BCCDC Data Summary

19 August 2021

Purpose

The surveillance deck is a summary of COVID-19 related indicators that can help inform the pandemic response in British Columbia. This surveillance monitoring constitutes the medical chart for population health assessment that guides the public health community of practice. As such this is a working document that reflects a snapshot in time and may differ from other published reports.

Data Sources

The collection, use and disclosure of case data is subject to the Public Health Act. COVID-19 cases are reported under the Public Health Act to the health authority of residence. Public health case notification, clinical management, contact tracing and follow-up contributes surveillance data for regional and provincial COVID-19 monitoring. Each regional health authority have their own workflows and information systems for capture of relevant data. This data foremost serves the public health and clinical management of the case and their contacts.

Disclaimer

- Data and key messages within these documents are not finalized and considered to be work in progress that is subject to retroactive changes as more data and information become available.
- Accurate interpretation of figures may be difficult with the limited inclusion of data notes and methodology descriptions in this document.

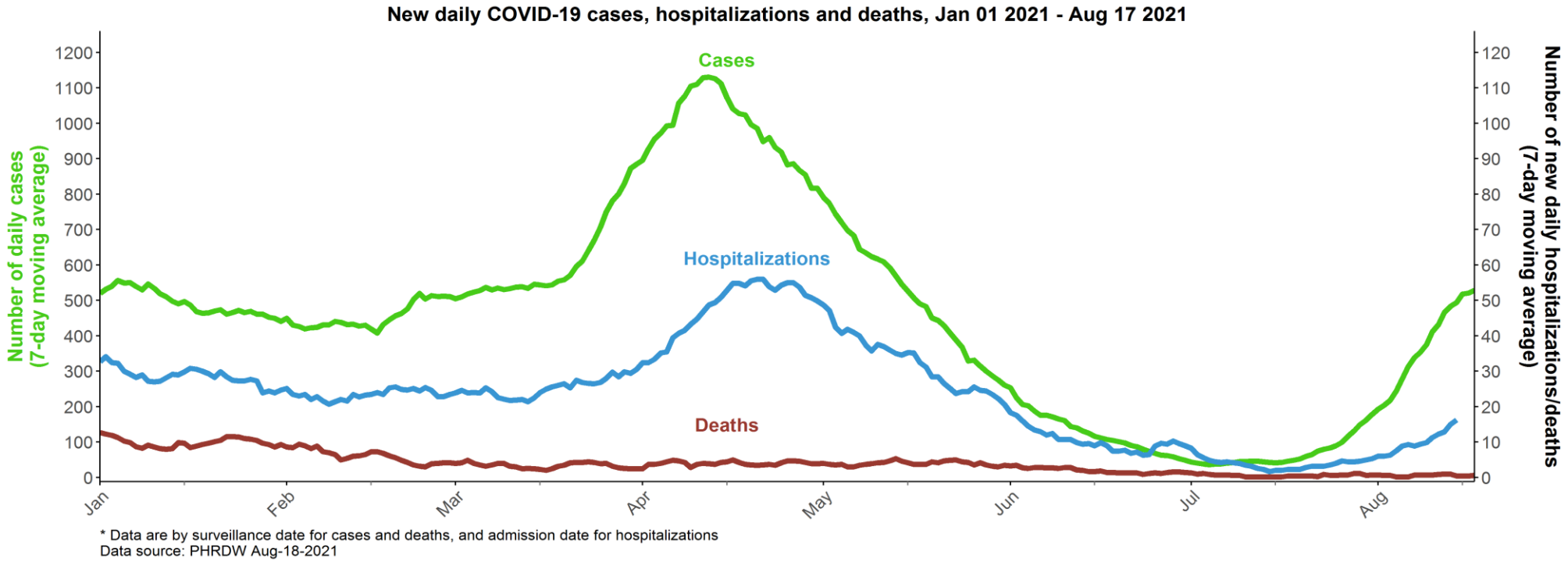
Table of Contents

Overall Summary for surveillance data up to 17 Aug

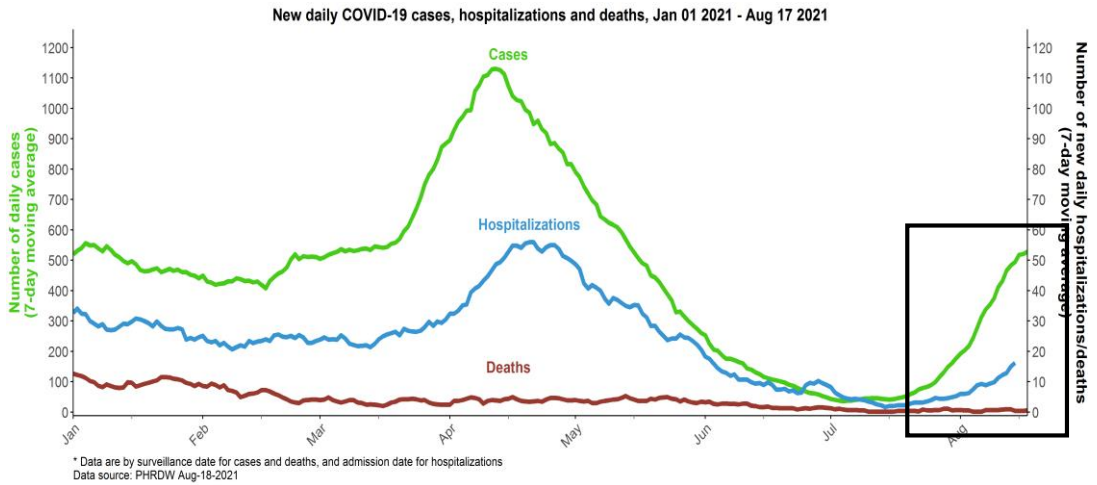
- Case rates are increasing in all regions; test positivity for public tests has increased to ~9% provincially, and is highest in IH and NH residents, >17%.
- New hospitalizations are increasing in IH, FH and NH; hospital/critical care census is increasing in IH and relatively stable elsewhere; new deaths are stable and very low.
- Most of the recent cases, hospitalizations and deaths continue to be among unvaccinated individuals. **Case rate per 100,000 people is ~10x higher among unvaccinated** individuals compared with fully vaccinated individuals, and **hospitalization rate is ~17x higher among unvaccinated** individuals.
- Vaccination with 2 doses provides better protection than 1 dose.
- Vaccine coverage in BC, 17 Aug: 74% of total population, 83% of 12+ eligible population have at least 1 dose. Lower vaccine coverage in Interior and Northern and among younger individuals.
- Variants of concern (VOCs) account for ~100% of all positive tests in BC from Aug 8th to 14th. Delta is the dominant VOC (97%) across all of BC.
- Short-term modelling indicates small to moderate increases in vaccination coverage can dramatically lower hospitalization incidence.

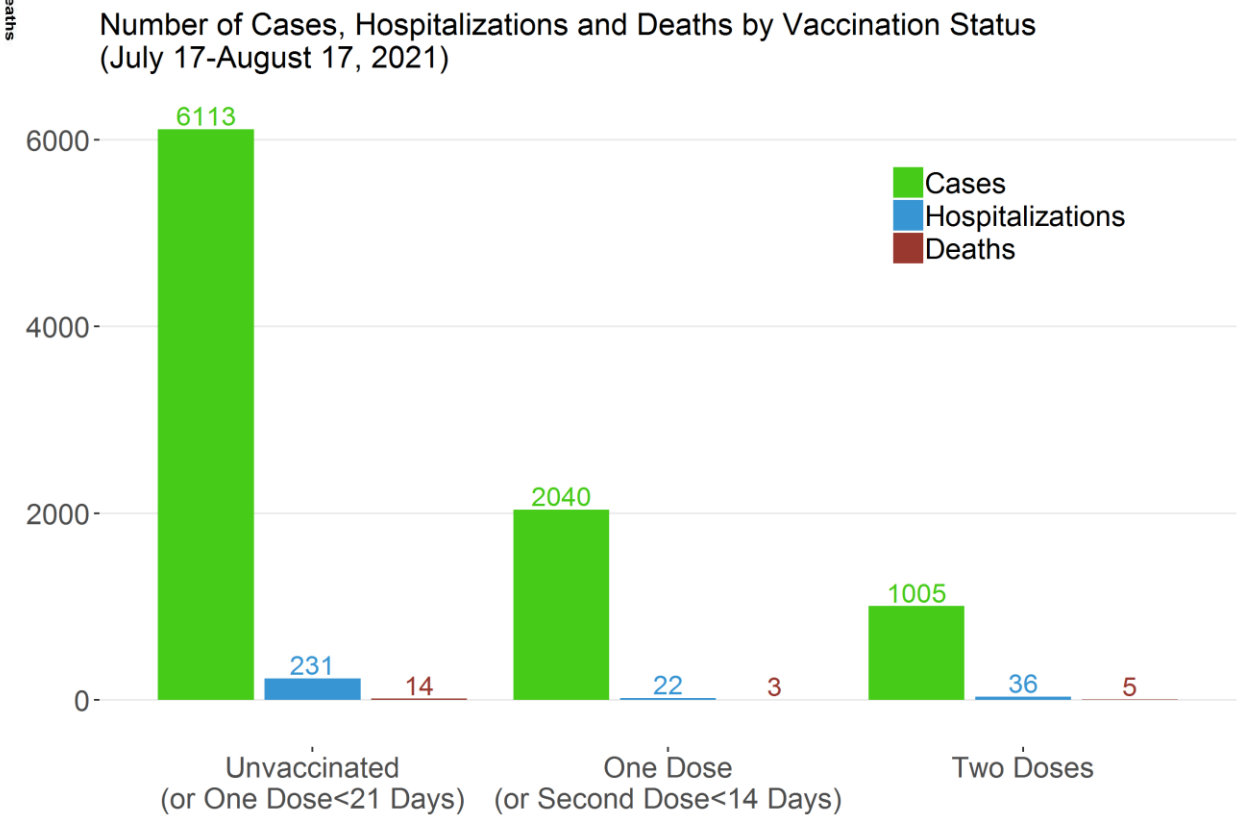
Aug 12 to Aug 17: BC COVID-19 Profile

157,567	total cases	1,782	total deaths
3,718	new this week	4	new this week
8,351	ever hospitalized	150,102	removed from isolation
120	new this week	1,656	new this week



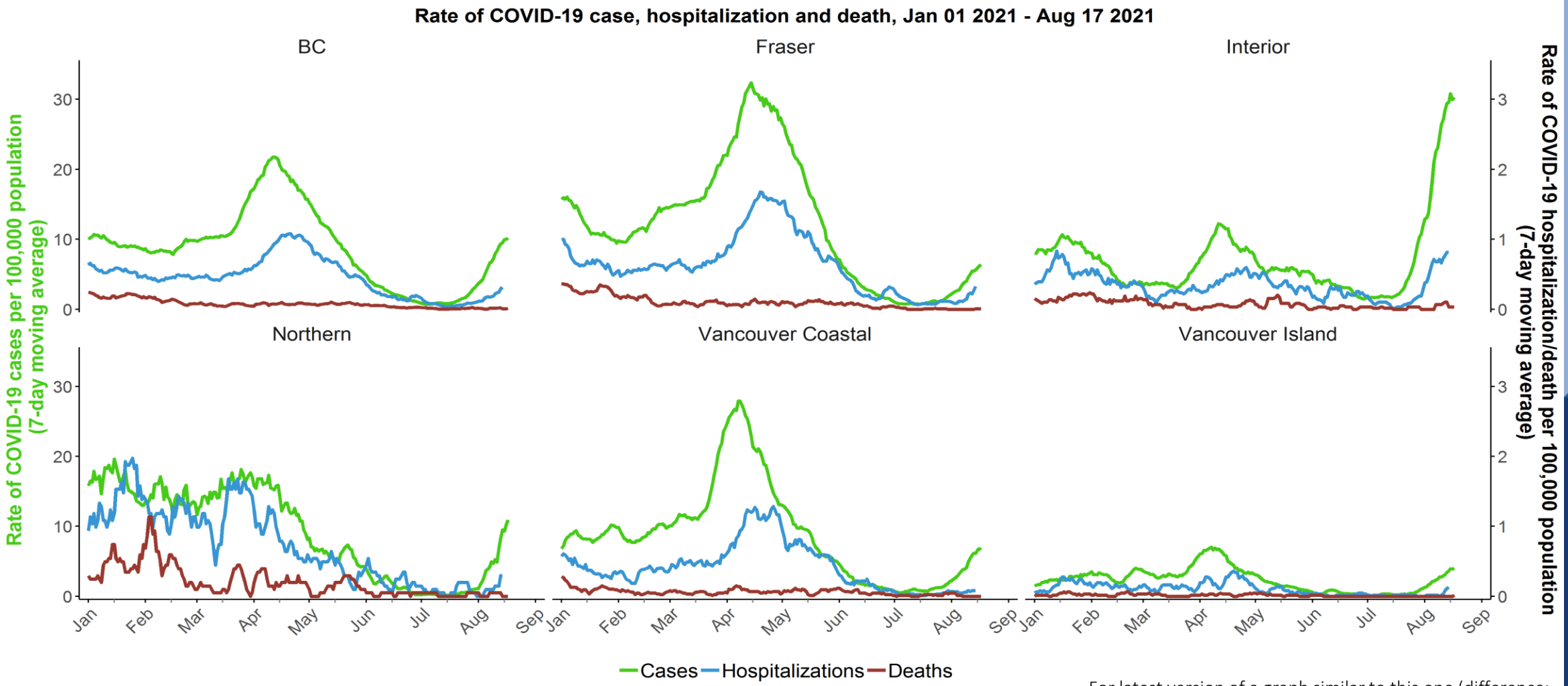
Most of the cases, hospitalizations and deaths over the past month were among unvaccinated individuals





*Also see slides 16-26

Case rates continue to increase in all HAs, with highest rates in Interior; new hospitalizations are increasing in IH, FH and NH; new deaths are stable and very low.

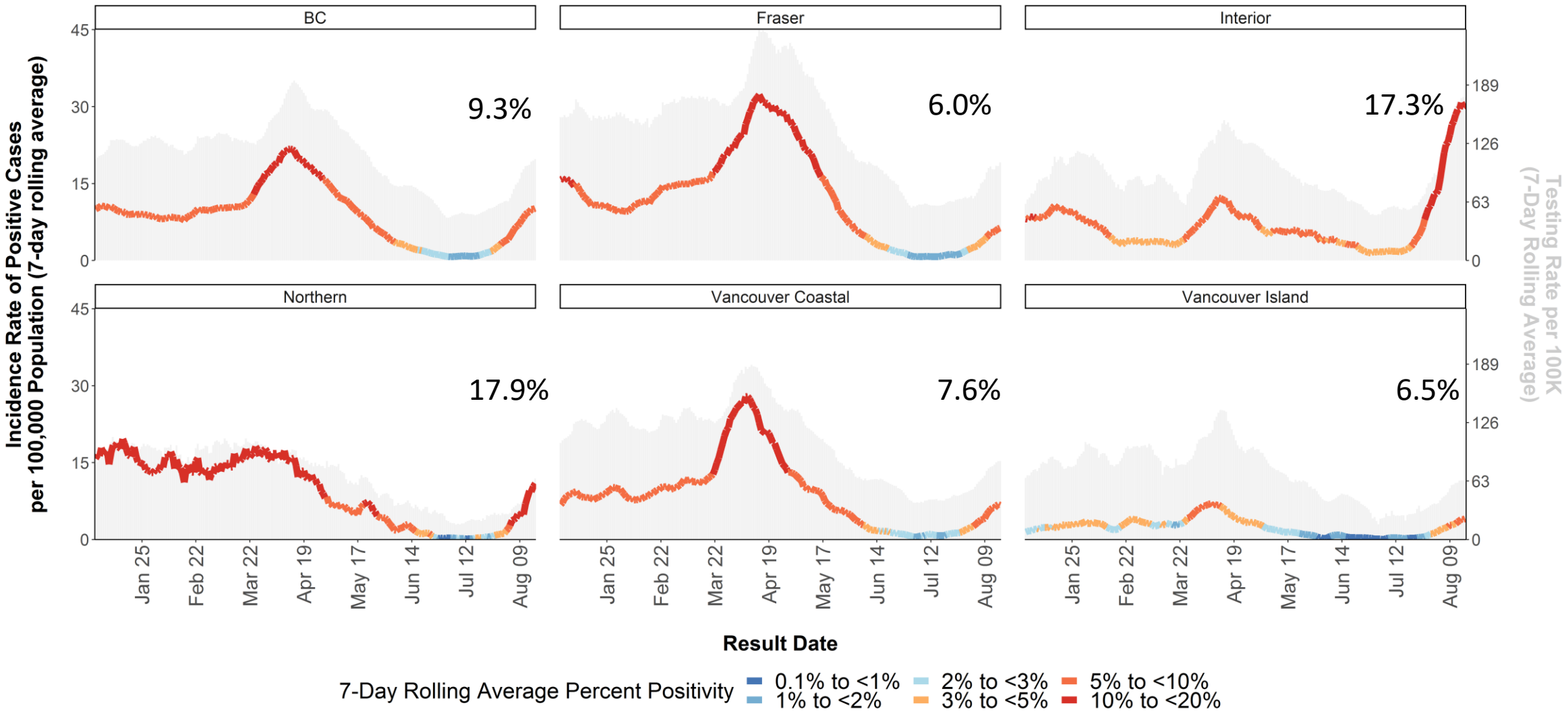


* Data are by surveillance date for cases and deaths, and admission date for hospitalizations
Data source: PHRDW Aug-18-2021

For latest version of a graph similar to this one (difference: hospital census, not new hospitalizations), see the Epi App

Incidence and % positivity have increased in all HAs, with positivity being highest in Interior and Northern health authorities, above 17%.

Case incidence rate, test percent positivity, and testing rate (Public Payers Only). Jan 1 2020 - Aug 17, 2021.

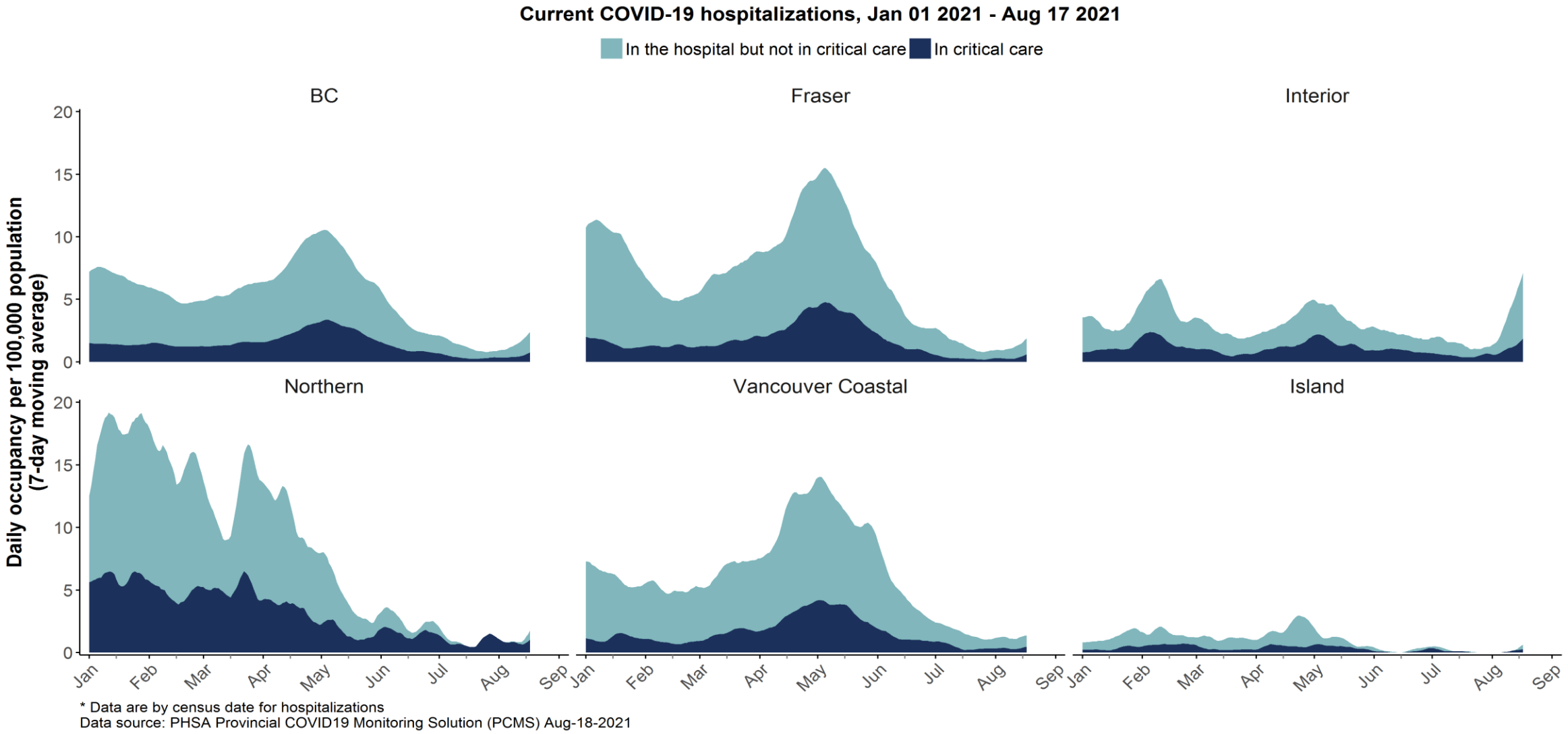


Data source: PLOVER 17-Aug-2021

For latest version of a graph similar to this one (difference: all tests, not public tests), see the Epi App

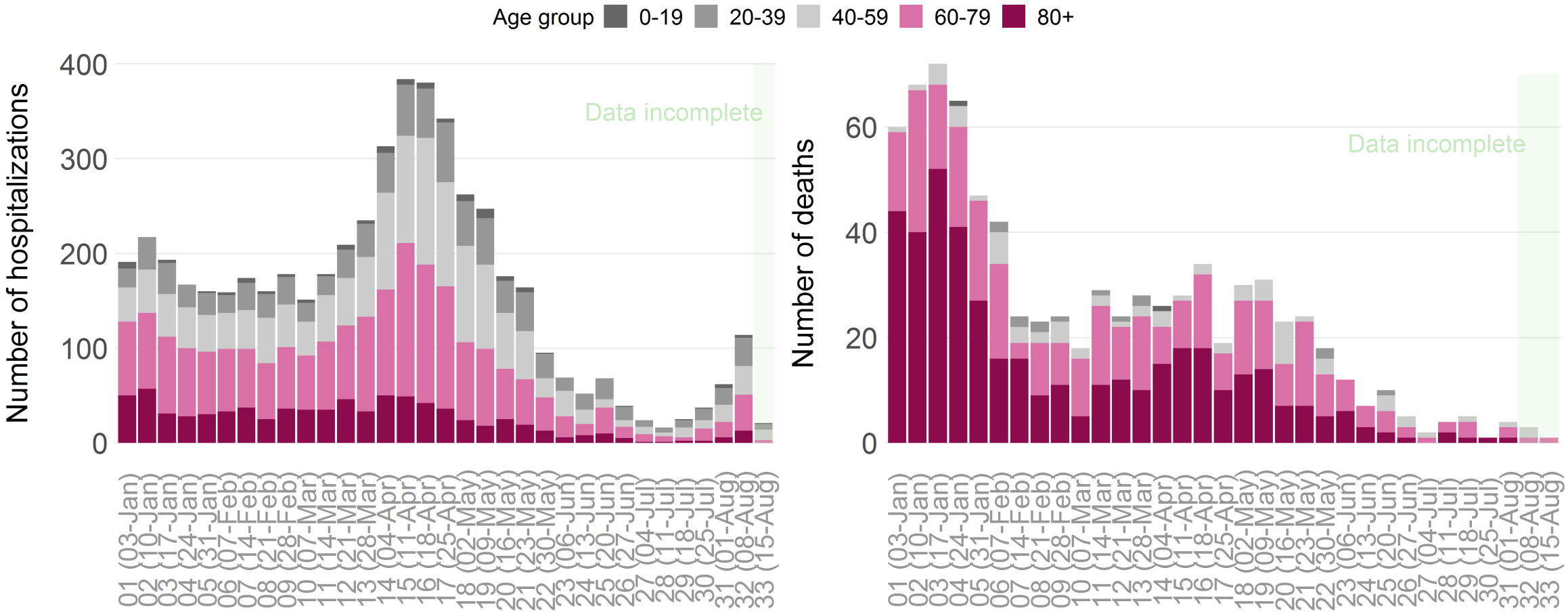
BC Centre for Disease Control

Hospital and critical care census is high and increasing in IH; other regions censuses remain relatively stable.



