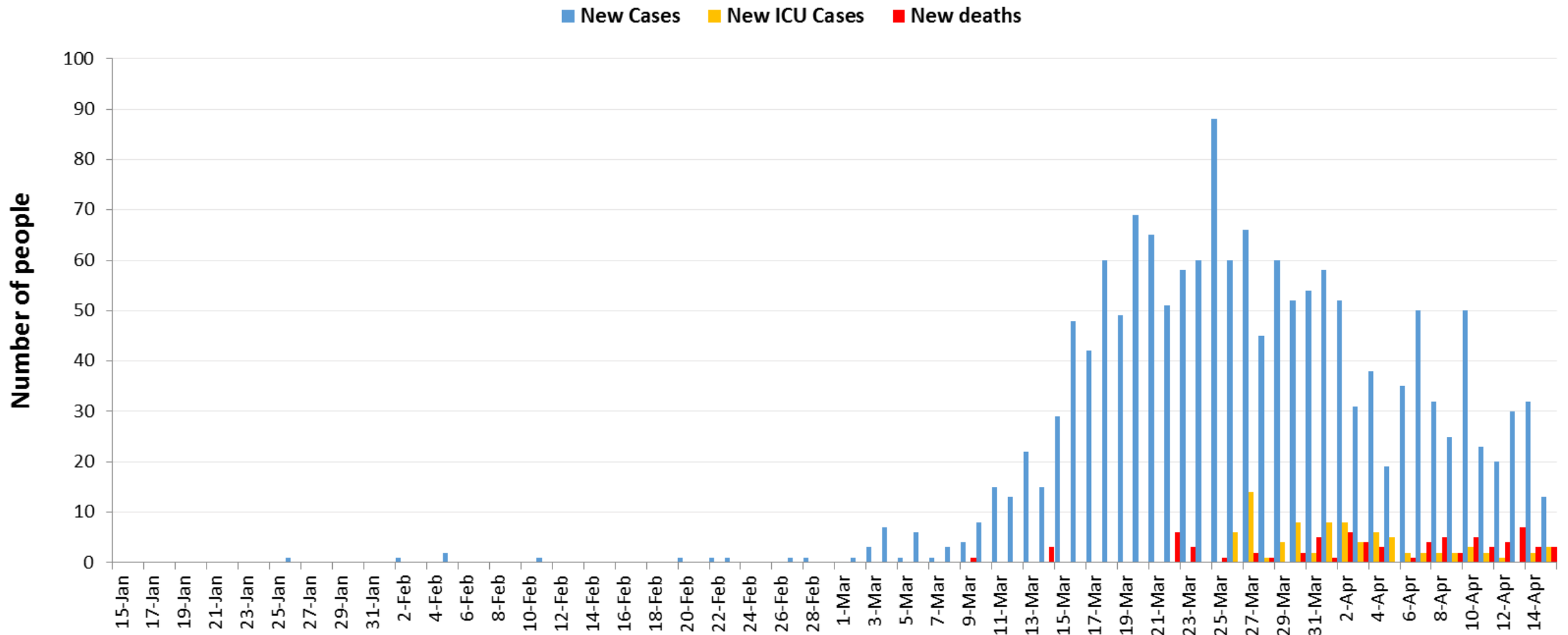


# Focus of Presentation

- To update on the current epidemiology of COVID-19 in BC
- To compare our current state in BC to previous projections with respect to cases and ICU status
- To provide an update on our health system level of preparedness for those critically ill with COVID-19
- To highlight the effect of our public health measures and societal action
- To identify considerations for next steps

# Current epidemiology in BC

# BC's daily new cases, new ICU admissions & deaths



Data from March 1, 2020 – April 14, 2020. Cases (diagnosed through testing) initially rose and have plateaued, as have ICU admissions. Deaths appear to follow no trend in relation to cases or ICU admissions.

# Epidemiological profile of COVID-19 cases in BC



1,517	Total cases
54	Median age
811	Female
689	Male

Sex information is available for 1,500 of 1,517 cases



349	Ever hospitalized
68	Median age of people ever hospitalized



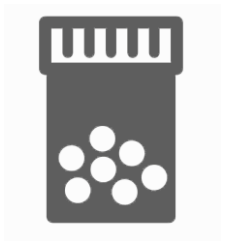
58	Currently in critical care
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942	Recovered
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72	Deaths
86	Median age of people who have died

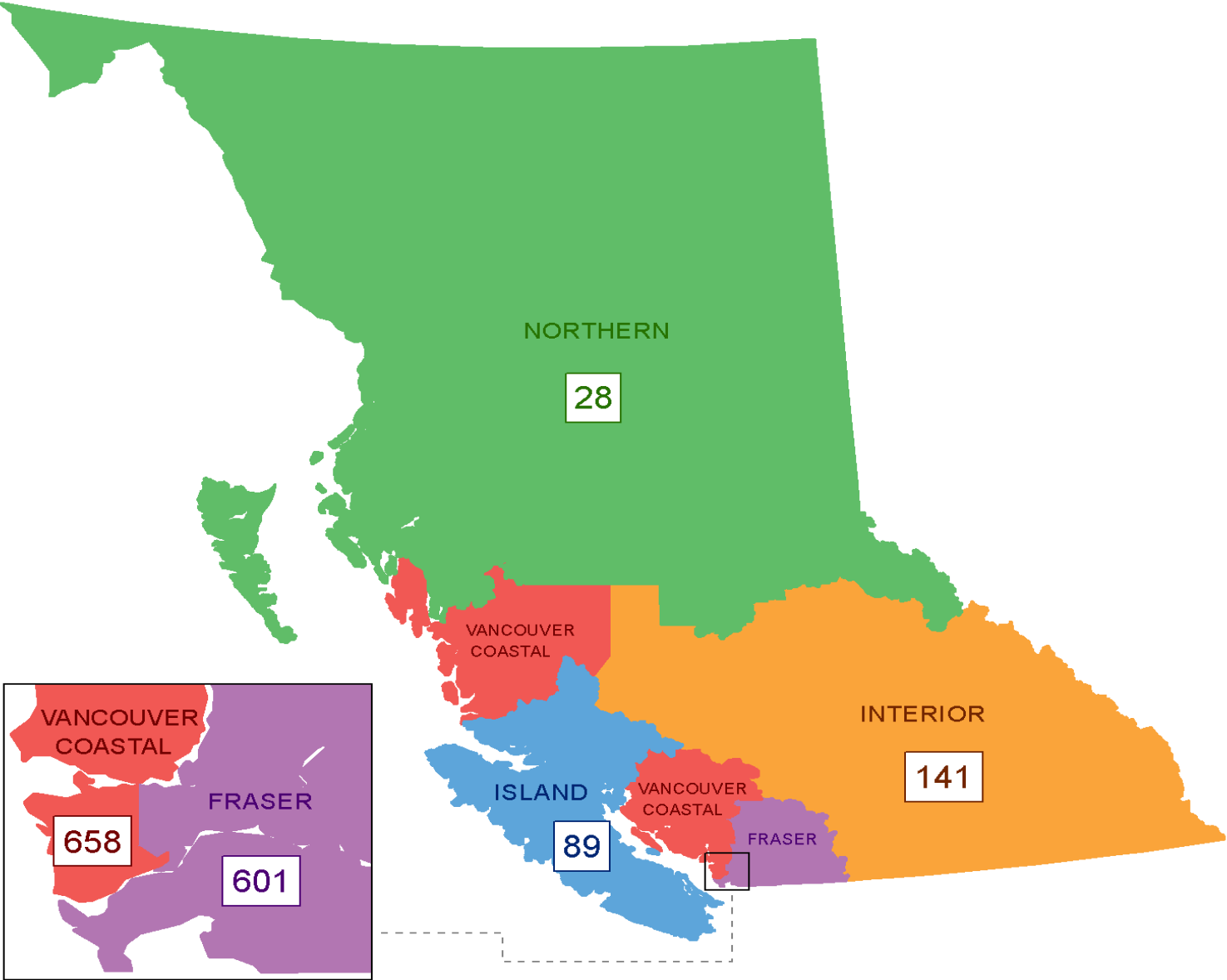


35.8%	Have at least one chronic condition
of 707 cases	Includes: cancer, diabetes, , cardiac disease, liver disease, neurological disorder, renal disease, or respiratory disease

As of April 5: 707 cases had risk factor information available (Source: Panorama)

