

COVID Model Projections

October 27, 2021

[BC COVID-19 Modelling Group](#)

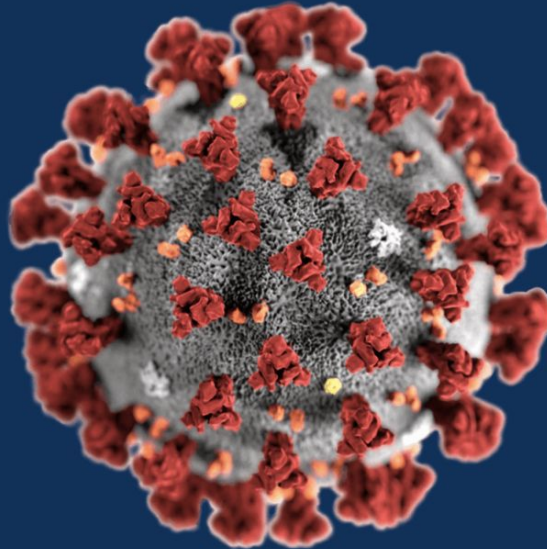
[@bcCOVID19group](#)



About BC COVID-19 Modelling Group

The BC COVID-19 Modelling Group works on rapid response modelling of the COVID-19 pandemic, with a special focus on British Columbia and Canada.

The interdisciplinary group, working independently from Government, includes experts in epidemiology, mathematics, and data analysis from UBC, SFU, UVic, and the private sector, with support from the Pacific Institute for the Mathematical Sciences.



<https://bccovid-19group.ca>

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*Independent and freely offered advice,
using a diversity of modelling approaches.*

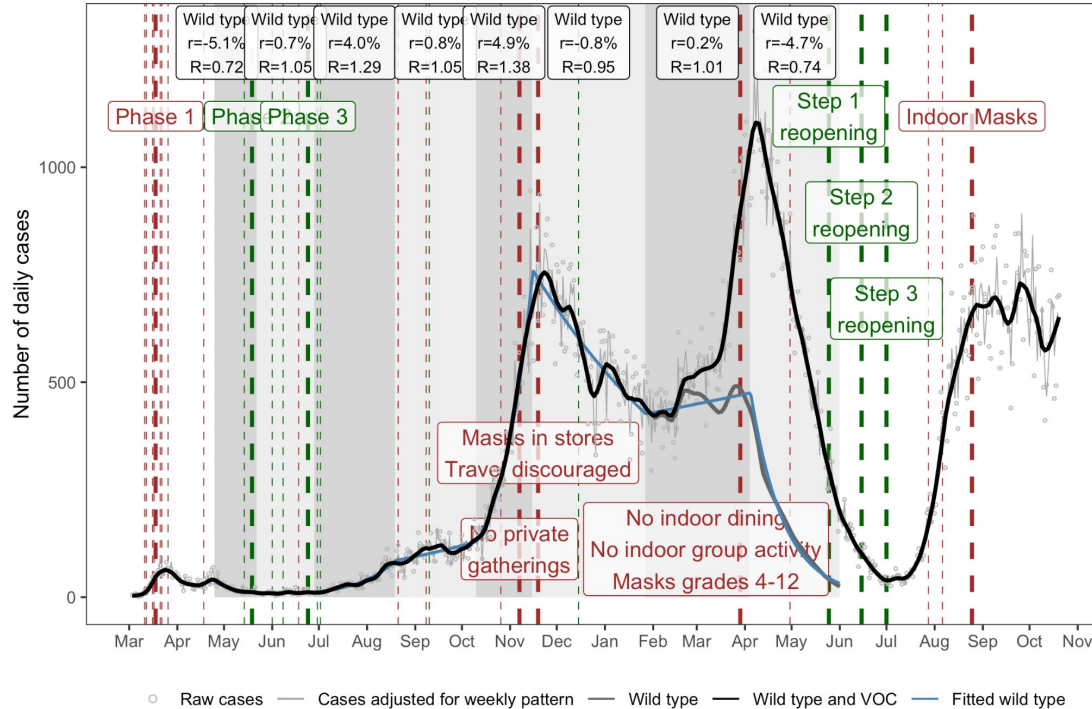
Overview

- State of the pandemic in BC
 - Case rates are slowly declining, currently at around 600 cases per day.
- Cases among children
 - Dramatic rise in case rate among <12 year olds has reversed.
 - Incidence remains slightly higher among <12 year olds across the province.
- Hospitalizations and ICU
- Vaccination and its impact
- Vaccine uptake
- Situation has improved in Alberta and Saskatchewan
- Most European nations are experiencing a fall resurgence.

