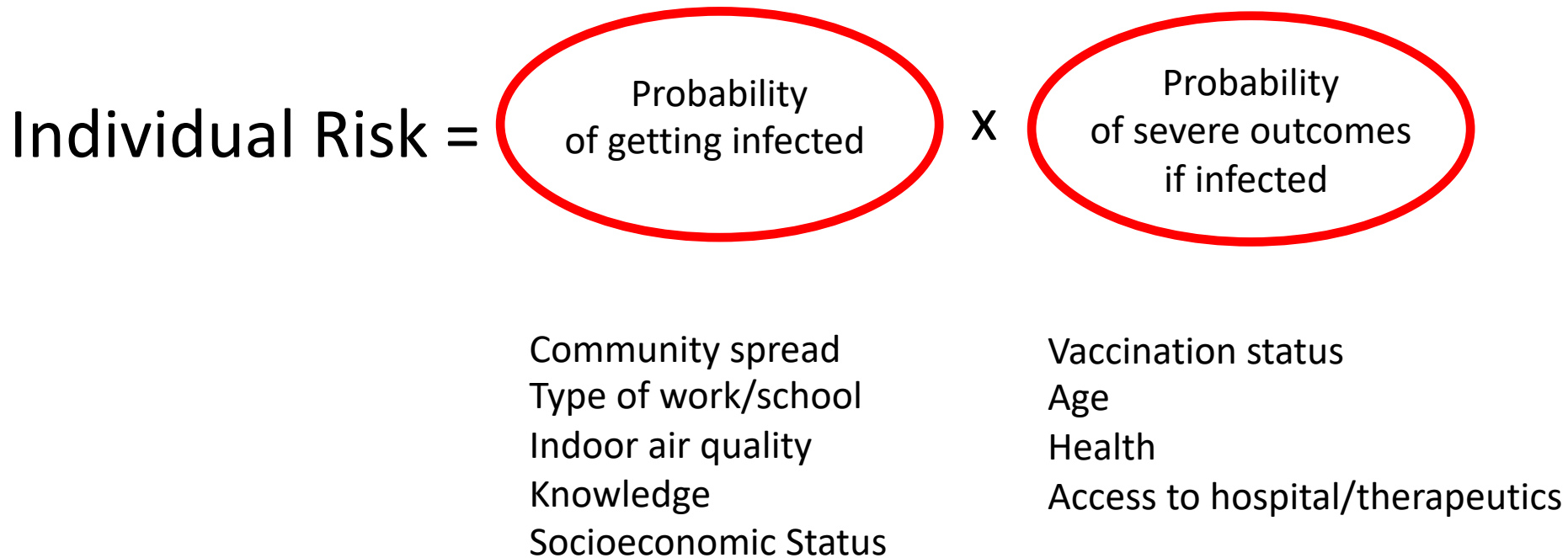# Reality check: Interpreting shifting data

Vaccines, public health measures, and good policy remain critical

Malgorzata (Gosia) Gasperowicz
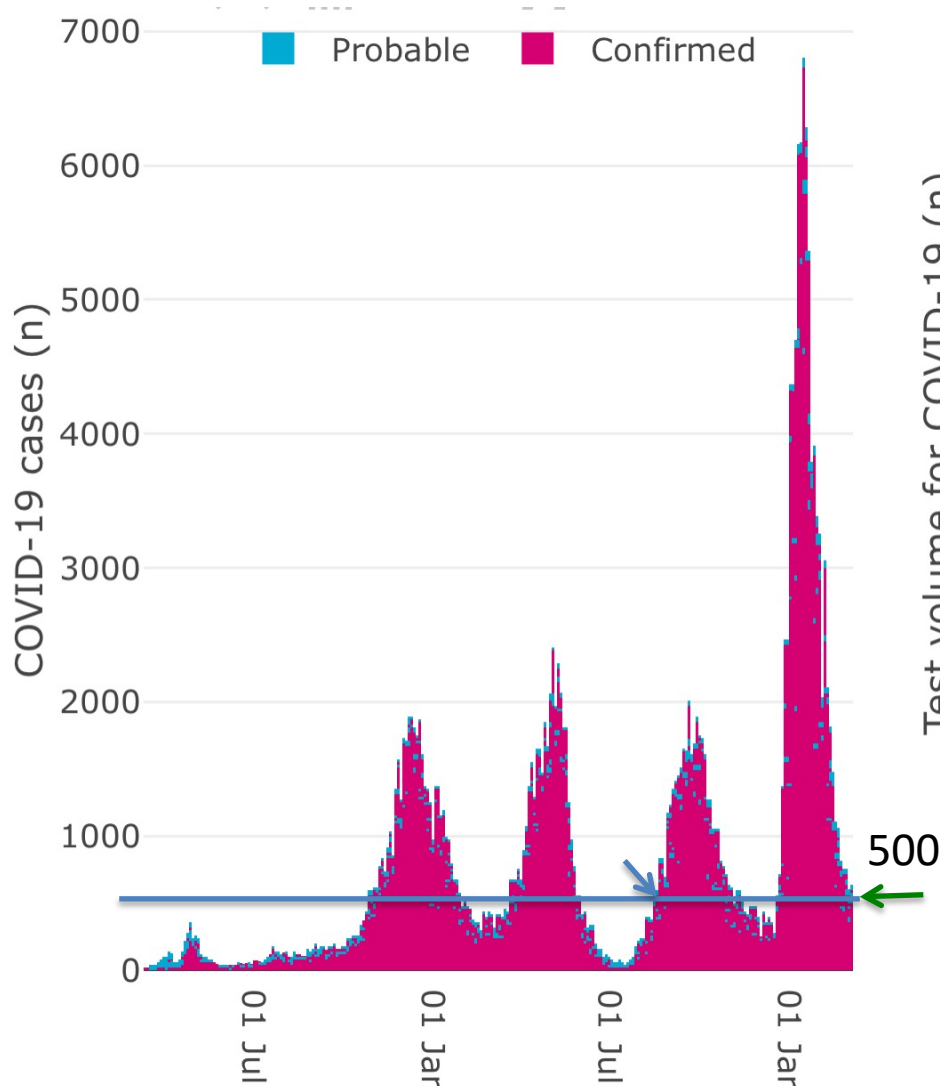
OCC-COVID Webinar Series
March 4, 2022

Vaccines, public health measures, and good policies reduce a person's risk of COVID-19 severe outcomes
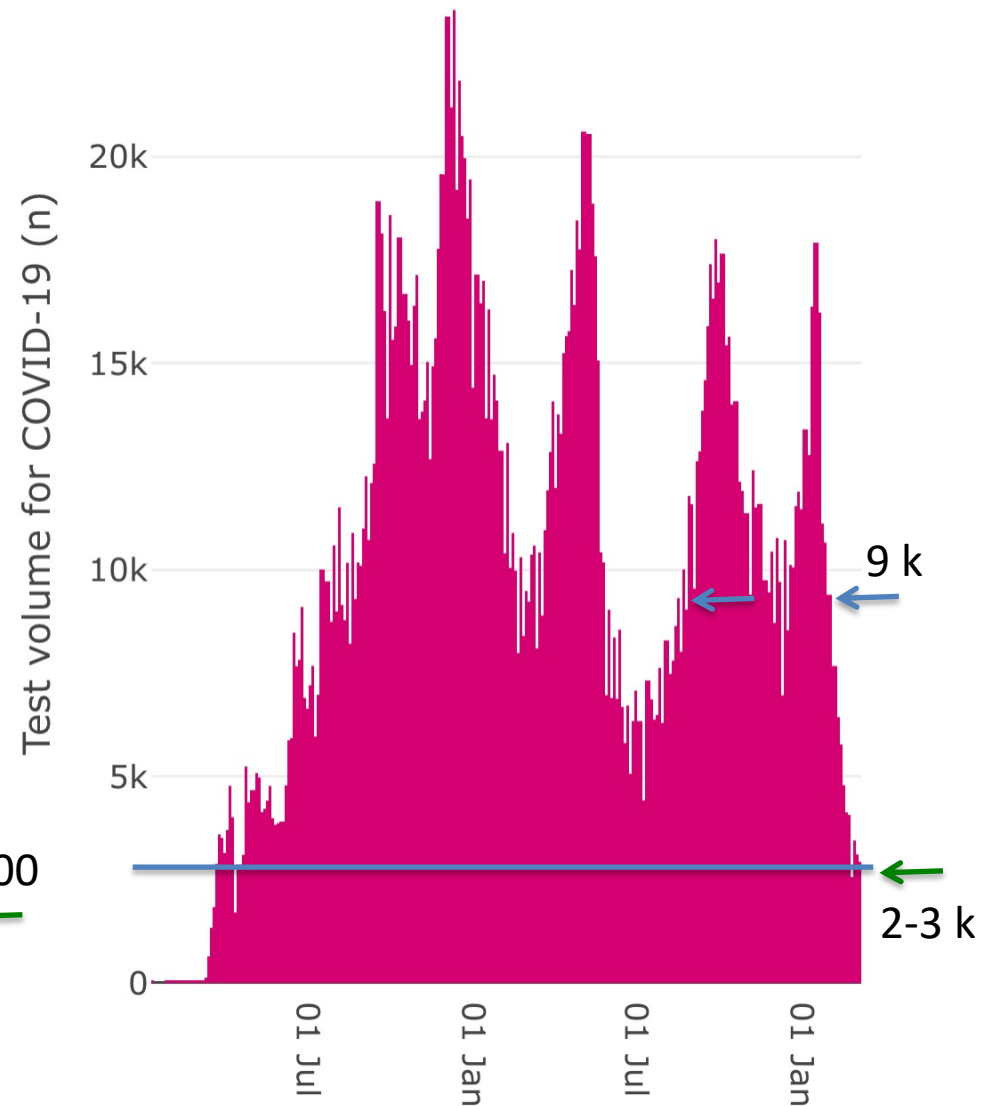
Individual Risk = (Probability of getting infected) X (Probability of severe outcomes if infected)

