COVID-19:
Going Forward

- Prepared for BC Ministry of Health
- June 23, 2020

Epidemiology

How and Where the Virus Has Affected People in BC

Epidemic Curve: COVID-19 cases in BC by reported date
January 15 – June 21, 2020. (N=2,822[‡])[¥]

Date reported to public health

Epi-linked   Lab-diagnosed
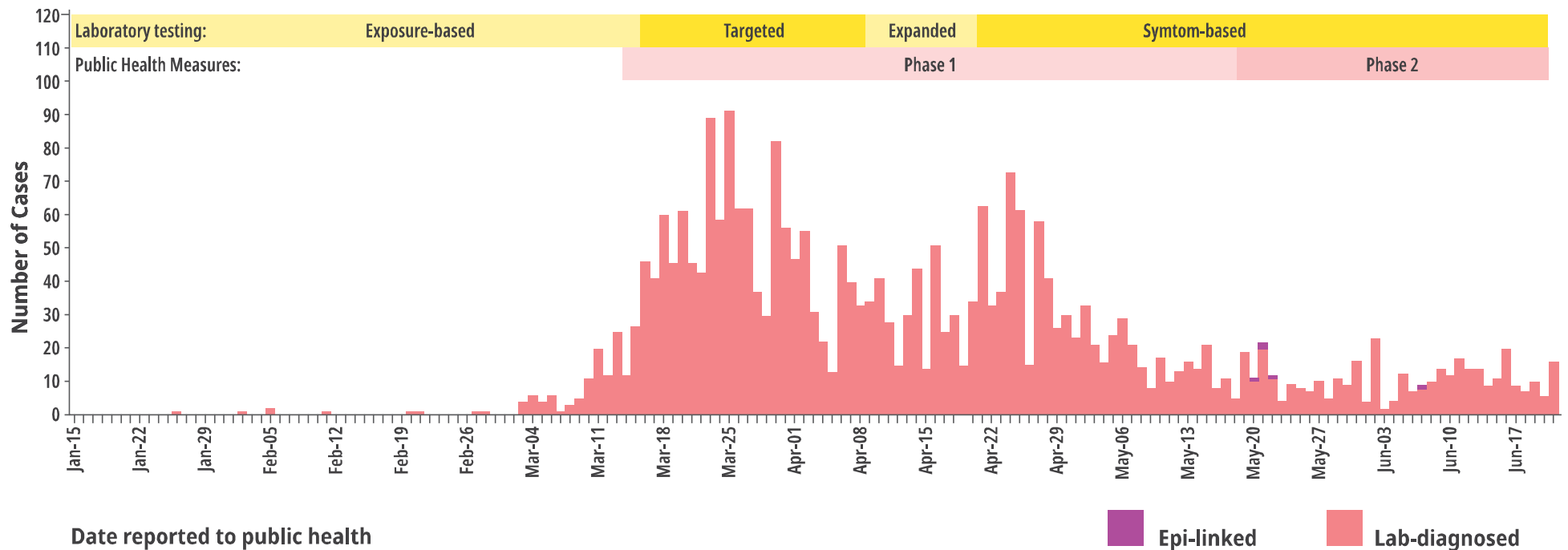
[‡] *The number of cases reported by day differs from that in Table 1 in previous reports as this figure reflects the date the case was lab-confirmed and reported to the Health Authority.*
[¥] *On June 3, a change in the FHA reporting system led to changes in the reported date of some FHA cases and concurrent changes to the epidemic curve by reported date.*