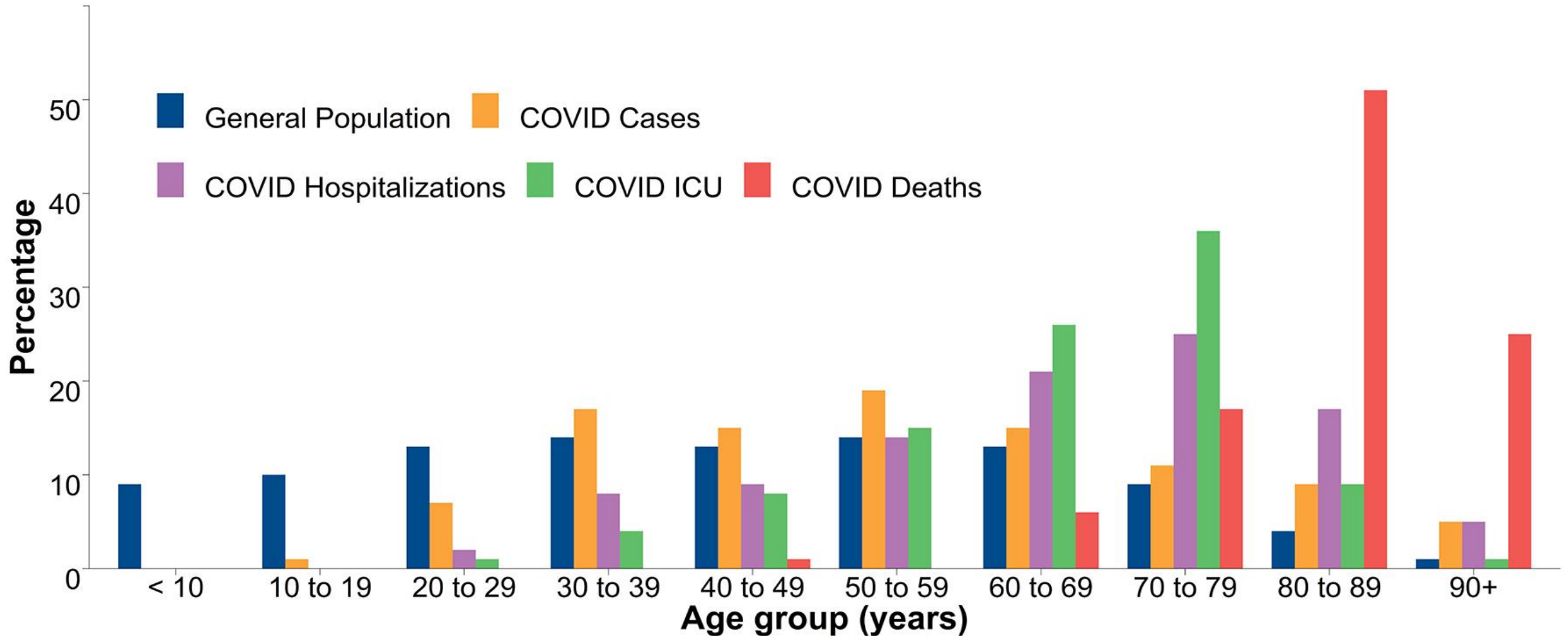
Data from January 15, 2020 – April 14, 2020.

# Confirmed COVID-19 cases in BC by Regional Health Authority



Data represents January 1 – April 14, 2020  
Source: BC COVID-19 Daily Situation Report,  
April 14, 2020: BCCDC

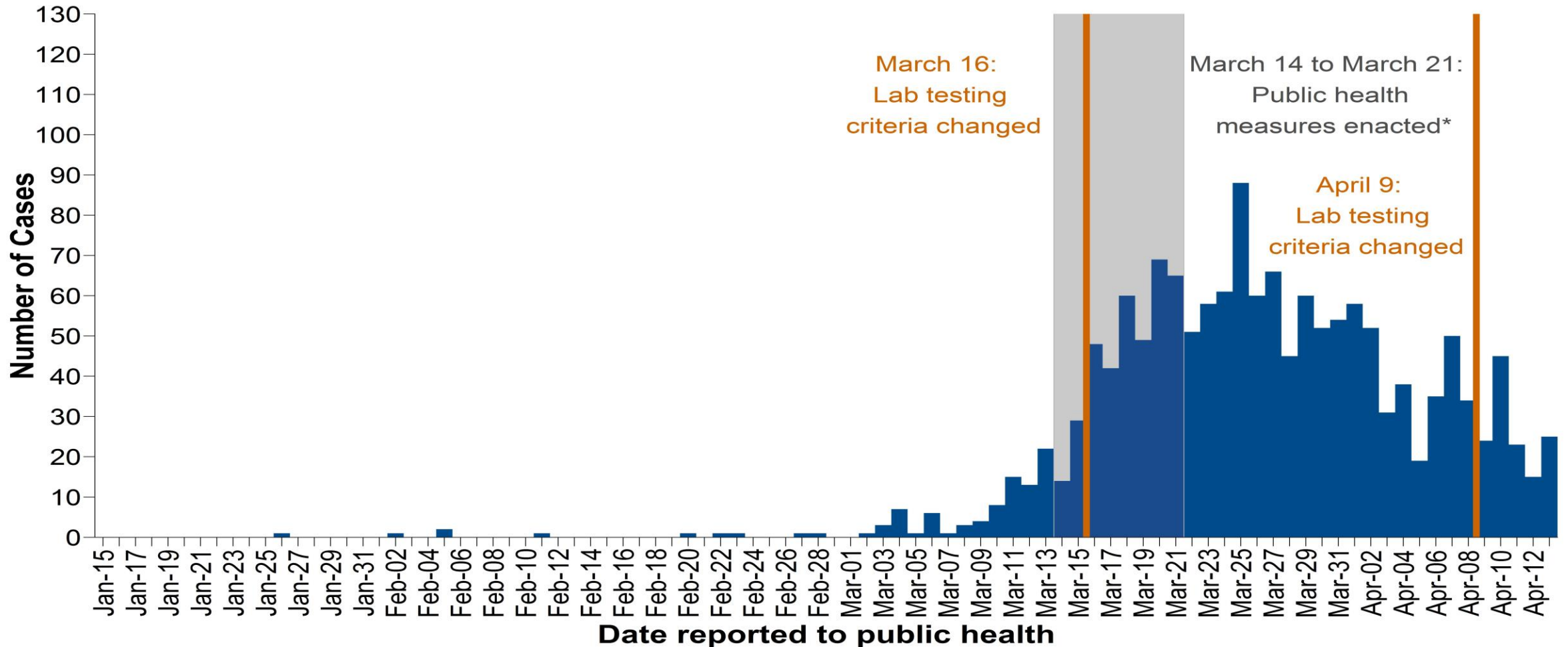
# Distribution of COVID-19 cases by age in BC



\*Includes 1498 cases, 346 hospitalizations, 149 ICU admissions, and 71 deceased with age information available. Distribution of COVID-19 cases, hospitalizations, ICU admissions and deaths by age compared to the BC general population to April 14, 2020.

# Confirmed COVID-19 cases in BC by reported date

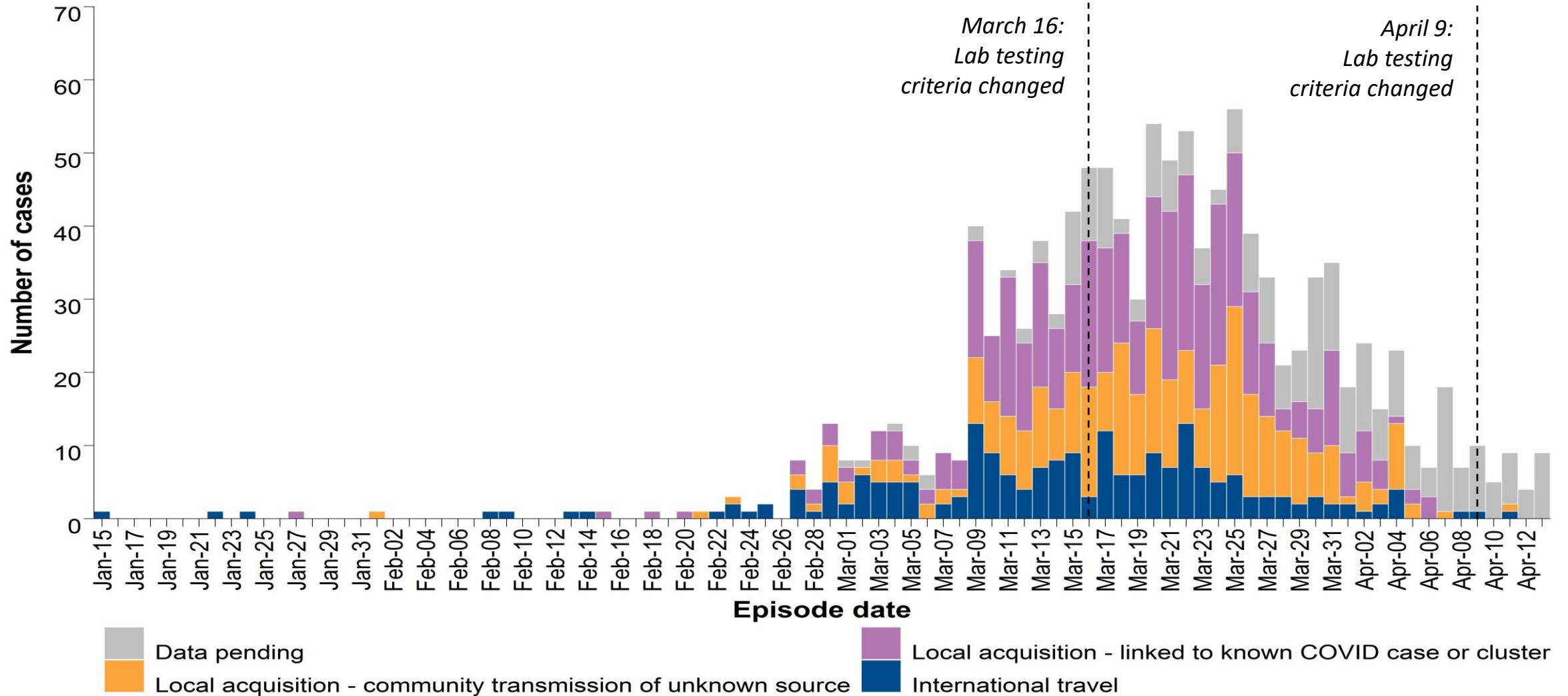
Figure 3: Epidemic curve, confirmed COVID-19 cases in BC by reported date January 1-April 13 2020 (N = 1514\*)



Notes: N = 1514: January 15, 2020 – April 14, 2020. Cases reported on the same day as the report have been excluded as only a portion of the total cases to be reported are available at the time the data are extracted. A number of public health measures were enacted during the week shaded in grey.