Community spread
Type of work/school
Indoor air quality
Knowledge
Socioeconomic Status

Vaccination status
Age
Health
Access to hospital/therapeutics

In Alberta PCR testing volume is disproportionally low
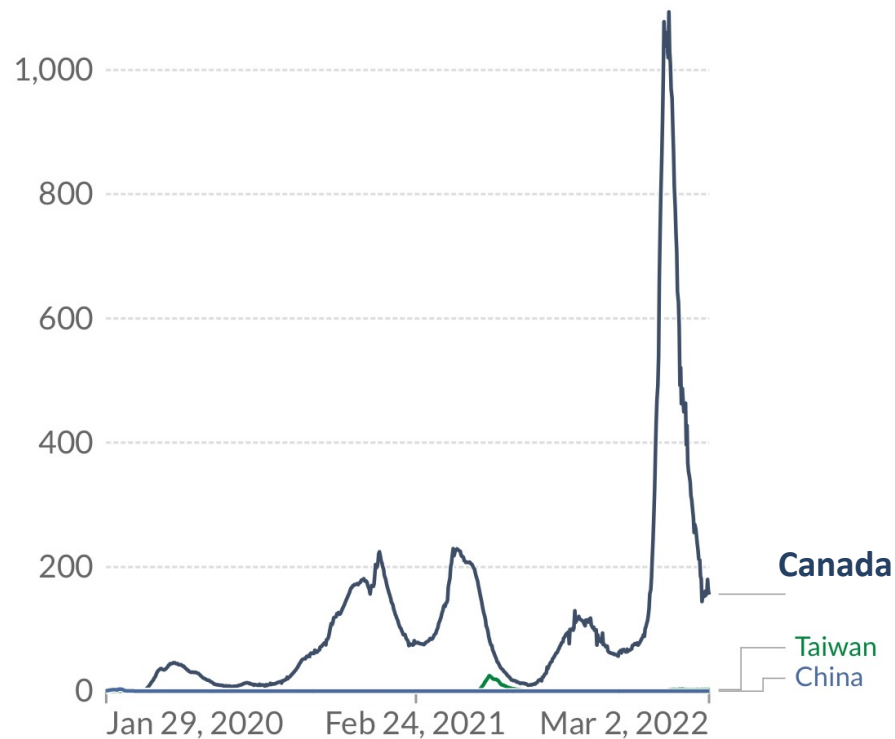
cases

PCR testing
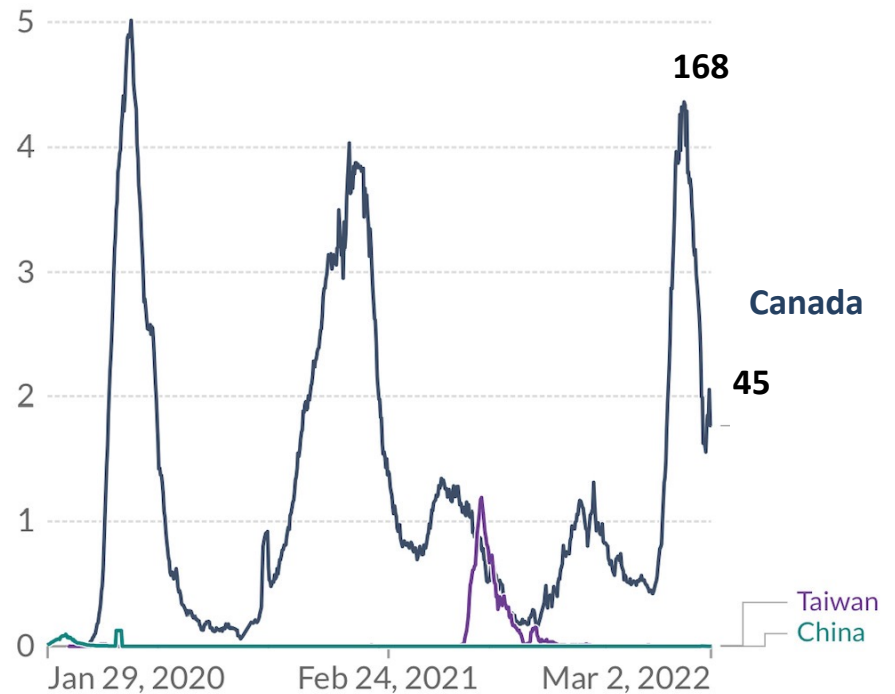

Source: alberta.ca/stats/covid-19

Today Canada is still in the highest COVID wave ever, which now kills around 45 Canadians every day

Daily new confirmed COVID-19 **cases** per million people

Daily new confirmed COVID-19 **deaths** per million people

1,000

800

600

400

200

Canada

Taiwan
China

0

Jan 29, 2020   Feb 24, 2021   Mar 2, 2022

5

168

4

3

Canada

2

45

1

Taiwan
China

0

Jan 29, 2020   Feb 24, 2021   Mar 2, 2022

Source: Johns Hopkins University CSSE COVID-19 Data   CC BY
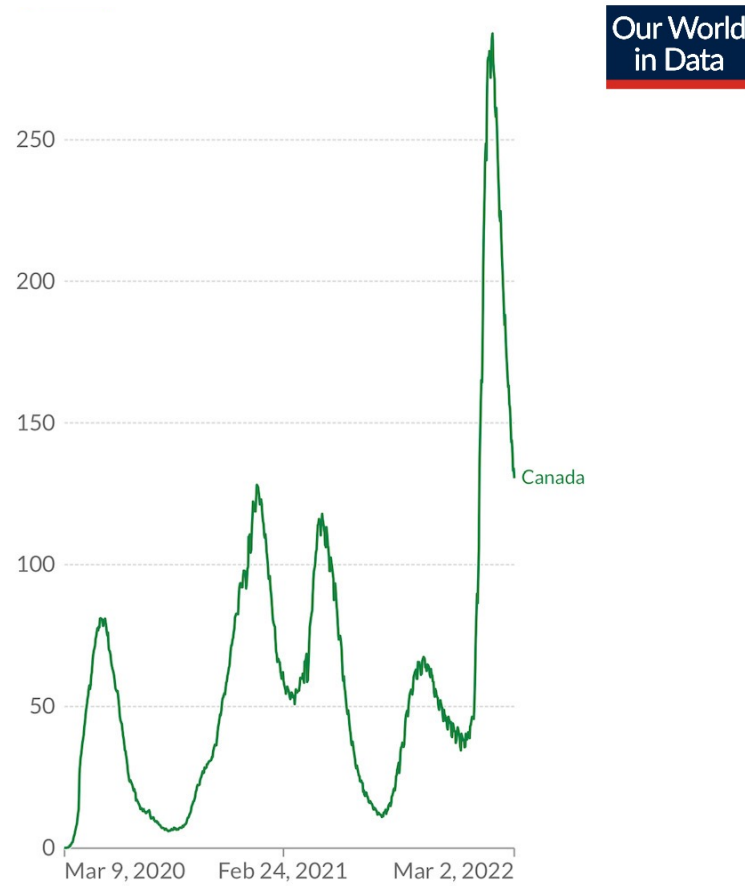
Source: Johns Hopkins University CSSE COVID-19 Data   CC BY