Likely source of infection for COVID-19 cases in BC by episode date§, January 15 – June 21, 2020. (N=2,821)
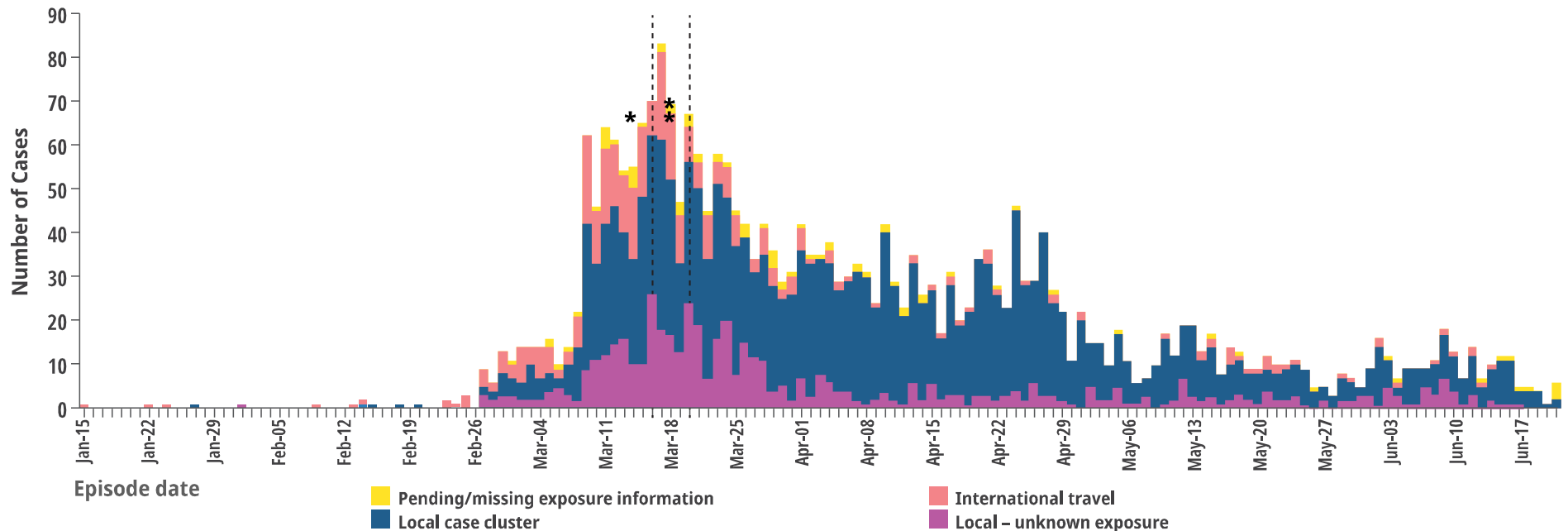
§ Episode date is based on symptom onset date (n=2,628), if not available then date COVID-19 was reported to health authority (n=193).
* March 16: Entry of foreign nationals banned; symptomatic individuals banned from flights to Canada; international flights restricted to four national airports.
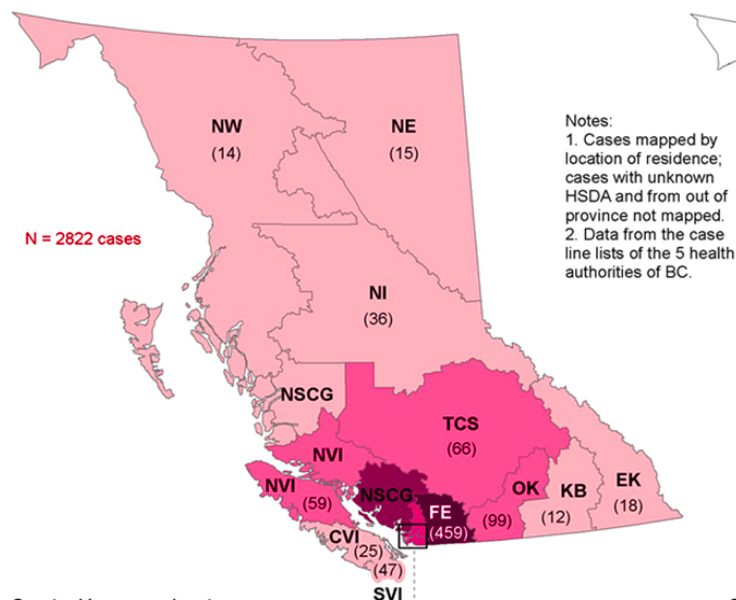** March 20: US/Canada border closed to non-essential travel.

Geographic Distribution of COVID-19 by Health Service Delivery Area of Case Residence
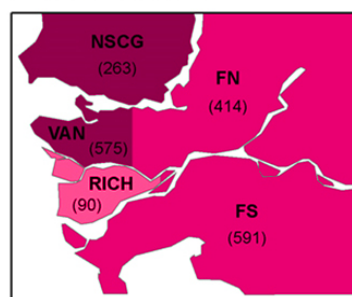
Notes: 1. Cases mapped by location of residence; cases with unknown HSDA and from out of province not mapped. 2. Data from the case line lists of the five regional health authorities of British Columbia. 3. COVID-19 may be circulating undetected in the community including where no cases have been identified by public health.

**Cumulative total: cases reported January 1 to June 21, 2020**

N = 2822 cases