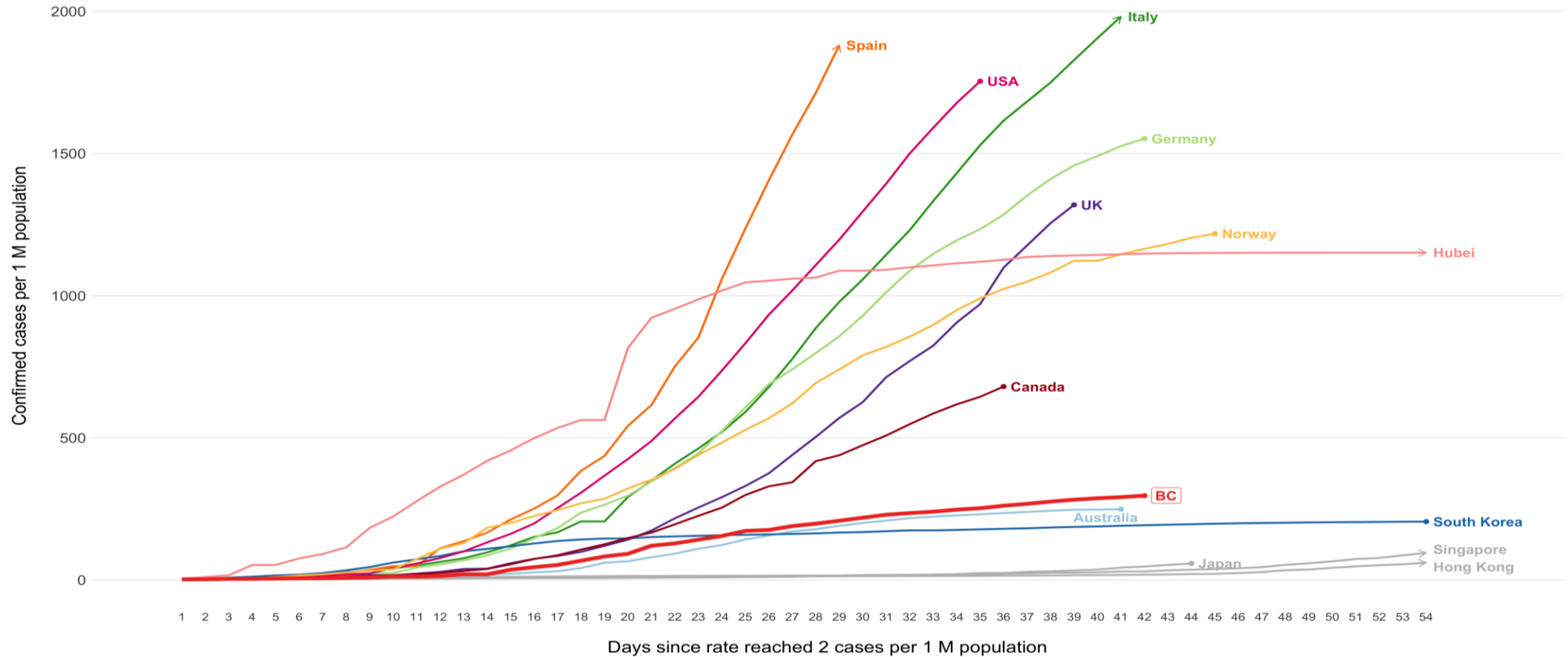


# Likely source of infection for COVID-19 cases in BC



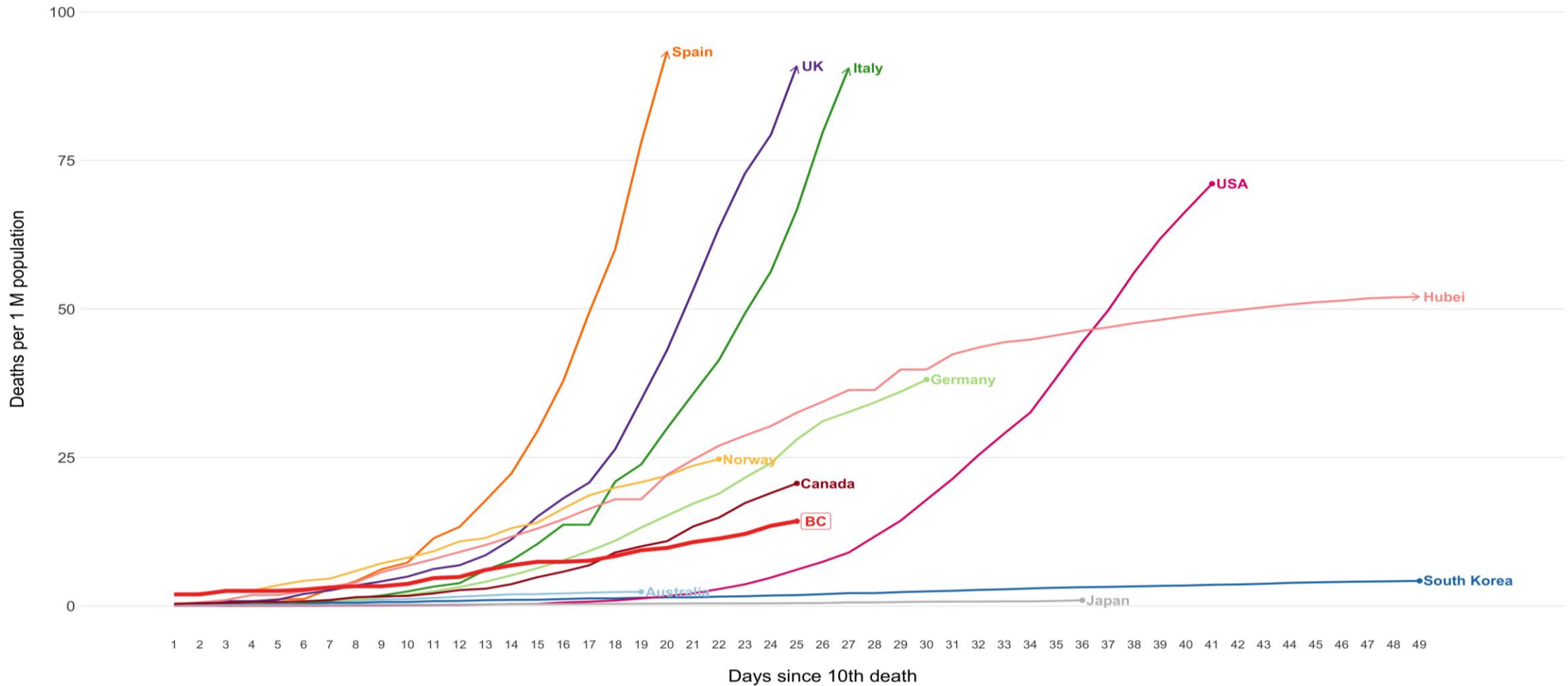
Notes: Episode date is based on symptom onset date (n= 628), if not available then date COVID-19 was reported to health authority (n= 528); January 15, 2020 – April 14, 2020. Data source: Panorama public health information system.

# International COVID-19 Cumulative Diagnosed Cases



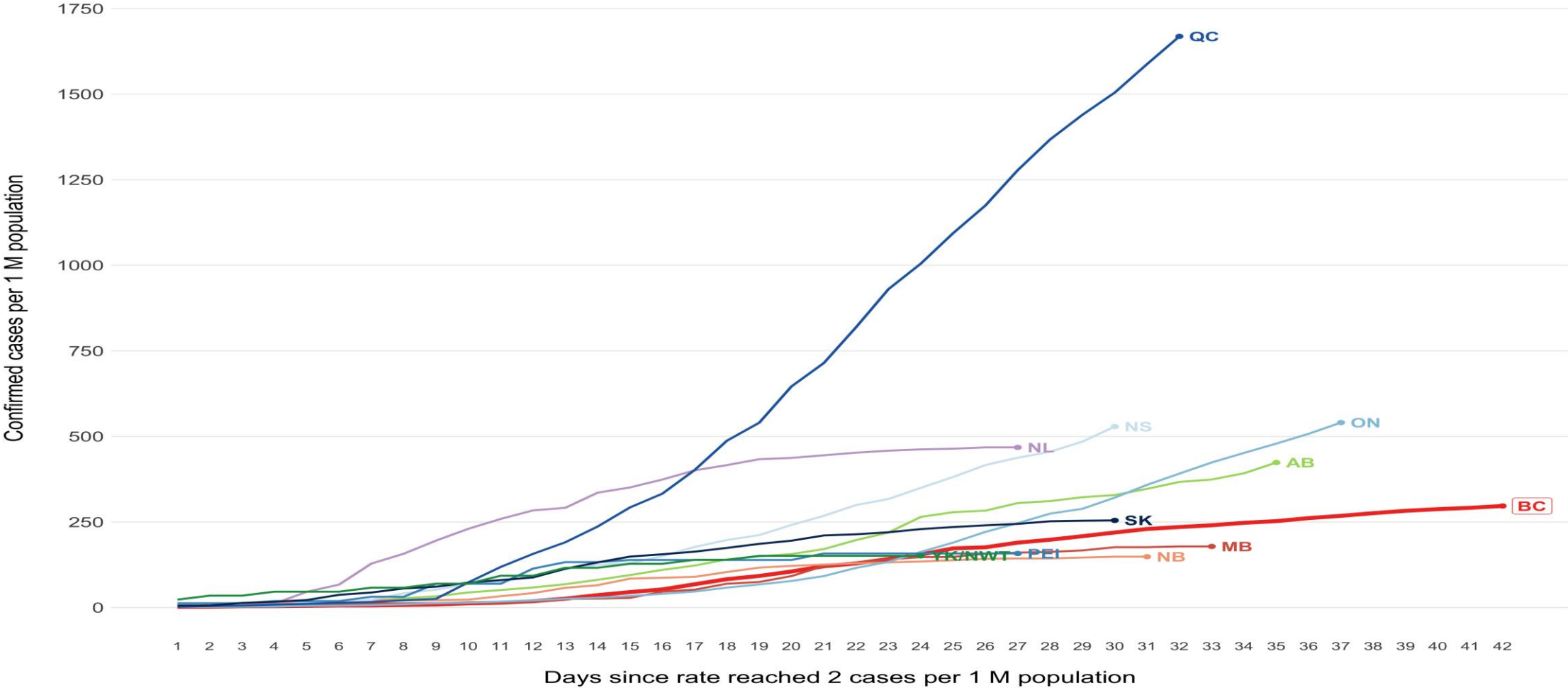
Data extracted from JHU CSSE Github repository on 2020-04-14