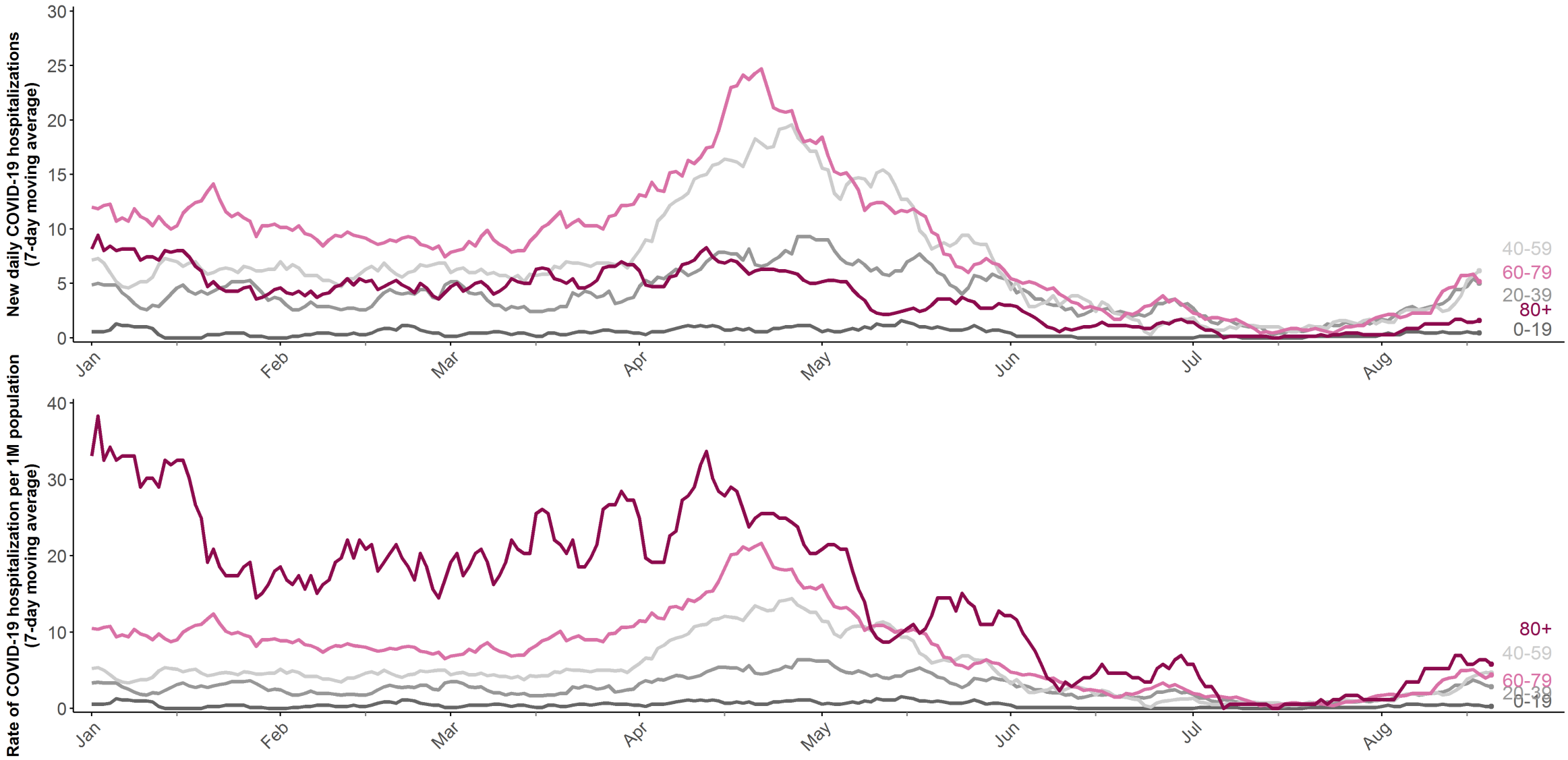
* Data are by census date for hospitalizations
Data source: PHSA Provincial COVID19 Monitoring Solution (PCMS) Aug-18-2021

Number of new hospital admissions are increasing in all age groups >20 years, mostly among unvaccinated individuals (see slides 17-19, 24-26). Deaths are stable and very low.



Data extracted on 2021-08-18; hospitalization and death data from health authority case line list data

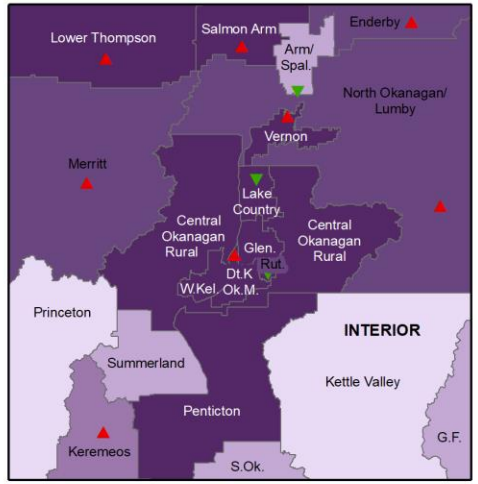
Trends in number and rate of new hospitalizations by age group, BC, 1 Jan – 17 August 2021



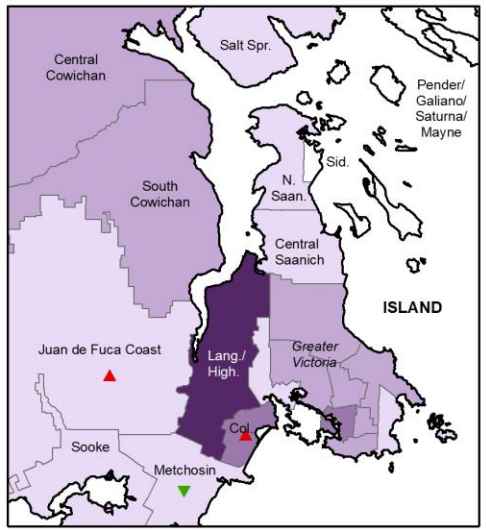
Geographic Distribution of COVID-19 by LHA and CHSA of Case Residence

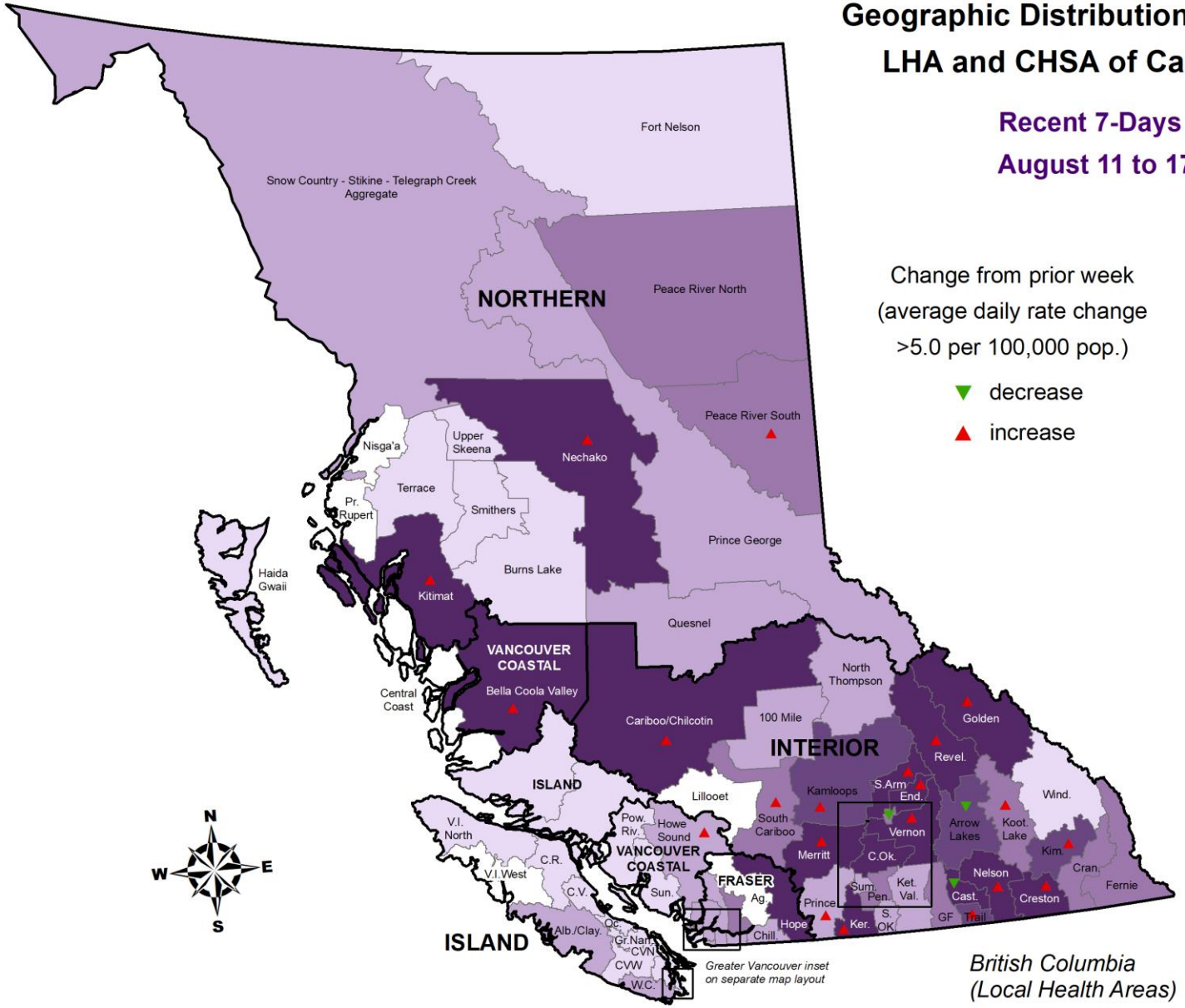
Recent 7-Days Cases
August 11 to 17, 2021

Okanagan Inset
(Community Health Service Areas)



Greater Victoria Inset
(Community Health Service Areas)





British Columbia
(Local Health Areas)

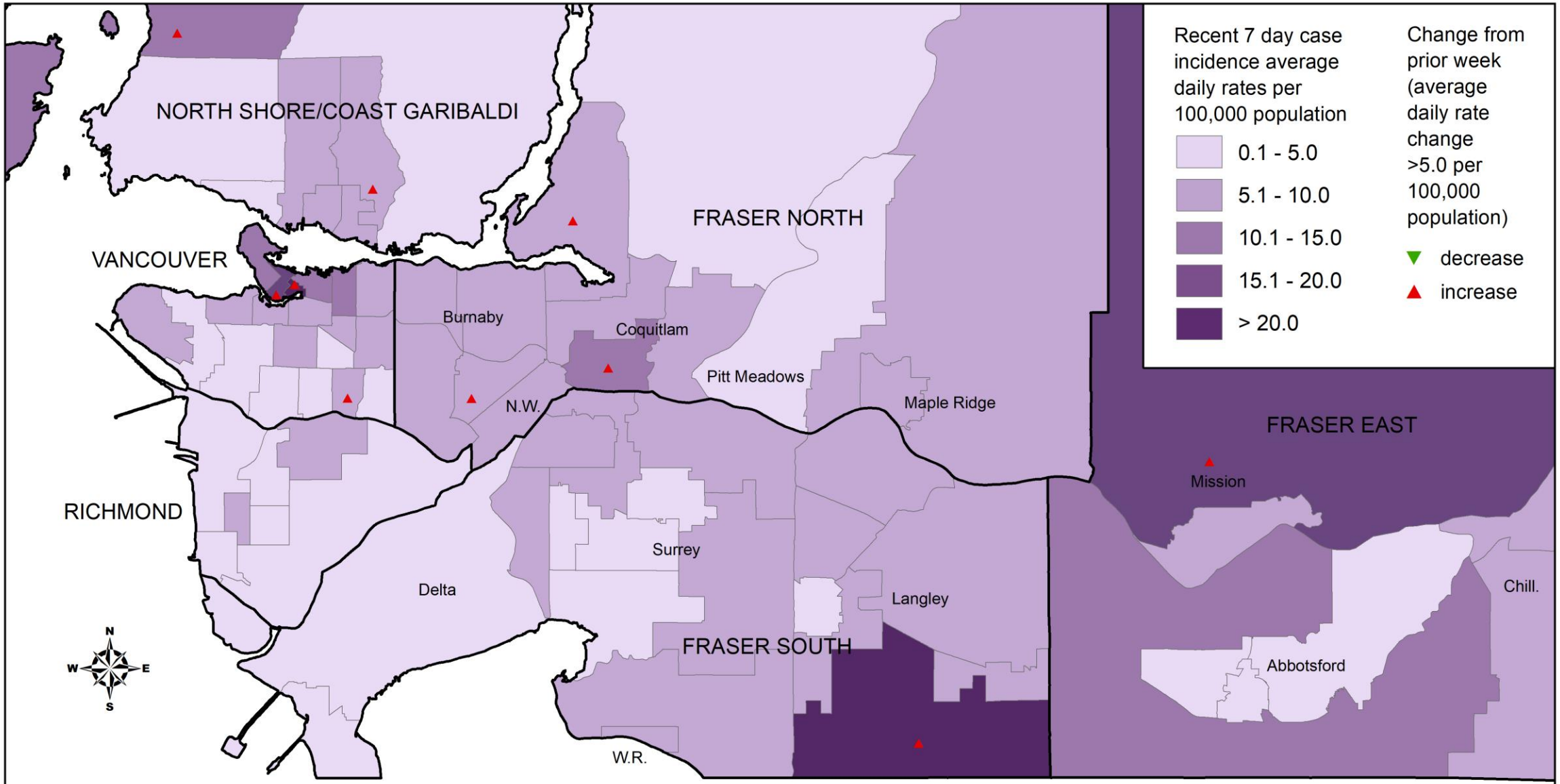
Change from prior week
(average daily rate change >5.0 per 100,000 pop.)

- ▼ decrease
- ▲ increase

Average daily rate per 100,000 population

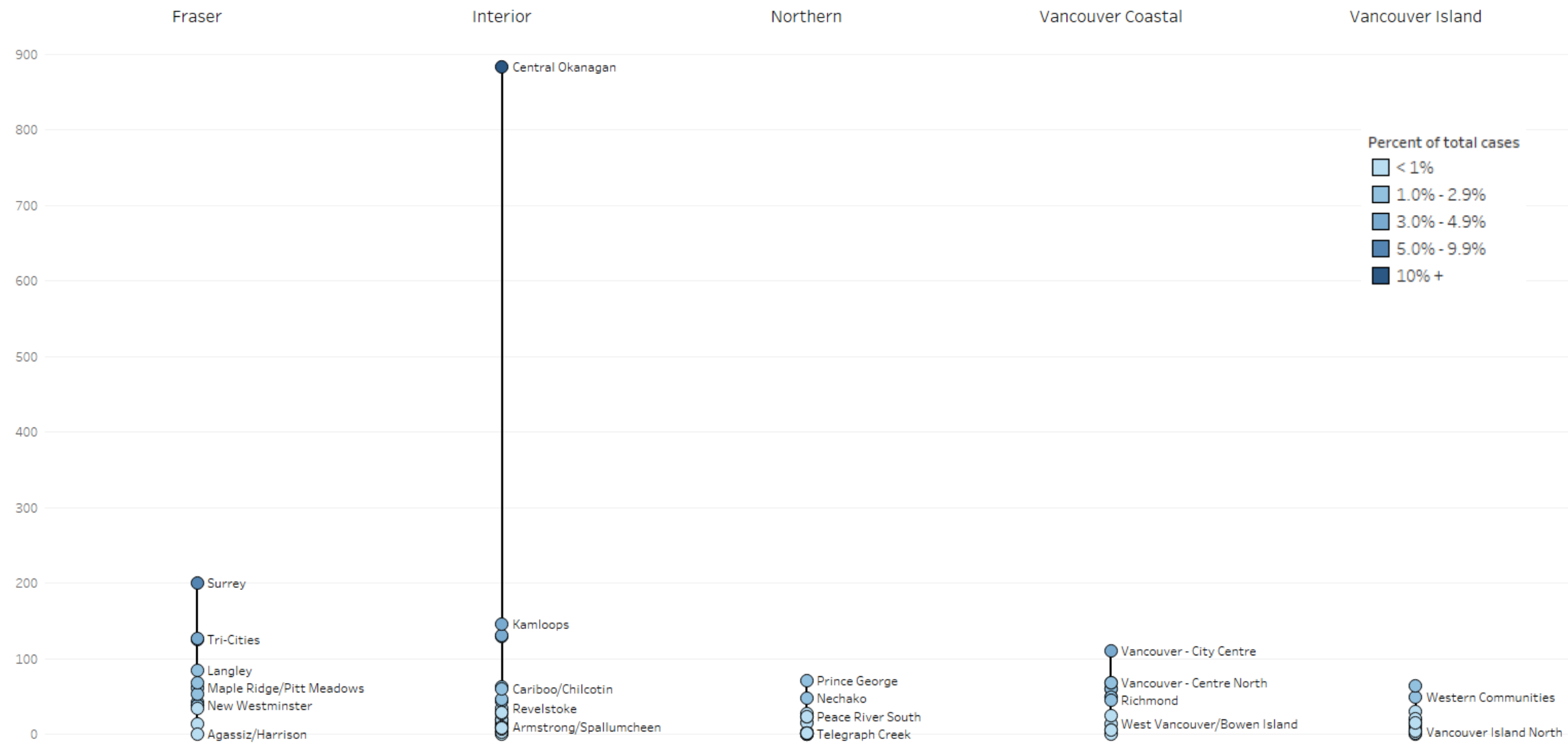
- 0.0
- 0.1 - 5.0
- 5.1 - 10.0
- 10.1 - 15.0
- 15.1 - 20.0
- > 20.0

Data source: Public Health Reporting Data Warehouse (PHRDW) integrated COVID dataset; we operate in a live database environment and case information is updated as it becomes available. Cases are mapped by location of residence; cases with unknown residence and from out of province are not mapped. Data are by date of first positive test, or date reported to public health for epi-linked cases. Population denominator from BC Stats PEOPLE estimates for 2021.