NW (14)
NE (15)
NI (36)
NSCG
TCS (66)
NVI
NVI (59)
NSCG
FE (459)
OK (99)
KB (12)
EK (18)
CVI (25)
(47)
SVI

Notes:
1. Cases mapped by location of residence; cases with unknown HSDA and from out of province not mapped.
2. Data from the case line lists of the 5 health authorities of BC.

Greater Vancouver Inset

NSCG (263)
FN (414)
VAN (575)
RICH (90)
FS (591)

Cumulative rate per 100,000 population of COVID-19 cases

0.1 - 25.0
25.1 - 50.0
50.1 - 75.0
75.0 - 100.0
100.0 +

Past 14 days: cases reported June 8 to 21, 2020

N = 169 cases

NW (0)
NE (1)
NI (0)
NSCG
TCS (1)
NVI
NVI (0)
NSCG
FE (67)
OK (2)
KB (0)
EK (0)
CVI (0)
(1)
SVI

Notes:
3. COVID19 may be circulating undetected in the community including where no cases have been identified by public health.

Greater Vancouver Inset

NSCG (0)
FN (5)
VAN (36)
RICH (2)
FS (42)
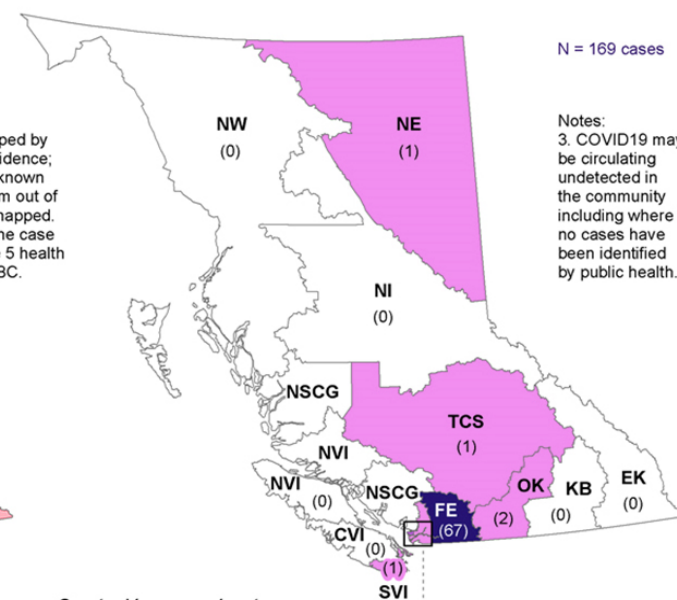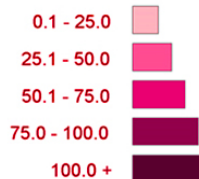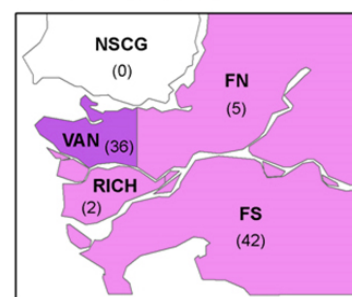
Past 14 days rate per 100,000 population of COVID-19 cases