The number of COVID-19 patients in hospital is still extremely high

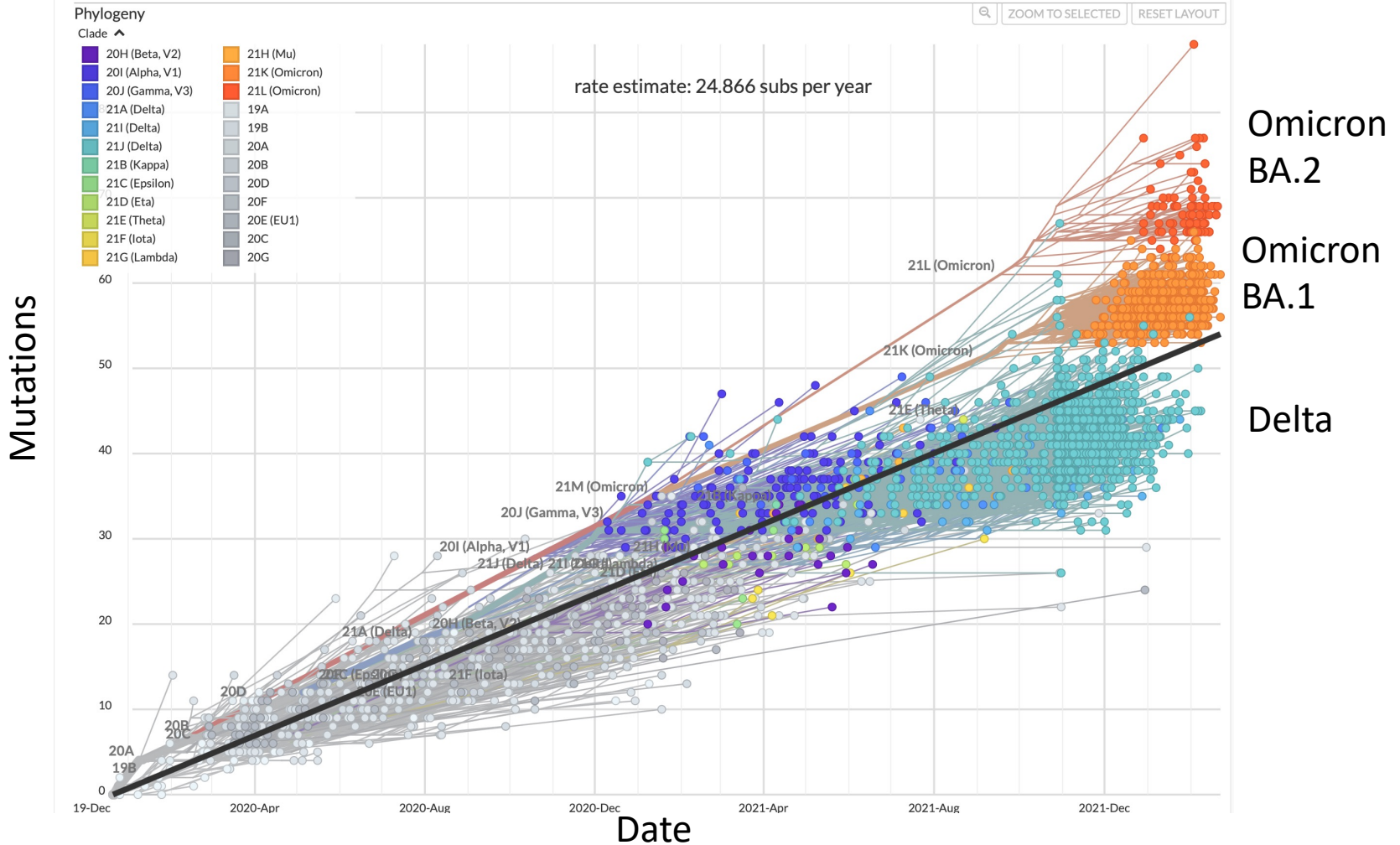Number of COVID-19 patients in hospital per million

Pandemic doesn't end with Omicron.
The future is highly uncertain.

Genomic epidemiology of novel coronavirus - Global subsampling

Built with nextstrain/ncov. Maintained by the Nextstrain team. Enabled by data from GISAID.

Showing 3219 of 3219 genomes sampled between Dec 2019 and Feb 2022.

Source: nextstrain.org

A variant that transmits faster, even if much milder, could lead to many more deaths.
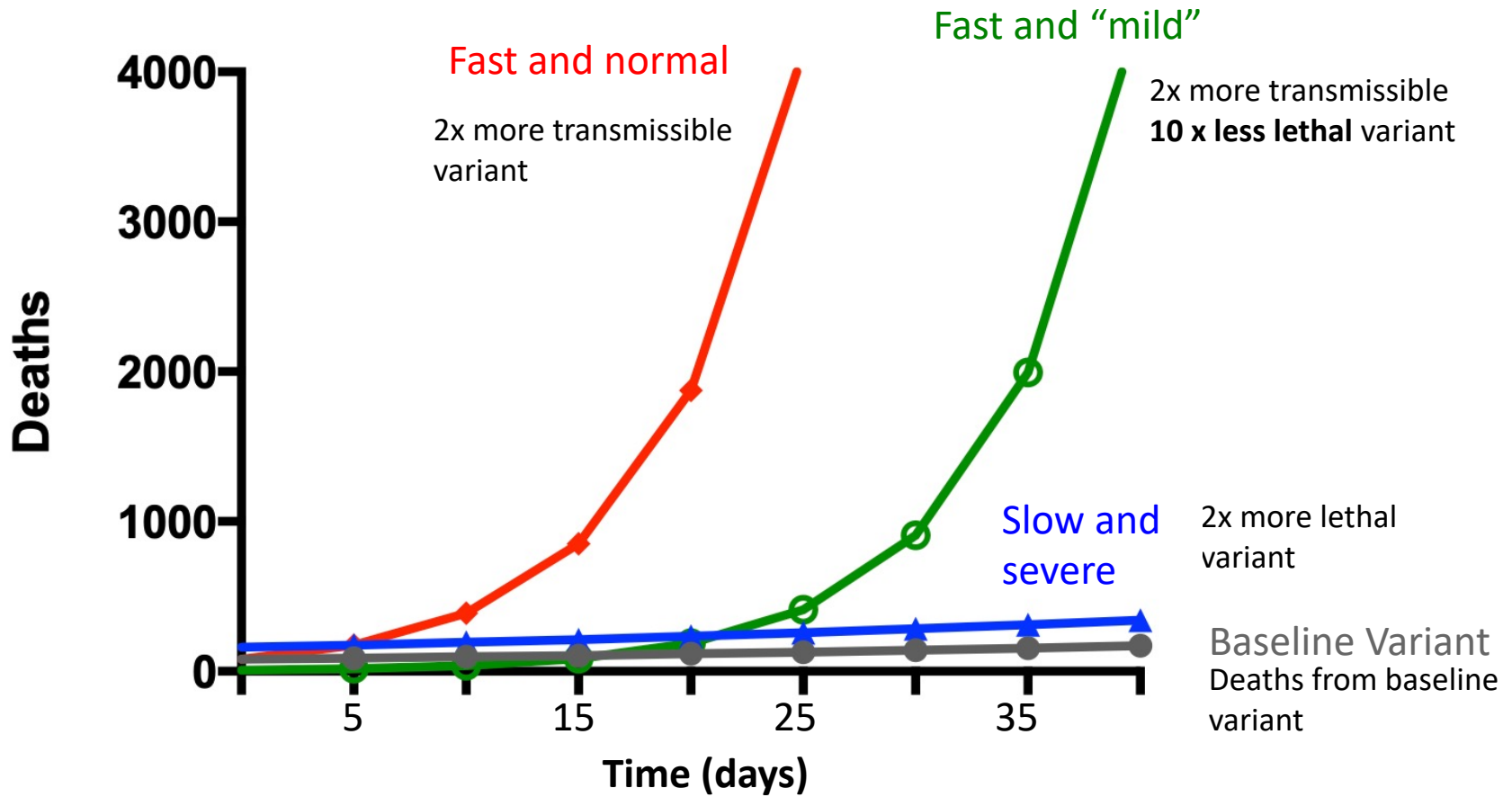
Omicron wave is the 3ʳᵈ most deadly wave: 6,500 deaths