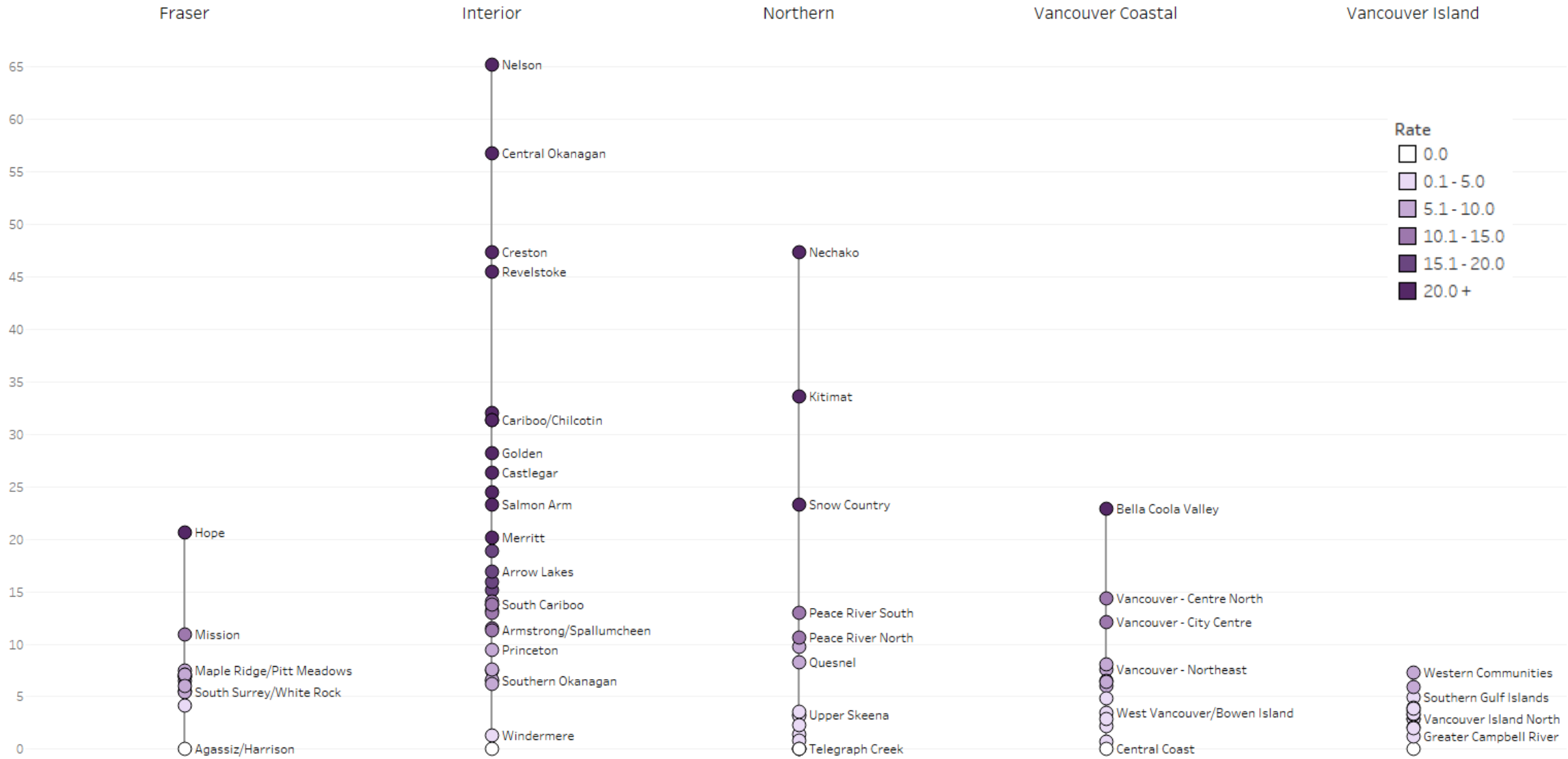


COVID-19 Recent 7-Day Case Incidence Rates by CHSA (August 11 to 17, 2021)

Total cases by local health area, Aug 11 - Aug 17, 2021



Average daily rate of new cases per 100,000 population, by local health area, Aug 11 - Aug 17, 2021



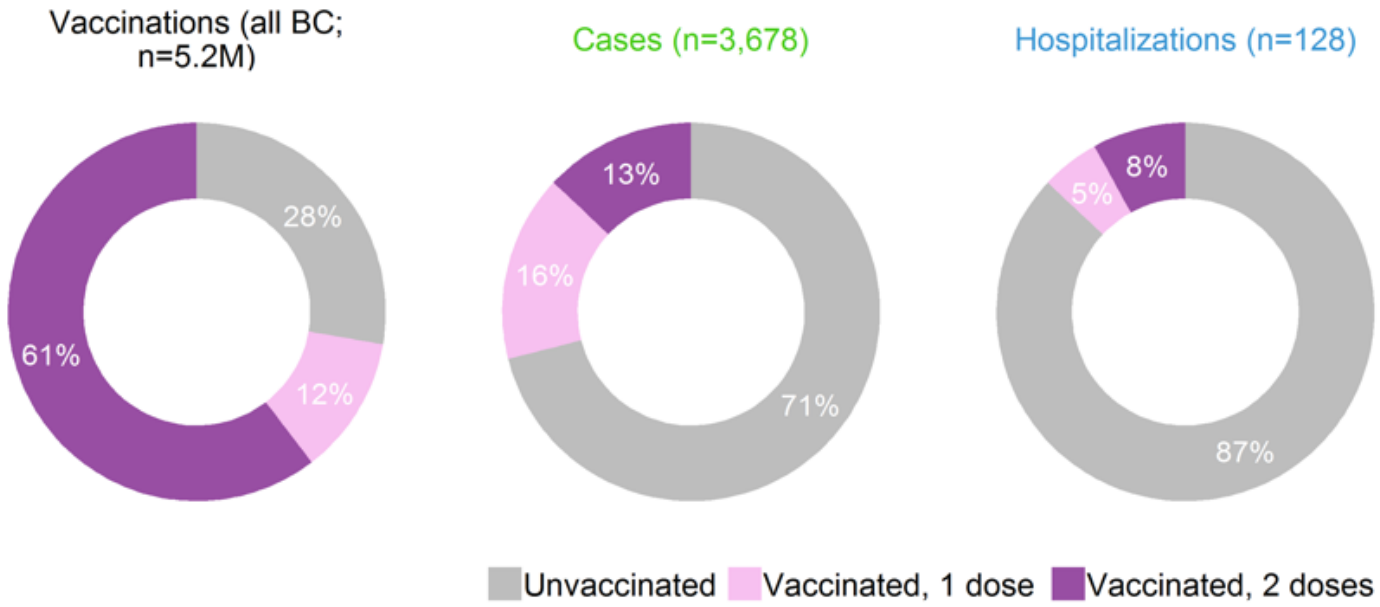
Key messages - Cases by vaccine status

- Most of the recent cases and hospitalizations continue to be among unvaccinated individuals
- Based on current data, case rate per 100,000 people is ~10x higher among unvaccinated individuals compared with fully vaccinated individuals and hospitalization rate is ~17x higher among unvaccinated individuals
- Hospitalization rates among children continue to remain very low

- Unvaccinated: no dose or <3 weeks since receipt of 1st dose
- Fully vaccinated: 2 weeks or more after receipt of 2nd dose

Over the past week (11-17 Aug), fully vaccinated individuals accounted for 13% of cases and 8% of hospitalizations.

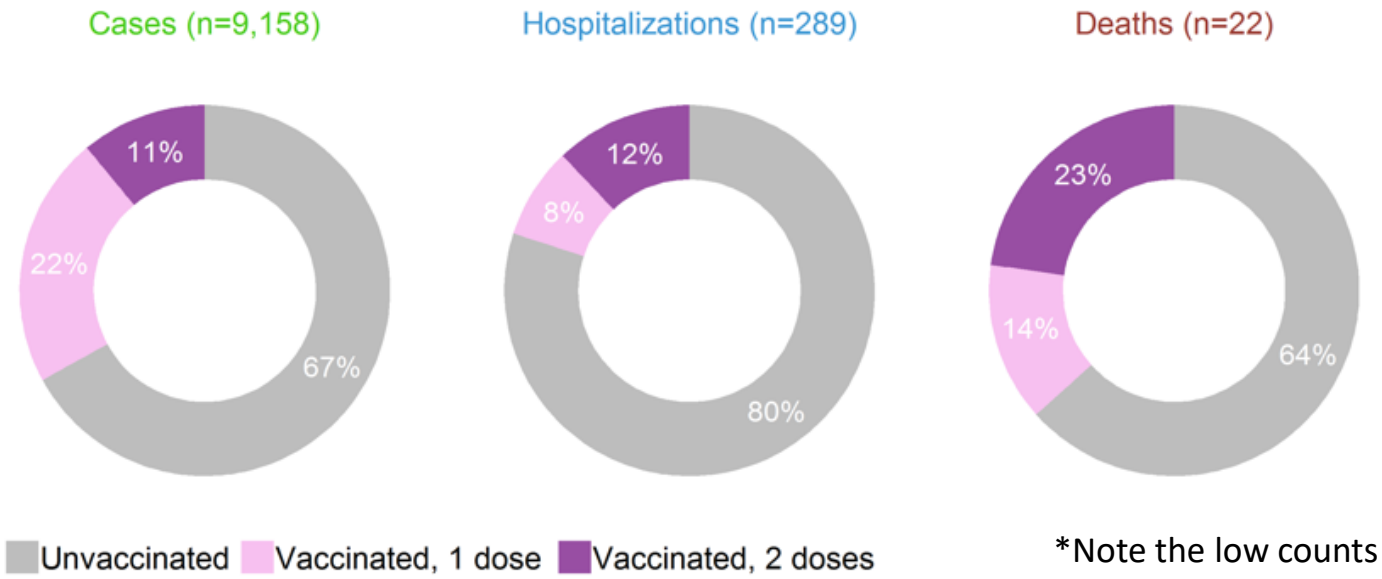
These % fluctuate over time. There are many more vaccinated individuals than unvaccinated individuals, and thus it is important to take the denominator into account. These figures do not represent vaccine effectiveness.



We operate in a live database environment and data get updated retrospectively. These figures were run on Monday August 23rd and thus will differ slightly from previously reported counts. Vaccinations represent vaccination coverage as of the last date (Aug 17th). Cases are captured based on surveillance date. Hospitalizations are by admission date. Please note that there is often a multiple-days lag in recording hospitalizations, e.g. some hospital admissions that occurred on Aug 17th may not be captured by our surveillance system until Aug 22nd. Proportions may not add up to 100% due to rounding.

Over the past month (17 Jul-17 Aug), fully vaccinated individuals accounted for 11% of cases and 12% of hospitalizations.

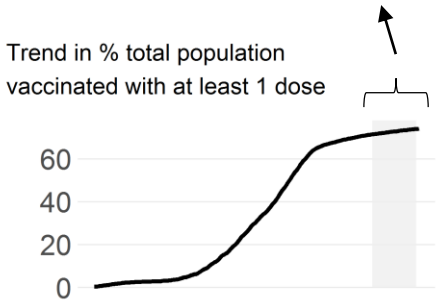
These % are expected to increase over time as more people get fully vaccinated and there are fewer unvaccinated people. If 100% of the population gets fully vaccinated, then any new cases, hospitalizations, or deaths will be among vaccinated people. Percentages for deaths among partially or fully vaccinated need to be interpreted with caution given small numbers in this 4 week snapshot.

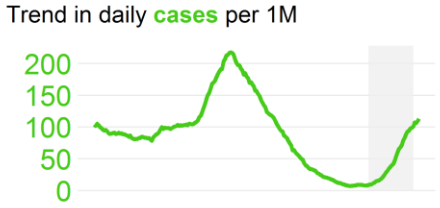


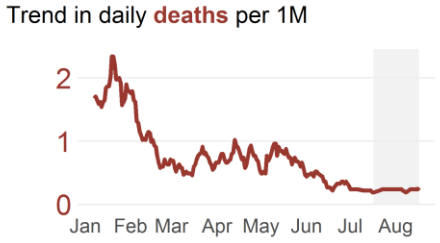
*Note the low counts for deaths; % tend to be unstable

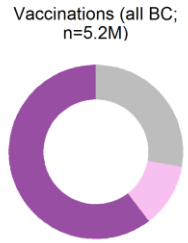
We operate in a live database environment and data get updated retrospectively. These figures were run on Monday August 23rd and thus will differ slightly from previously reported counts. Cases are captured based on surveillance date. Hospitalizations are by admission date. Deaths are by date of death. Please note that there is often a multiple-days lag in recording hospitalizations and deaths, e.g. some hospital admissions that occurred on Aug 17th may not be captured in our surveillance system until Aug 22nd. Proportions may not add up to 100% due to rounding.

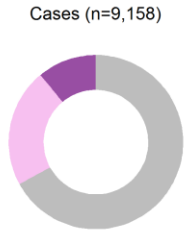
COVID-19 health outcomes by vaccination status and age, BC
July 17 – August 17, 2021

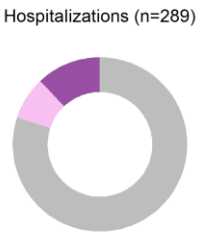


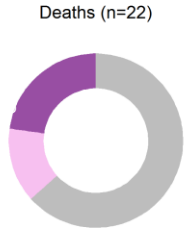


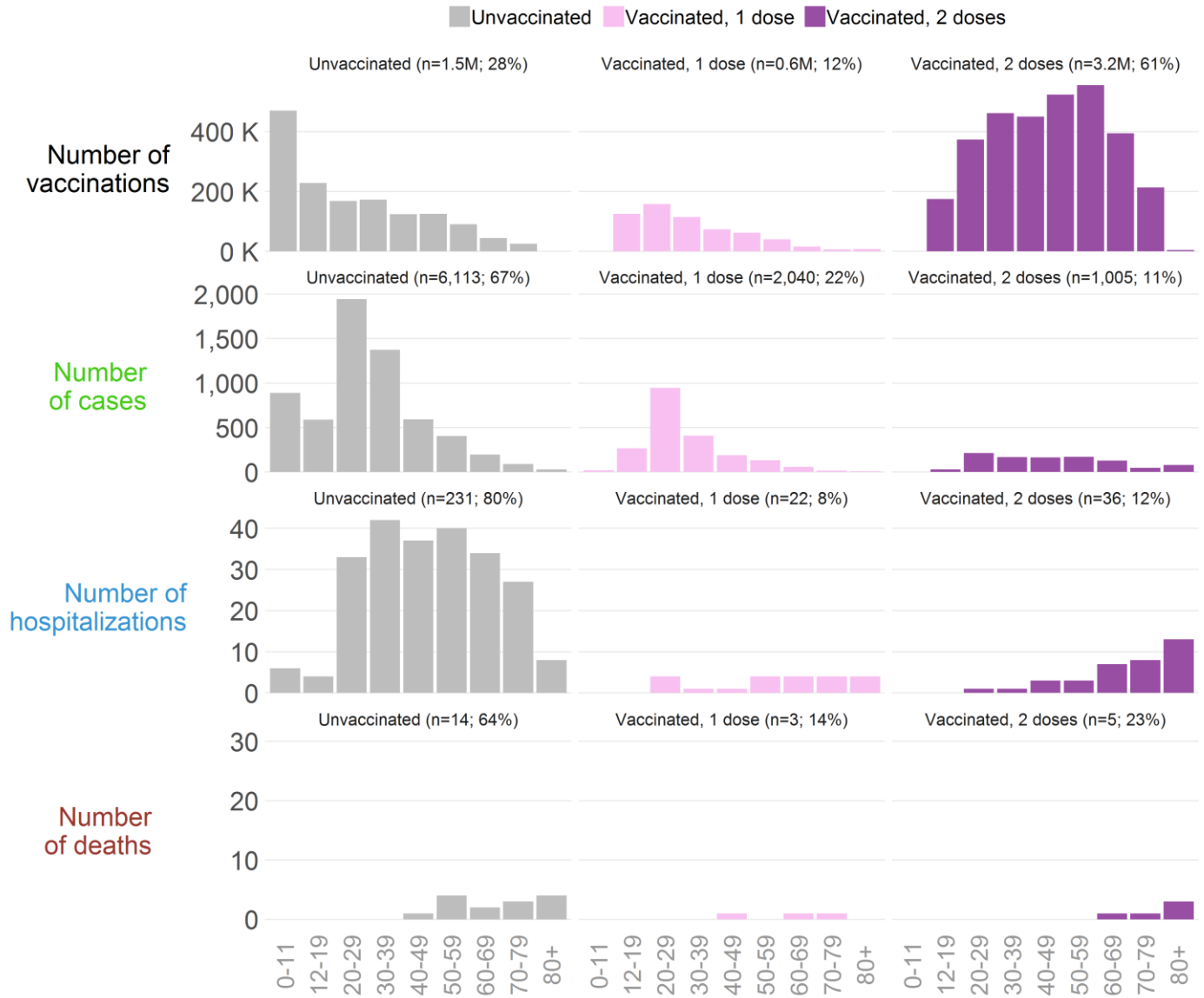












Provincial Health Services Authority
Province-wide solutions. Better health.

We operate in a live database environment and data get updated retrospectively. These figures were run on Monday August 23rd and thus will differ slightly from previously reported counts. Vaccinations represent vaccination coverage as of the last date (Aug 17th). Cases are captured based on surveillance date. Hospitalizations are by admission date. Deaths are by date of death. Please note that there is often a multiple-days lag in recording hospitalizations and deaths, e.g. some hospital admissions that occurred on Aug 17th may not be captured in our surveillance system until Aug 22nd. Proportions may not add up to 100% due to rounding.

BC Centre for Disease Control

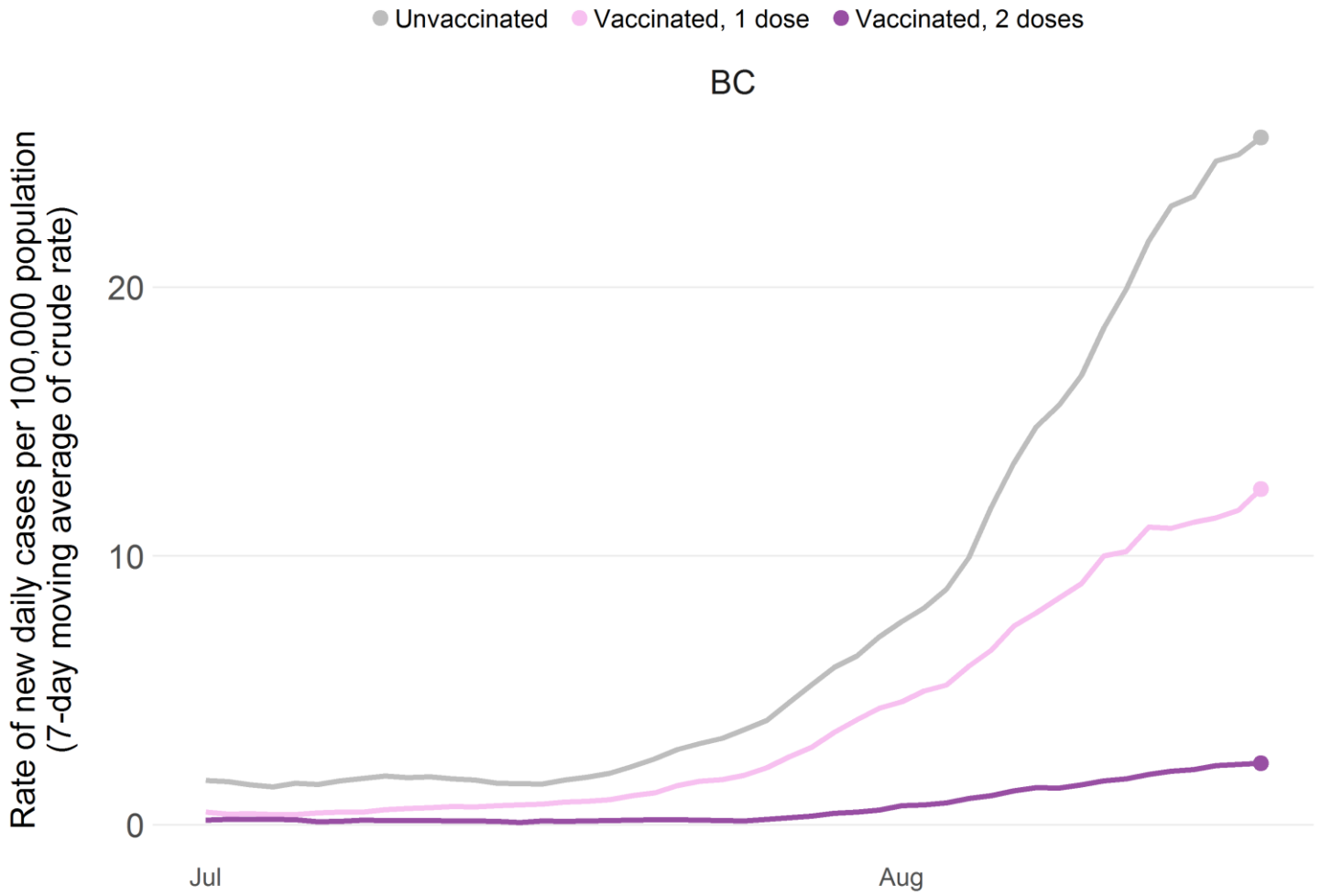
The importance of reporting rates

- The above numerator-only graphs do not tell the full story. There are many more fully vaccinated individuals than there are unvaccinated individuals. It is critical to take the denominator into account.
- However, because these denominators are dynamic and are constantly changing as more people get vaccinated with 1st and 2nd doses, comparing the vaccine status figures only on a daily or weekly basis results in incomparable statistics over time and can be misleading.
- This is why a better metric to monitor epidemic progress by vaccine status is to report trends in rates over time. Please see figures that follow.
- It is also important to report age. The relationship between age and risk of severe outcomes remains very strong, with older individuals at higher risk compared with younger individuals. The age distribution of the vaccinated and unvaccinated individuals is also very different, with unvaccinated individuals being, on average, much younger.