0.0
0.1 - 5.0
5.1 - 10.0
10.1 - 15.0
15.0 +

COVID-19 IN BC
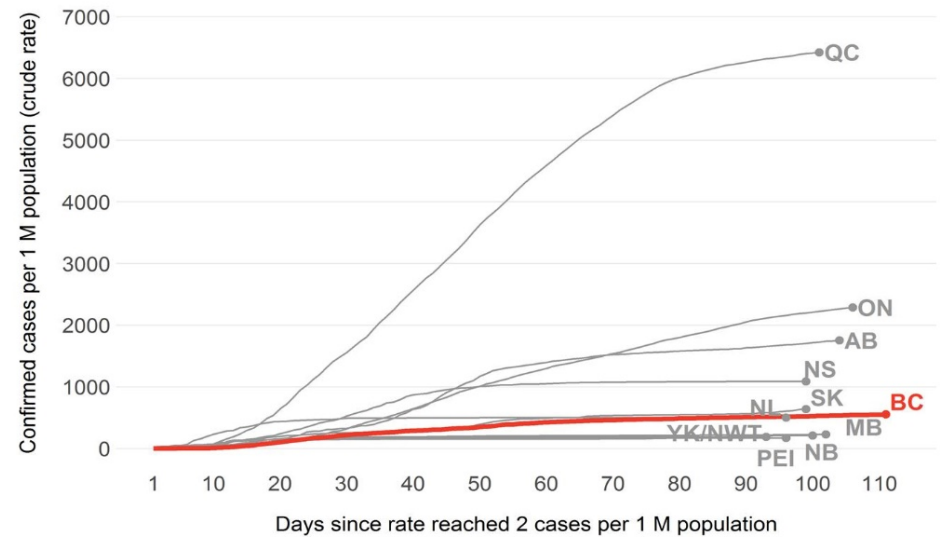
5
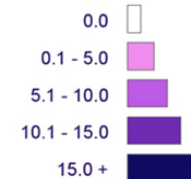
Case Rate Comparison

International Case Rates Comparison:
Cumulative diagnosed COVID-19 case rates by select countries vs BC and rest of Canada.
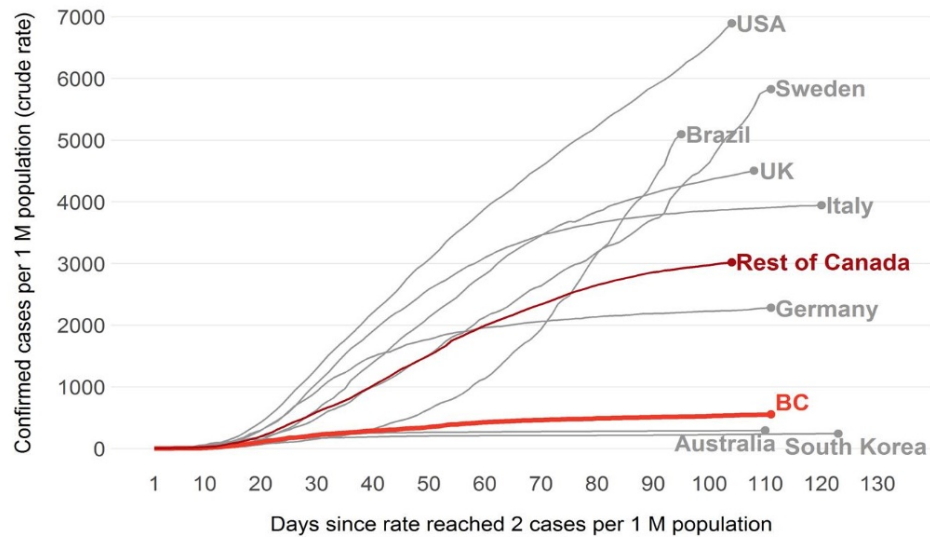
National Case Rates Comparison:
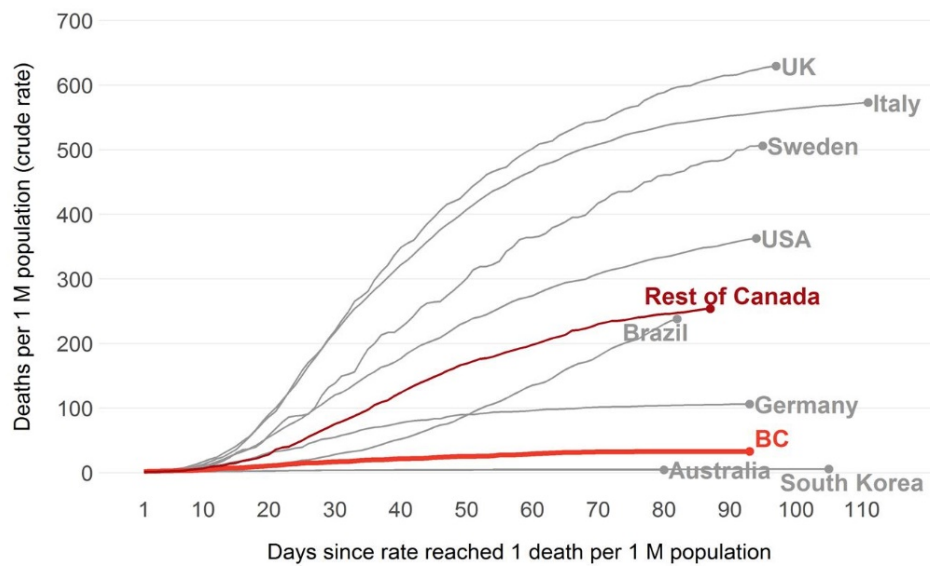Cumulative diagnosed COVID-19 case rates by Canadian provinces.