Source: Johns Hopkins University CSSE COVID-19 Data
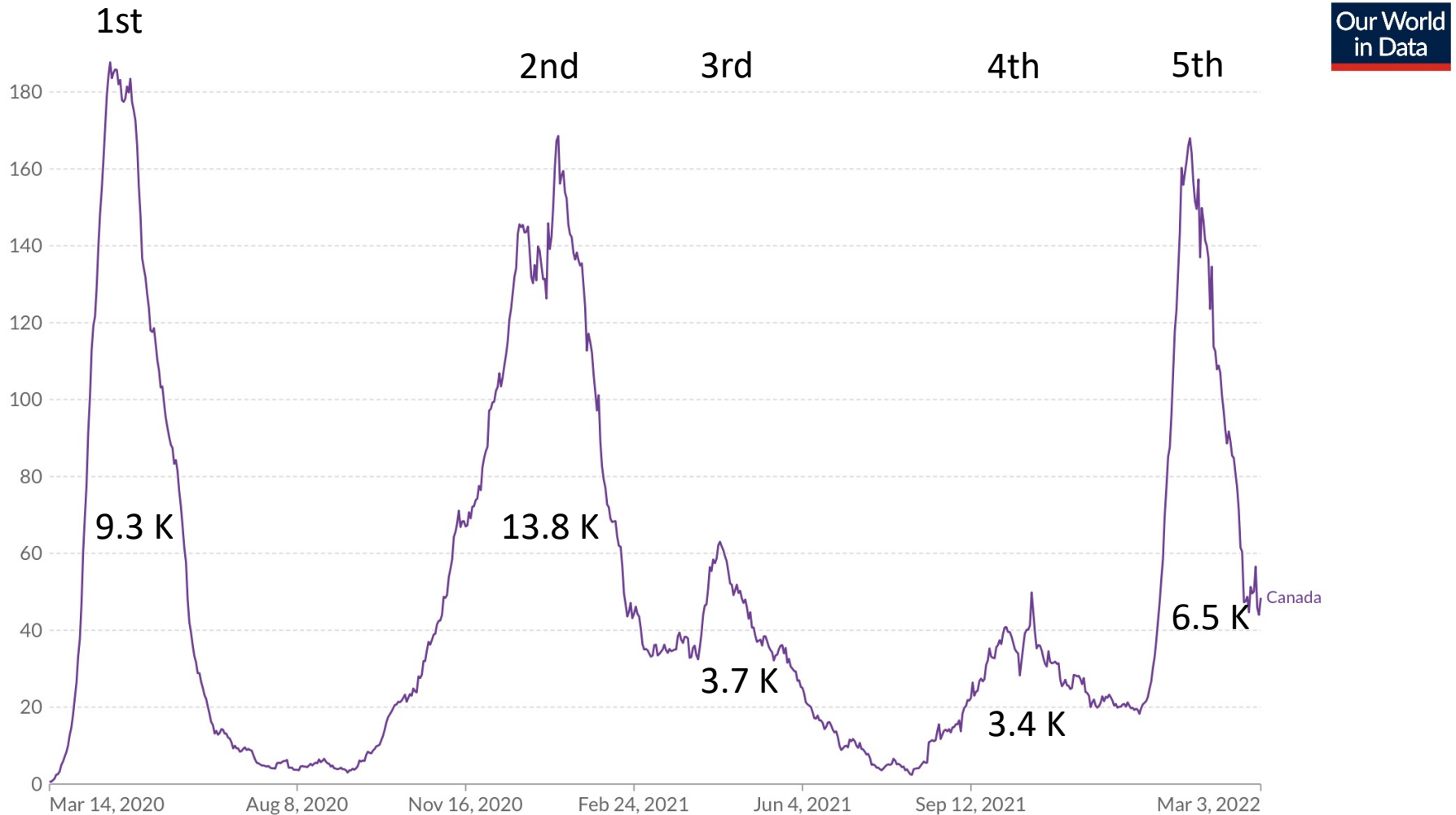
It seems that the 6th wave is starting in Canada

Daily new confirmed COVID-19 cases

7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.

LINEAR   LOG   ⊕ Add country

20,000

10,000

5,000

2,000

1,000

500

May 15, 2021   Jul 24, 2021   Sep 12, 2021   Nov 1, 2021   Dec 21, 2021   Mar 2, 2022

Canada

Our World in Data

The principles of COVID-19 elimination strategy

Bundle of Public Health measures
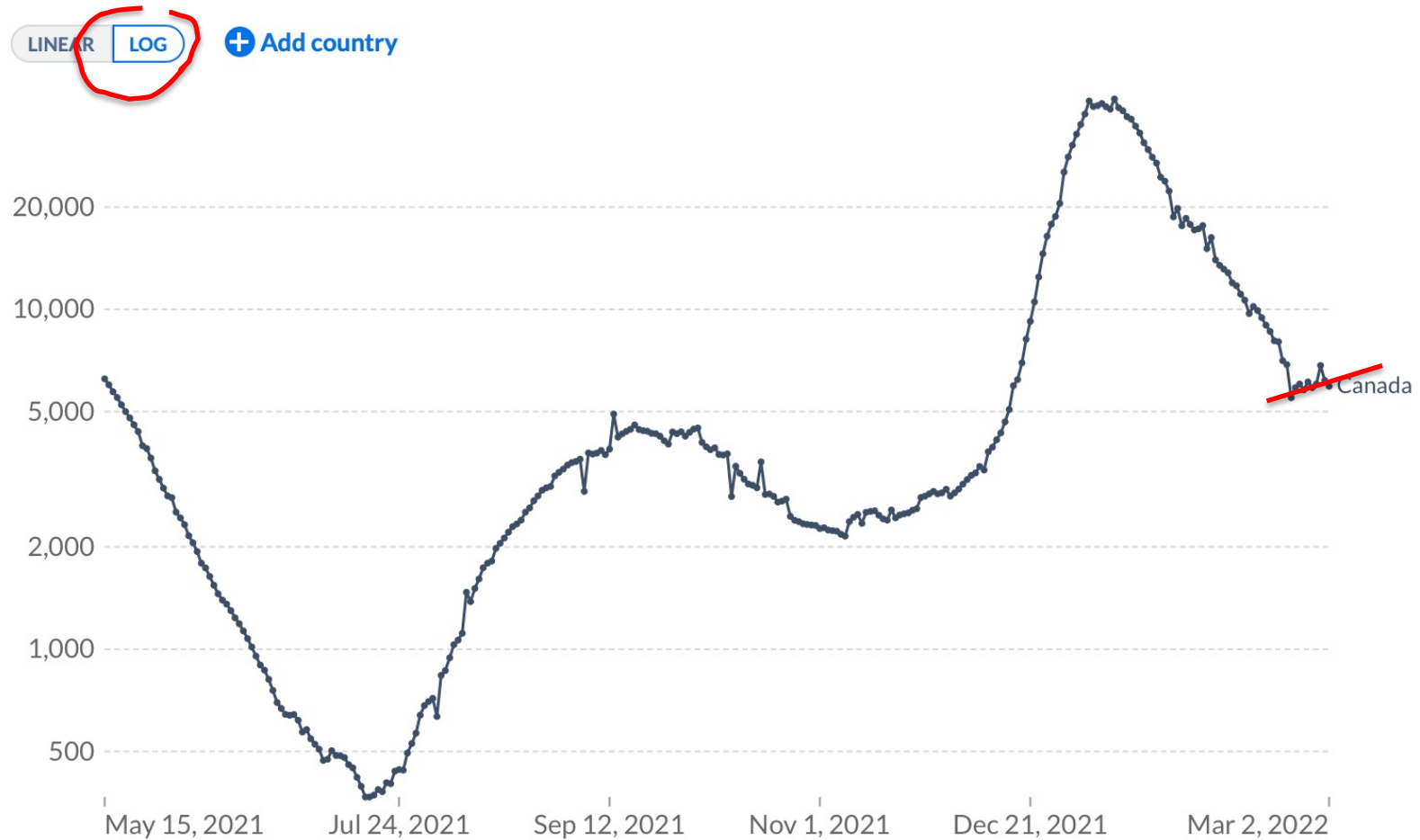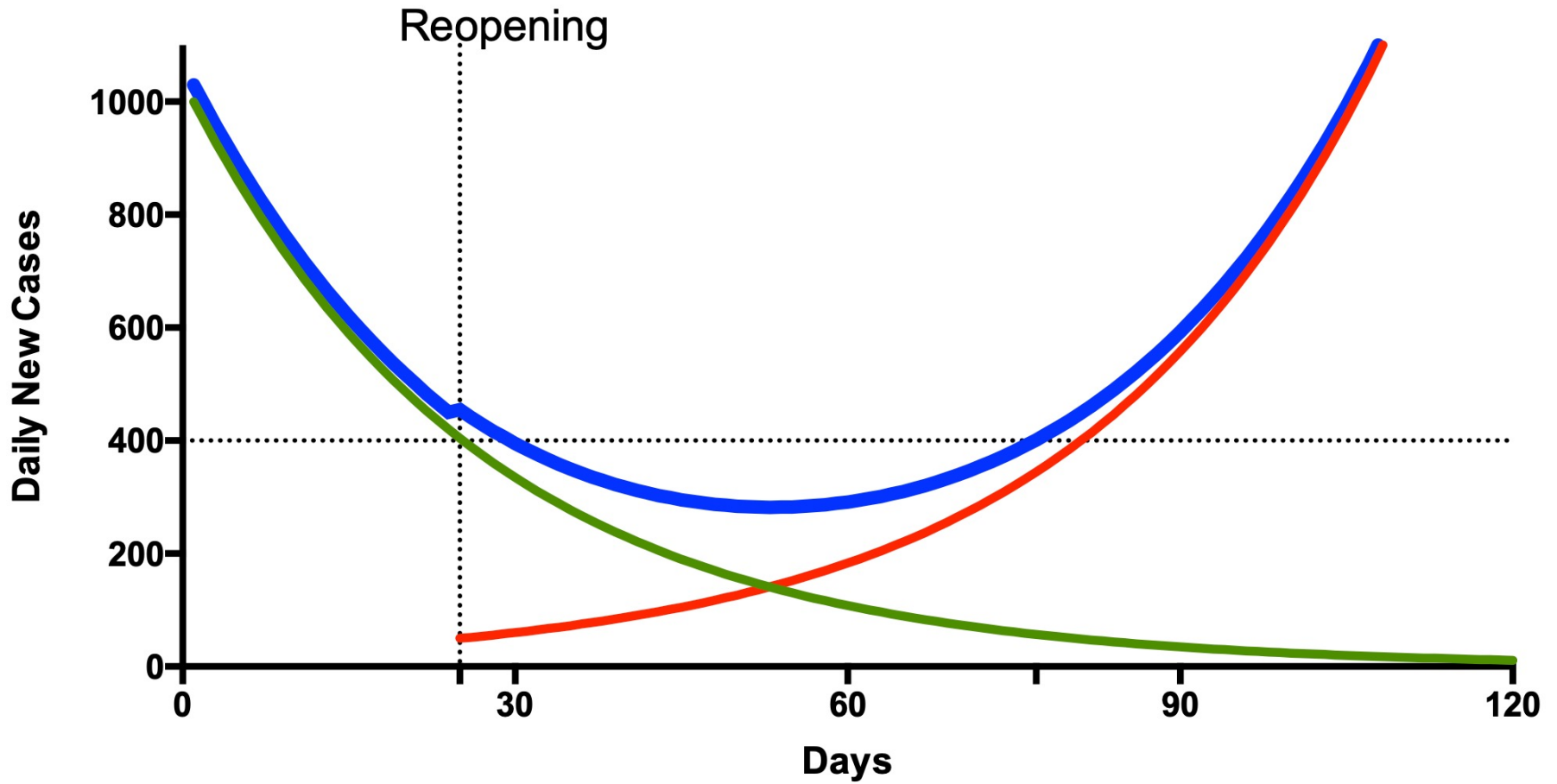(now: +vaccines & airborne precautions)
to **stop the transmission**