# International COVID-19 Cumulative Diagnosed Deaths



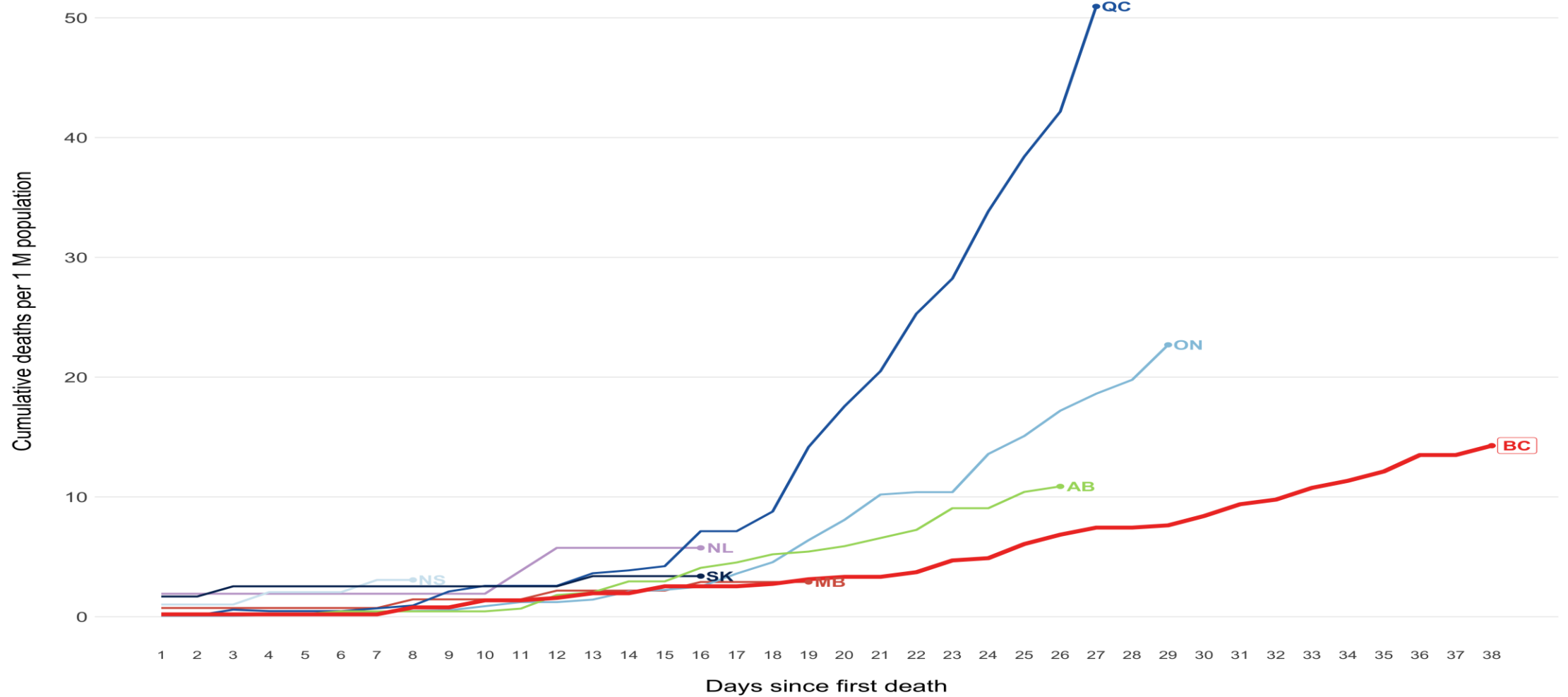
Data extracted from JHU CSSE Github repository on 2020-04-14.

# Canadian COVID-19 Cumulative Diagnosed Cases



Data up to 14 April 2020.

# Canadian COVID-19 Cumulative Diagnosed Deaths

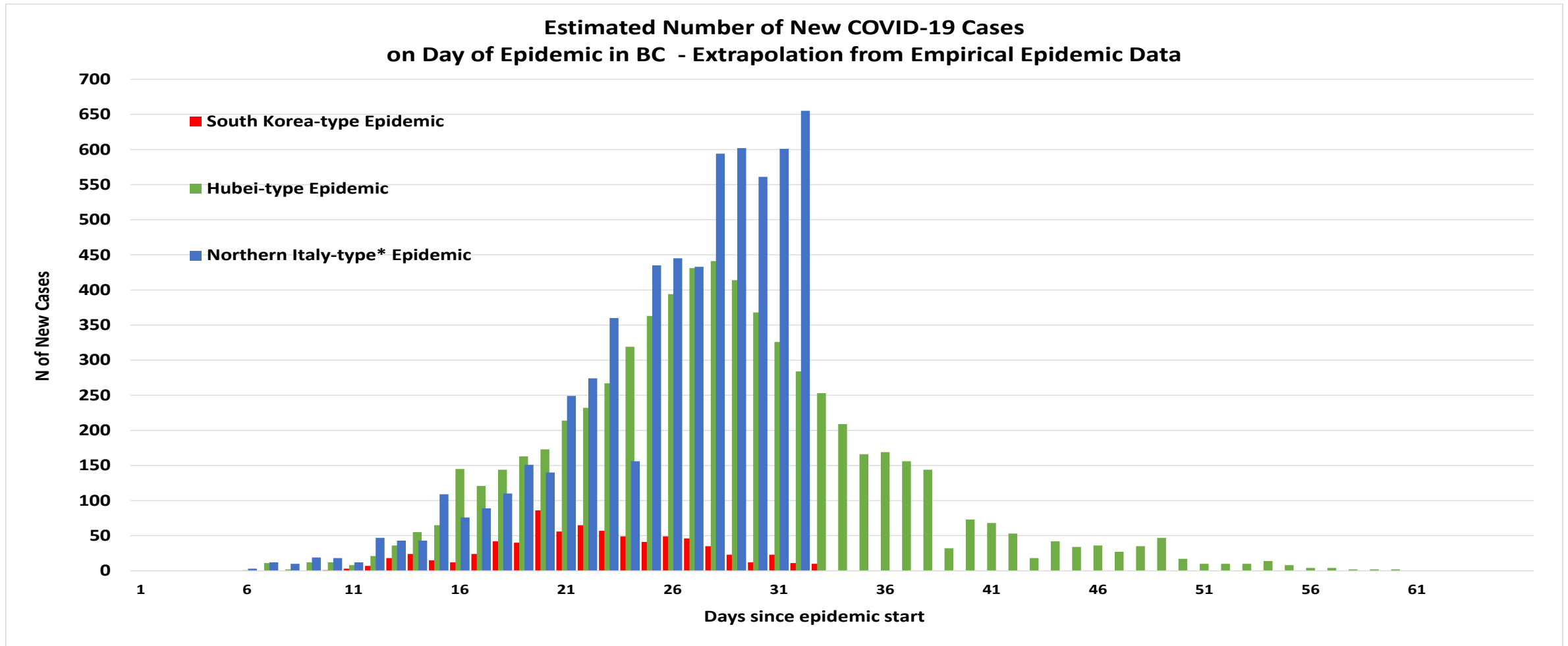


Data extracted from JHU CSSE Github repository on 2020-04-14.