Note: QC, and, to a lesser extent, ON, account for most of the deaths count for the Rest of Canada.
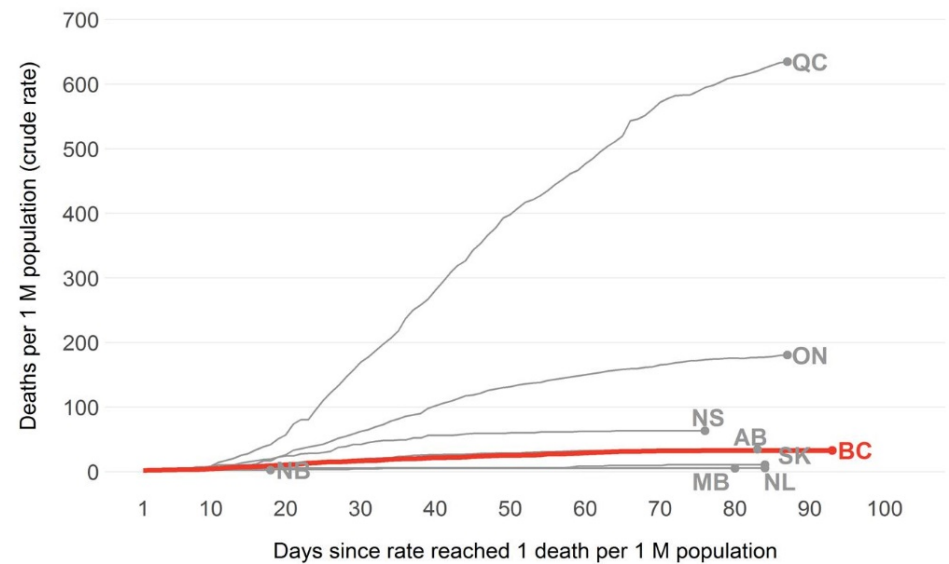
Death Rate Comparison

International Death Rates Comparison:
Cumulative COVID-19 death rates by select countries vs BC
and rest of Canada.

National Death Rates Comparison:
Cumulative COVID-19 death rates by
Canadian province.

Note: QC, and, to a lesser extent, ON, account for most of the deaths count for the Rest of Canada.

New Monitoring Methods
in our Communities

The B.C. Centre for Disease Control is working with other jurisdictions to develop a method to test waste water for COVID-19 RNA sequences.
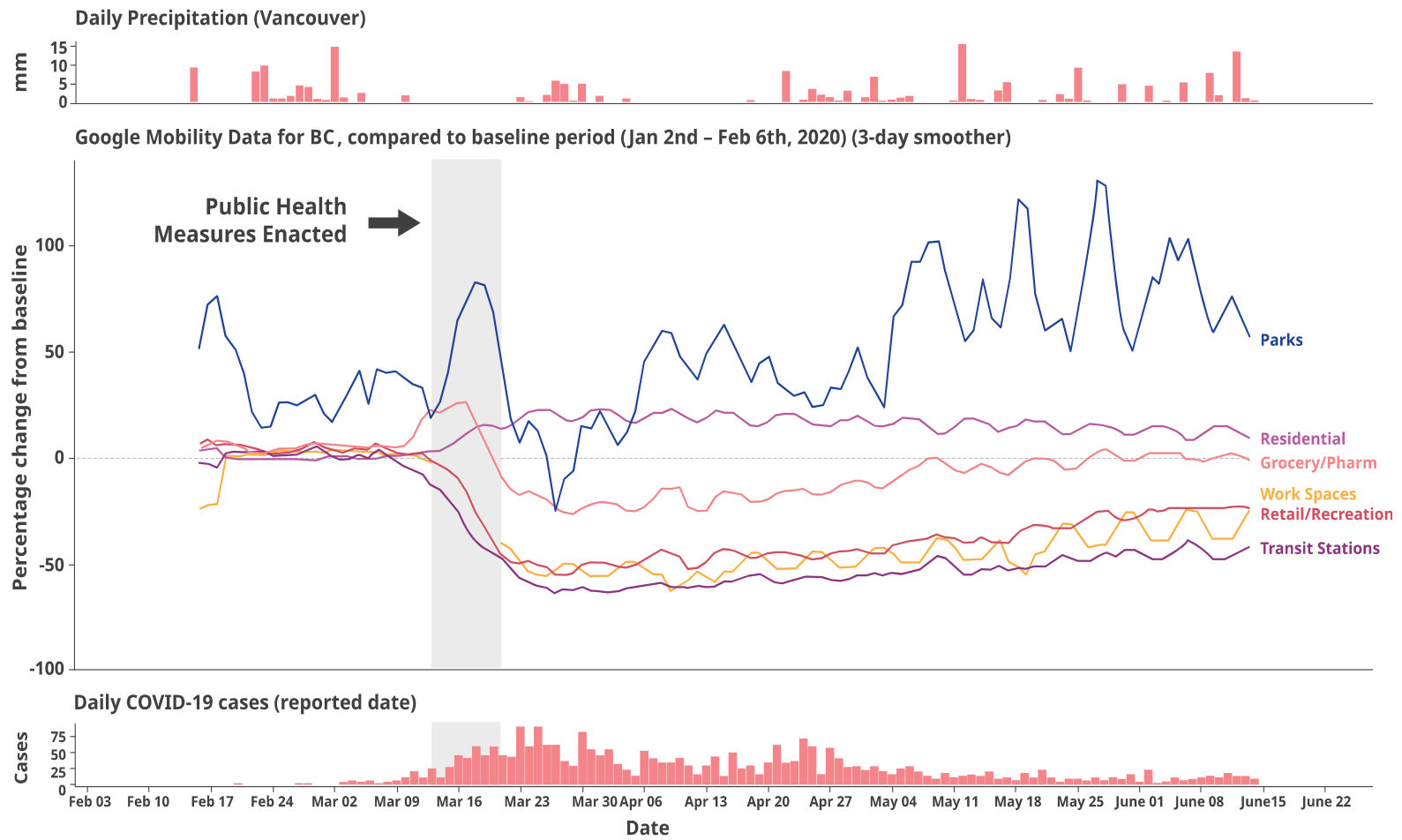
Their research could become an early detection tool in our communities.