State of the COVID-19 Pandemic in BC

Covid-19 daily new cases in British Columbia (up to Wed Oct 20)

Timeline of **closure** and **reopening** events

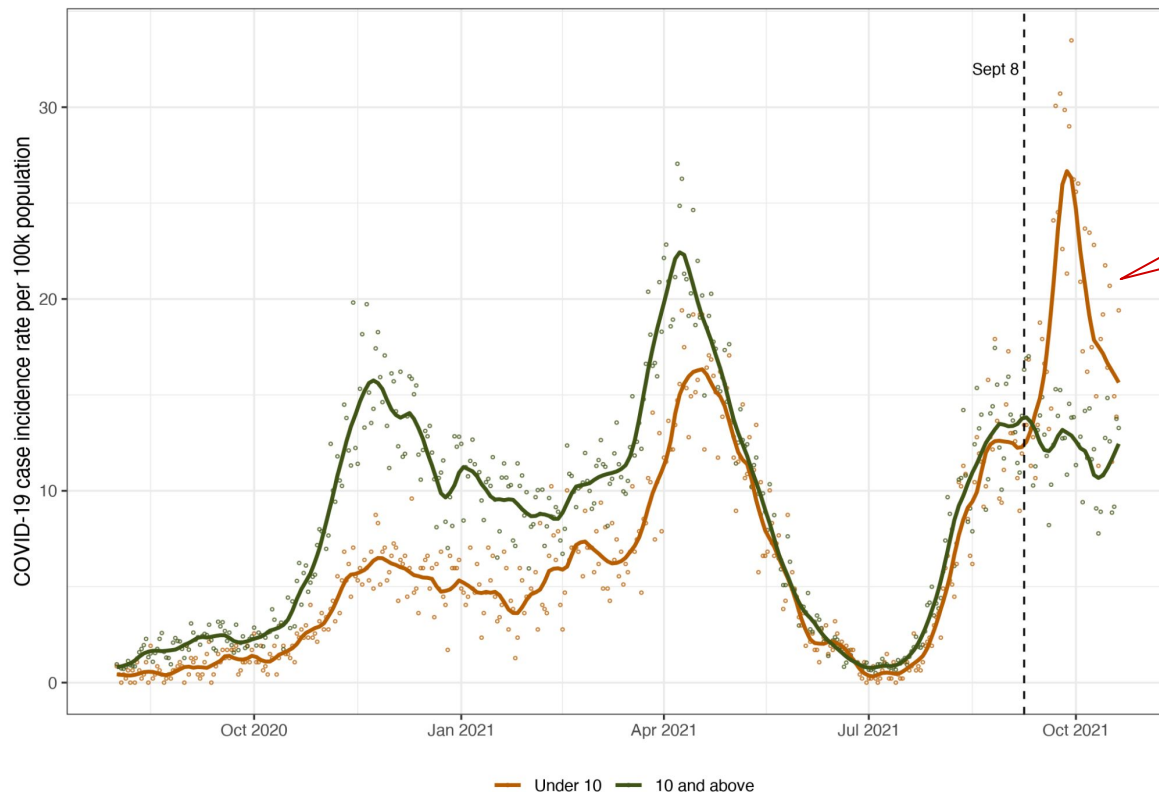


MountainMath, Data: BCCDC

Source (J. von Bergmann) Case data from BC COVID-19 Database (<http://www.bccdc.ca/health-info/diseases-conditions/covid-19/data>). Vertical lines give dates of public health measures (major as thick lines, minor as thin lines). Grey dots are raw case counts, grey lines is cases abused for weekly pattern, black STL trend line and blue fitted periods of constant exponential growth. *Central Okanagan – July 29: masks, August 6: restrictions on group gatherings; [Interior](#) – August 21: masks; August 23: some restrictions on group gatherings. BC – August 25 mask mandate; BC's Vaccine Card to come into effect on September 13 (first dose) and October 24 (second dose)

State of the COVID-19 Pandemic in BC

BC Covid cases in BC (up to Oct 20, 2021)