**Where are we at with respect to our previous models?**

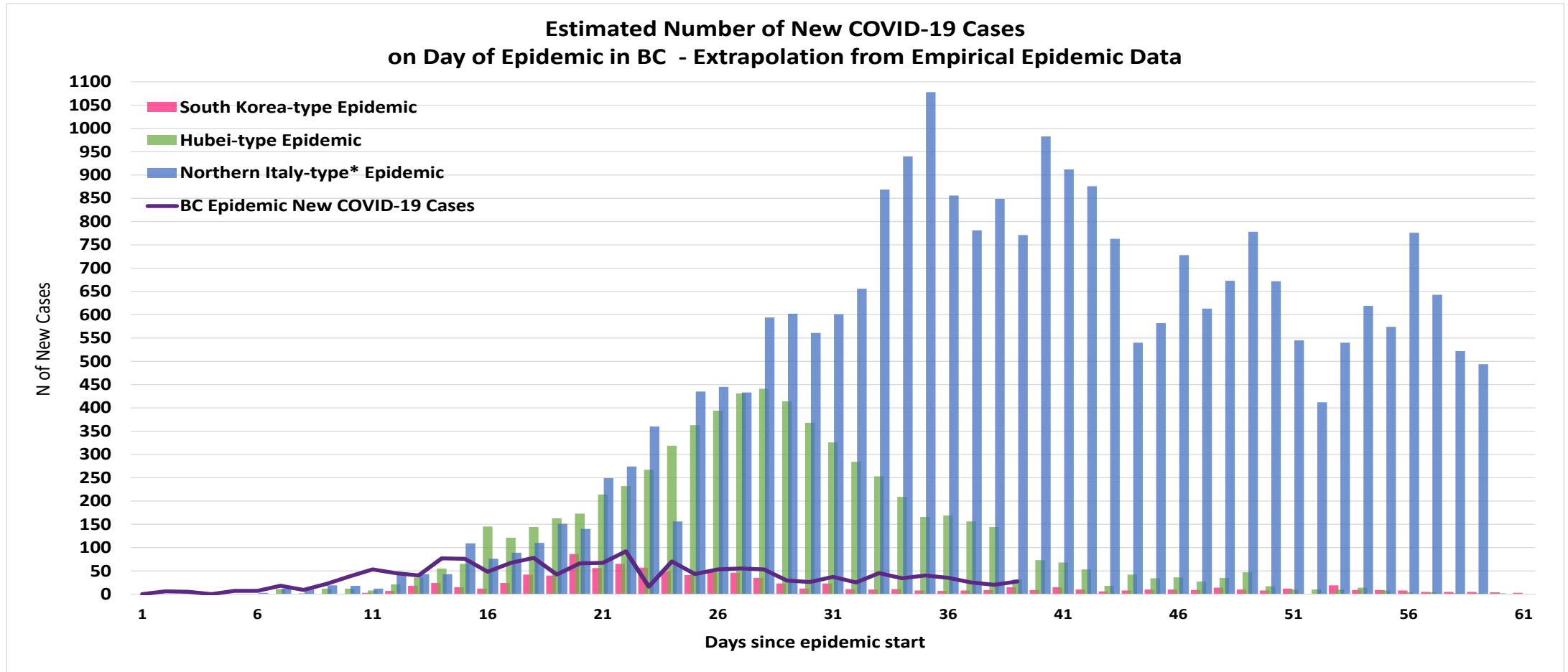
**What can we further understand about the effects of our public health measures?**

# Recall: March 27, 2020 modelling of potential new cases in BC (*based on other jurisdictions' actuals*)



Note: This March 27<sup>th</sup> model was predicting what we could see based on data and analyses completed on March 23<sup>rd</sup>, 2020. Italian epidemic in progress has not reached its peak.

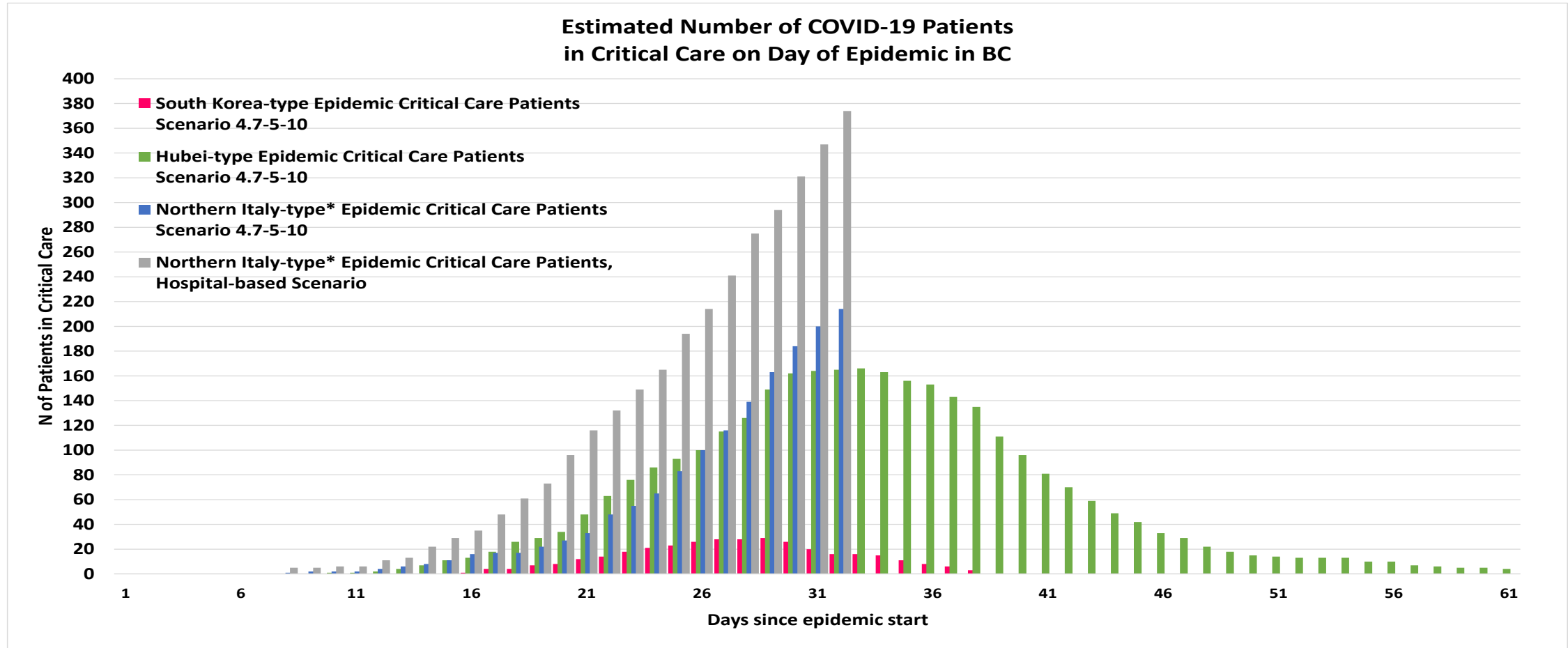
# BC actual new cases compared to updated modelled cases from other jurisdictions



Note: Updated to now be based on April 14 (day 38) data superimposed onto March 27, 2020 model; March 27, 2020 represented day 21 based on the date when BC reached 2 cases per million). April 14, 2020 represents Day 38; Cases are denoted as those diagnosed through testing.

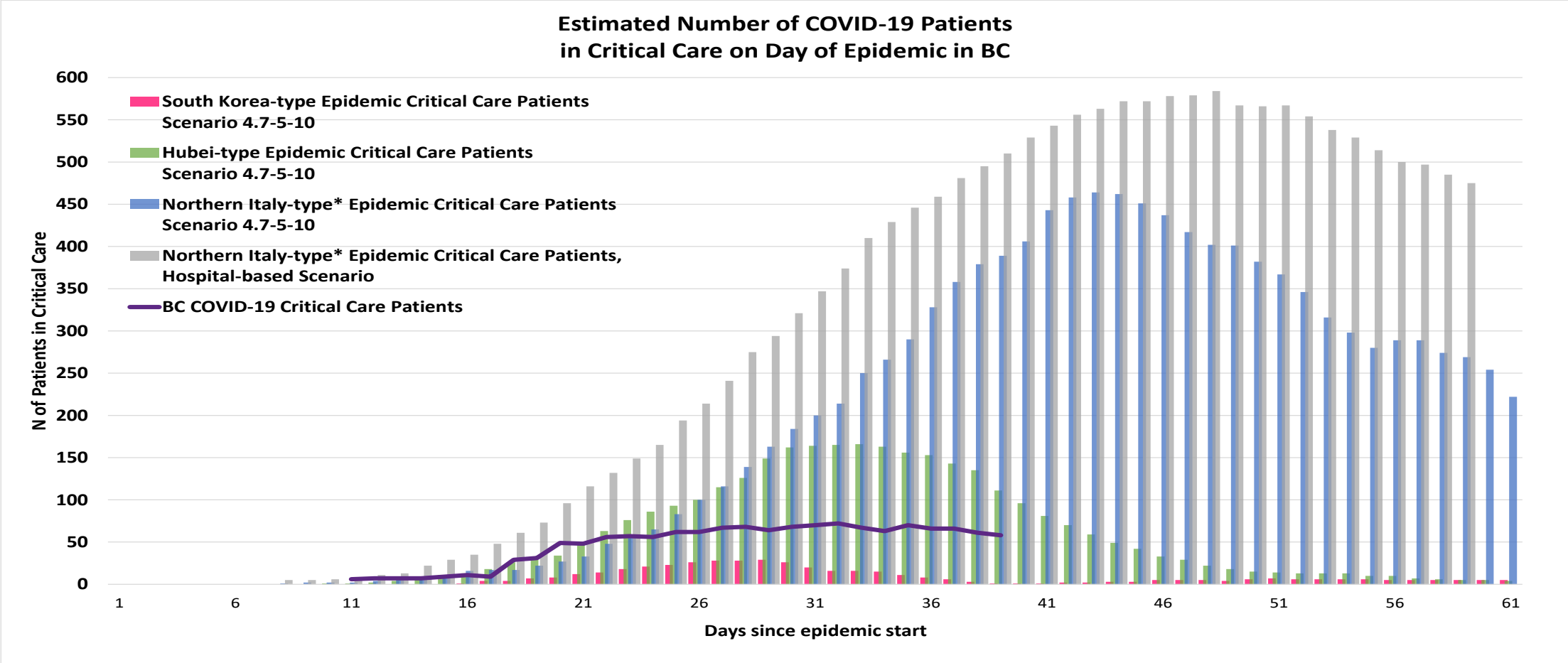


# Recall: March 27, 2020 modelling of potential BC critical care patients based on other jurisdictions' actuals



Scenario 4.7-5-10 assumes that 4.7% of all COVID-19 cases will be admitted to critical care. Critical care admissions will commence 5 days (range 4-7 days) after symptom onset; ALOS in Critical Care will be 10 days (range 7-14 days). Note: Italian epidemic in progress and did not reach the peak.