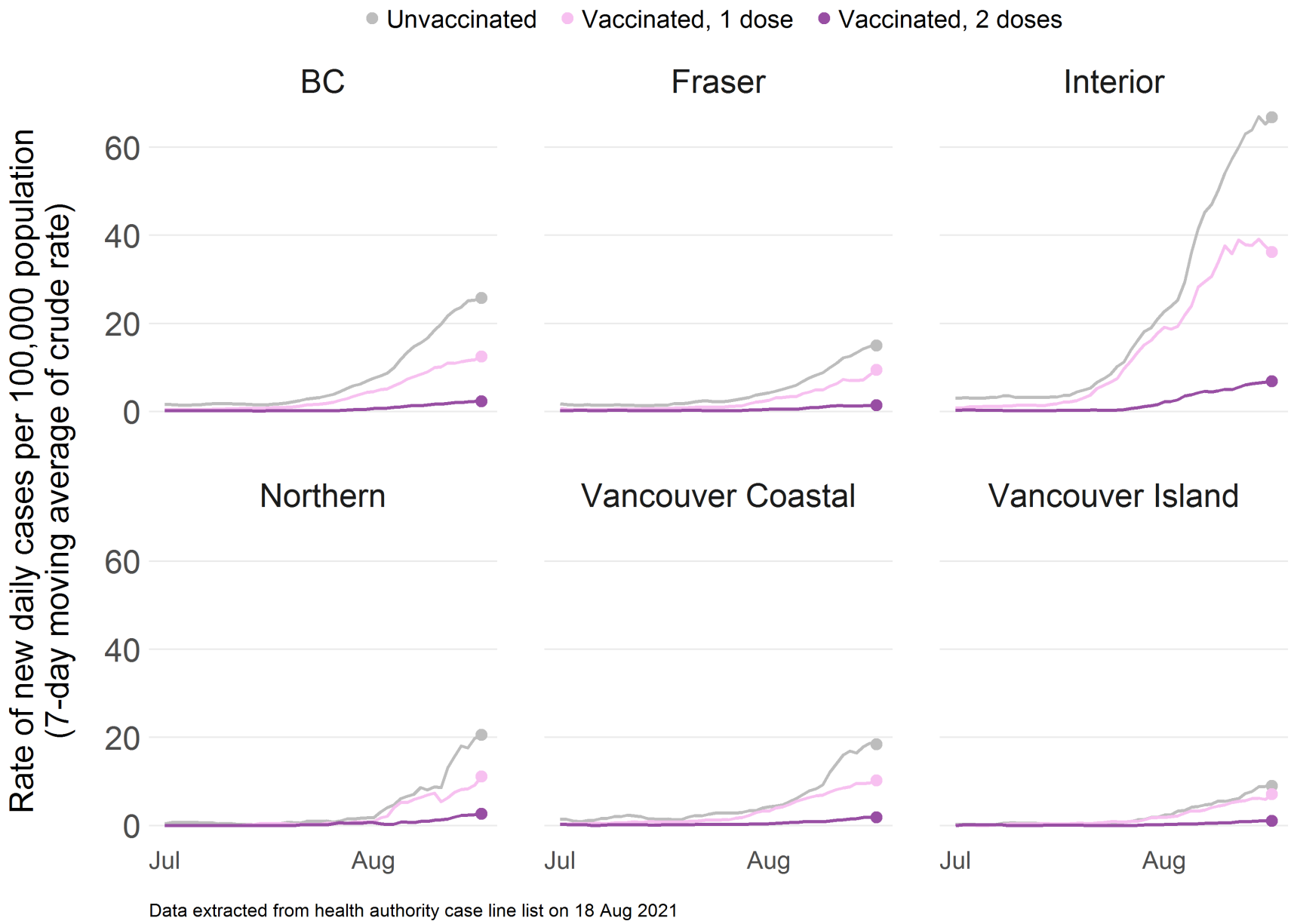
Over the past 6 weeks (1 July – Aug 17), case rate among the unvaccinated individuals has been ~10x higher than case rate among fully vaccinated individuals. Vaccination with 2 doses provides better protection than 1 dose.

Interpretation: in mid-August in BC, there were 28 reported daily cases per 100,000 unvaccinated individuals compared with 2.6 reported daily cases per 100,000 fully vaccinated individuals, ~10x higher crude relative rate.

Denominators for each vaccine status group are dynamic and change daily as people flow from being unvaccinated to protected by 1 dose to protected by 2 doses.



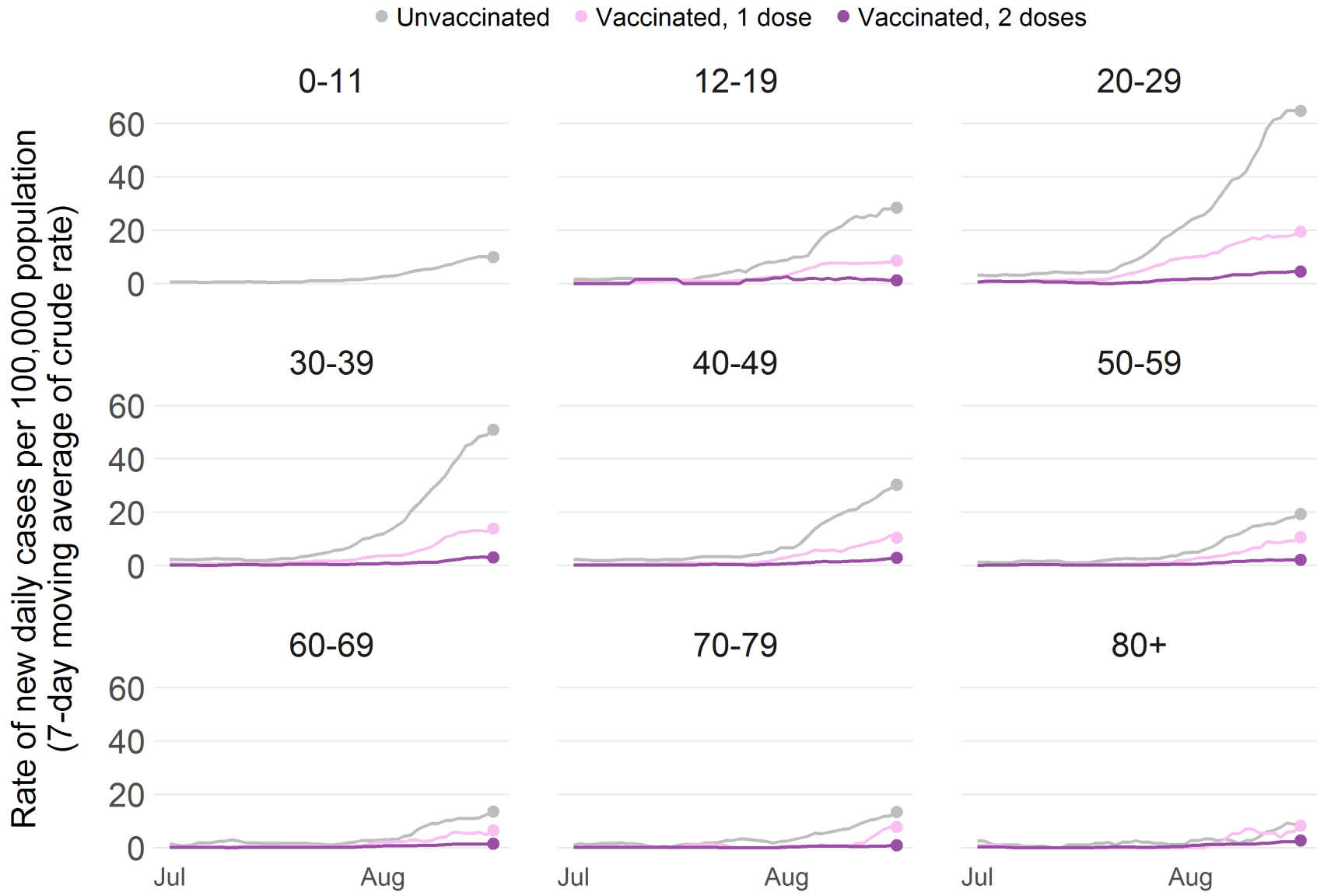
COVID-19 case rate by vaccination status and Health Authority, July 1 – August 17, 2021



Data extracted from health authority case line list on 18 Aug 2021

Denominators for each vaccine status group are dynamic and change daily as people flow from being unvaccinated to protected by 1 dose to protected by 2 doses. Therefore, the denominators are different across groups and over time.

COVID-19 case rate by vaccination status and age, July 1 – August 17, 2021

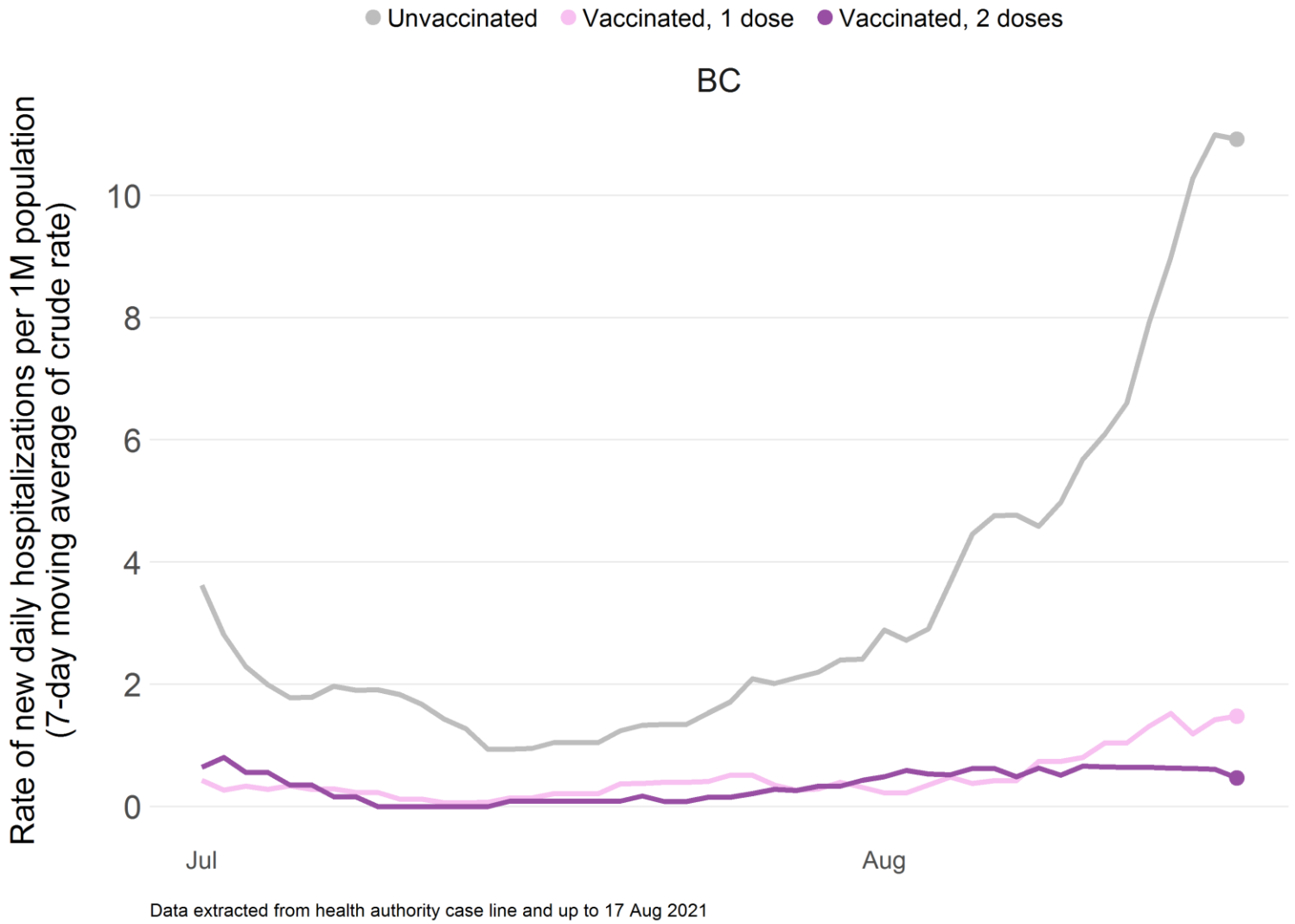


Data extracted from health authority case line list on 18 Aug 2021

Denominators for each vaccine status group are dynamic and change daily as people flow from being unvaccinated to protected by 1 dose to protected by 2 doses. Therefore, the denominators are different across groups and over time.

COVID-19 hospitalization rate by vaccination status, July 1 – August 17, 2021

Interpretation: in mid-August in BC, there were 11 reported daily hospitalizations per 1 million unvaccinated individuals compared with 0.65 reported daily cases per 1 million fully vaccinated individuals, ~17x higher crude relative rate

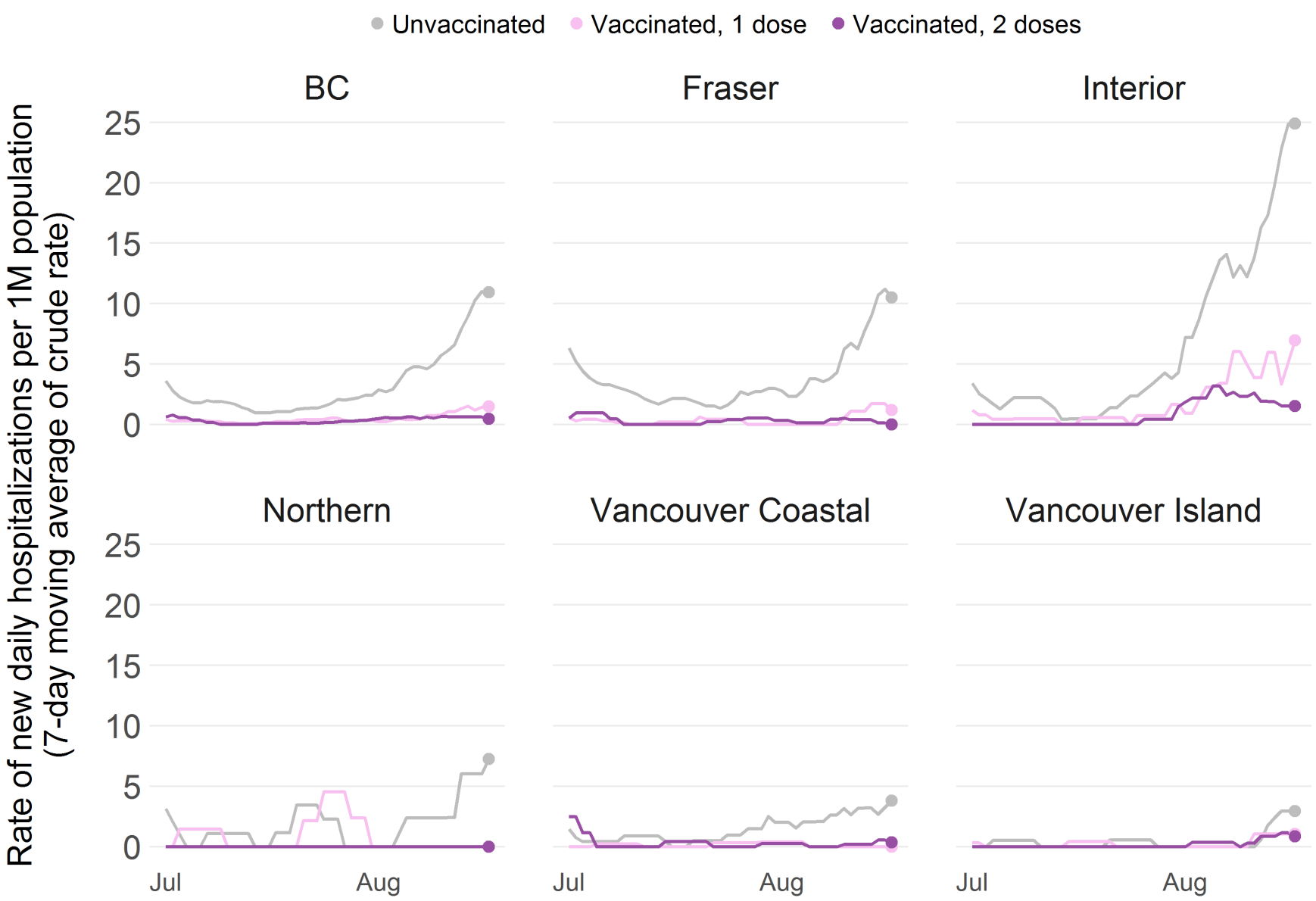


Data by hospital admission date, graph run on Aug 23rd. Please note that there is often a multiple-days lag in recording hospitalizations and deaths, e.g. some hospital admissions that occurred on Aug 17th may not be recorded until Aug 22nd. Denominators for each vaccine status group are dynamic and change daily as people flow from being unvaccinated to protected by 1 dose to protected by 2 doses.

COVID-19 hospitalization rate by vaccination status, July 1 – August 17, 2021

Given relatively low numbers, please interpret these results with caution. Trends tend to be unstable with low counts.

Data by hospital admission date. Denominators for each vaccine status group are dynamic and change daily as people flow from being unvaccinated to protected by 1 dose to protected by 2 doses. Therefore, the denominators are different across groups and over time.

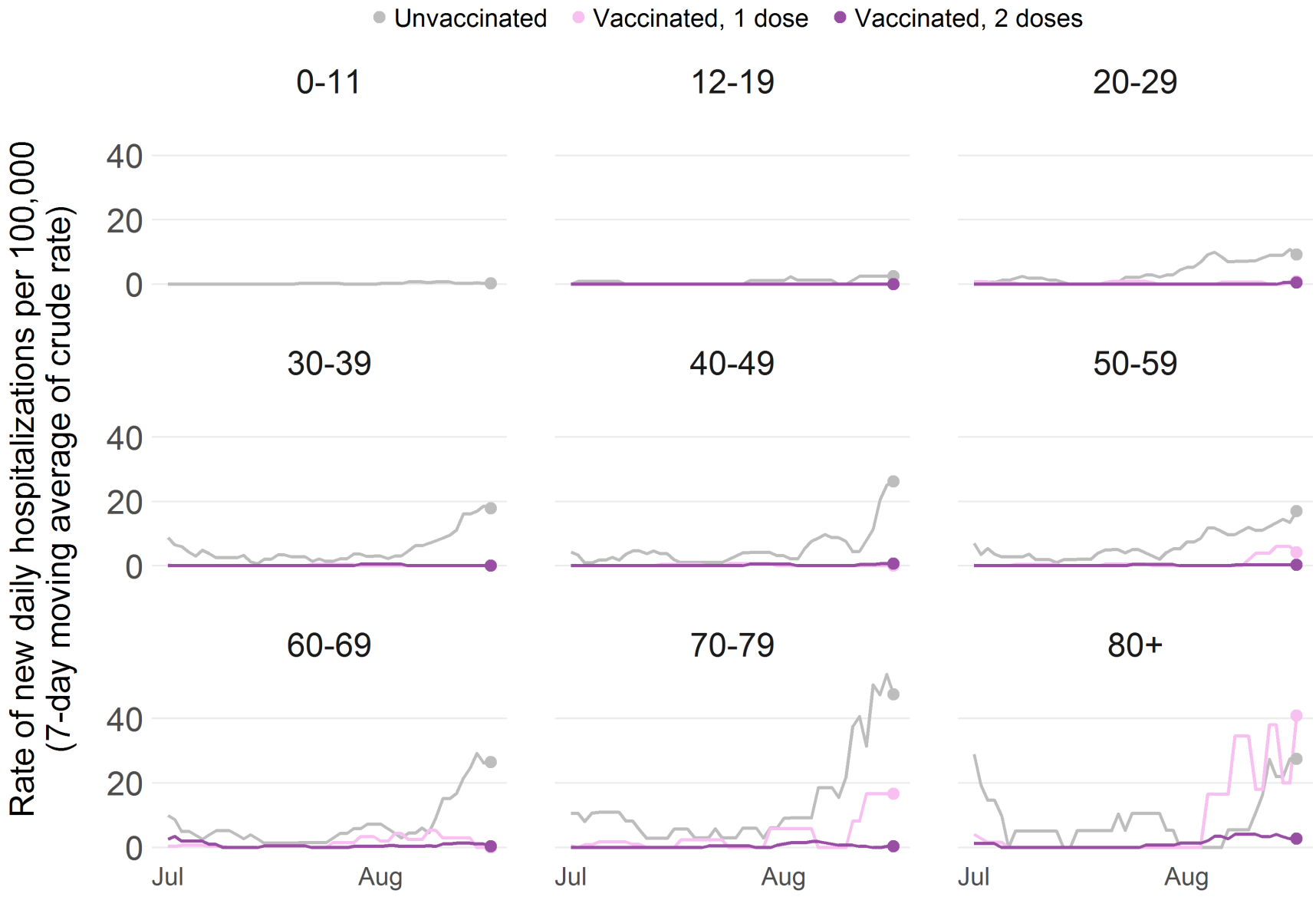


Data extracted from health authority case line and up to 17 Aug 2021

COVID-19 hospitalization rate by vaccination status and age, July 1 – August 17, 2021

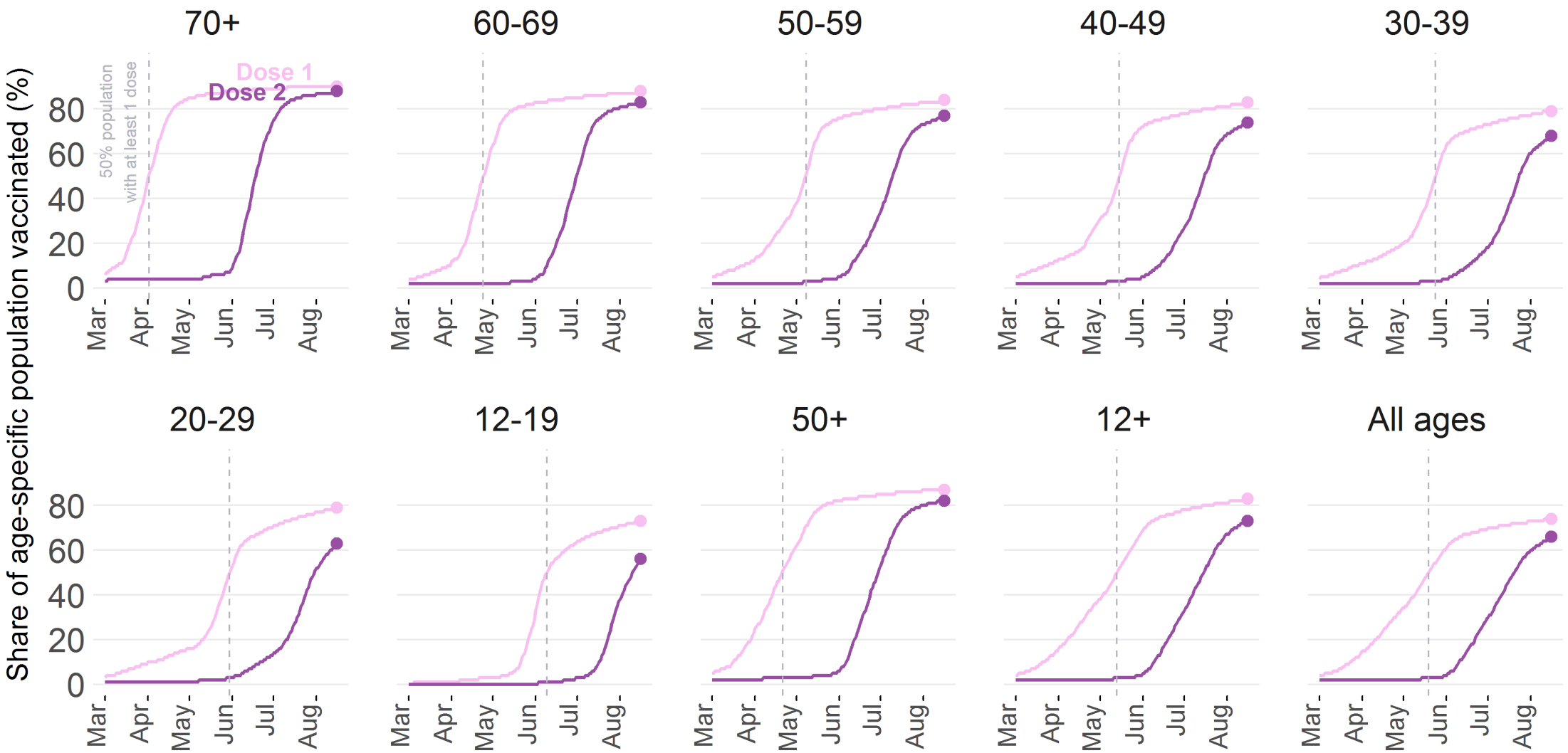
Given relatively low numbers, please interpret these results with caution. Trends tend to be unstable with low counts.