MountainMath, Data: BCCDC

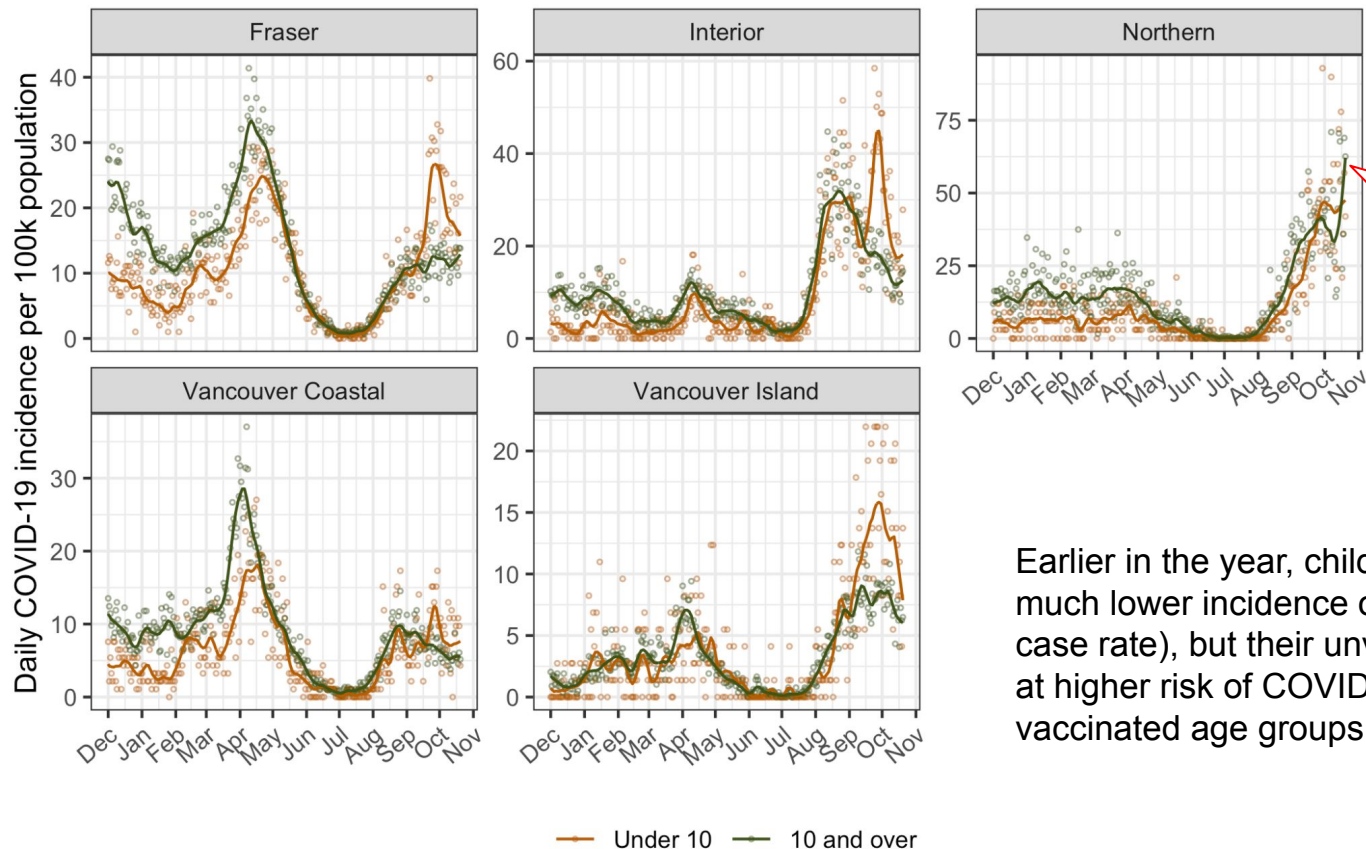
Rapid rise in <10 cases has largely reversed.

The rapid rise and fall in cases in this age group suggest more contacts at the end of summer & beginning of the school year, stabilizing afterwards.

Testing also increased, but whether increased testing was a cause or consequence of higher case rates is unclear.

State of the COVID-19 Pandemic in BC

BC COVID-19 cases (up to Oct 20, 2021)

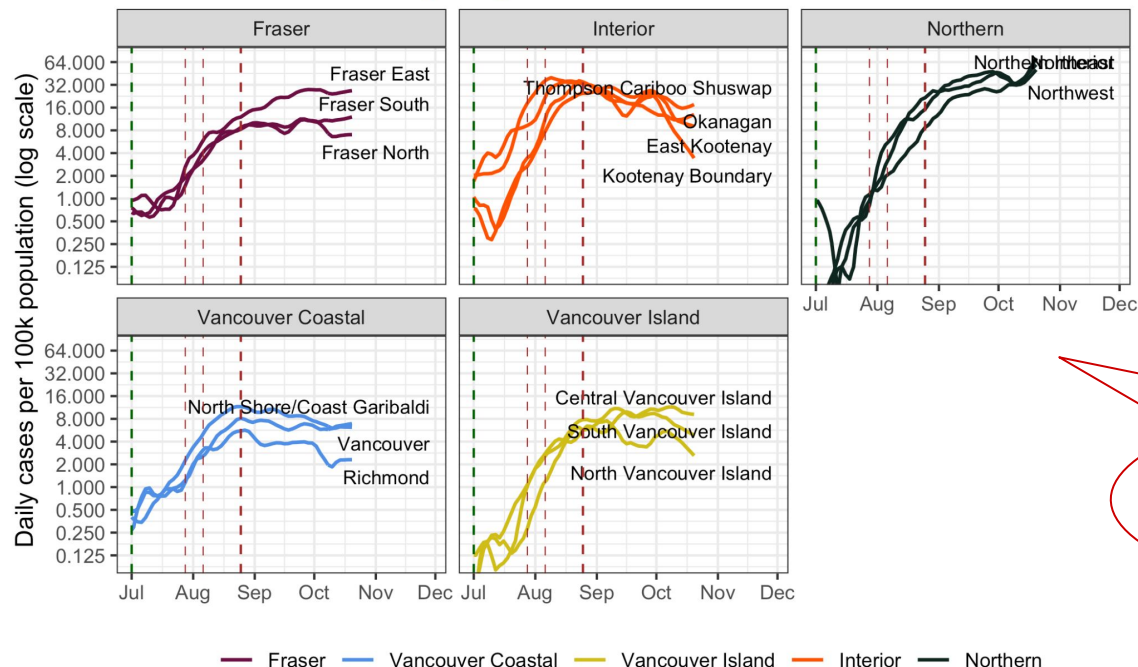


Earlier in the year, children under 10 tended to have a much lower incidence of COVID-19 (roughly half the case rate), but their unvaccinated status is placing them at higher risk of COVID-19 relative to older and more vaccinated age groups.