British Columbians' Mobility

Mobility index based on GPS data from smartphone users who have Google location services set to "on" (opt-in).

It shows how visits to, and length of stay at, different location types compare to a baseline period Jan 3-Feb 6.

Data Source

Daily Precipitation (Vancouver)

Google Mobility Data for BC , compared to baseline period (Jan 2nd – Feb 6th, 2020) (3-day smoother)

Public Health Measures Enacted →

Parks
Residential
Grocery/Pharm
Work Spaces
Retail/Recreation
Transit Stations

Percentage change from baseline

Daily COVID-19 cases (reported date)

Date

Mobility Status

Mobility metrics are generally increasing from post-intervention lows, but many remain below seasonal norms (based on 2019 data).

Mobility data indicate a continued movement towards pre-intervention activity levels with higher park usage, decrease in time spent in residential spaces and increase in other activities such as groceries/pharmacies, retail, workplace and transit stations.

Synthesis of Modelling and Analyses to Date

Keeping the Curve Flat

Our Current Models

- Our mathematical models use simulations to illustrate how individual public health actions influence transmission.

- Wherever possible, the models are calibrated using BC data.

- Here, we explore recent trends in transmission and consider how future transmission might be influenced by different levels of physical distancing and contact tracing.

- It is important to remember when interpreting models, that they are illustrative, not predictive. Since multiple actions were put in place at the same time, the reduction in cases cannot be attributed to one particular intervention.

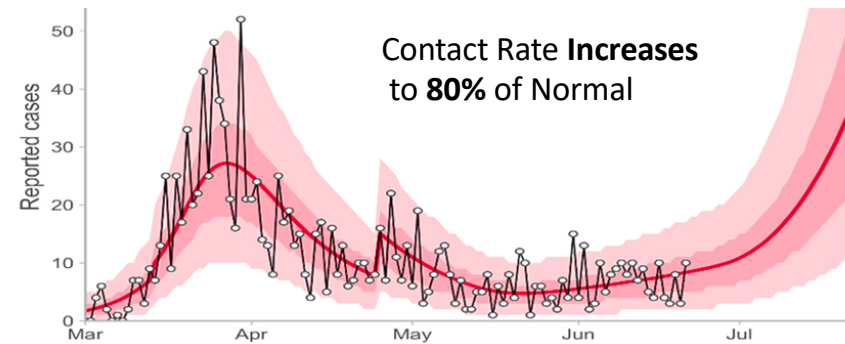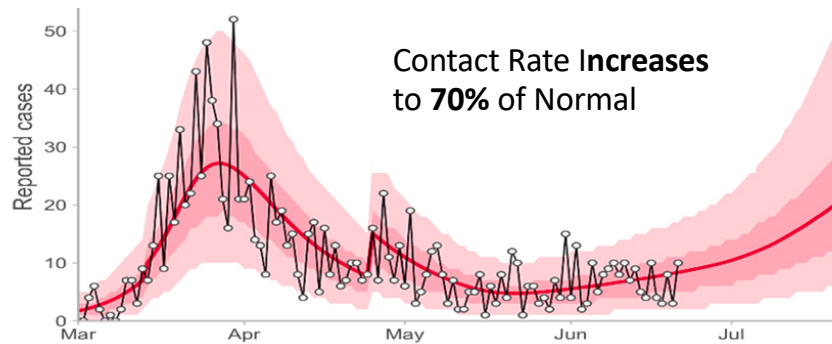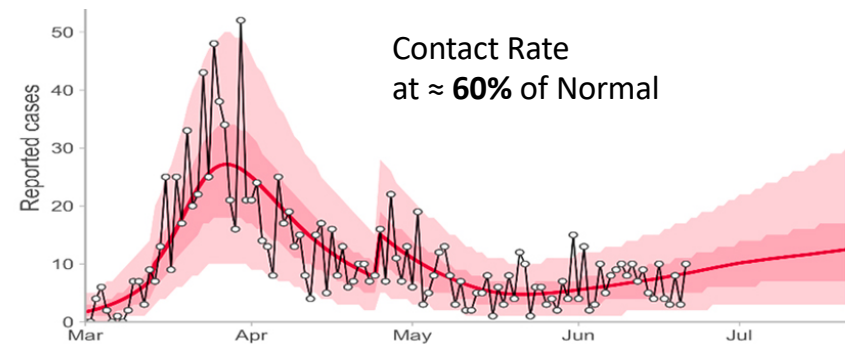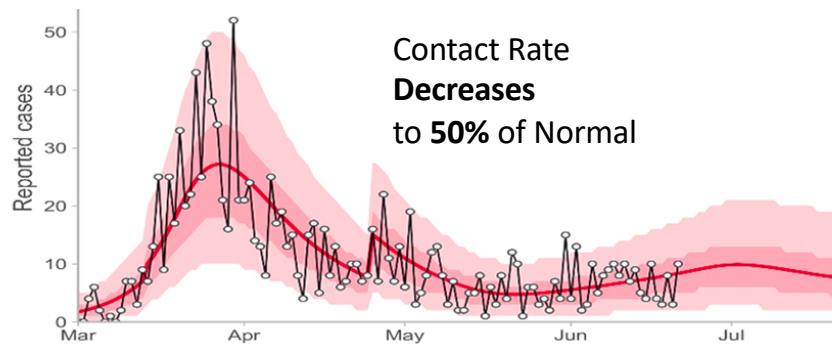# Dynamic Compartmental Modelling: Projections