# BC actual critical care cases compared to updated modelled cases from other jurisdictions data



Scenario 4.7-5-10 assumes that 4.7% of all COVID-19 cases will be admitted to critical care. Critical care admissions will commence 5 days (range 4-7 days) after symptom onset; ALOS in Critical Care will be 10 days (range 7-14 days). Note: Italian epidemic in progress and did not reach the peak.

# Key findings regarding epidemiology and trajectory of COVID-19

- BC's epidemic curve has been well below projections based on the Italy and Hubei experience.
- BC's COVID-19 cases plateaued and started to decline.
- Similarly BC's COVID-19-related ICU census curve has remained well below the Hubei and Italian experience. This, too, appears to be plateauing with cautious optimism of a downward trend.
- Deaths continue to be seen particularly amongst those who are elderly and/or frail.
- Given these findings, using the Italian epidemic and perhaps even the Hubei epidemic, as reference points for BC is now less important. New models based on our BC experience and understanding of the virus will guide us going forward.

## **The health system level of preparedness for those critically ill due to COVID-19**

# Critical care demand and supply

- Over the past weeks, health authorities throughout BC have prepared for the ill and critically ill patients.
- Hospitals have created capacity through decanting patients and decreasing elective procedures and surgeries.
- Critical care capacity has been prepared in each health authority through the creation of 19 COVID-19 sites throughout BC.
- Each “primary COVID-19 site” has specifically planned their space, their workforce and their supplies including ventilator capacity to address a surge based on the models presented on March 27, 2020.

# Provincial bed capacity - snapshot

Provincially, there currently is less than 50% occupancy of total critical care beds with added surge capacity. This added surge capacity includes additional beds in intensive care units and high acuity units as well as other critical care spaces (e.g., cardiac care units, recovery rooms, operating room capacity, reconfiguration of units).

Note: "Total Critical Care Beds with Surge Capacity" represents full surge capacity (over and above funded beds) and over and above even Italian curves, should the need arise. Source: Health authority reported data on April 14, 2020

## All sites (primary/secondary COVID-19 sites and non-COVID-19 sites)

Health Authority	Total Critical Care Beds with Surge Capacity <sup>1</sup>	Critical Care COVID-19 Census <sup>2</sup>	Critical Care Non-COVID-19 Census	Total Vacant Critical Care Beds	Critical Care Bed Occupancy rate
<b>IHA</b>	98	6	59	33	66.30%
<b>FHA</b>	371	32	130	209	43.70%
<b>VCHA</b>	190	17	61	112	41.10%
<b>VIHA</b>	108	2	41	65	39.80%
<b>NHA</b>	86	1	28	57	33.70%
<b>PHSA</b>	98	0	58	40	59.20%
<b>BC Total</b>	<b>951</b>	<b>58</b>	<b>377</b>	<b>516</b>	<b>45.70%</b>

1. Critical care capacity and census as of April 13, 2020 midnight.

2. COVID-19 critical care census reported as of April 14, 2020 at 10:00am.

# Provincial adult-capable critical care ventilators

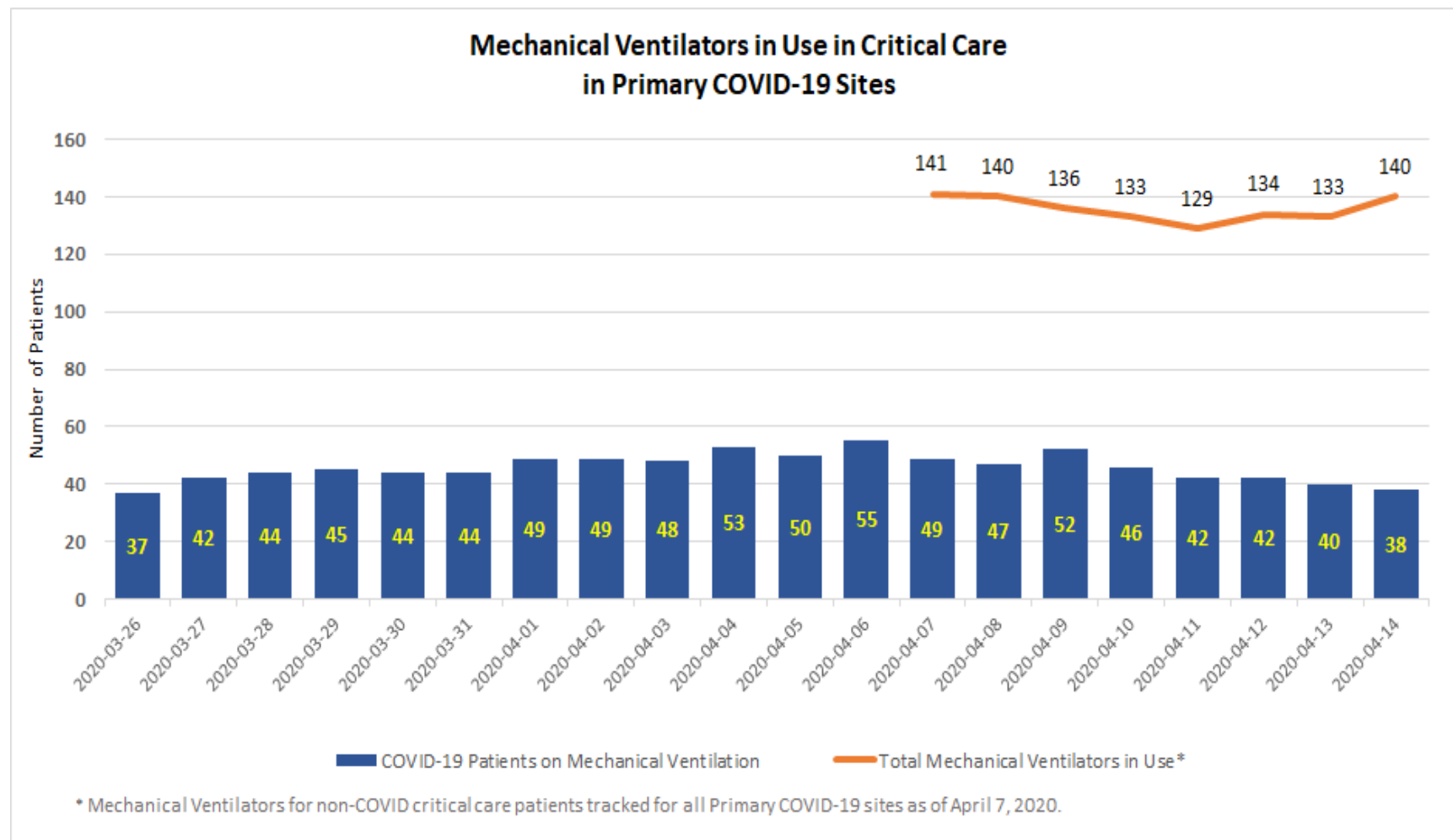
- On March 5, 2020 HEMBC had identified 457 adult critical care ventilators available across all sites in BC.
- Since that time, ventilator availability has increased due to a number of measures: additional pediatric ventilators that are “adult-capable” have been identified; ventilators have been refurbished; newly acquired ventilators have started to arrive. An additional 55 ventilators from the federal stockpile have arrived but have not yet been included in the data as they are being assessed.

Source: Provincial BioMed database, reported data on April 9, 2020

Location of Ventilators	Provincial Pandemic Fleet	Site Pandemic Fleet	Regular Inventory	Total
<b>Available Not Yet Assigned</b>	39	–	–	<b>39</b>
No Site Assigned (KGH)	3	–	–	3
No Site Assigned (VGH)	36	–	–	36
<b>Available</b>	11	65	566	<b>642</b>
<b>IHA</b>	8	1	78	87
<b>FHA</b>	–	12	176	188
<b>VCH</b>	–	15	114	129
<b>PHC</b>	–	11	36	47
<b>VIHA</b>	–	3	102	105
<b>NHA</b>	3	–	33	36
<b>PHSA</b>	–	23	27	50
<b>BC Total</b>	<b>50</b>	<b>65</b>	<b>566</b>	<b>681</b>

# Provincial mechanical ventilators in critical care

This chart describes, for example on April 14, 2020, that at primary/secondary COVID-19 hospital sites across BC, 38 COVID-19 patients (27%) were on mechanical ventilation with 140 patients in critical care on mechanical ventilation.