State of the COVID-19 Pandemic in BC

Covid-19 daily new cases trend lines in British Columbia (up to Wed Oct 20)

Timeline of **closure** and **reopening** events

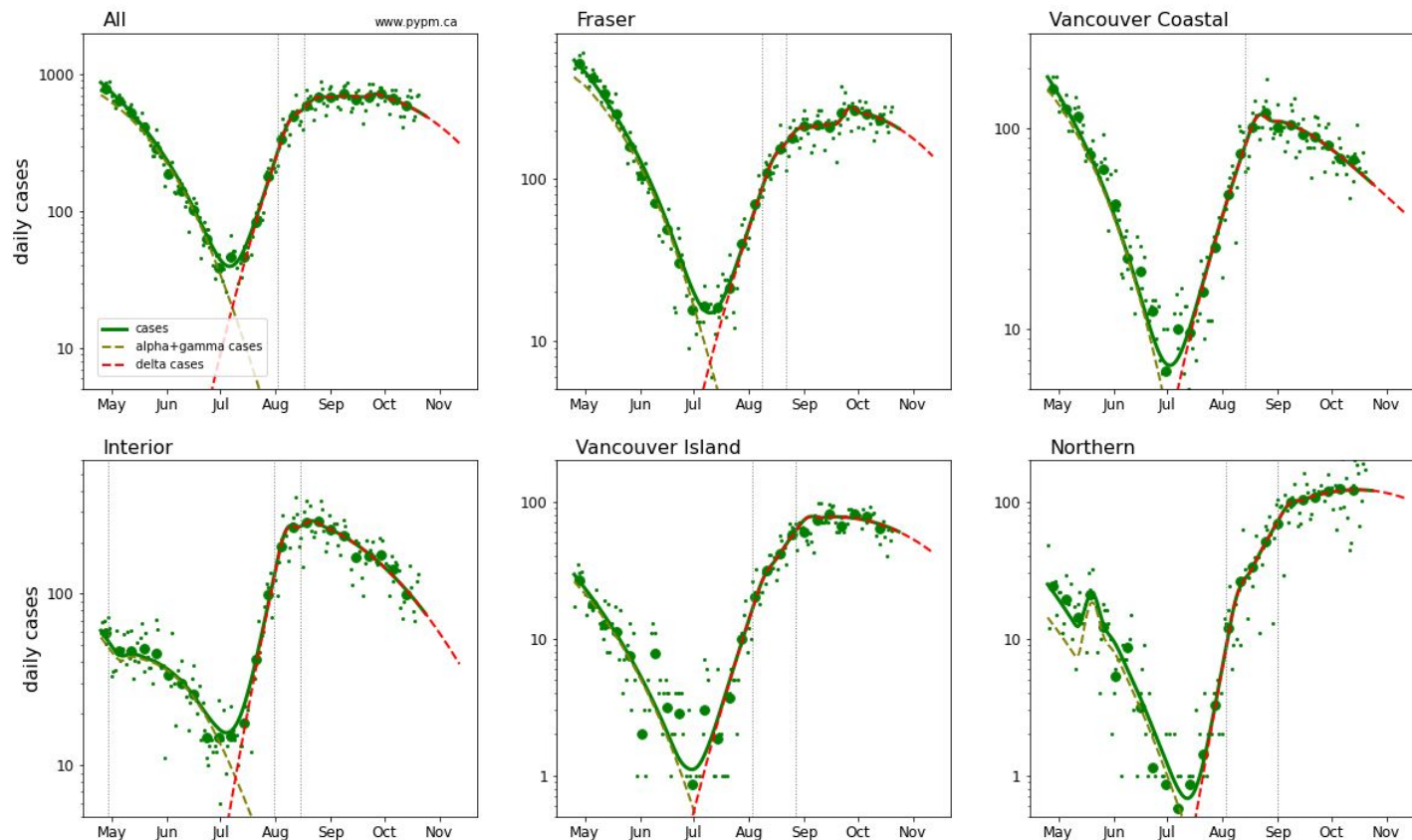


Health Service Delivery Areas (HSDA) follow similar trends within a Health Authority, with the highest per-capita case rates in Northern Health.

MountainMath, Data: BCCDC, BC Stats

Source (J. von Bergmann) Case data from BC COVID-19 Database (<http://www.bccdc.ca/health-info/diseases-conditions/covid-19/data>). Vertical lines give dates of public health measures (major as thick lines, minor as thin lines). STL trend lines on log scale.

Model fits to BC data



The measures taken in August and the public's response significantly reduced transmission.