- Our model suggests a slight increase in new cases during June and the possibility of continued growth in new cases during the summer.

- Recent contact rates are estimated to be at roughly 65% of normal.

Solid line: mean; shaded bands: 50% and 90% credible intervals; Open circles: reported cases. Cases used for model fitting exclude those attributed to outbreak clusters.
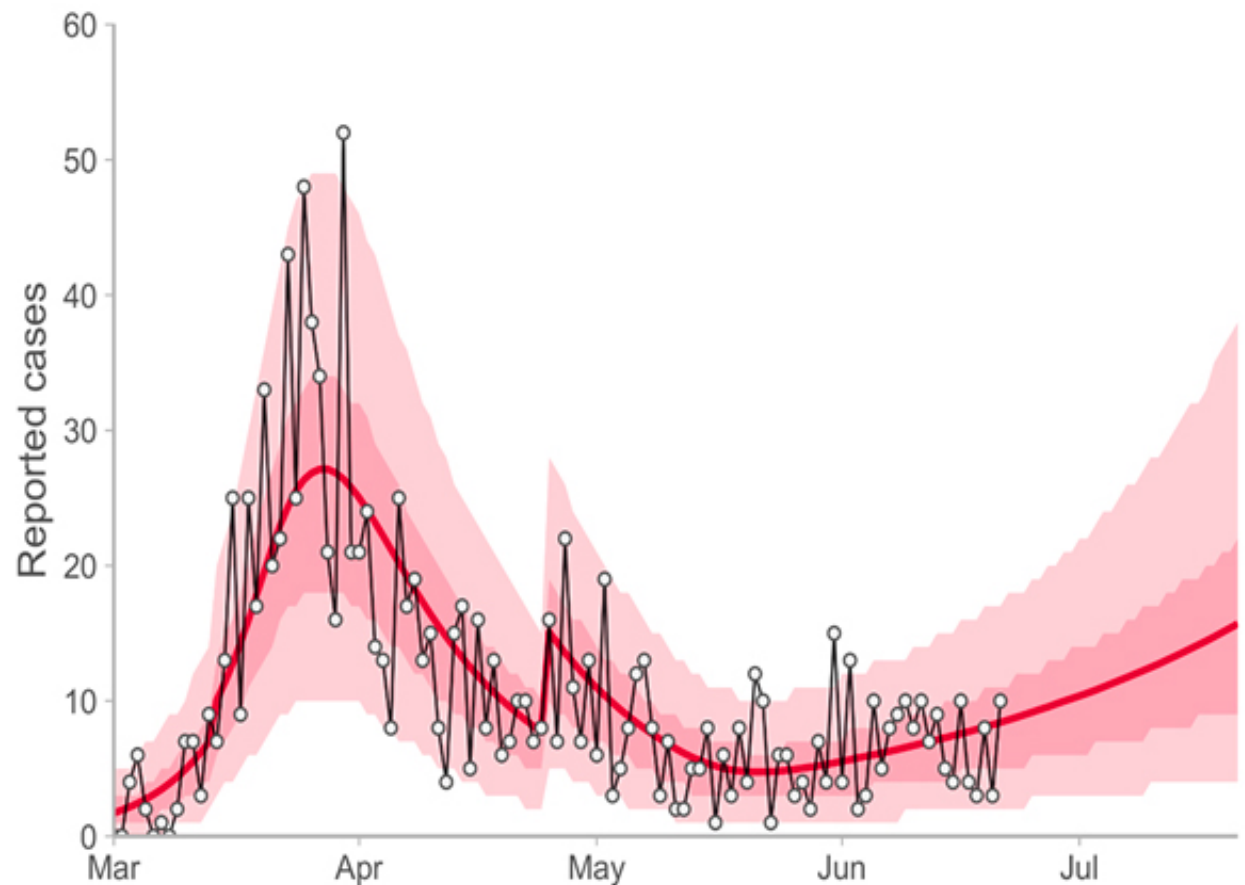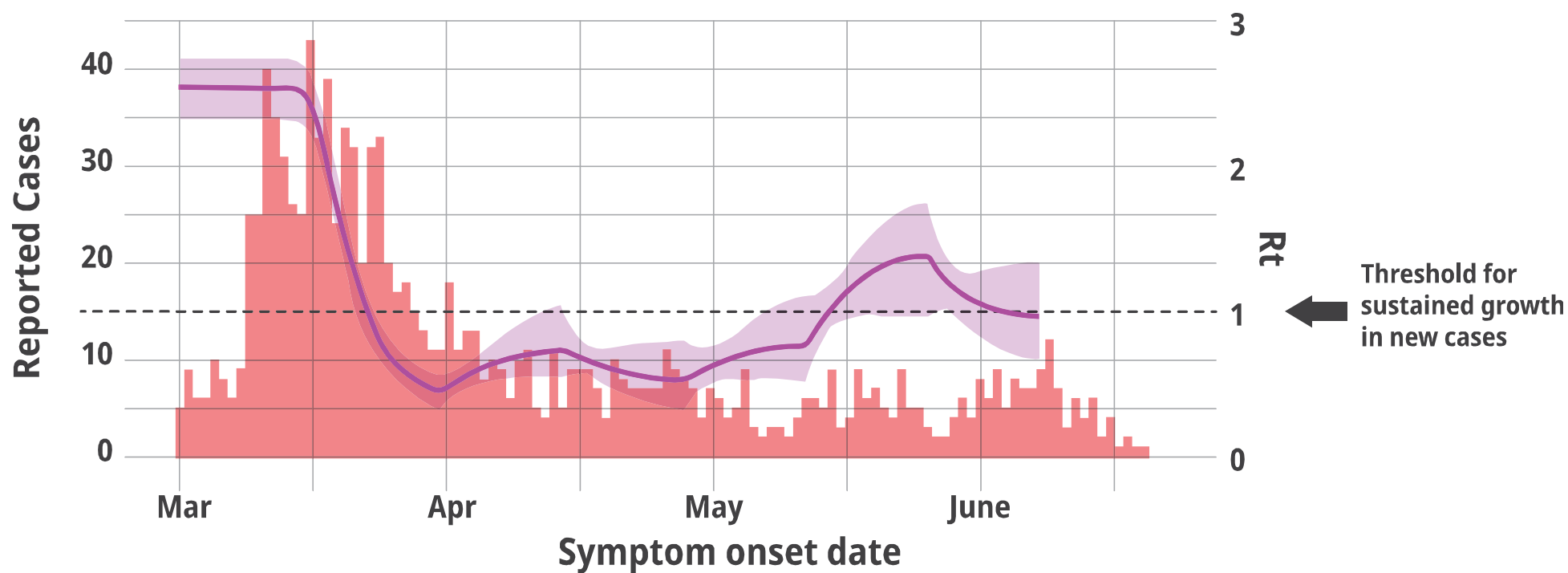
Dynamic Compartmental Modelling: Scenarios