Source: Provincial Critical Care Monitoring Solution, reported data on April 14, 2020



# Key findings regarding health system preparedness for critically ill COVID-19 patients

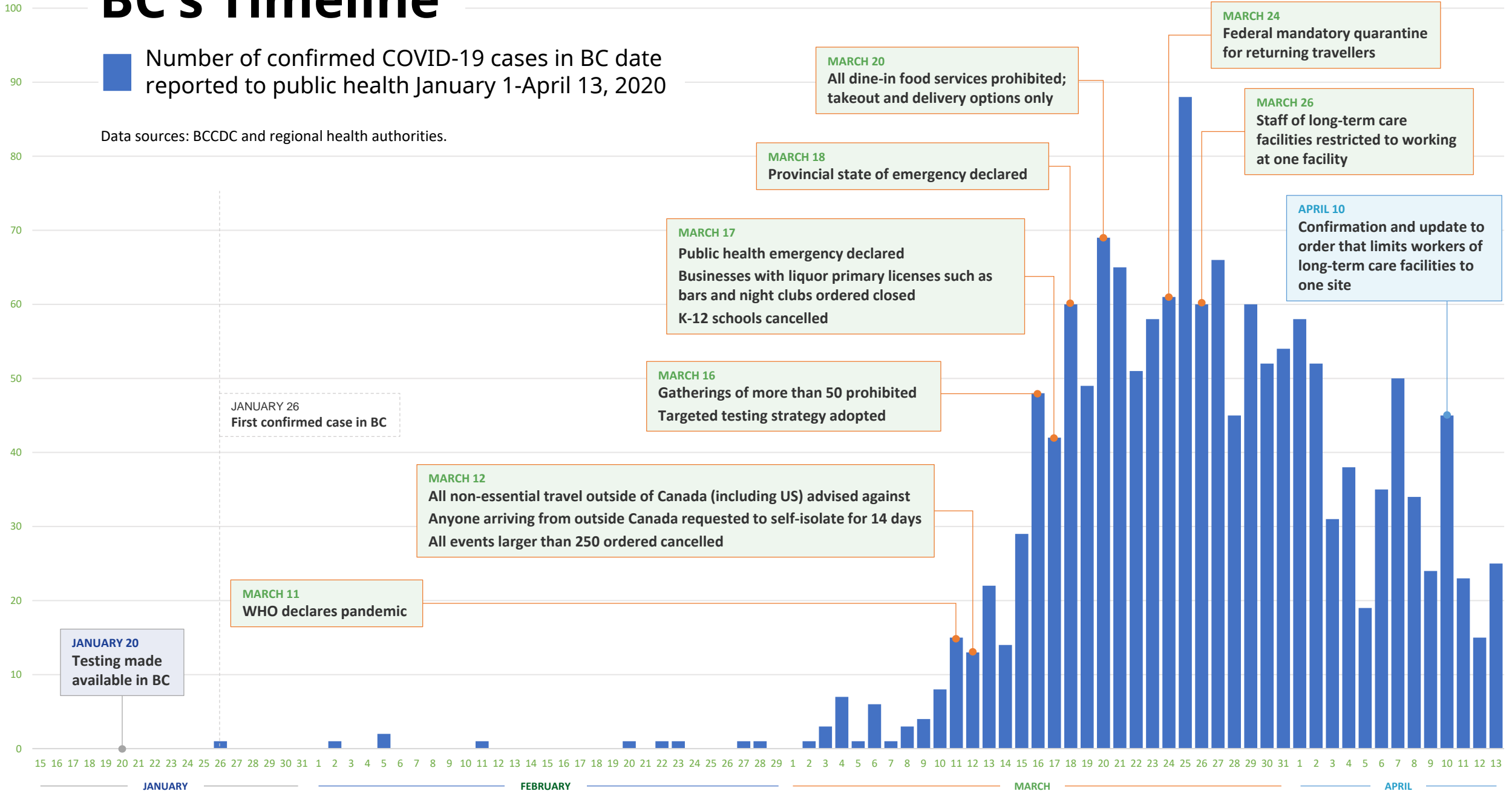
- Provincial critical care leaders and all health authorities have carefully reviewed and articulated specific available critical care beds as well as potential surge beds in other spaces within sites. Surge beds identified even surpass the highest Italian modelled curves.
- Additional adult-capable critical care ventilators have been identified, purchased and loaned and 681 which surpass the numbers required for the Italian modelled modelled curves.
- Critical care capacity (COVID-19 patients and non-COVID patients) and thus far in the epidemic has been sufficient. As a province as a whole, critical care capacity (ICU and HAU) has been at 70% over this period. Some individual sites have seen higher capacity being reached.

## **The effect of our public health measures and societal action**

# BC's Timeline

■ Number of confirmed COVID-19 cases in BC date reported to public health January 1-April 13, 2020

Data sources: BCCDC and regional health authorities.



JANUARY 26  
First confirmed case in BC

JANUARY 20  
Testing made available in BC

MARCH 11  
WHO declares pandemic

MARCH 12  
All non-essential travel outside of Canada (including US) advised against  
Anyone arriving from outside Canada requested to self-isolate for 14 days  
All events larger than 250 ordered cancelled

MARCH 16  
Gatherings of more than 50 prohibited  
Targeted testing strategy adopted

MARCH 17  
Public health emergency declared  
Businesses with liquor primary licenses such as bars and night clubs ordered closed  
K-12 schools cancelled

MARCH 18  
Provincial state of emergency declared

MARCH 20  
All dine-in food services prohibited; takeout and delivery options only

MARCH 24  
Federal mandatory quarantine for returning travellers

MARCH 26  
Staff of long-term care facilities restricted to working at one facility

APRIL 10  
Confirmation and update to order that limits workers of long-term care facilities to one site