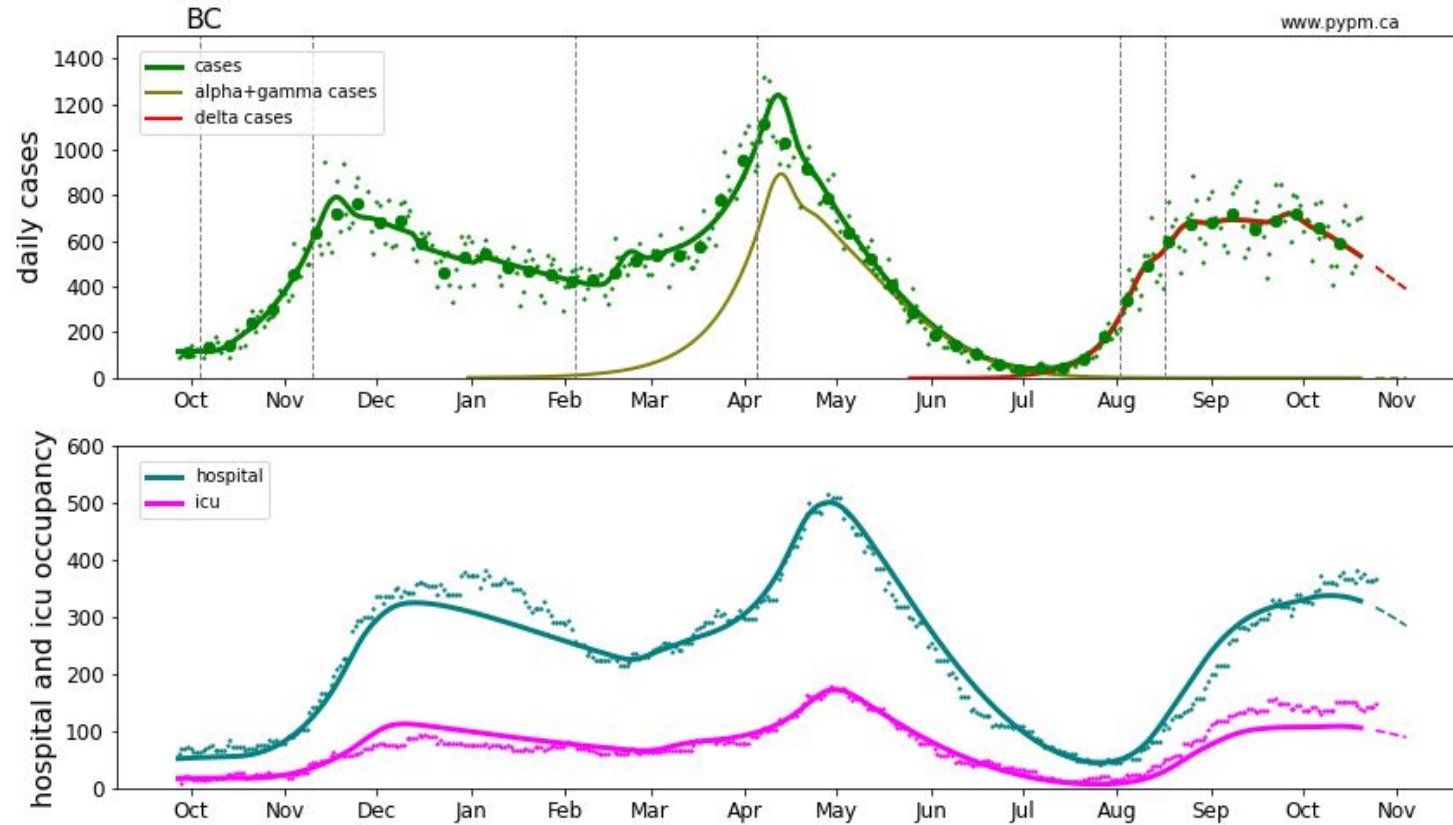
Cases in BC overall are currently declining at a rate of 2% per day.

Strongest declines are in Interior, Fraser, and Vancouver Coastal.

Fraser HA model indicates a burst of infections in early September.

Source (D. Karlen). See www.pyppm.ca. These models have no age structure. Fits include past vaccination schedule. Seasonal effects, such as the increased transmission in Fall 2020, or the appearance of new variants may increase growth, additional vaccinations beyond current rates of vaccination would bring growth rates down. Vertical lines show fitted dates for transmission rate changes. The larger dots show weekly averages.

Estimating demands on health care



The COVID-19 pandemic is tracked using positive tests (cases), yielding an infection model (green curve).

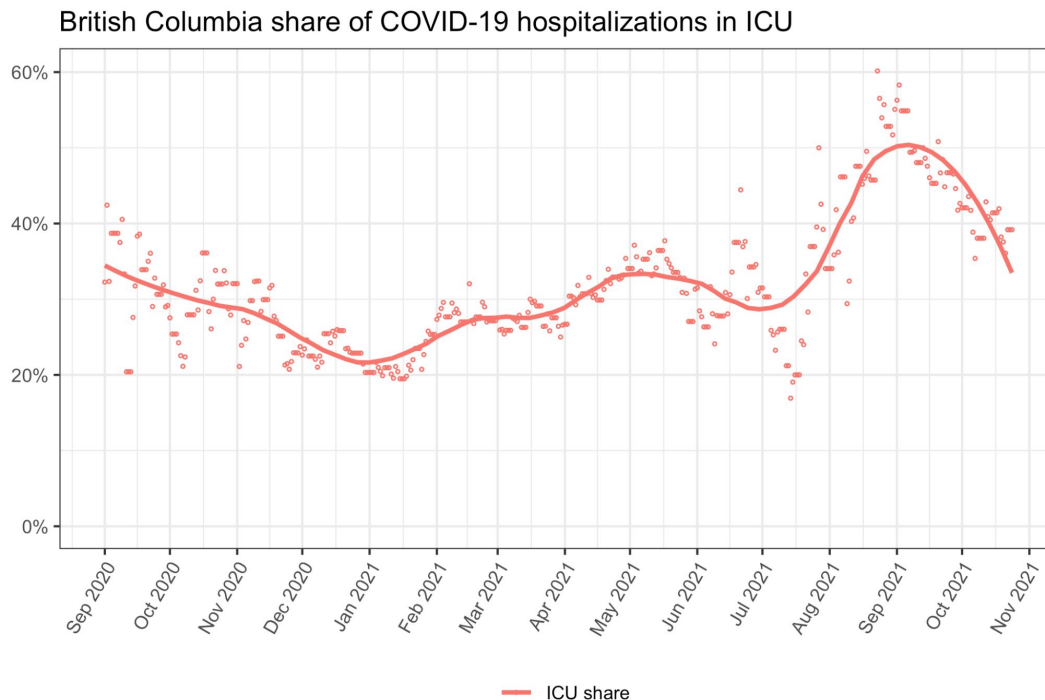
The infection model well describes past hospital occupancy.