Denominators for each vaccine status group are dynamic and change daily as people flow from being unvaccinated to protected by 1 dose to protected by 2 doses. Therefore, the denominators are different across groups and over time.



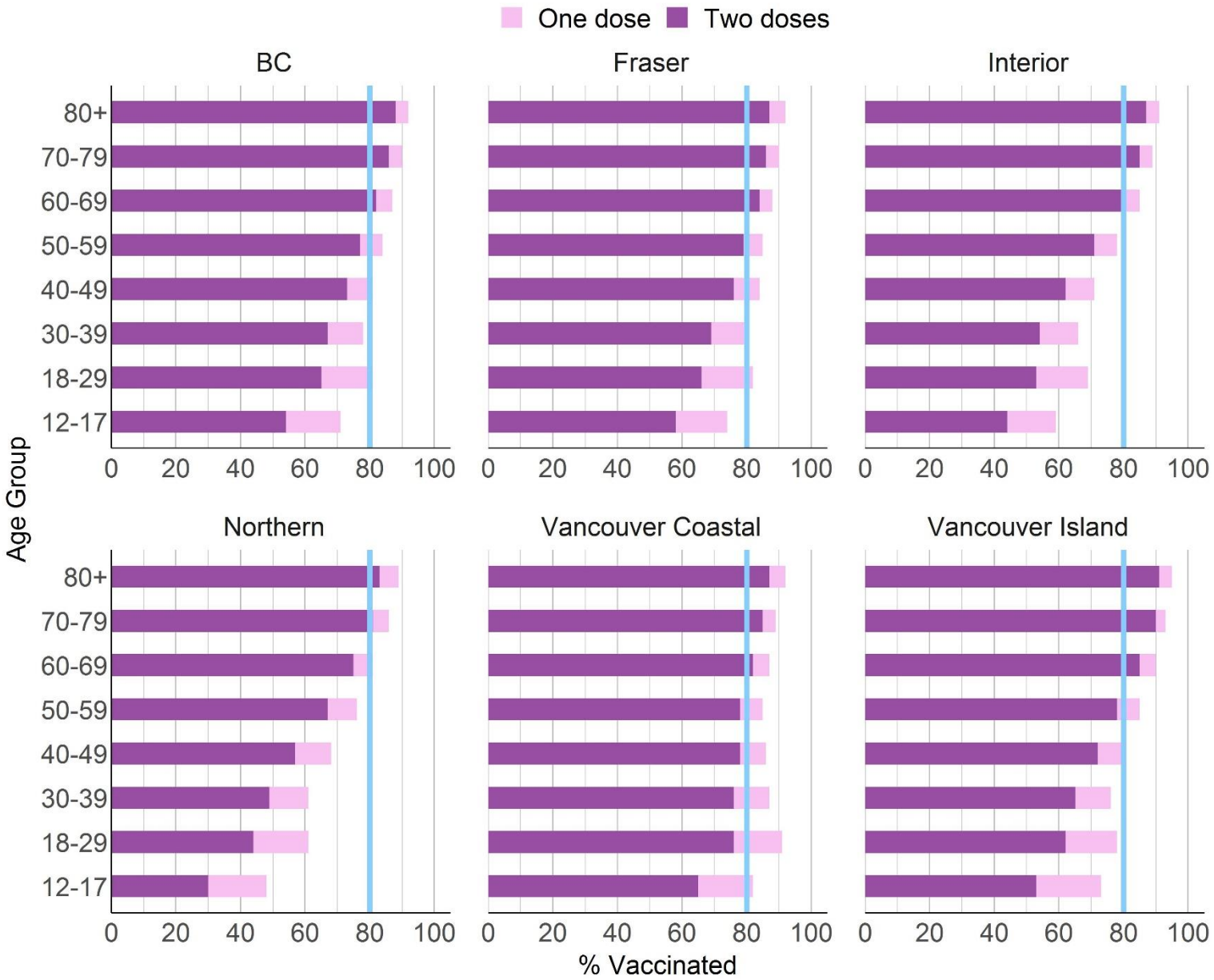
Data extracted from health authority case line and up to 17 Aug 2021

Vaccination progress in BC over time by age group and dose number up to 17 August



Data updated 2021-08-17
Data Source: Provincial Immunization Registry, PHSA

Vaccination progress in BC by Health Authority, age group and dose number as of August 17th



*Note: BC numbers include individuals where health authority of residence was not assigned

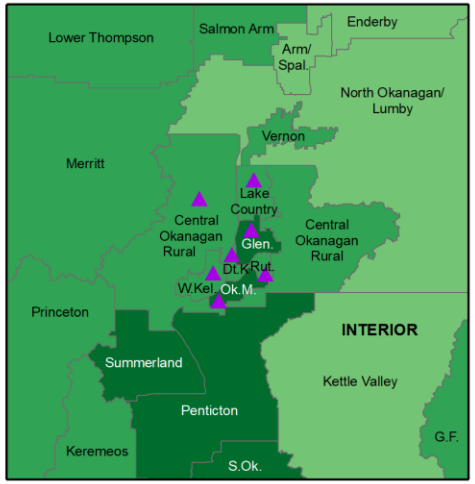
Blue lines at 80% are for visual reference only for easier navigation across panels

Data updated 2021-08-16
Data Source: Ministry of Health

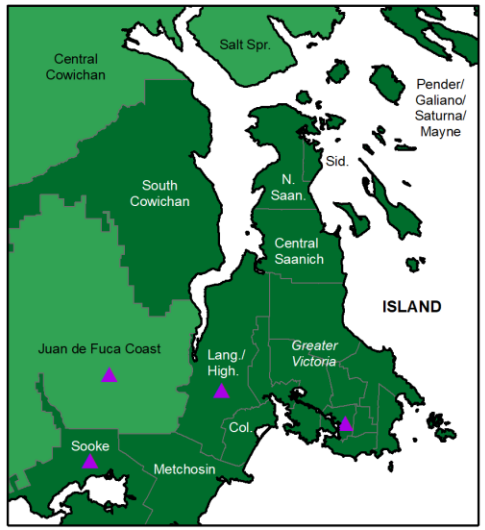
Geographic Distribution of COVID-19 Vaccination Coverage by LHA and CHSA

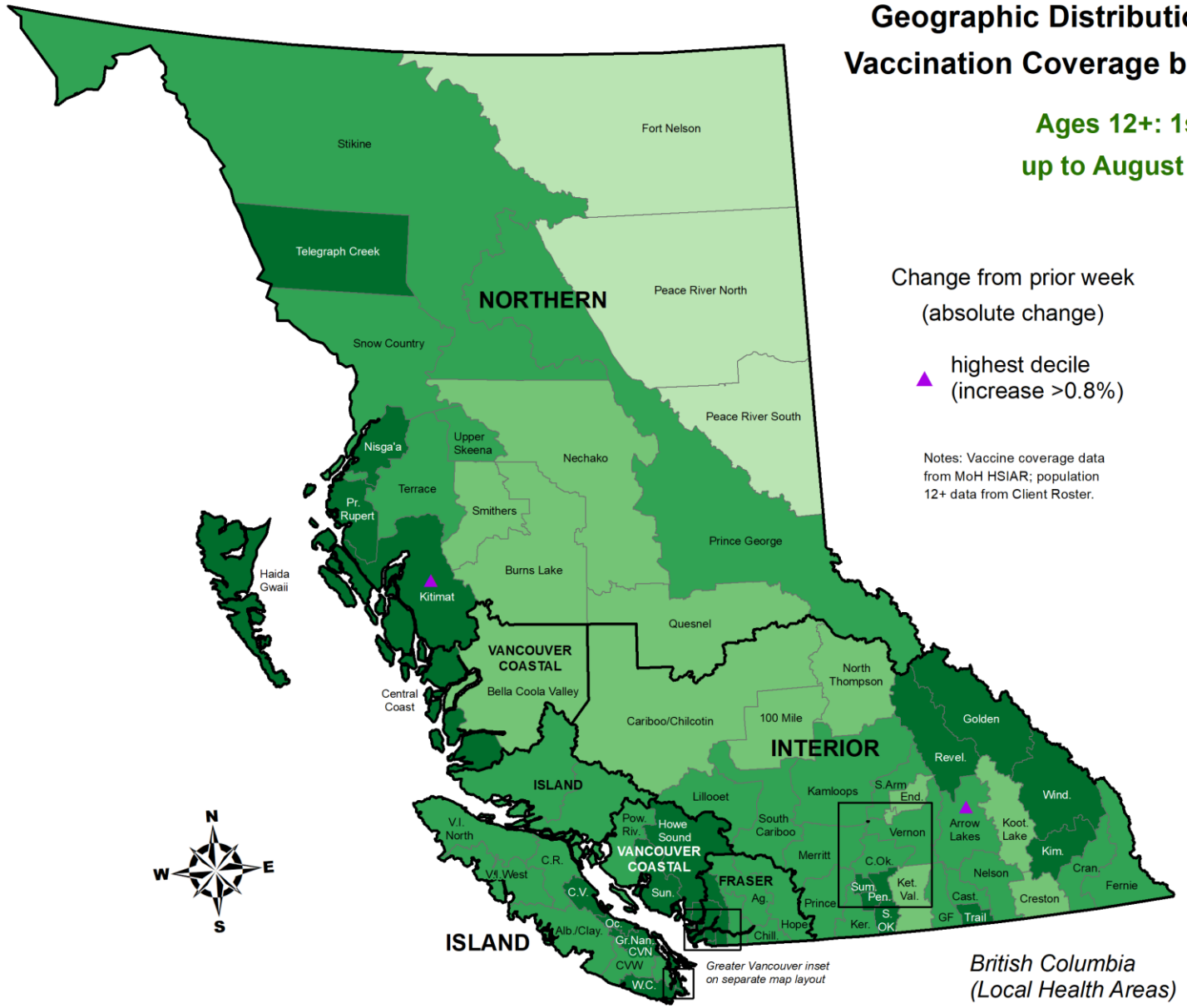
Ages 12+: 1st Dose
up to August 16, 2021

Okanagan Inset
(Community Health Service Areas)



Greater Victoria Inset
(Community Health Service Areas)





Greater Vancouver inset on separate map layout

British Columbia
(Local Health Areas)

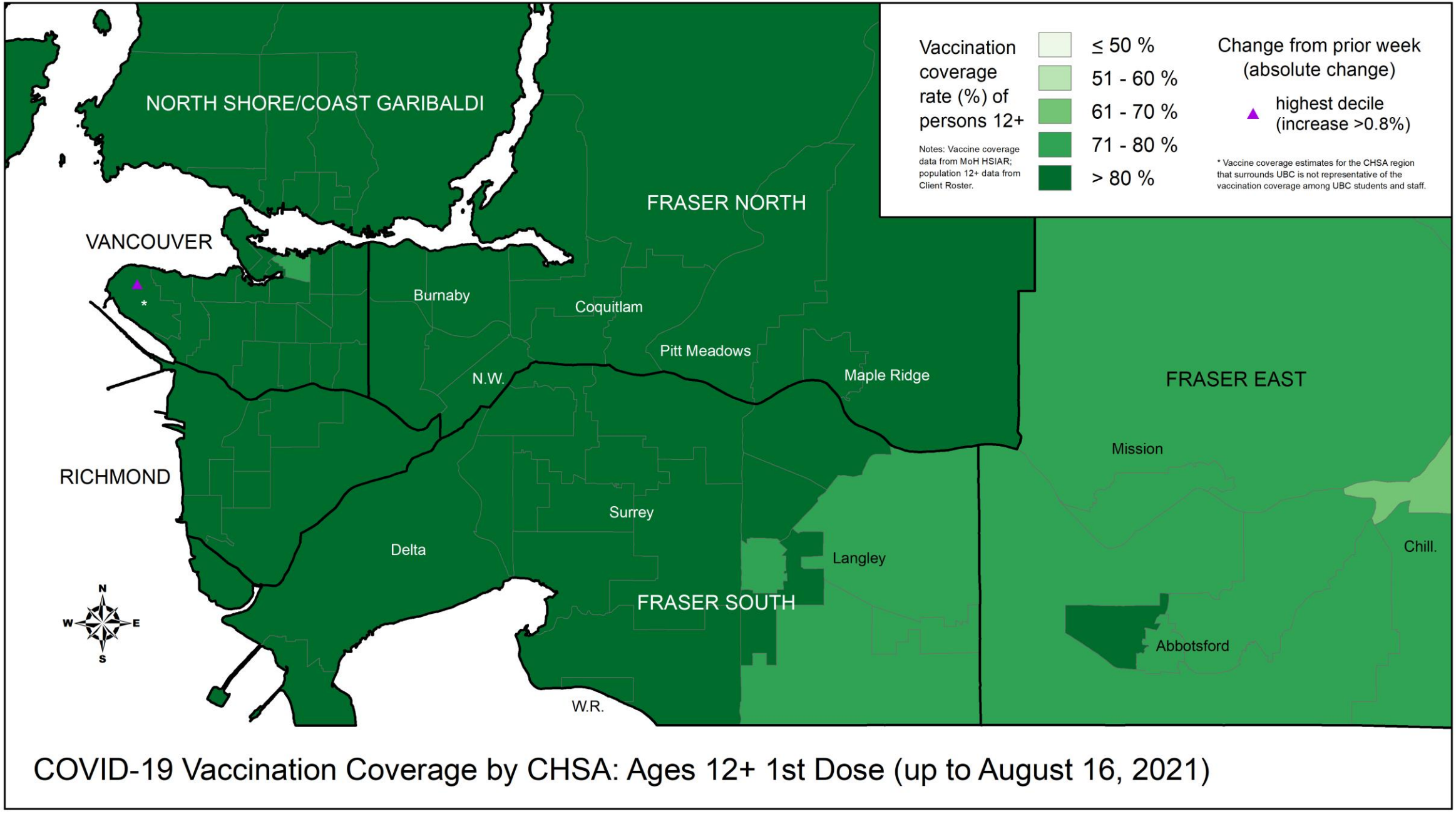
Change from prior week (absolute change)

▲ highest decile (increase >0.8%)

Notes: Vaccine coverage data from MoH HSIAR; population 12+ data from Client Roster.

Vaccination coverage rate (%) of persons 12+

- ≤ 50 %
- 51 - 60 %
- 61 - 70 %
- 71 - 80 %
- > 80 %

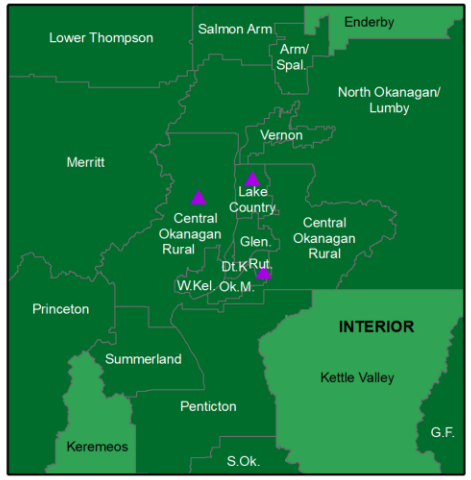


COVID-19 Vaccination Coverage by CHSA: Ages 12+ 1st Dose (up to August 16, 2021)

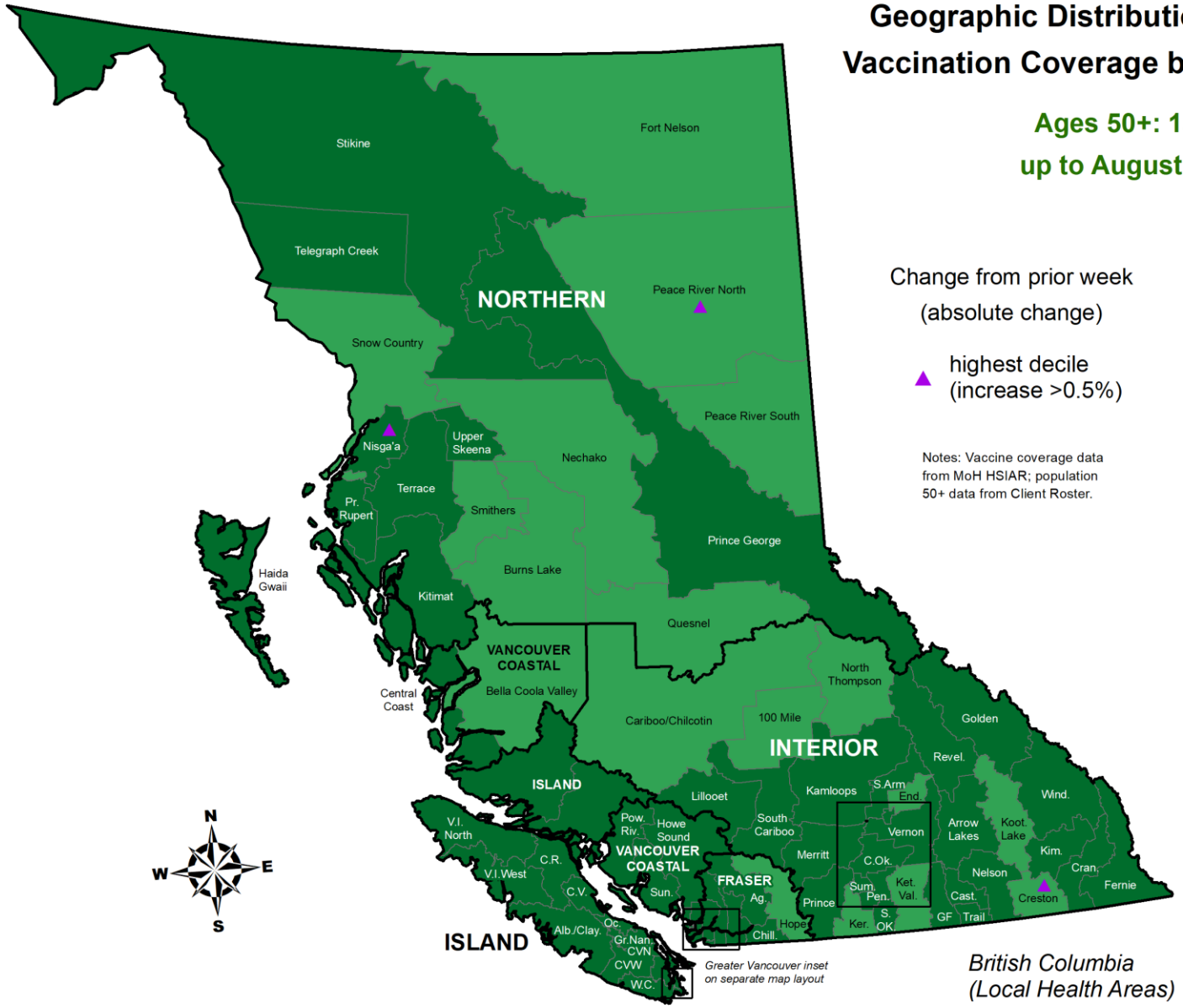
Geographic Distribution of COVID-19 Vaccination Coverage by LHA and CHSA

Ages 50+: 1st Dose
up to August 16, 2021

Okanagan Inset
(Community Health Service Areas)



Greater Victoria Inset
(Community Health Service Areas)



British Columbia
(Local Health Areas)

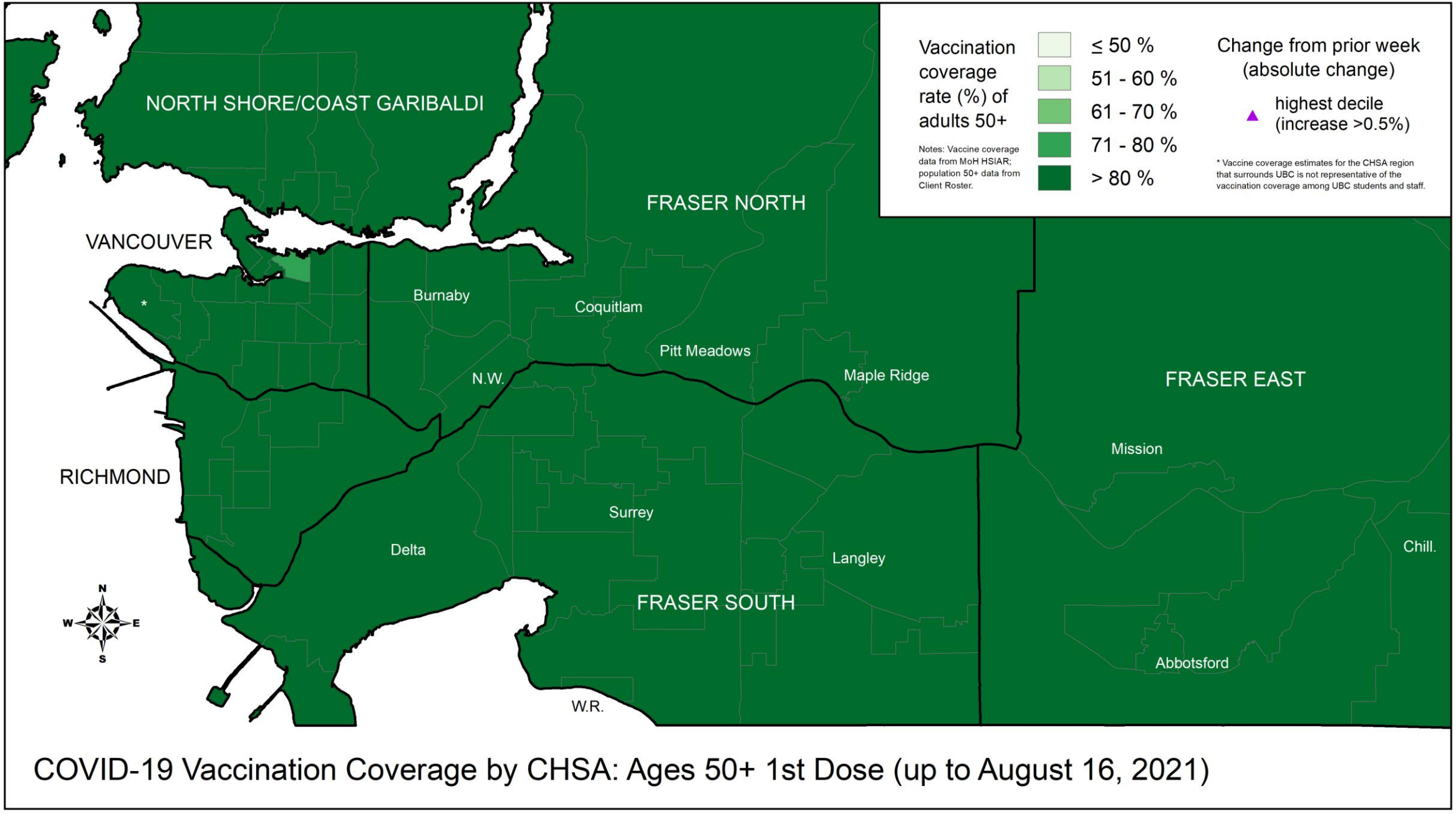
Change from prior week
(absolute change)

▲ highest decile
(increase >0.5%)

Notes: Vaccine coverage data from MoH HSIAR; population 50+ data from Client Roster.