@zero community cases
internal measures are lifted

Occasional outbreaks
stamped out w/ short
enhanced local measures

Nova Scotia Daily New Cases_7 day avg

01-Mar-2020   01-Jun-2020   01-Sept-2020   01-Dec-2020   01-Mar-2021
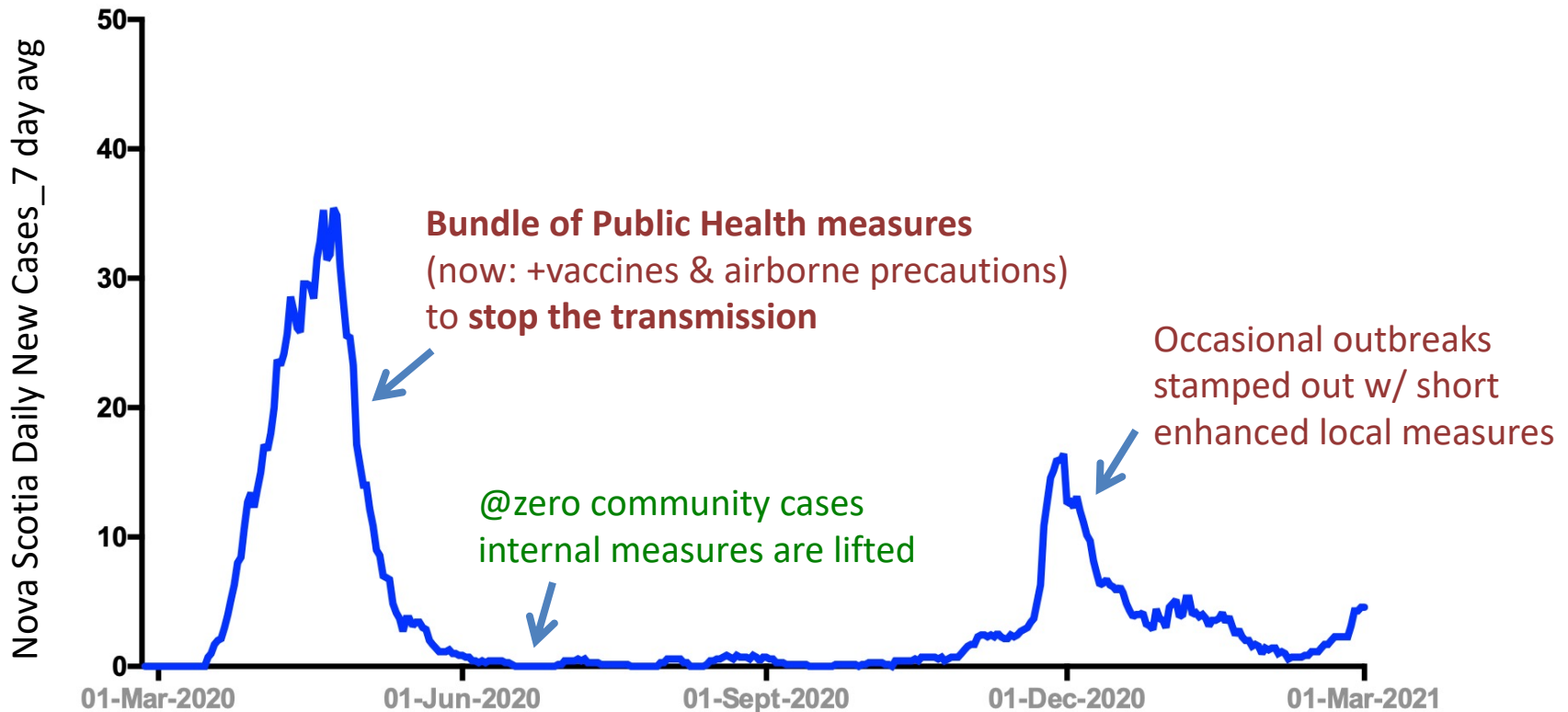
Measures that prevent "reinfection" of the region are kept in place:

1) Preventing importation of cases: quarantine of incoming travellers, vax passes, tests
2) Making the population resilient to reinfection: e.g. vaccinations, airborne precautions, tests

Regions that eliminated COVID-19 cases can form safe travel bubbles with each other.