Recent hospital and ICU occupancies exceed projections calibrated by data from the third wave.

Hospital and ICU occupancy over time

Of those patients in hospital, the recent increase of the fraction in ICU has stabilized and reverted.

Although many factors may contribute, the Delta variant that now predominates (98% of BC cases) has been found to be more severe in other jurisdictions*.



Data: BCCDC for cases, Canada Covid-19 tracker for hospital and ICU census

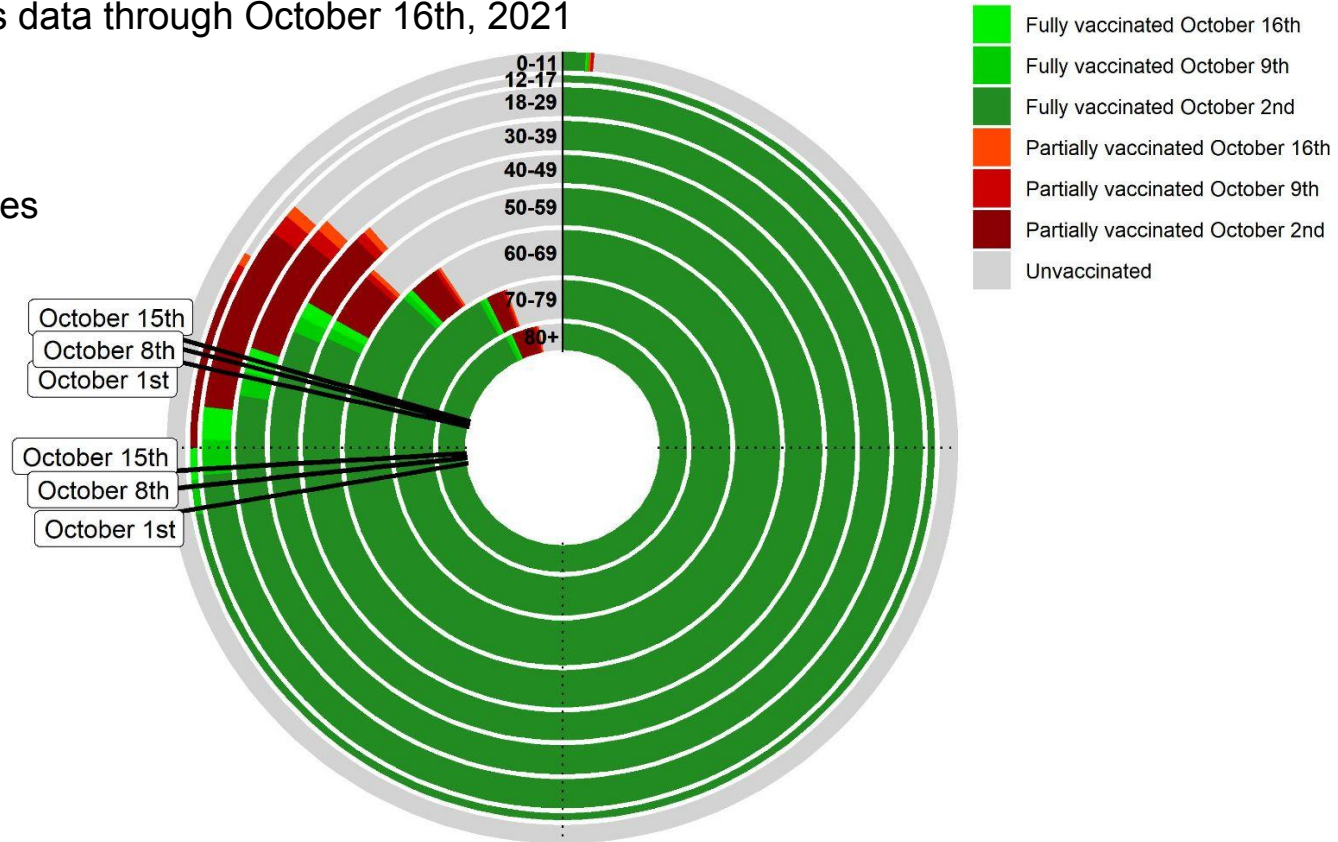
Source (J. von Bergmann) Case data from BC COVID-19 Database (<http://www.bccdc.ca/health-info/diseases-conditions/covid-19/data>). STL trend lines on linear scale. *[Singapore study](#) found that Delta was 4.9 times more likely to lead to an oxygen requirement, ICU admission, or death among unvaccinated hospitalized patients; see overview of Delta severity in [CBC article](#).