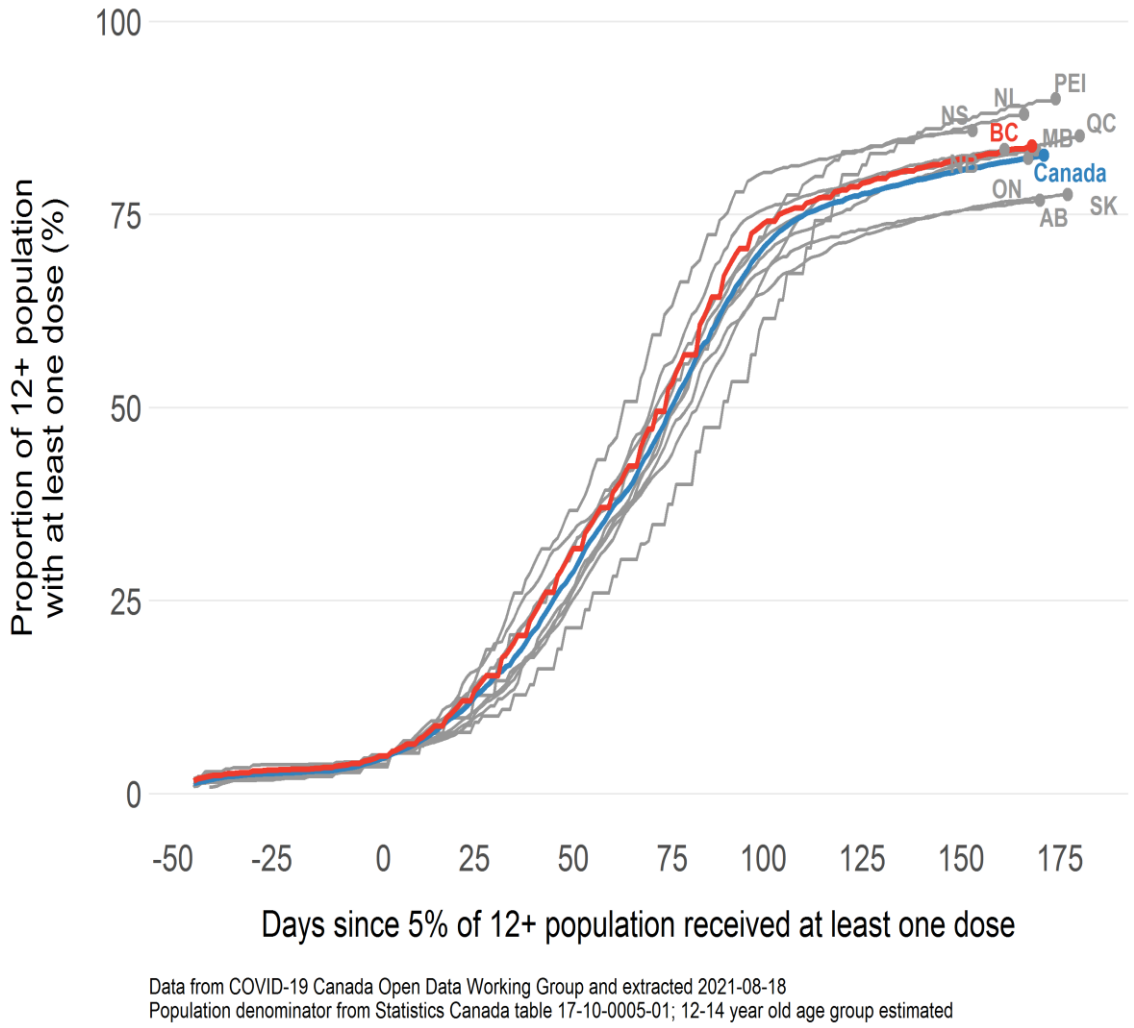
Vaccination coverage rate (%) of adults 50+

- ≤ 50 %
- 51 - 60 %
- 61 - 70 %
- 71 - 80 %
- > 80 %



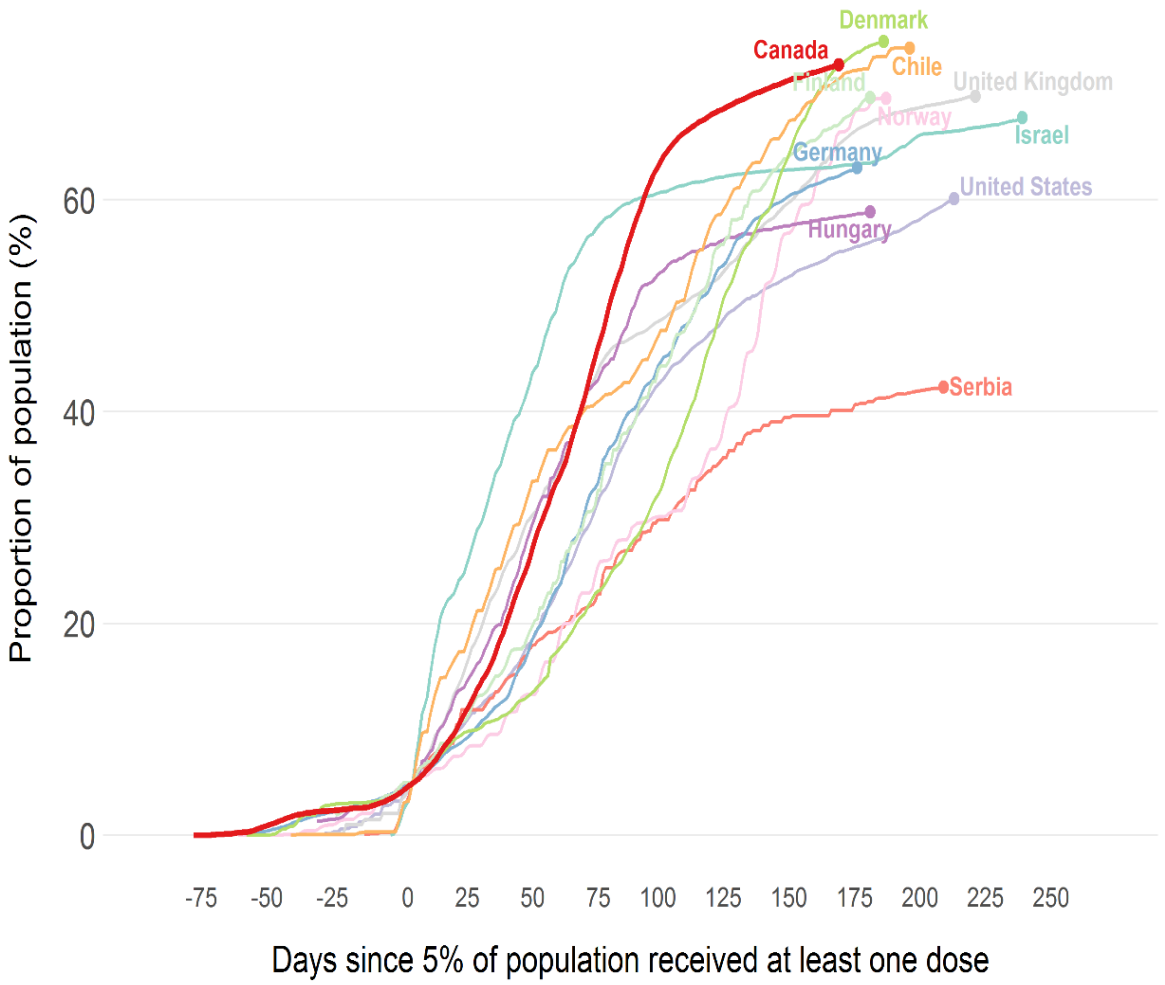
COVID-19 Vaccination Coverage by CHSA: Ages 50+ 1st Dose (up to August 16, 2021)

Nationally, BC's vaccination rate is very close to Canadian average; internationally, Canada is one of the countries with the highest proportion of the population with at least one dose.



Data from COVID-19 Canada Open Data Working Group and extracted 2021-08-18
Population denominator from Statistics Canada table 17-10-0005-01; 12-14 year old age group estimated

Data source: Open Data
Visualization: BCCDC



Data from Our World in Data and extracted on 2021-08-18

Data source: Our World in Data
Visualization: BCCDC

Lab - Key Messages

- Percent positivity among publicly funded tests increased to 9.3%
  - Test positivity varied by HA, ranging from 6.0% in FH to 17.9% in NH.
  - Increase in incidence and positivity in individuals aged < 45 years; most marked increase in individuals 19 to 29 years.
- Testing rates increased 8% this week (~71,000 total tests August 8 to 14)
- The provincial weekly median turnaround time (time from specimen collection to lab result) is 16 hours, indicating good testing capacity; only 1 in 4 tests took ≥24 hours to result.
- The share of VOCs among all positive tests in BC is ~100% from August 8 to 14.
- Sequencing-based VOC prevalence for August 8 to 14 shows B.1.617.2 (Delta) continues to be dominant at ~97%.

Weekly Summary of ALL lab tests performed

3,248,935	total specimens tested
71,386	new this epi week
164,460	total positive specimens
3,620	new positive this epi week
20 hr	mean turnaround time (TAT)
16 [10-24]	Median [Q1 – Q3] TAT

⬆8% relative to last week

5.1% positivity
⬆1.1% absolute change from last week

⬇23% TAT relative to last week

Weekly Summary of Lab tests paid Publicly

2,502,908	total specimens tested
38,051	new this epi week
162,647	total positive specimens
3,537	new positive this epi week

⬆26% relative to last week

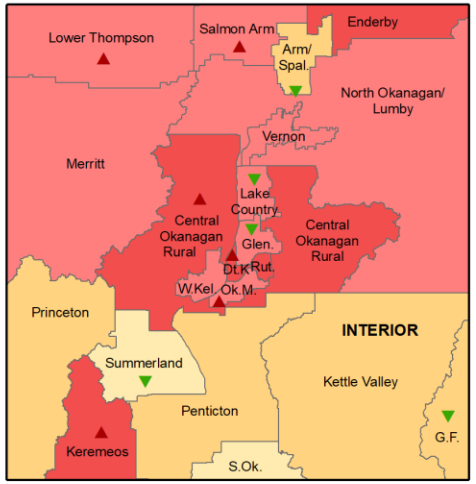
9.3% positivity
⬆1.0% absolute change from last week

Data source: PLOVER extract at 10:30am on August 17, 2021.
Epi week 32 (Aug 8 - 14)

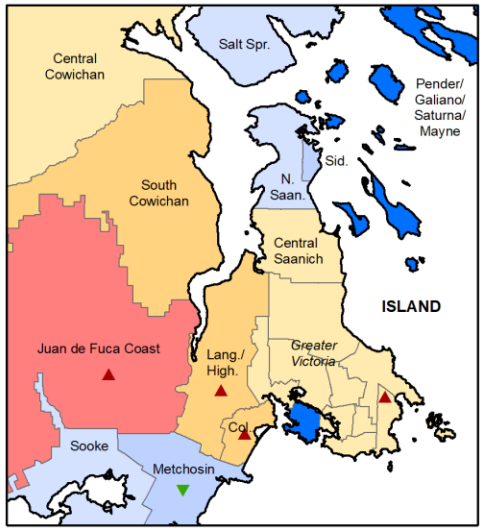
Geographic Distribution of COVID-19 Testing Positivity by LHA and CHSA

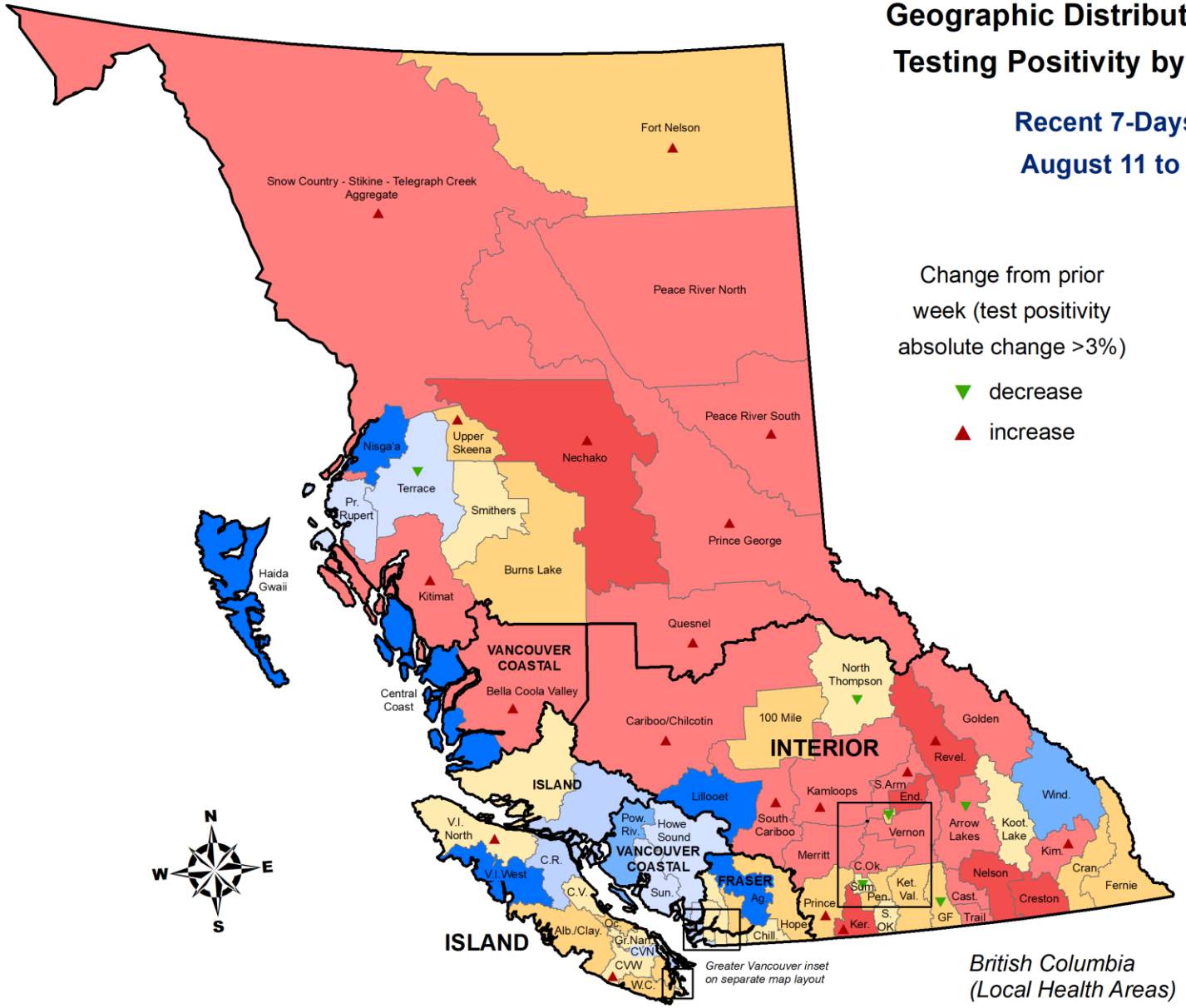
Recent 7-Days Testing
August 11 to 17, 2021

Okanagan Inset
(Community Health Service Areas)



Greater Victoria Inset
(Community Health Service Areas)





British Columbia
(Local Health Areas)

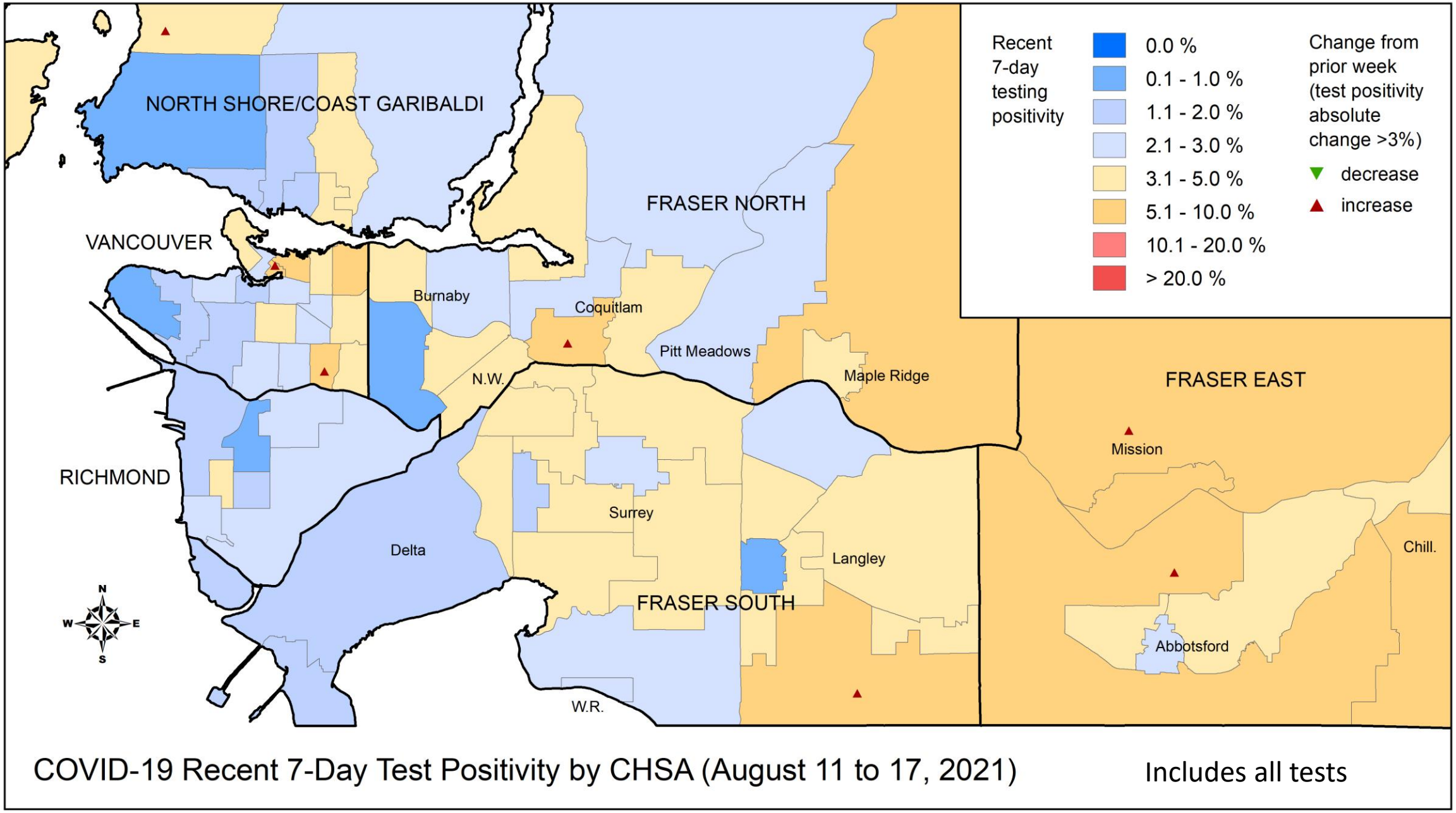
Change from prior week (test positivity absolute change >3%)

- ▼ decrease
- ▲ increase

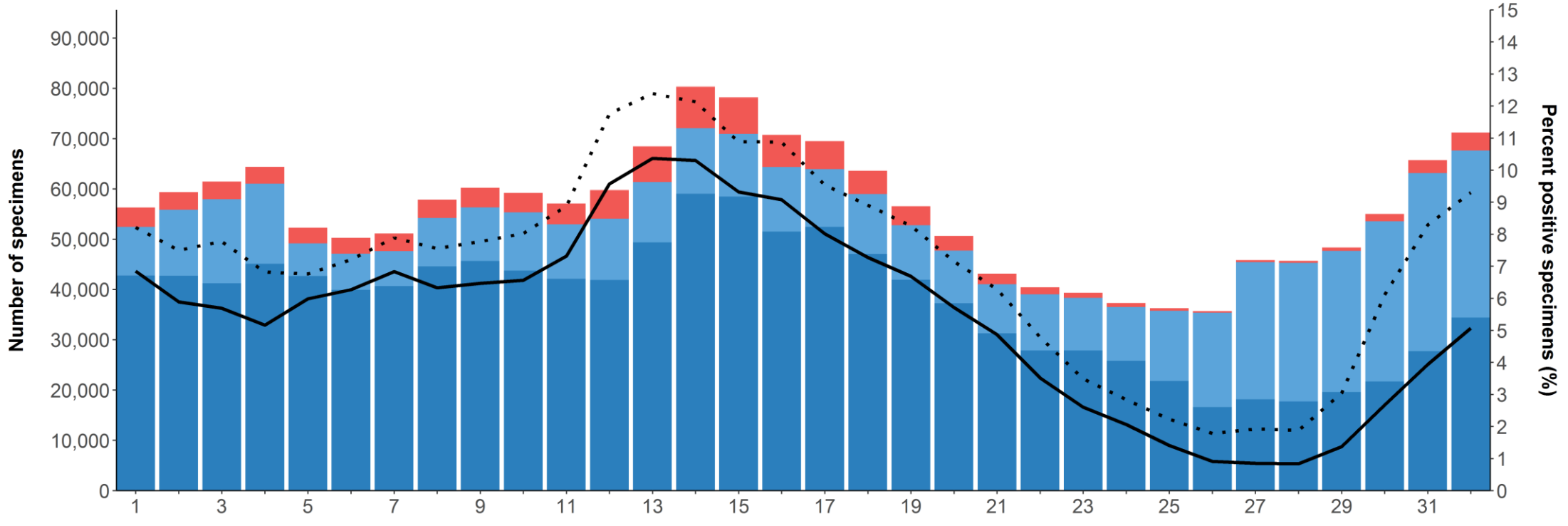
Test positivity rate

- 0.0 %
- 0.1 - 1.0 %
- 1.1 - 2.0 %
- 2.1 - 3.0 %
- 3.1 - 5.0 %
- 5.1 - 10.0 %
- 10.1 - 20.0 %
- > 20.0 %

Data source: BCCDC Public Health Laboratory PLOVER system (all tests performed). Data are by testing result date, and location of client's residence or if missing, physician's address.