Scenarios from our model illustrate the importance of reducing contacts that could lead to transmission.
Higher rates of infectious contact lead to a more rapid rebound in new cases.

Contact Rate
Decreases
to **50%** of Normal

Contact Rate
at ≈ **60%** of Normal

Contact Rate **Increases**
to **70%** of Normal

Contact Rate **Increases**
to **80%** of Normal

Dynamic Compartmental Modelling: Recent Trends

R_t (average daily number of new infections generated per case) hovers around 1 suggesting that BC is close to the threshold for rebound in new cases.

Dynamic Compartmental Modelling:
# Key Messages

Our models suggests that contact rates since mid-May are roughly 65% of normal, which is roughly the threshold for a rebound in new cases.

Overall Key Messages From All Models

- As expected following some re-opening, models suggest that British Columbia is now closer to a threshold where renewed growth of cases could occur.

- To maintain epidemic control, physical distancing, self-isolation for those who feel sick, and a continued focus on hygiene measures are critical.

- Complete contact tracing helps to ensure epidemic control when population level restrictions are relaxed.
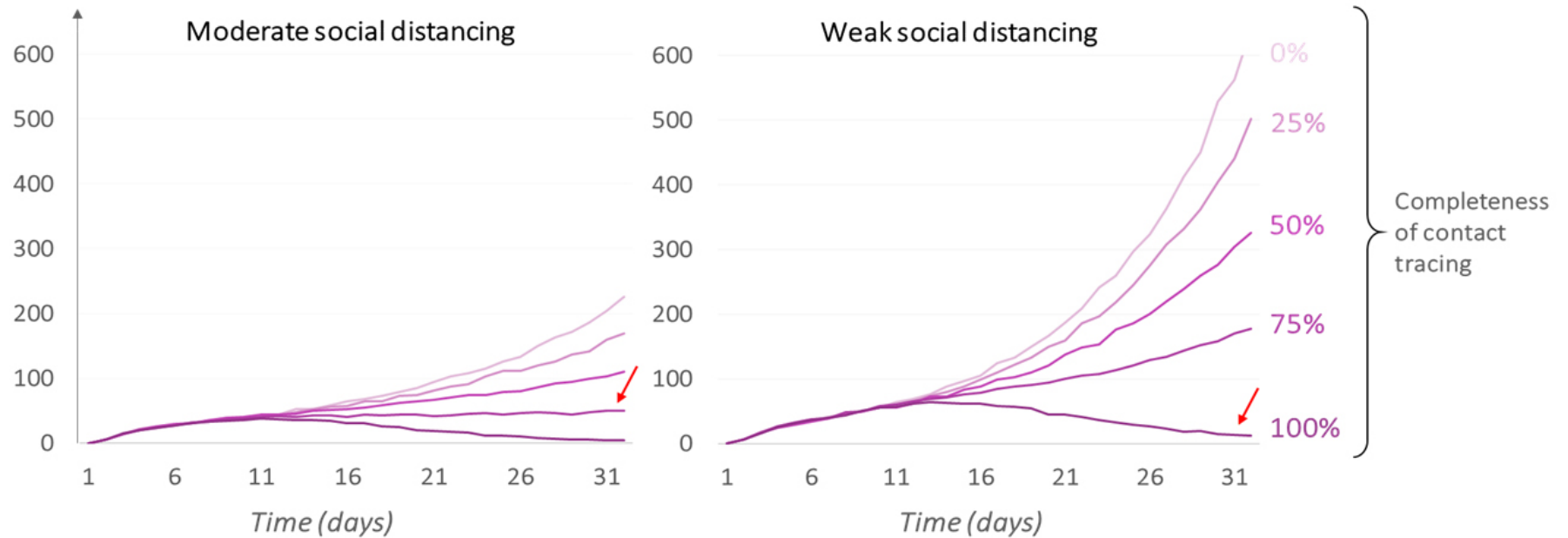
Contact Trace Modelling: Scenarios

With relaxed distancing, contact tracing needs to be both <u>complete</u> and <u>prompt</u> in order to prevent sustained transmission.
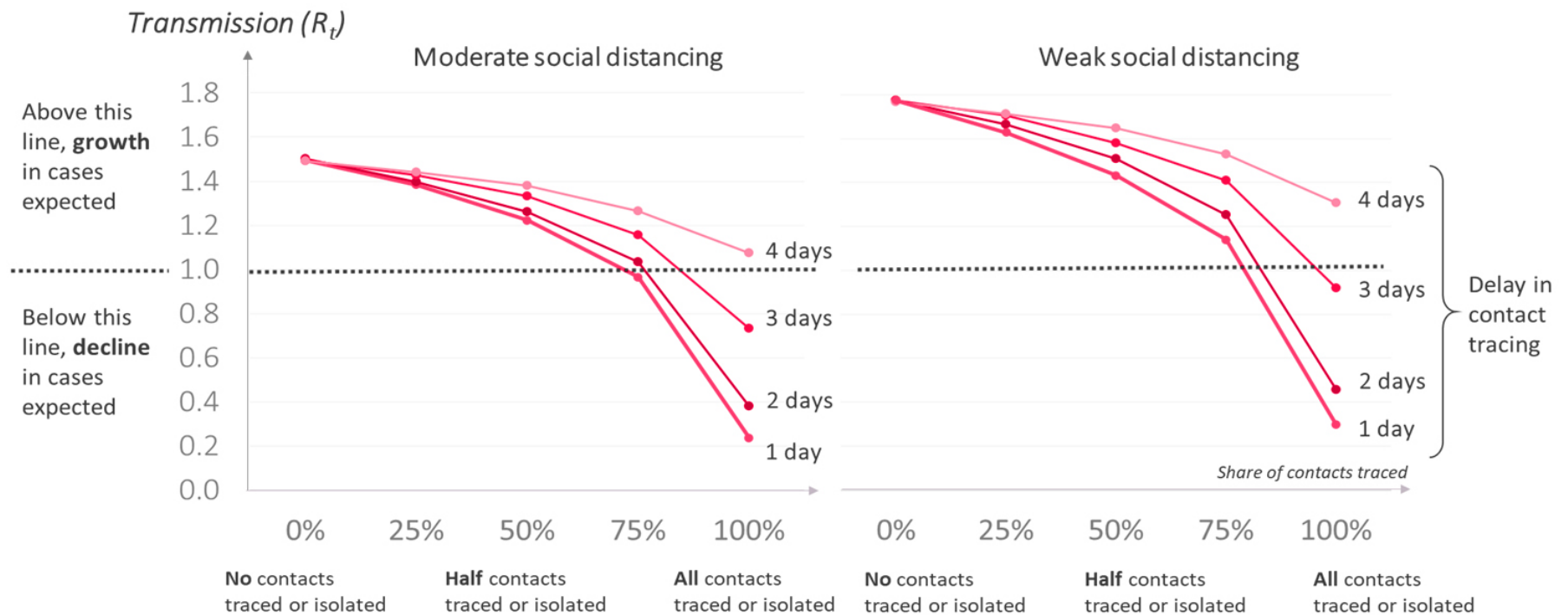
Contact Trace Modelling: Scenarios

Complete contact tracing helps to ensure epidemic control when population level restrictions are relaxed.

Need to trace **at least 75% of contacts** to maintain epidemic control

Need to trace **more than 75% of contacts** to maintain epidemic control

Contact Tracing Modelling:
Key Messages

- As we have relaxed distancing measures, strong contact tracing in BC has provided a buffer against renewed growth of cases.

- As we further relax, the completeness and rapidity of contact tracing will be even more important for controlling transmission, in combination with self-isolation by sick individuals and strict hygiene practices.

Conclusions

These models show we are increasing our contacts – and doing it in a safe way.

To continue to safely increase our contacts, we need to maintain the measures we have in place and ensure well supported public health teams to efficiently and thoroughly undertake contact tracing across our province.

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