Closing the circle: Vaccination status by age

October 22nd update includes data through October 16th, 2021

Slowing progress:

The fraction of BC's entire population with one or two doses is rising, but slowly (0.3% and 0.7% increase over the past week, respectively).

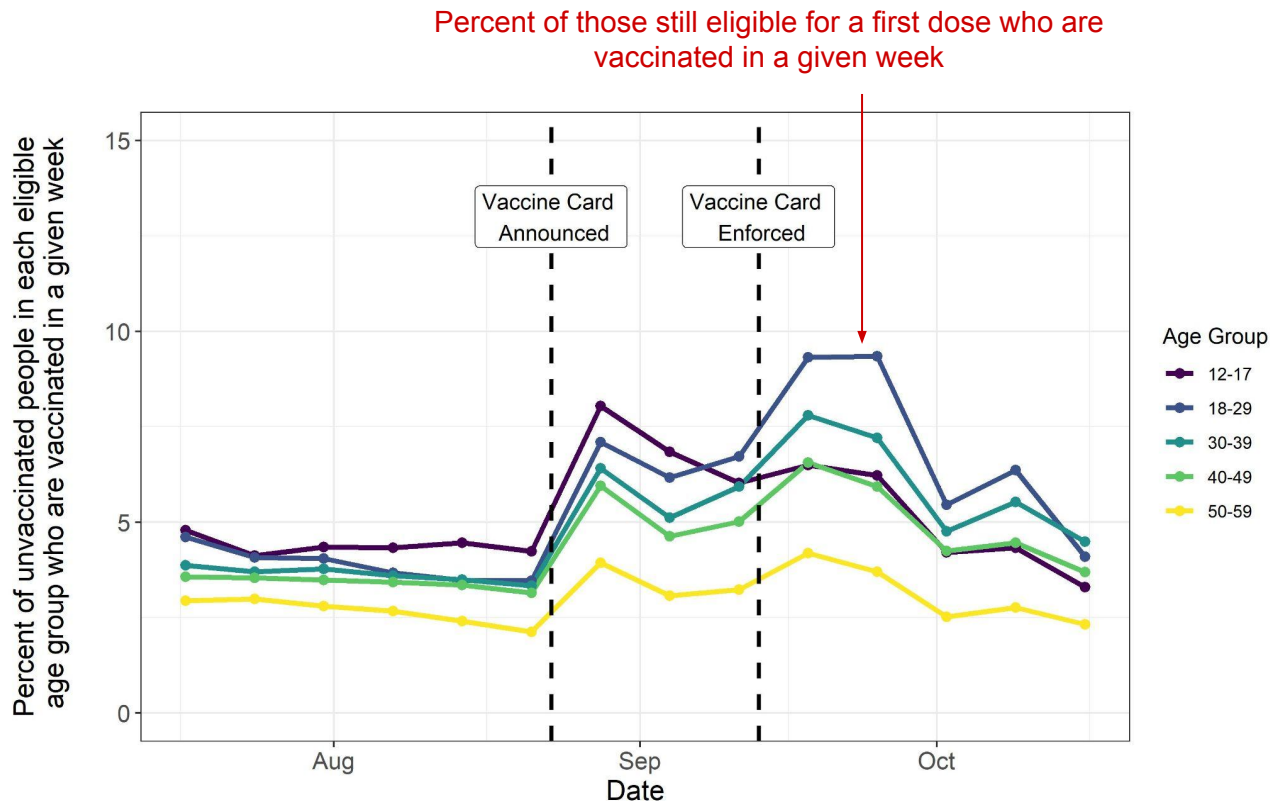


Slow movement on vaccinations in BC

Slowing progress:

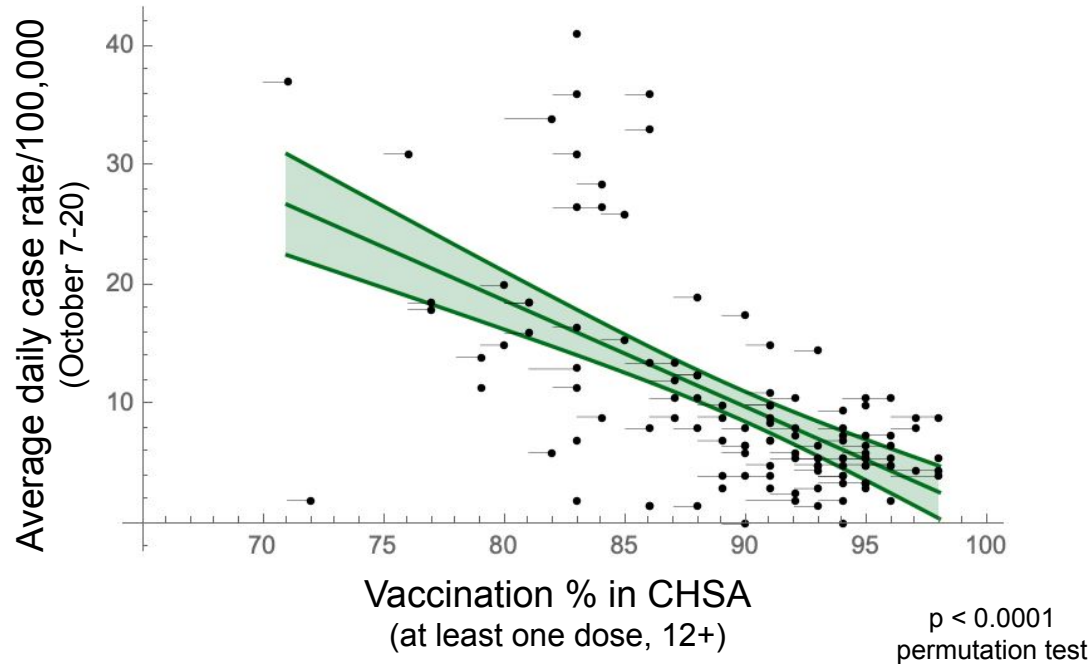
Both the announcement and the enforcement of BC's vaccine card boosted the rate of vaccinations among the unvaccinated.