NORTH SHORE/COAST GARIBALDI
VANCOUVER
FRASER NORTH
Burnaby
Coquitlam
Pitt Meadows
N.W.
Maple Ridge
FRASER EAST
Mission
RICHMOND
Surrey
Delta
Langley
Chill.
FRASER SOUTH
Abbotsford
W.R.
N
W
E
S
Recent 7-day testing positivity
0.0 %
0.1 - 1.0 %
1.1 - 2.0 %
2.1 - 3.0 %
3.1 - 5.0 %
5.1 - 10.0 %
10.1 - 20.0 %
> 20.0 %
Change from prior week (test positivity absolute change >3%)
decrease
increase
COVID-19 Recent 7-Day Test Positivity by CHSA (August 11 to 17, 2021)
Includes all tests

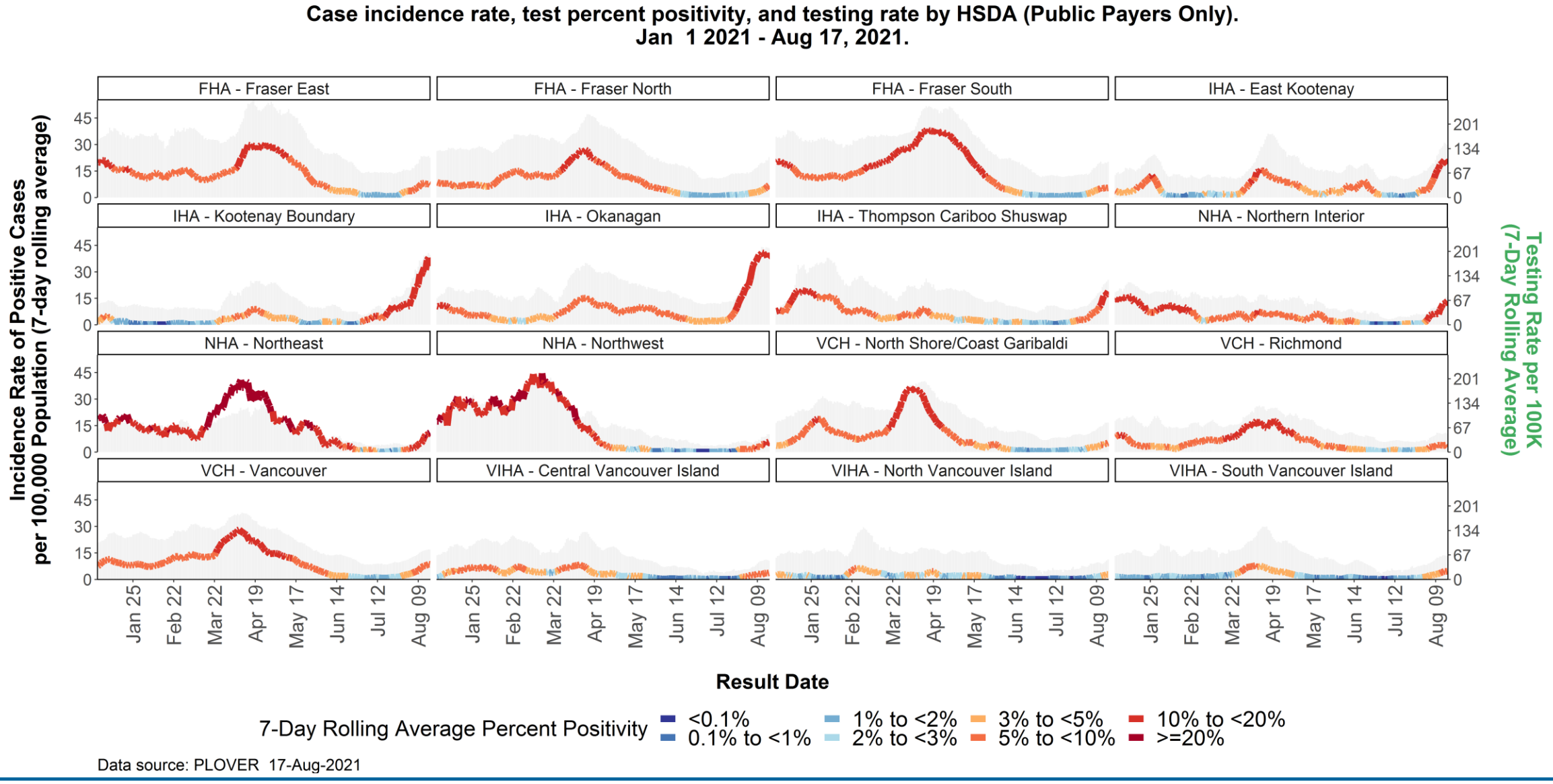
In epi week 32, percent positivity among publicly funded tests increased to 9.3%



Note: Invalid (n = 1238) and indeterminate (n = 4689) results have been excluded

Data source: PLOVER 18-Aug-2021

Incidence and test positivity are high across Interior and Northern HSDAs, with many showing increasing trends.

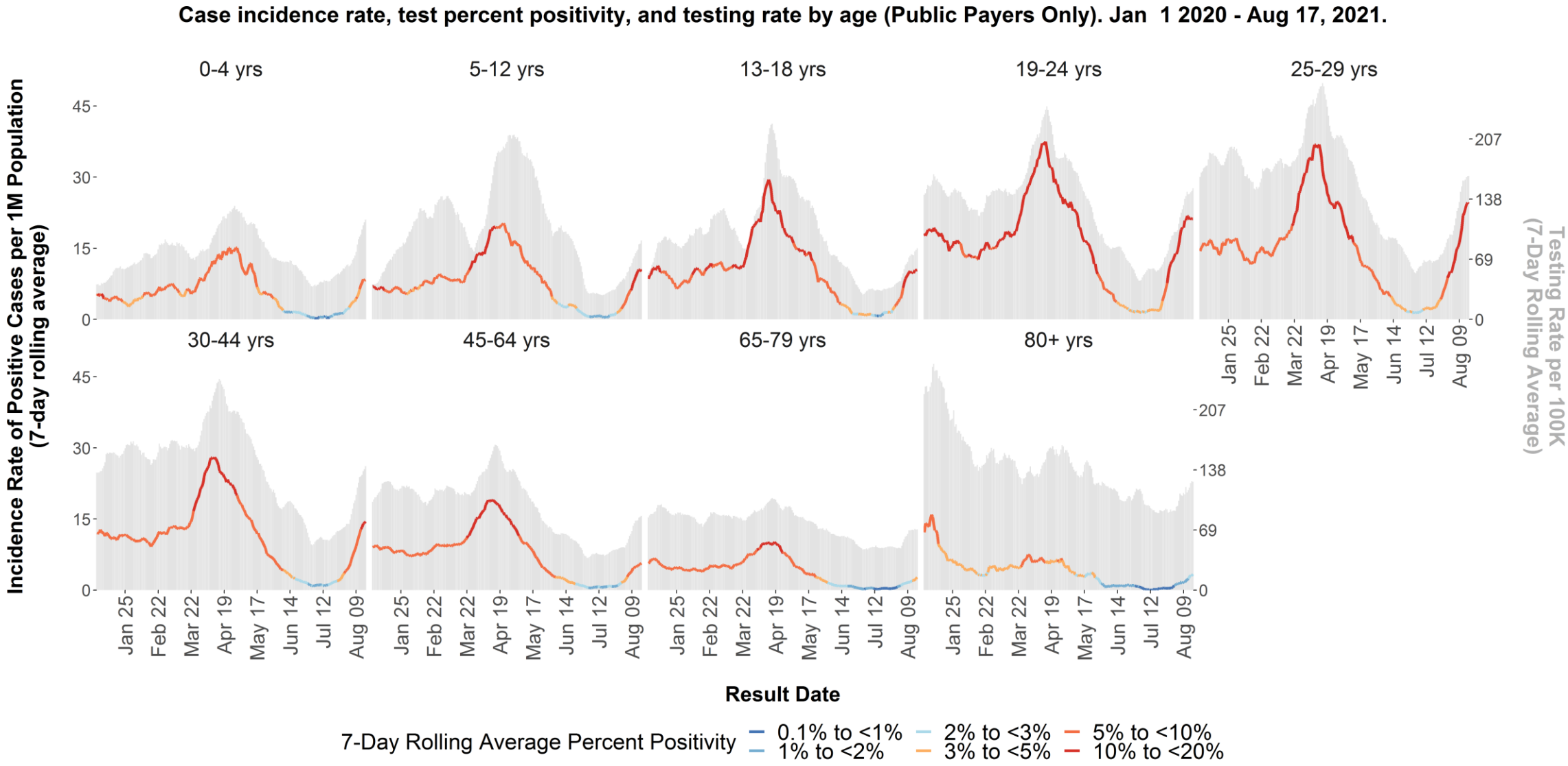


Data source: PLOVER 17-Aug-2021

For latest version of a graph similar to this one (difference: all tests, not public tests), see the Epi App

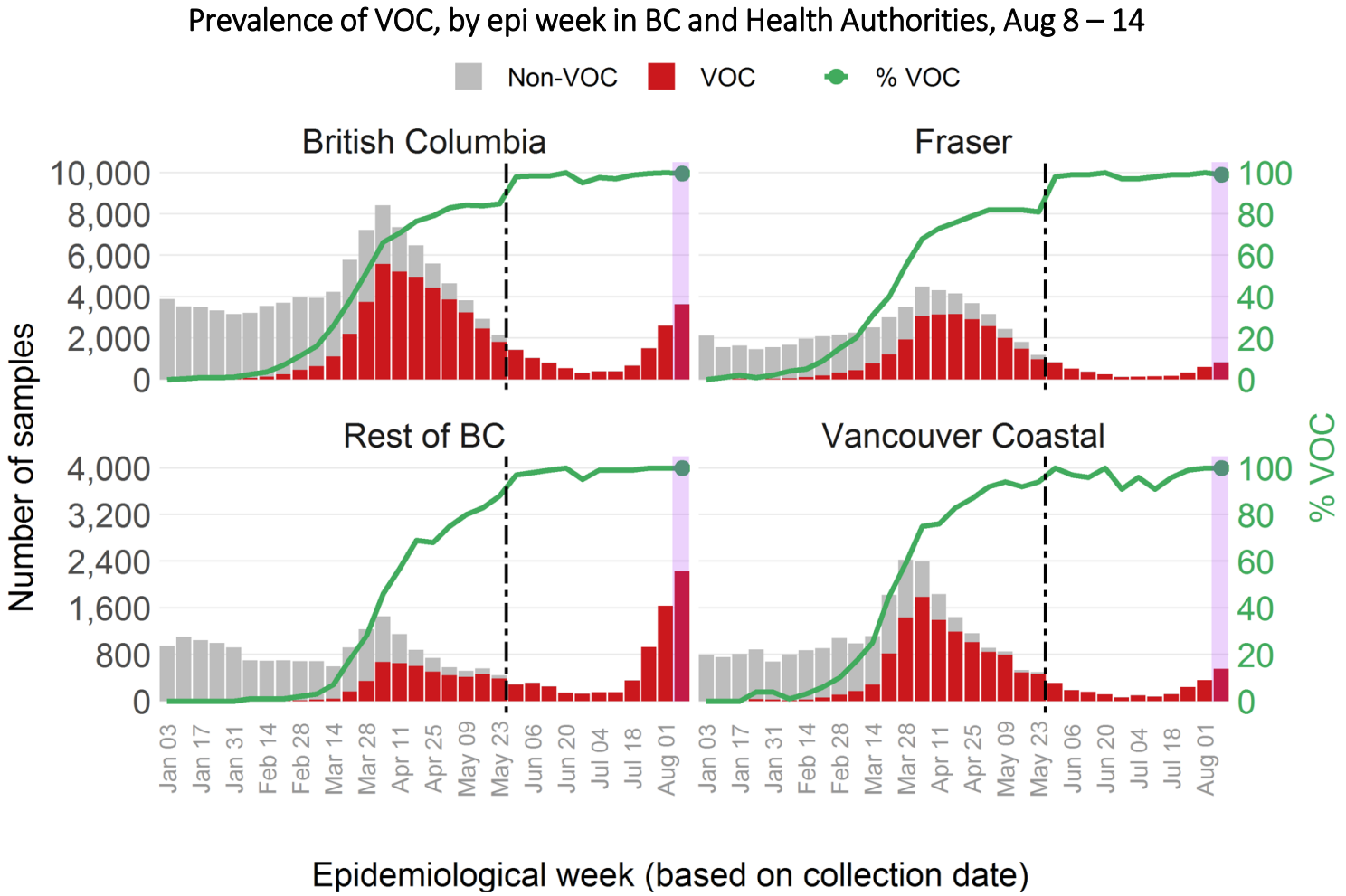
BC Centre for Disease Control

Increase in incidence and positivity in individuals aged <45 years; most marked increase in last month among individuals 19 to 29 years.



Data source: PLOVER 17-Aug-2021

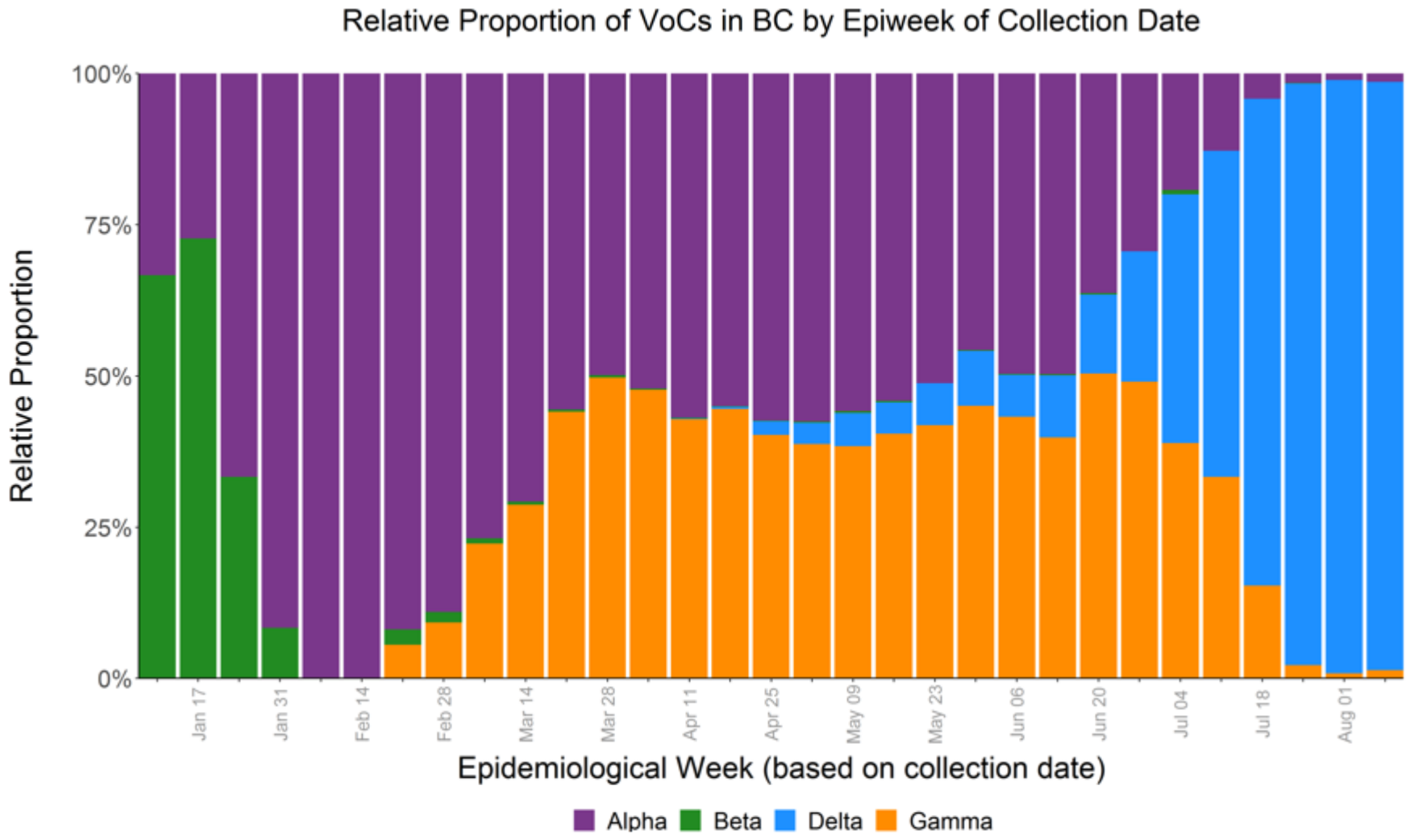
Almost all (~100%) COVID-19 positive samples continue to be variants of concern (VOCs). Due to the lack of changes from week to week, this is the last week this graph will be shown in this deck. VOC report will continue to be produced.



Shaded area reflects partial data and is subject to change

This figure can also be found in the weekly VOC report

Among sequenced VOC samples provincially based on information for August 8 to 14, the dominant VOC is Delta, at ~97%



Alpha (%)~1%

Delta (%)~97%

Gamma (%)~1%

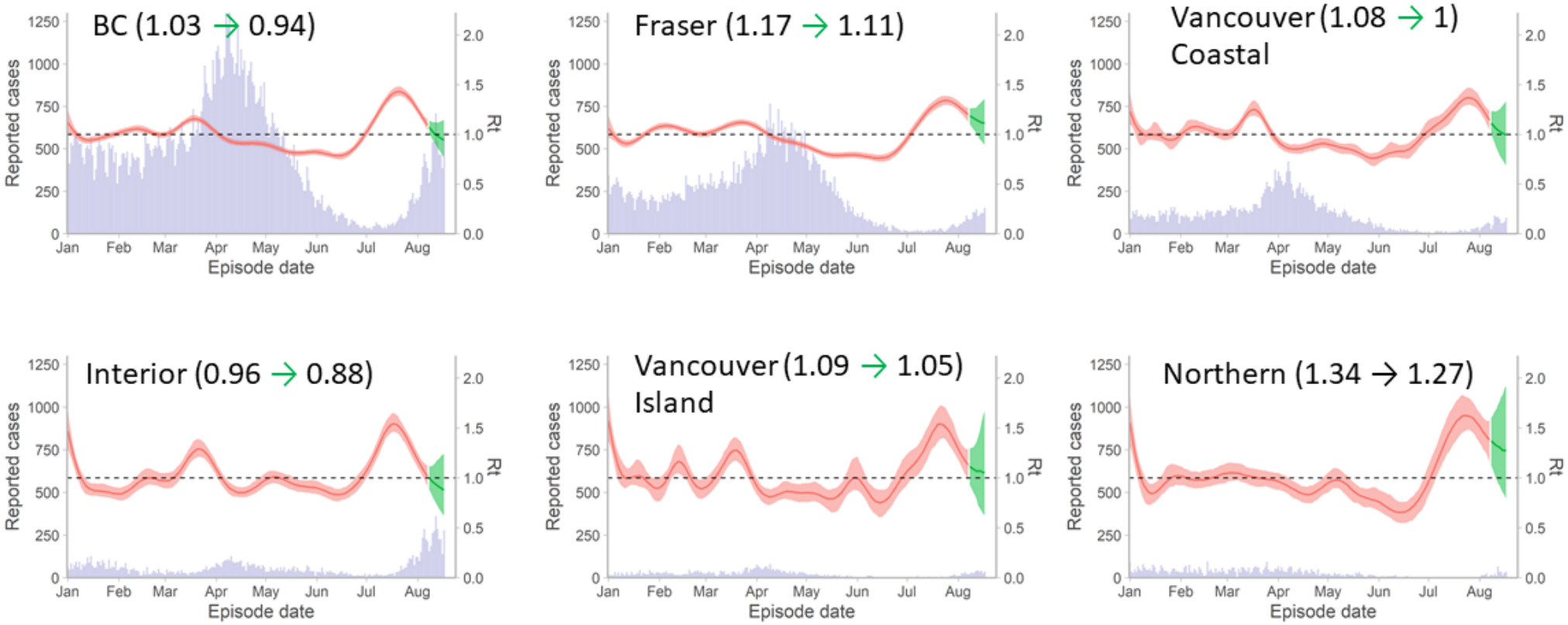
Weeks 13 onward include specimens from qPCR SNP screening that resulted as presumptive positive for B.1.1.7 and P.1.