Canadian Atlantic Provinces: elimination strategy success

Atlantic provinces travel quarantine

Daily New Cases per 100 000 people

Summer 2021
New Brunswick
shifts to Mitigation

6 Large Provinces
(Mitigation Strategy)
Focusing on hospitalizations and deaths

Atlantic Canada
(Elimination Strategy)
Focusing on controlling transmission

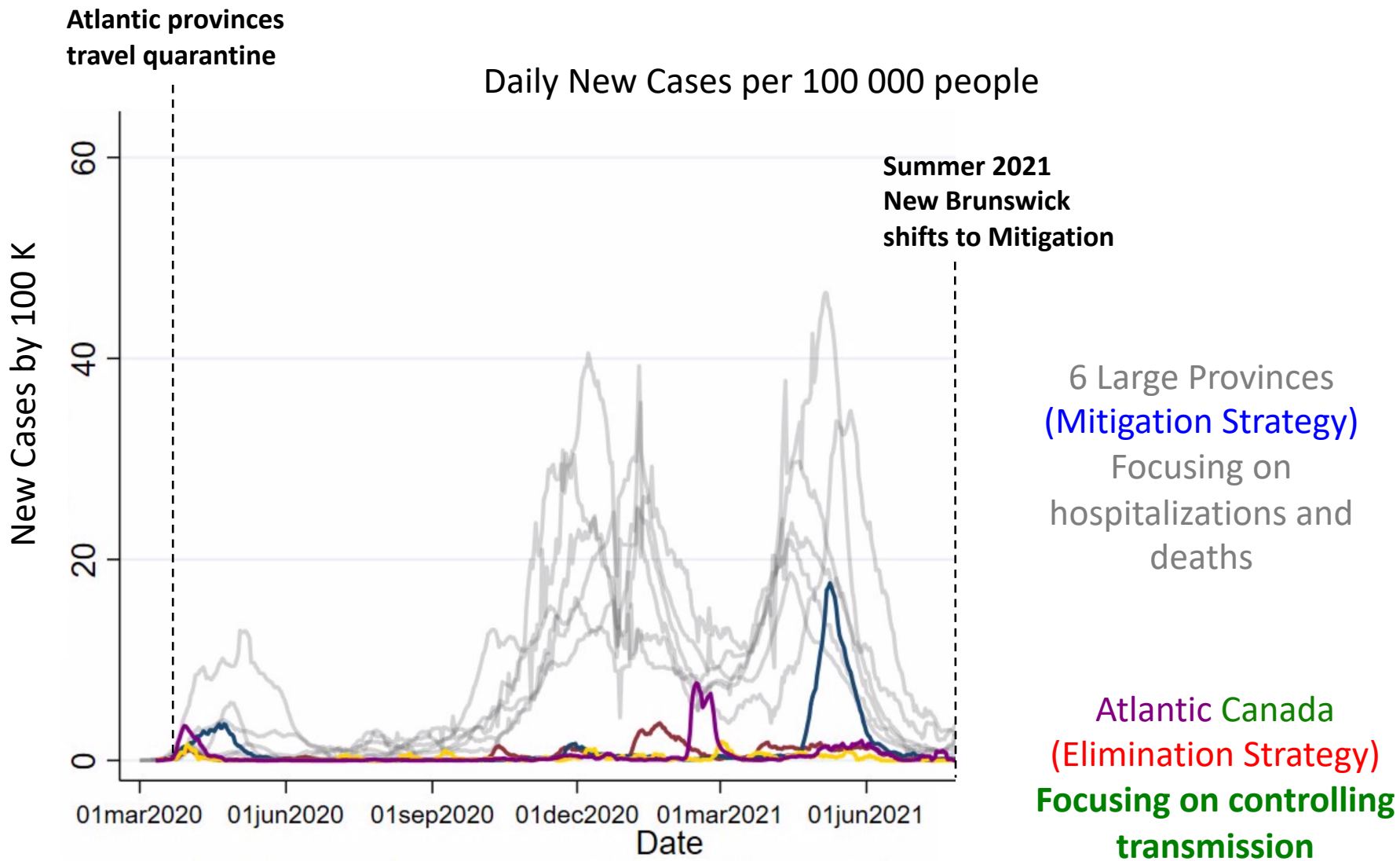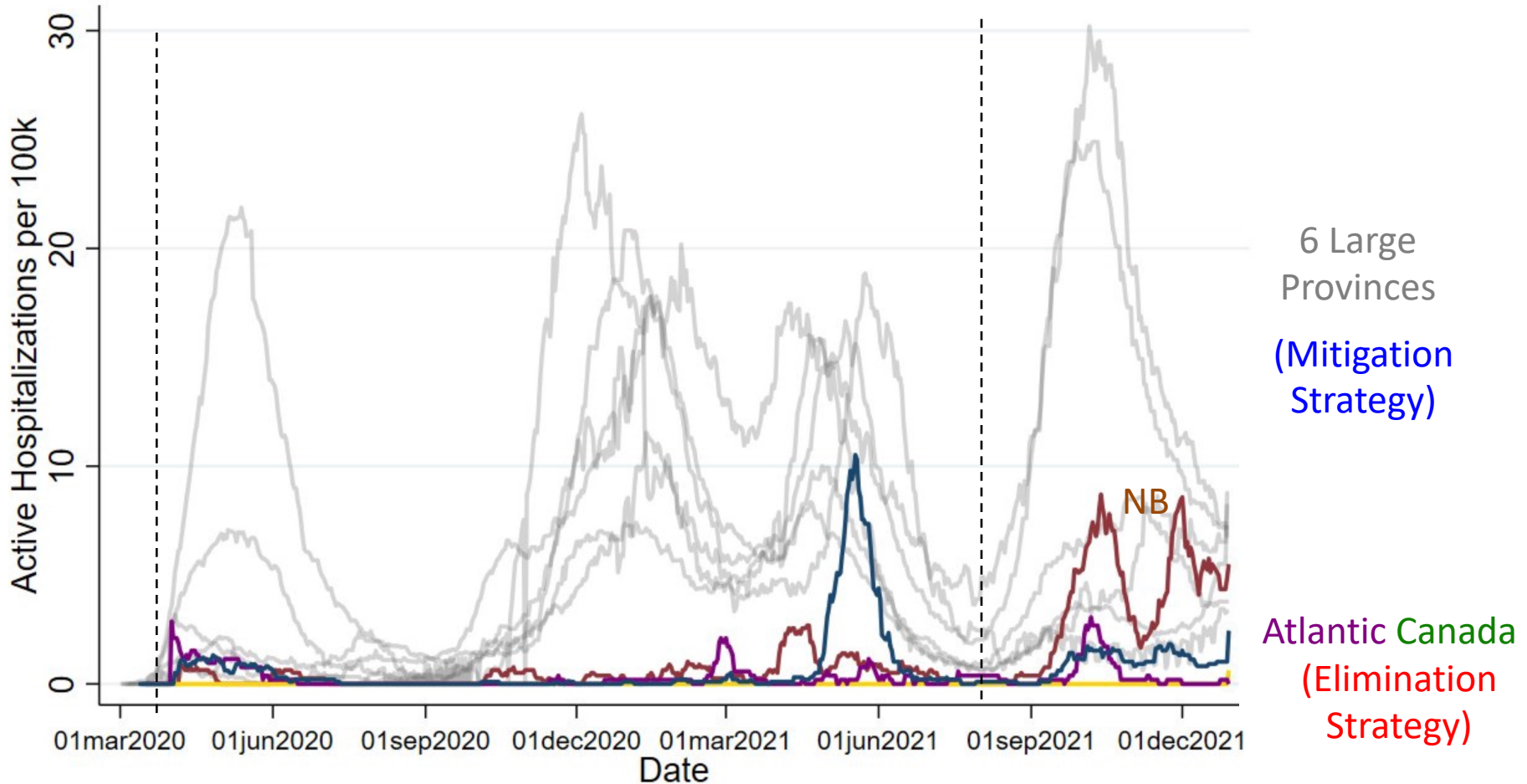New Cases by 100 K

Date

Chart: Kevin Wilson @WilsonKM2,
Data source: PHAC

NB   NS   PEI   NL

Elimination strategy provinces had better health, economy & mobility outcomes than Mitigation strategy provinces

Hospitalizations per 100 K

Chart modified from: Kevin Wilson @WilsonKM2, Data source: PHAC

The meaning of R_0 and R_t

The more contagious, the higher the R0 number

Original virus in Wuhan		2.4-2.6
The version that caused Europe's first wave		3
Alpha		4-5
Delta		5-8
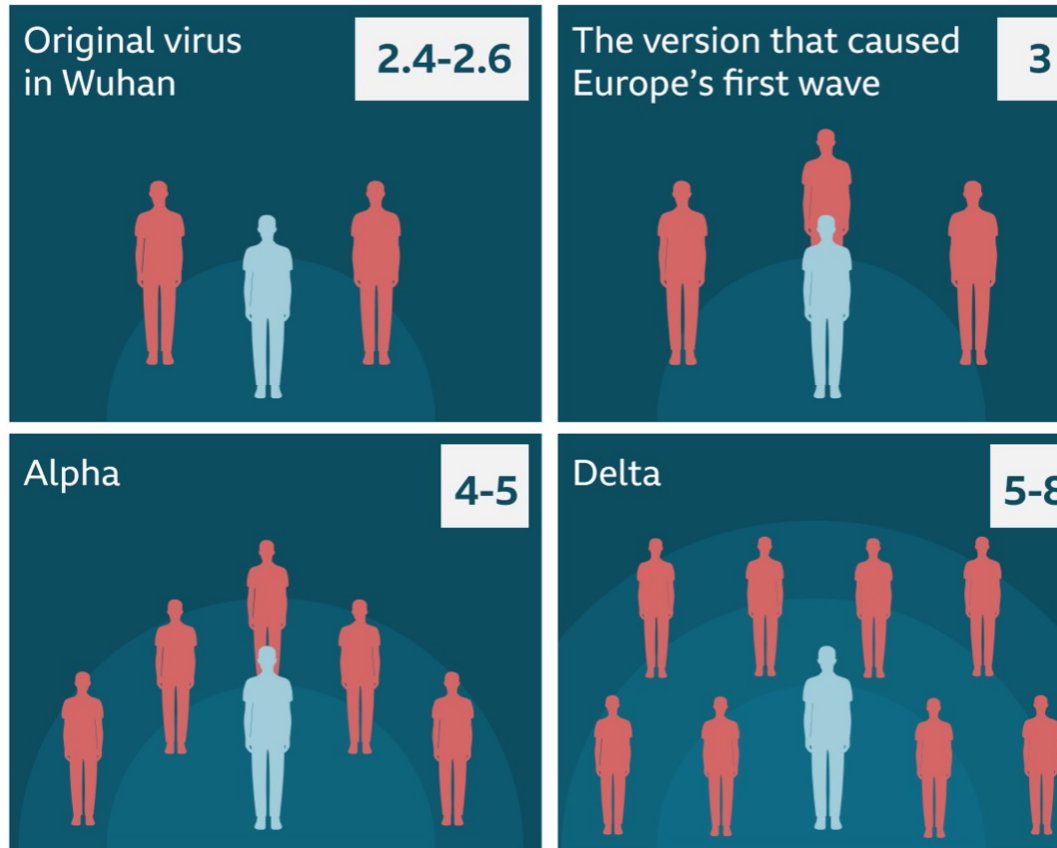
Source: Imperial College, Lancet, Australian government