# Comparing timing and stringency of public health measures in BC

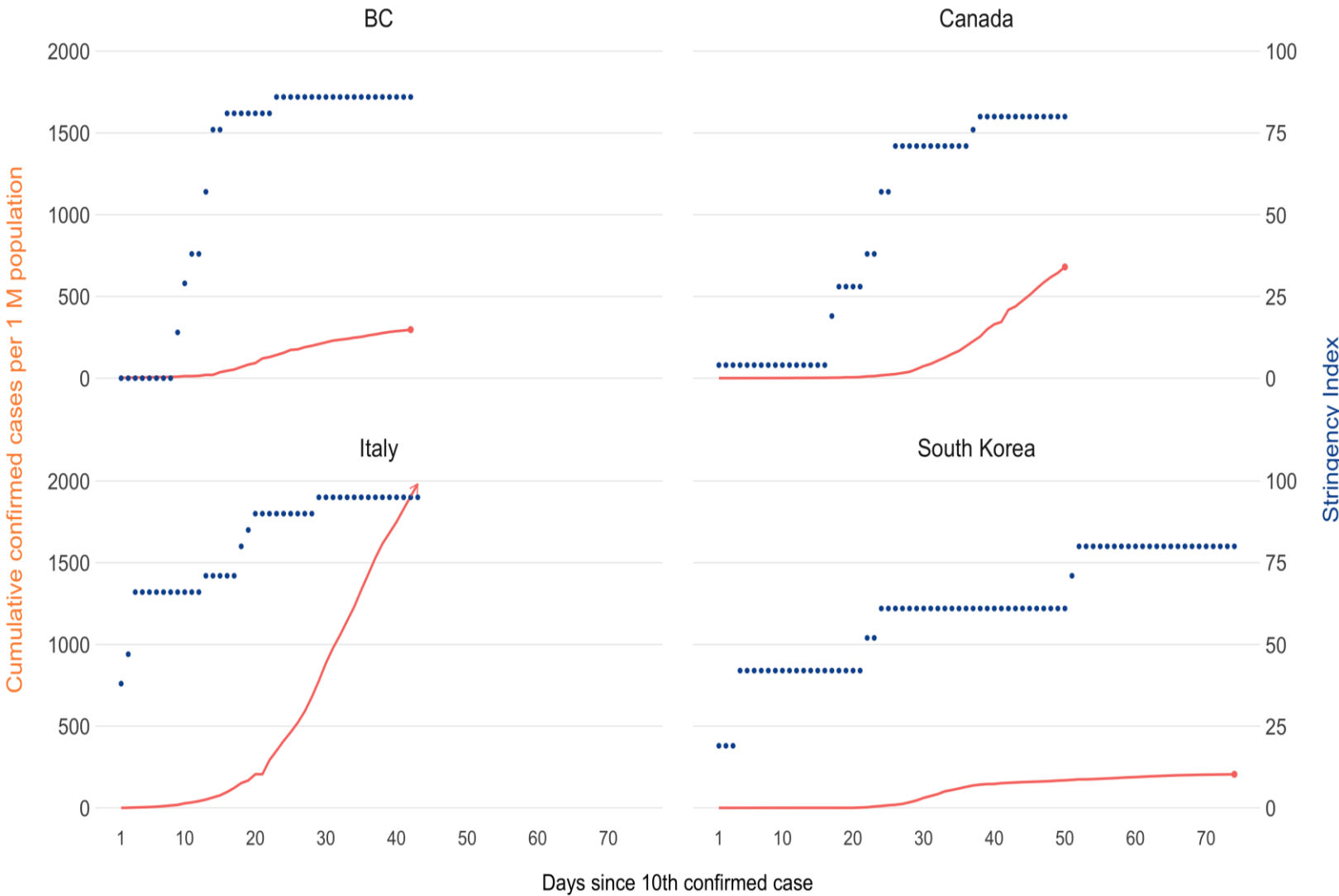
## Oxford's Stringency Index

- a standardized measure of public health measures

## BC enacted

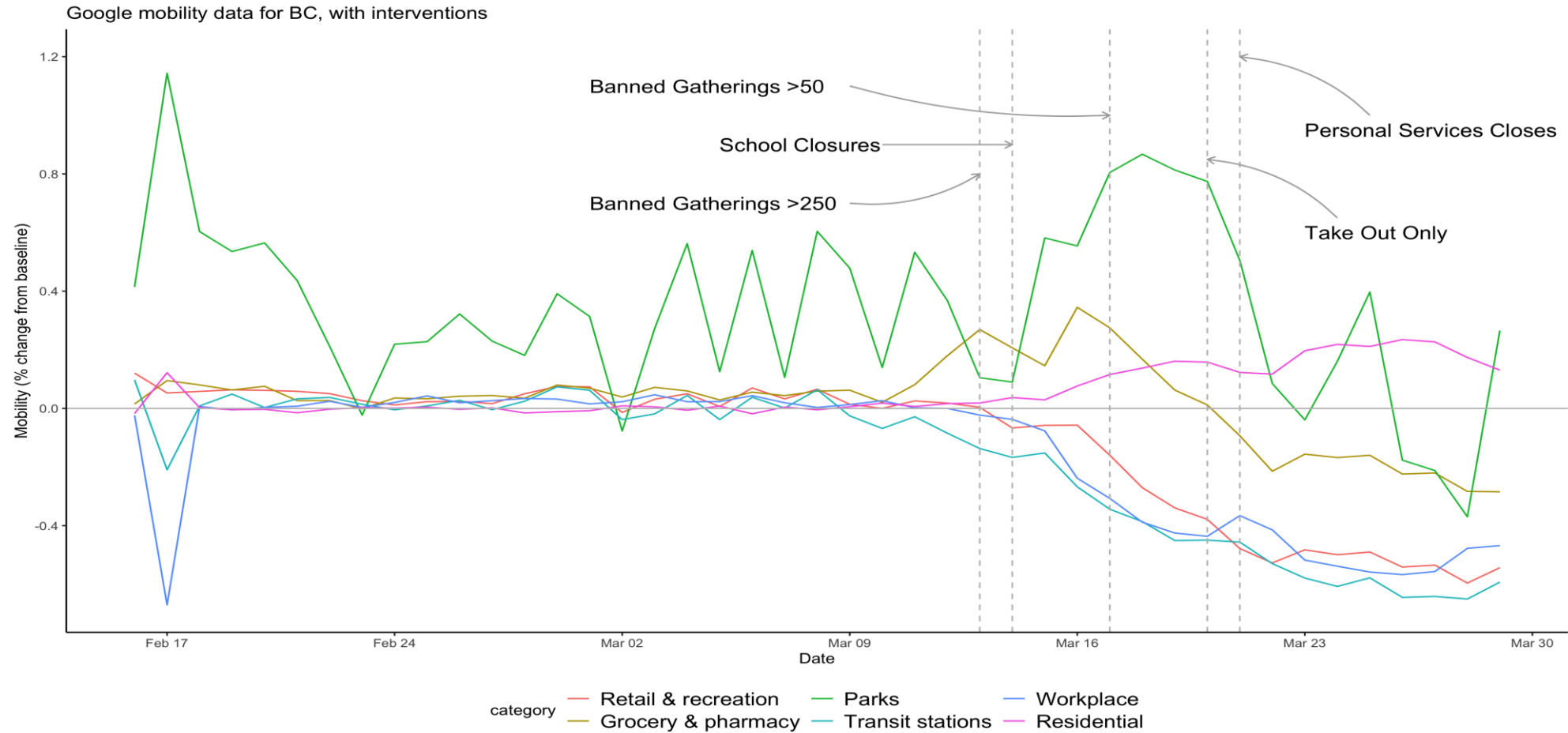
- relatively stringent public health measures
- over a short period
- early in the epidemic

Source: BCCDC visualization of Oxford Government Response Tracker; scoring for BC was done by BCCDC using the same methodology. Data extracted from JHU CSSE Github repository on 2020-04-14. Stringency index data extracted from Oxford COVID-19 Government response tracker on 2020-04-13.



Data extracted from JHU CSSE Github repository on 2020-04-14  
Stringency index data extracted from Oxford COVID-19 Government Response Tracker on 2020-04-13

# Effect of public health measures in BC: Transit, recreation & workplace visits substantially reduced



Source: BCCDC visualization of Google Mobility Reports April 13, 2020

# **Summary of our current state and next steps**

# Key messages regarding our current state

- BC's actual case rate and actual ICU admission rate has been far below what was potential based on other jurisdictions' experience and data.
- BC is experiencing a **slowing in the rate of new diagnoses** and stabilization of COVID-19 patients in hospital/ICU.
- **This difference between what could have been and what has happened is because of the collective action of BC citizens.**
- This slowdown is due to **public health action, not herd immunity** – and what happens next will also be due to public health action. This is an important message.

# Our goal as we move forward

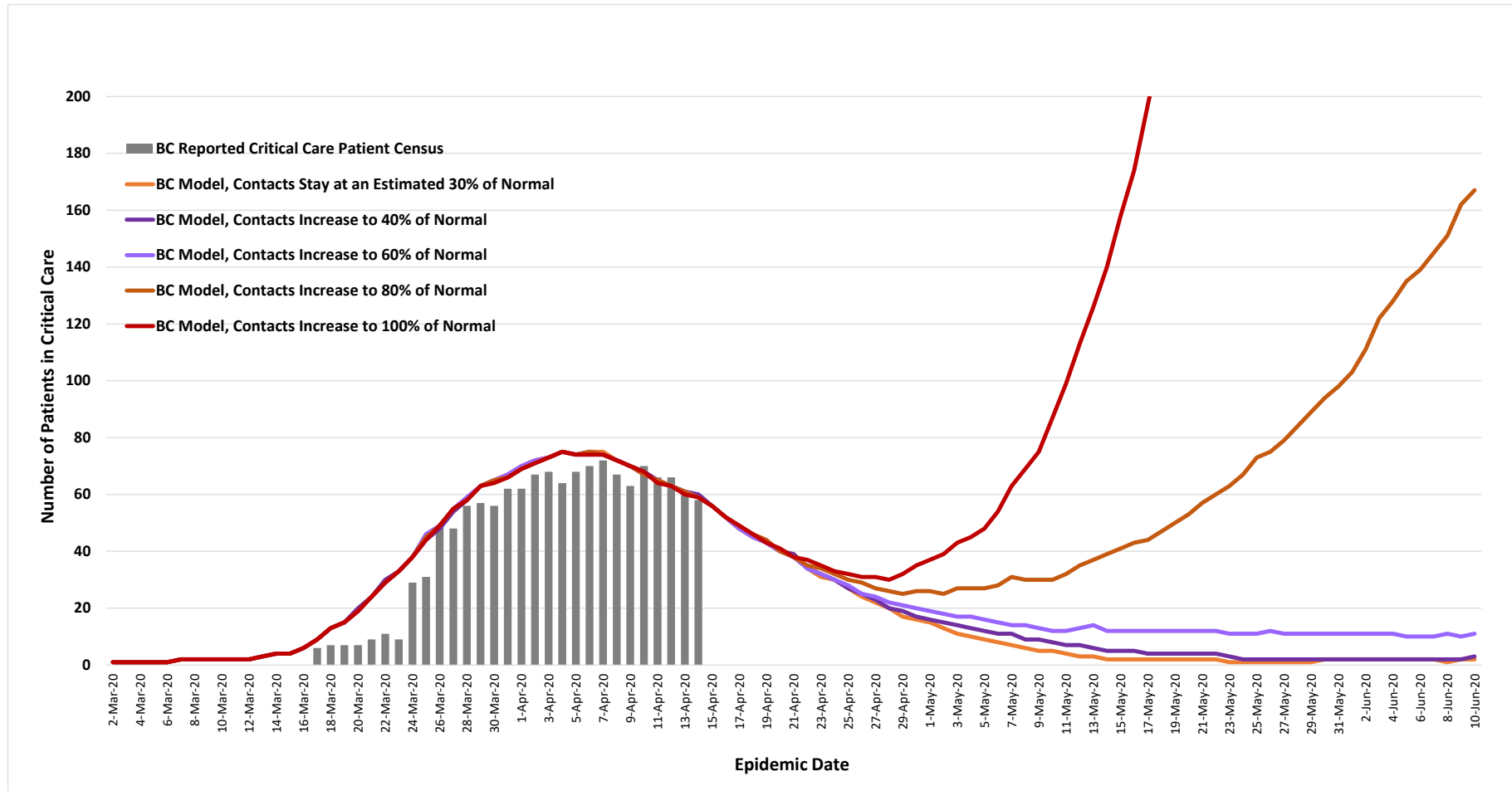
**Our collective goal:** Control transmission and growth in new cases while monitoring and minimizing unintended consequences of necessary public health measures



# What additional tools will facilitate movement forward?

- Modelling will again help in BC with planning
- BC epidemiologists are building two types of models to better understand the future potential direction of the epidemic:
  - *Forecasting models* predict new cases in the short-term assuming no change in our current public health measures.
  - *Dynamic models* use simulations to understand what would happen if conditions changed – for example, how case counts might change under different levels of physical distancing.
- These models will be a tool to support policy makers and health system planners in making informed decisions about potential next steps.

# Example: Critical care implications of dynamic model in BC's context



## Assumptions:

Scenario 11-3-12 assumes that 11% of all COVID-19 cases will be admitted to critical care.

Critical care admissions will commence 3 days (range 1-5 days) after symptom onset; ALOS in Critical Care will be 12 days (interquartile range 5-16 days).

The Scenario 11-3-12 is based on analysis of BC data on COVID-19 patients admitted to critical care by April 10<sup>th</sup> 2020.

Note: This epidemic curve is aligned with the date that BC reached 2 cases per million to align with international comparators.

Note: Confidence intervals exist around the lines presented; however, these are not depicted in this image.

# **We are on the right track. We must keep going.**

- Together we have made good decisions and carried through with tenacity.
- Like we have done already, we will develop an evidence-based and thoughtful plan for this unknown path forward.
- It is essential that everyone in BC continue to practice strong physical distancing until directed otherwise –we know we still face the potential of growth in cases and deaths in British Columbia.
- We have had success in BC by being diligent and thoughtful. We can and will continue on this path and will do so by working together.

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