Modelling – Key messages

- Recent modeling indicates a decrease in the growth rate, especially in Interior, where measures were brought into place.
- Short-term modelling indicates small to moderate increases in vaccination coverage can dramatically lower hospitalization incidence.
- Projected rates of hospitalizations are highly uncertain due to variability in many input parameters and overall trends in cases.
- Compared with no vaccination, modelling indicates that vaccination is providing a large amount of protection for the population both for case growth.
- Please note that model outputs are not predictions of what will happen, they are scenarios of what could happen under certain conditions. We present scenarios that are, in our judgement, appropriate to explore, given the context of public health in BC and the available epidemiological data.

Dynamic compartmental modeling: recent trends

Our model shows that R_t is above 1 in some regions of BC, however with a recent downward trend. Note Rt methodology has been updated, see slide 50 for details



Solid black line: median Rt , modeled using all reported cases up to August 18, 2021; Red band: 5%-95% credible interval; Green band: estimate based on partial data. Purple bars: all reported cases. Due to lag from symptom onset to reporting, most recent case counts and Rt are not shown. Recent trend shown comparing median Rt estimate from (last week → this week). Only January 2021 onward shown here. Data source: BCCDC HA linelist.

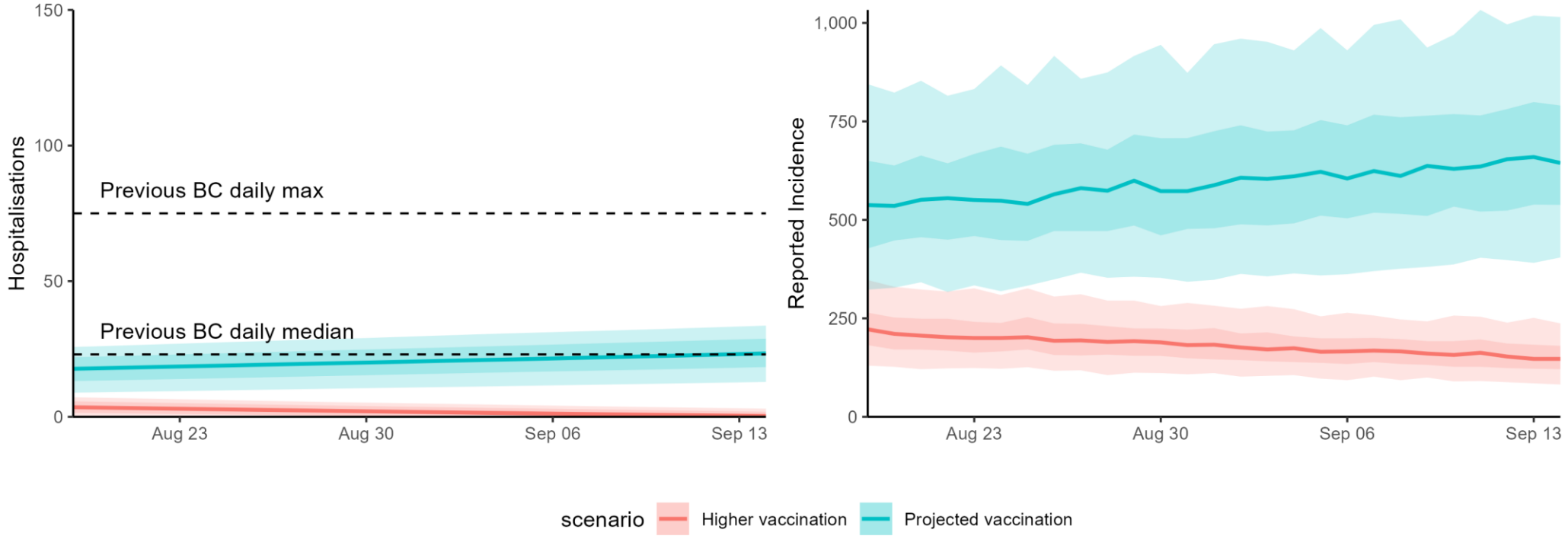
Modeling scenarios - overview

- All scenarios begin on August 18, 2021 with a one-month time horizon. Our output is limited to short-term projections only because uncertainty greatly increases over time, and it is unrealistic to assume no changes to policies or people's behaviour in case of local resurgences.
- Model scenarios are based on plausible range of vaccine effectiveness including reduction in risk of infection, reduction in risk of onward transmission if infected, and reduction in risk of hospitalization.
- It is assumed that all eligible and willing individuals will have completed their two-dose vaccination schedule and sufficient time has passed such that they are fully immunized.
- Reduction in infection due to vaccination is 80%, reduction in onward transmission ranges from 40-45%, and reduction in hospitalization ranges from 95-99%. Additionally, the increased severity of the delta variant ranges from 0-125%. Initial number of infections also varies over a plausible range. Reduction in reporting infection due to vaccination ranges from 80-95%. Vaccination parameters are comparable with other established models [1], [2], [3]
- Projected vaccination coverage scenarios were compared to where coverage in each age group is additionally increased by a level consistent with individual hesitancy derived from the COVID SPEAK survey, and an additional scenario which considers if none of the population were vaccinated.

Scenario	12 - 17	18 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	> 75
Projected vaccination	75%	75%	80%	80%	82%	84%	89%	88%
Higher vaccination	87%	87%	85%	86%	89%	95%	98%	99%

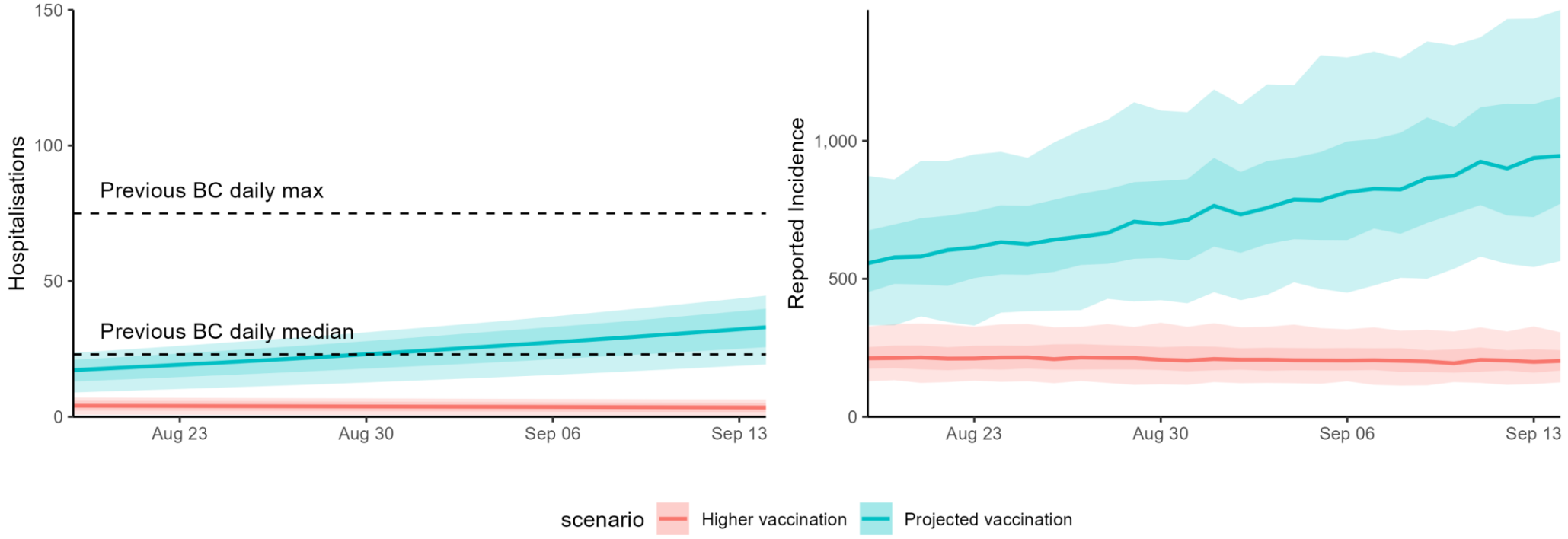
Lower transmission scenario

The following plot summarizes the lower transmission scenario where levels of transmission are equivalent to an initial $R_t = 1.1$ in the projected vaccination scenario and $R_t = 0.85$ in the potential vaccination scenario. Shading indicates uncertainty due to effectiveness of vaccination with 90% confidence interval and 50% confidence interval shown.



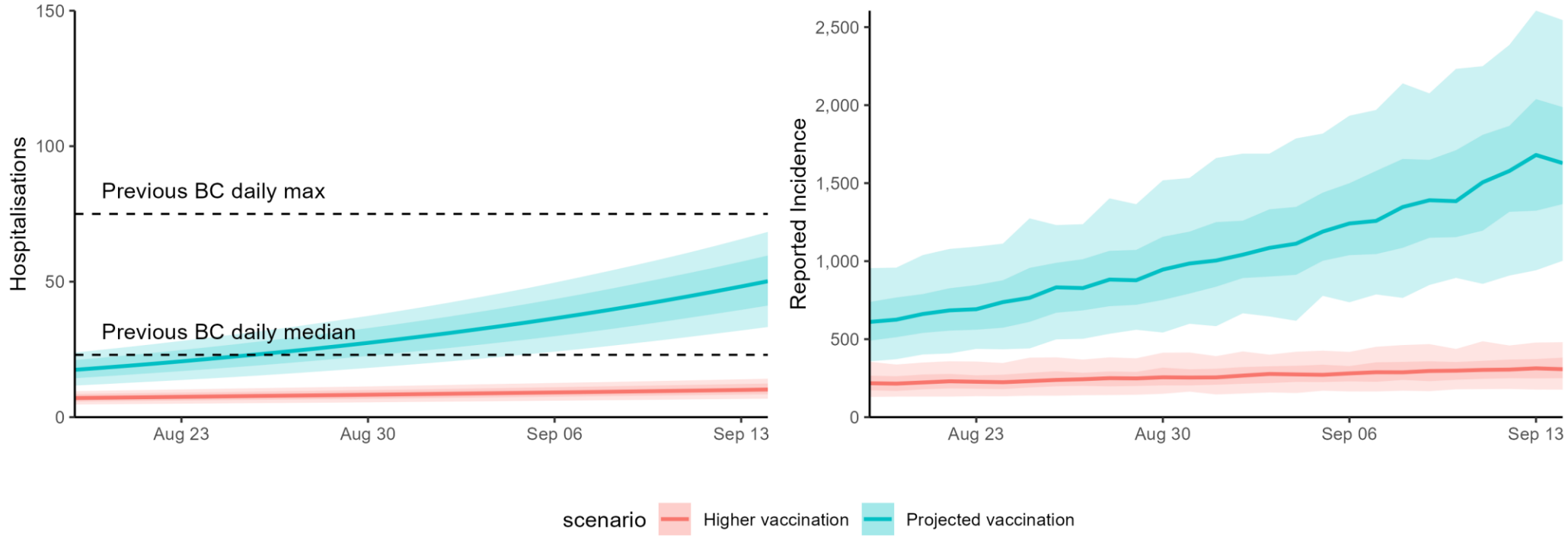
Moderate transmission scenario

The following plot summarizes the moderate transmission scenario where levels of contact that result in transmission are equivalent to an initial $R_t = 1.25$ in the projected vaccination scenario and $R_t = 0.97$ in the potential vaccination scenario. Shading indicates uncertainty due to effectiveness of vaccination with 90% confidence interval and 50% confidence interval shown.



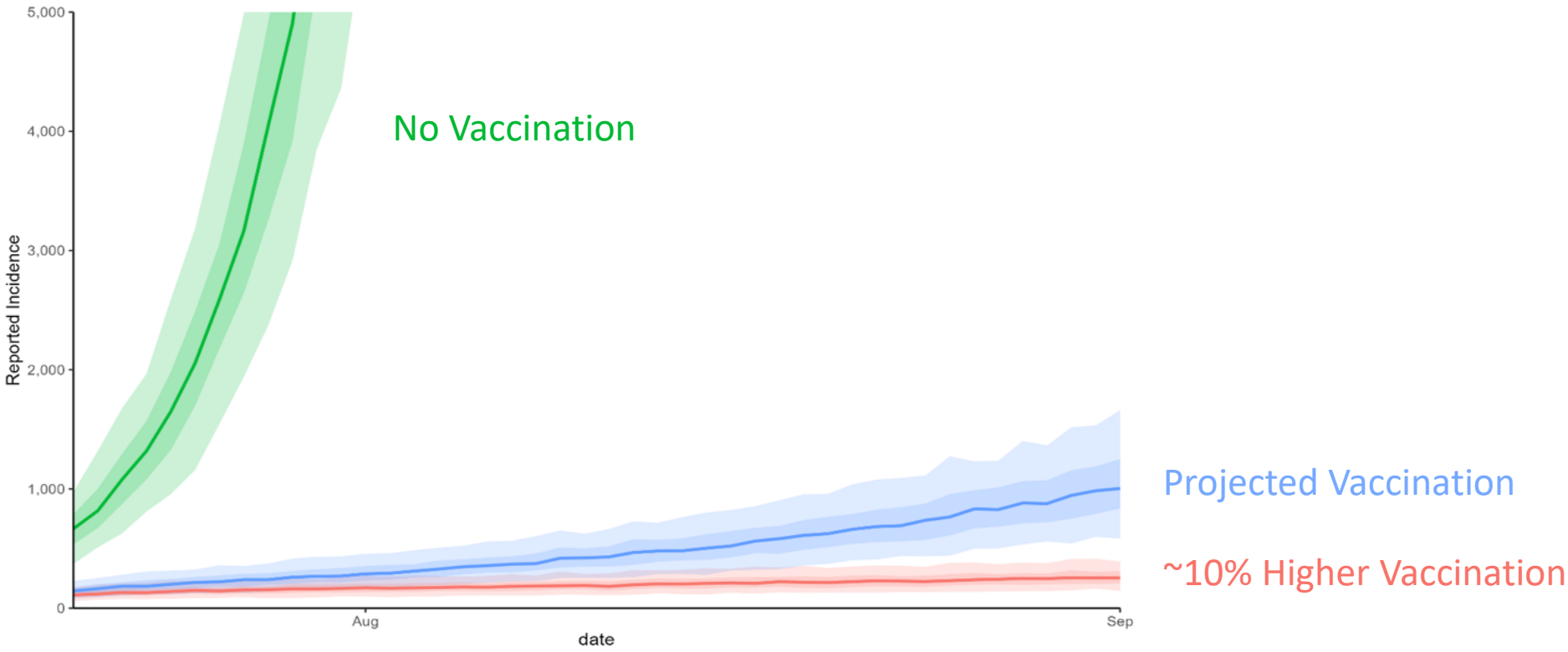
Higher transmission scenario

The following plot summarizes the higher transmission scenario where levels of contact that result in transmission are equivalent to an initial $R_t = 1.5$ in the projected vaccination scenario and $R_t = 1.17$ in the potential vaccination scenario. Shading indicates uncertainty due to effectiveness of vaccination with 90% confidence interval and 50% confidence interval shown. Note these scenarios do not include further public health measures that may be implemented given rate of increase in cases.



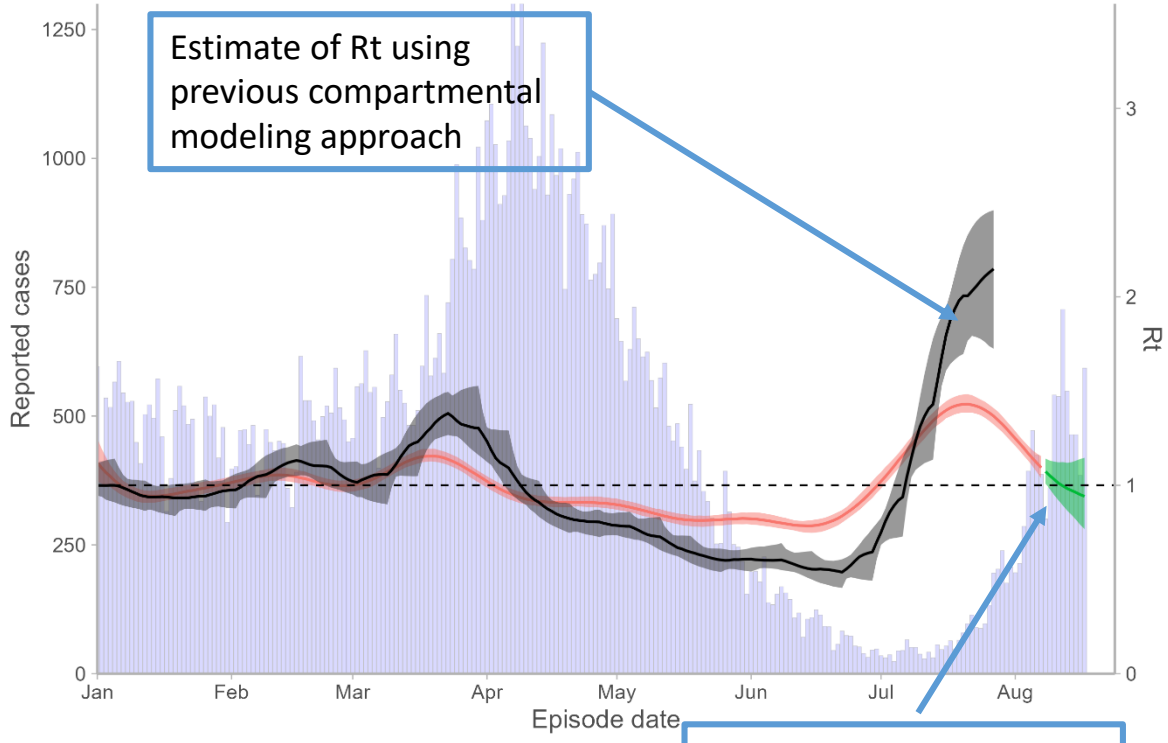
High transmission scenario - comparison to no vaccine

The following plot summarizes total doses given in the high transmission scenario where levels of contact that result in transmission are equivalent to an initial $R_t = 1.5$ in the projected vaccination scenario, $R_t = 1.16$ in the higher vaccination scenario, and $R_t = 2.91$ in the scenario with no vaccination. Shading indicates uncertainty due to effectiveness of vaccination with 90% confidence interval and 50% confidence interval shown. Note these scenarios do not include further public health measures that may be implemented given rate of increase in cases.



Updates to Rt estimation methodology

- All Rt methods are model-based meaning they have necessary underlying assumptions around the distribution of infectiousness, delays in reporting, under-reporting and other factors. In addition many separate definitions of Rt exist. These methods typically show agreement on when Rt is above or below one, but can have differences in their absolute values estimated for a given time period.
- As more data are collected Rt estimates at previous points in time are updated and refined. This is because future trends in cases help to confirm the case growth or decline and its extent.
- Original method for estimating Rt was based on a compartmental modelling framework. This framework was originally designed to capture changes in patterns of infectious contact pre-variants and vaccination. It was found this method was overly sensitive to periods of growth and decline in cases compared with other methods (see figure).
- A review of Rt estimation methodology was conducted including appraising external estimates for BC. The Cori et al method was selected given: 1) it provides a more flexible approach where weekly patterns of case reporting can be accounted for; 2) it provides more up to date estimates of Rt based on partial data and 3) it is more in line with other methods for the estimation of instantaneous Rt (See Hellewell, 2020). For more details on the comparison of Rt methods see Gostic, 2020



Model notes and assumptions

- **R_t modelling**: Note due to ongoing changes requiring a more flexible methodological approach the Rt estimation procedure has been updated from previous estimates. A renewal equation model with a non-stationary Gaussian process based on Cori et al was fit to COVID-19 data for BC using a Bayesian framework (Abbott et al, 2020). Results are presented as provincial and regional time-varying estimates of average daily transmission rate (R_t).
  - The model does not consider importation of cases, hence all transmission is assumed to arise from local cases
  - The model does not distinguish cases arising from different variants of concern; model estimates represent average rates of transmission. Not that almost all cases in BC are now Delta variant.
  - This is a model-based estimate using daily case counts -- these estimates assume a fixed distribution in the delay of reporting and that under-ascertainment of cases remains consistent for each region

- **Scenario modelling:** Model was constructed using an extended SEIR framework with additional structure for vaccination and the potential effects of waning immunity. Age-adjusted rates for vaccination and hospitalisations were incorporated into the model structure.
  - The vaccinated group was modeled using a "leaky"-vaccine framework (Bubar et al, 2020), where vaccinated individuals become infected at a reduced rate and subsequently transmit at a reduced rate compared to the unvaccinated population.
  - Although seasonality was not explicitly modelled, the differences in pre-pandemic transmission provide a range of scenarios indicative of the potential for seasonal effects.
  - Model parameters were derived from provincial data or literature-based estimates. As understanding of these parameters evolves this will change the likelihood of each of the scenarios presented here.

Additional Resources

- BCCDC COVID-19 Regional Surveillance Dashboard showing maps, vertical plots, and trends by LHA can be found here
- More BC COVID-19 data, including the latest Situation Report, maps, and BC COVID-19 public dashboard, can be found here
- For more information on variants of concern and whole genome sequencing, the latest report is posted here
- To put BC provincial, Health Authority, and HSDA trajectories into national and international context, see BCCDC COVID-19 Epidemiology app
- COVID SPEAK 2020 Round 1 Survey results
- Slides for previous public and modelling briefings by Dr. Bonnie Henry can be found here
- PHAC's COVID-19 Epidemiology update can be found here