BBC

Picture source: bbc.com/news/health-57431420

A) Effects of Vaccines and Public Health (PH) Measures on Virus Spread

Original Strain $R_0 = 3$

Daily new variant cases

R = 0.9

Vaccines Only
75% total pop. vaxxed
93% efficiency

R = 0.6

R = 0.18

PH Measures Only

(0 in 11 days)

(0 in 37 days)

Vaccines + PH Measures

Days

Chart and analysis: @GosiaGasperoPhD
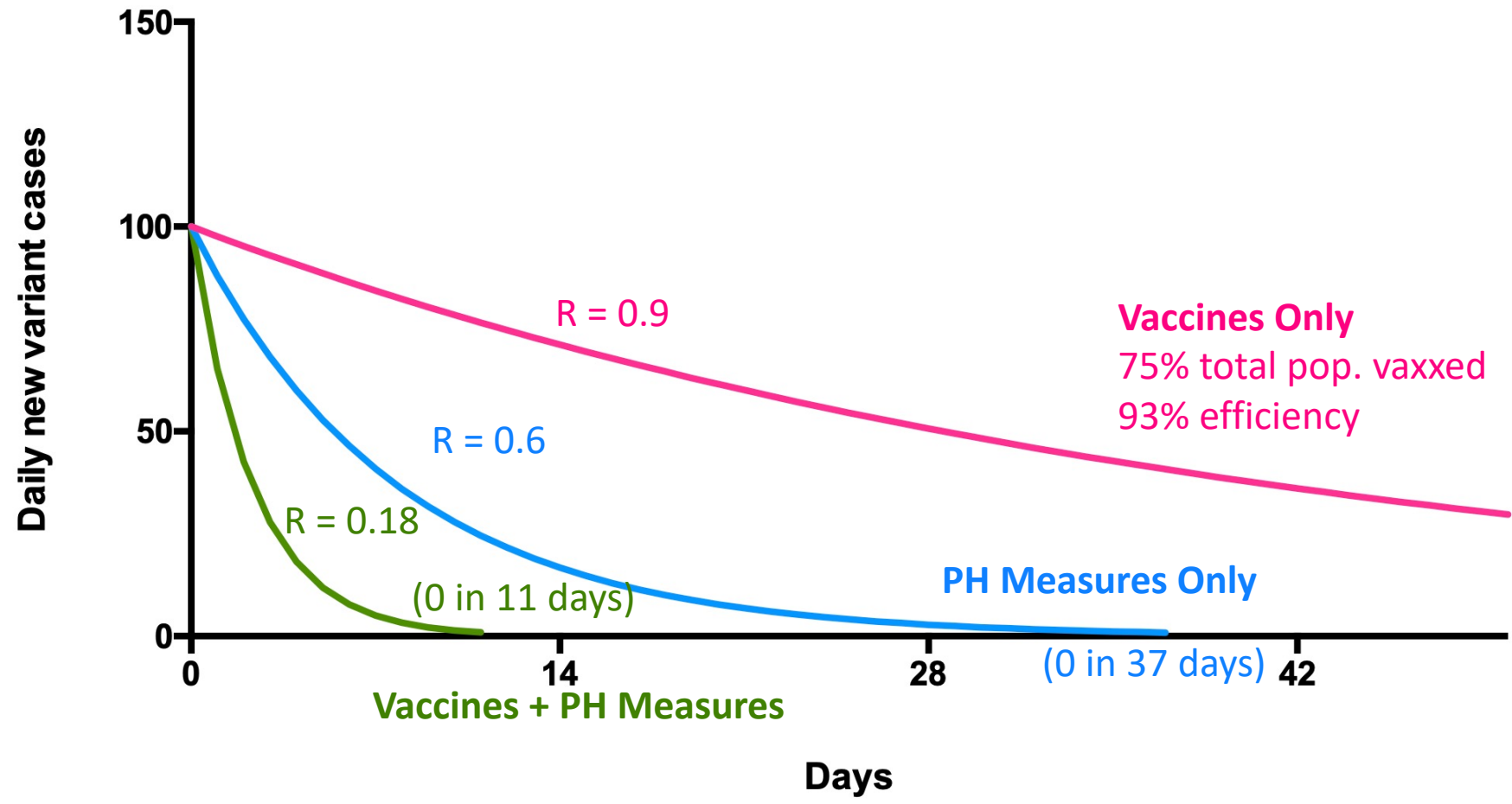
B) Effects of Vaccines and Public Health (PH) Measures on Virus Spread

Delta Variant $R_0 = 6$

Vaccines Only
75% total pop. vaccinated
93% efficiency

R = 1.8

PH Measures Only

R = 1.2

R = 0.36

Vaccines + PH Measures

(0 in 19 days)

Daily new variant cases

Days

Chart and analysis: @GosiaGasperoPhD
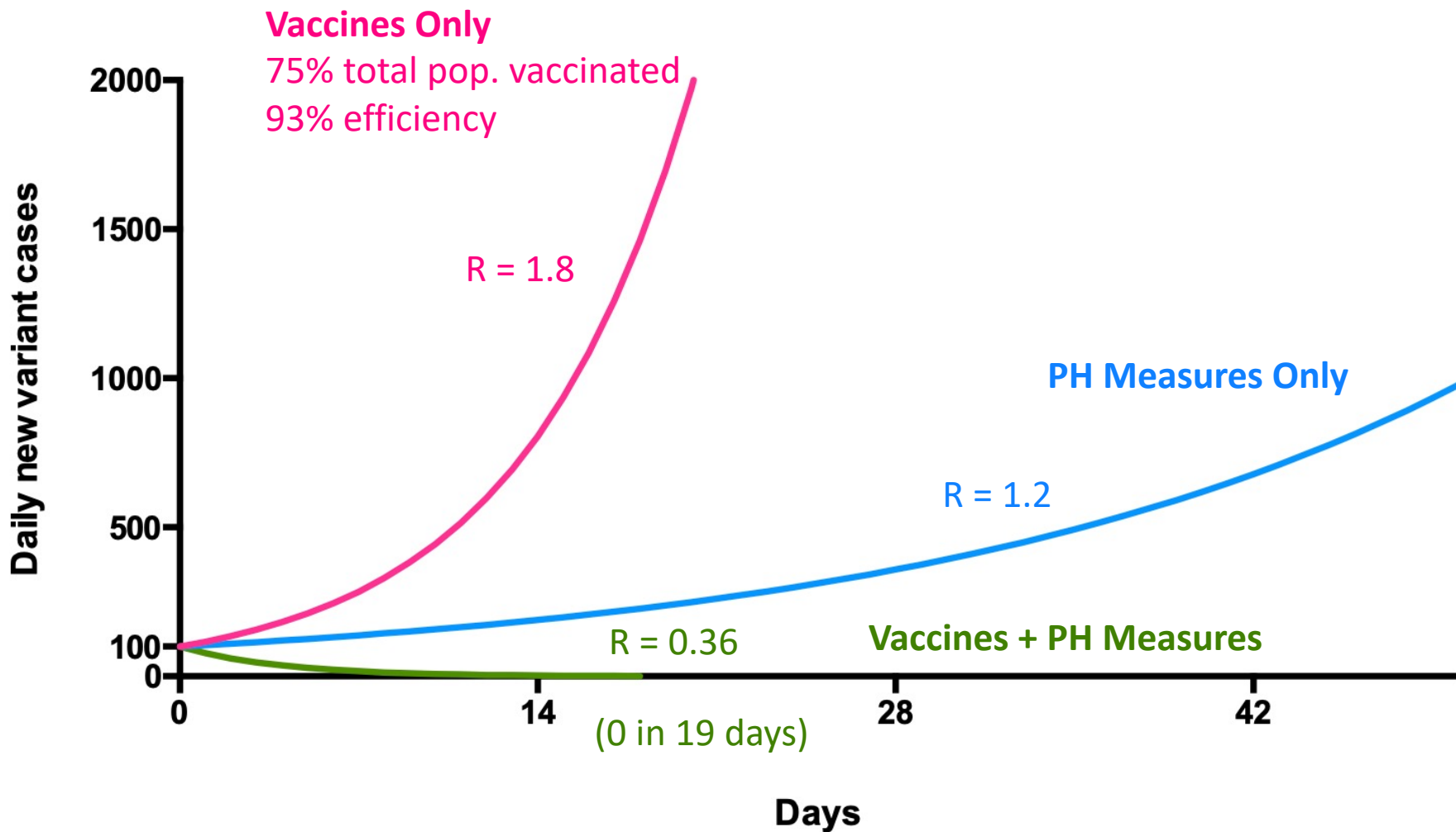
C) Effects of Vaccines and Public Health (PH) Measures on Virus Spread

Hypothetical Variant $R_0 = 8$ (& immune evasive)

Vaccines Only
75% total pop. vaccinated
60% efficiency

PH Measures Only

R = 4.4

R = 1.6

Daily new variant cases

2000
1500
1000
500
100
0

R = 0.88   Vaccines + PH Measures

0   14   28   42   (0 in 52 days)

Days

Chart and analysis: @GosiaGasperoPhD
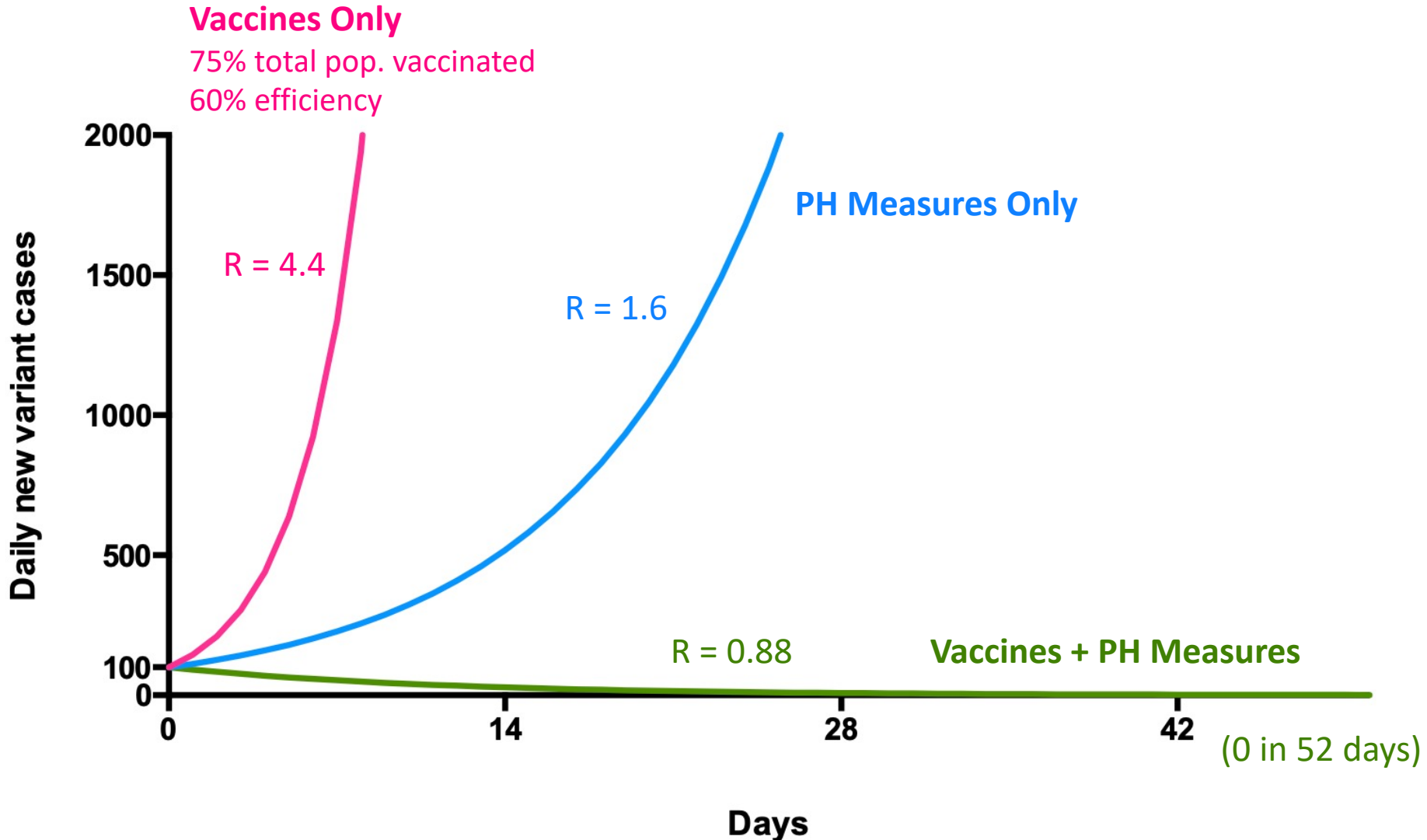
With COVID-19 measures we achieved de facto #FluZERO – a minimal level of Influenza in Alberta
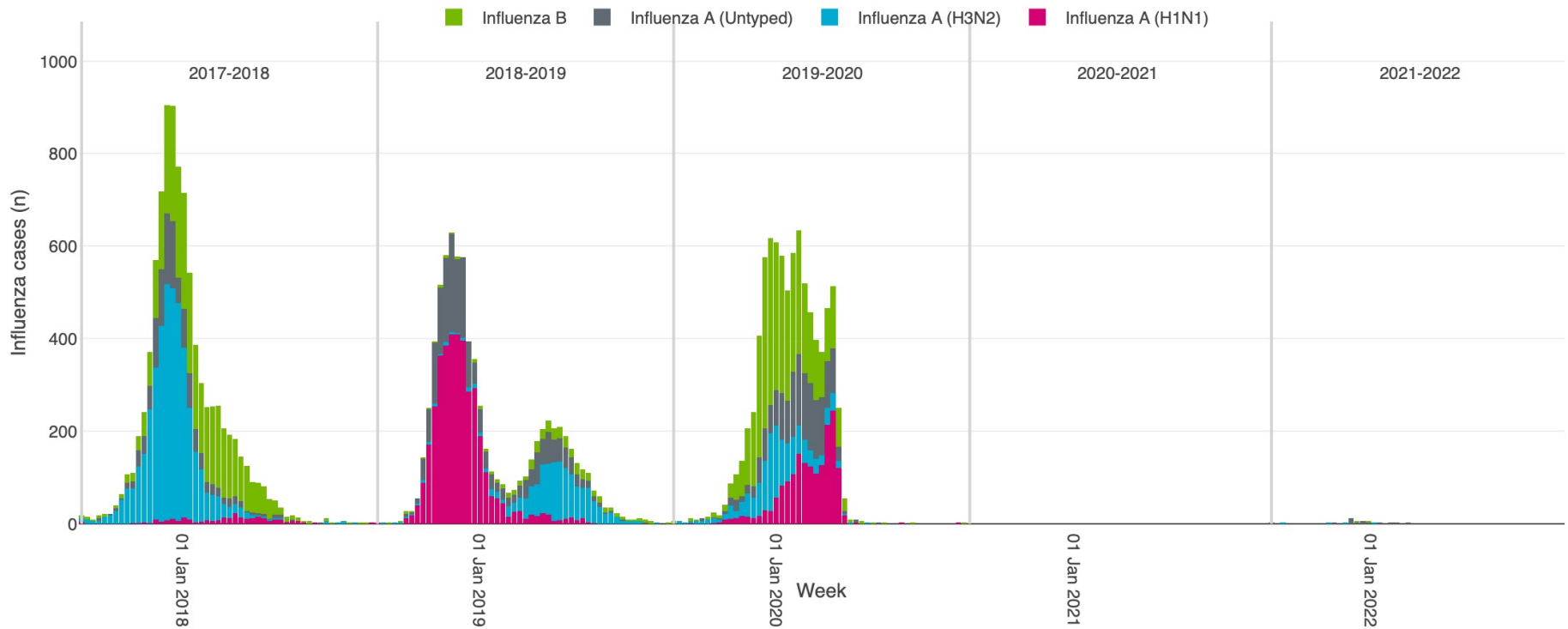
Influenza in Alberta

Figure 2: Laboratory-confirmed influenza cases by subtype from the previous five seasons

Influenza in Alberta

Figure 6: Hositalizations, ICU admissions and deaths (in hospital) among people with laboratory-confirmed influenza cases by serotype and age group, 2021-2022

Age group	Hospitalizations		ICU admissions		Deaths (in hospital)	
	Count	Population rate	Count	Population rate	Count	Population rate
Under 1 year	0	0.0	0	0	0	0
1-4 years	0	0.0	0	0	0	0
5-9 years	0	0.0	0	0	0	0
10-19 years	0	0.0	0	0	0	0
20-29 years	0	0.0	0	0	0	0
30-39 years	1	0.1	0	0	0	0
40-49 years	0	0.0	0	0	0	0
50-59 years	0	0.0	0	0	0	0
60-69 years	0	0.0	0	0	0	0
70-79 years	0	0.0	0	0	0	0
80-89 years	0	0.0	0	0	0	0
90+ years	0	0.0	0	0	0	0
Unknown	0	0.0	0	0	0	0

Source: alberta.ca/stats/influenza

Vaccines, public health measures, and good policies reduce a person's risk of COVID-19 severe outcomes

- Policies limiting transmission
- Engineering solutions (air)

Individual Risk = (**Probability of getting infected**) X (**Probability of severe outcomes if infected**)

Community spread
Type of work/school
Indoor air quality
Knowledge
Socioeconomic Status

Vaccination status
Age
Health
Access to hospital/therapeutics

Thank you!