At current numbers of first dose vaccinations per week, it would take **~5 weeks** to vaccinate 90% of the 18-29 age group and **~9 weeks** for the 50-59 age group.



A pandemic of the unvaccinated: Communities at risk

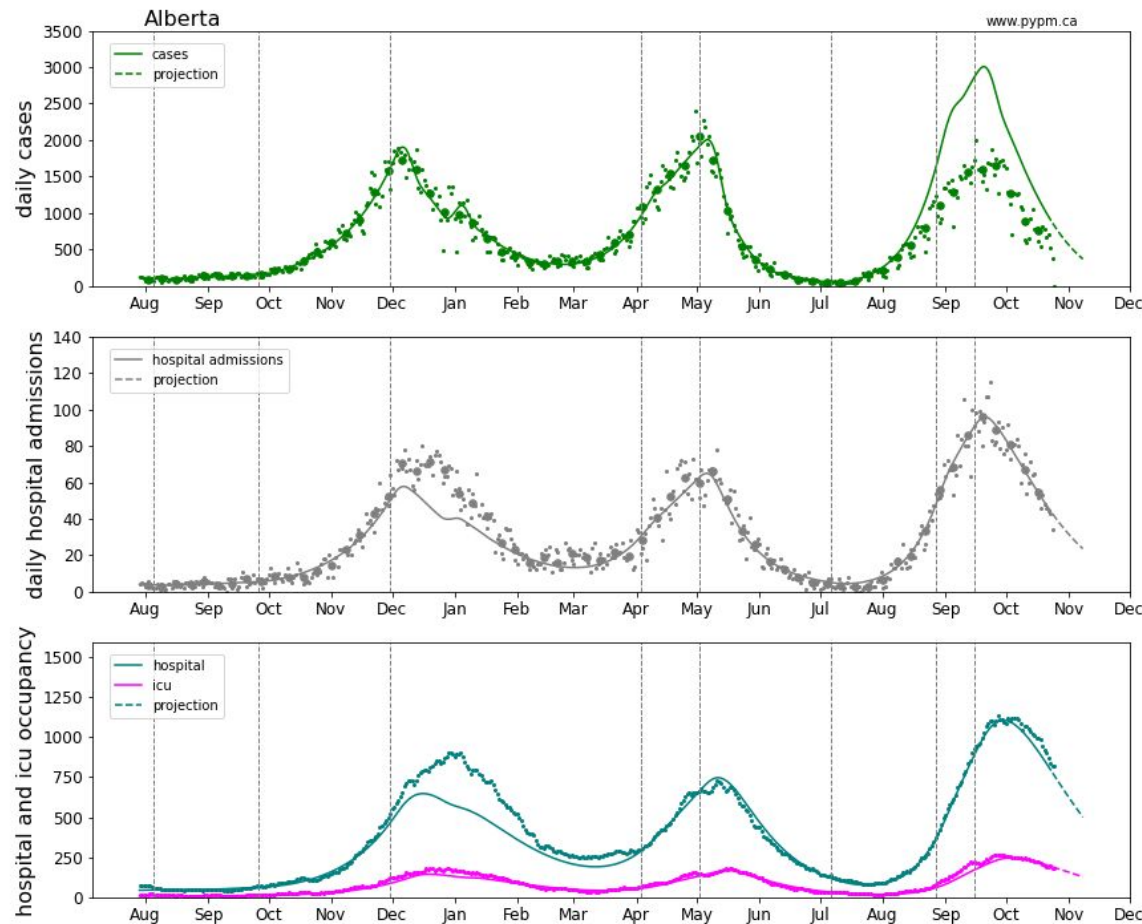
We continue to see a major effect of vaccination levels across Community Health Service Areas (CHSA). For the most recent two-weeks of cases, communities with 95% of eligible people vaccinated have **4.3 times** fewer COVID-19 cases than those with 75% vaccination.



Thin lines show vaccination progress over the past two weeks.

Vaccinations protect communities, as well as protecting individuals.

Alberta update



Fits hospital admission data (grey) rather than case data.

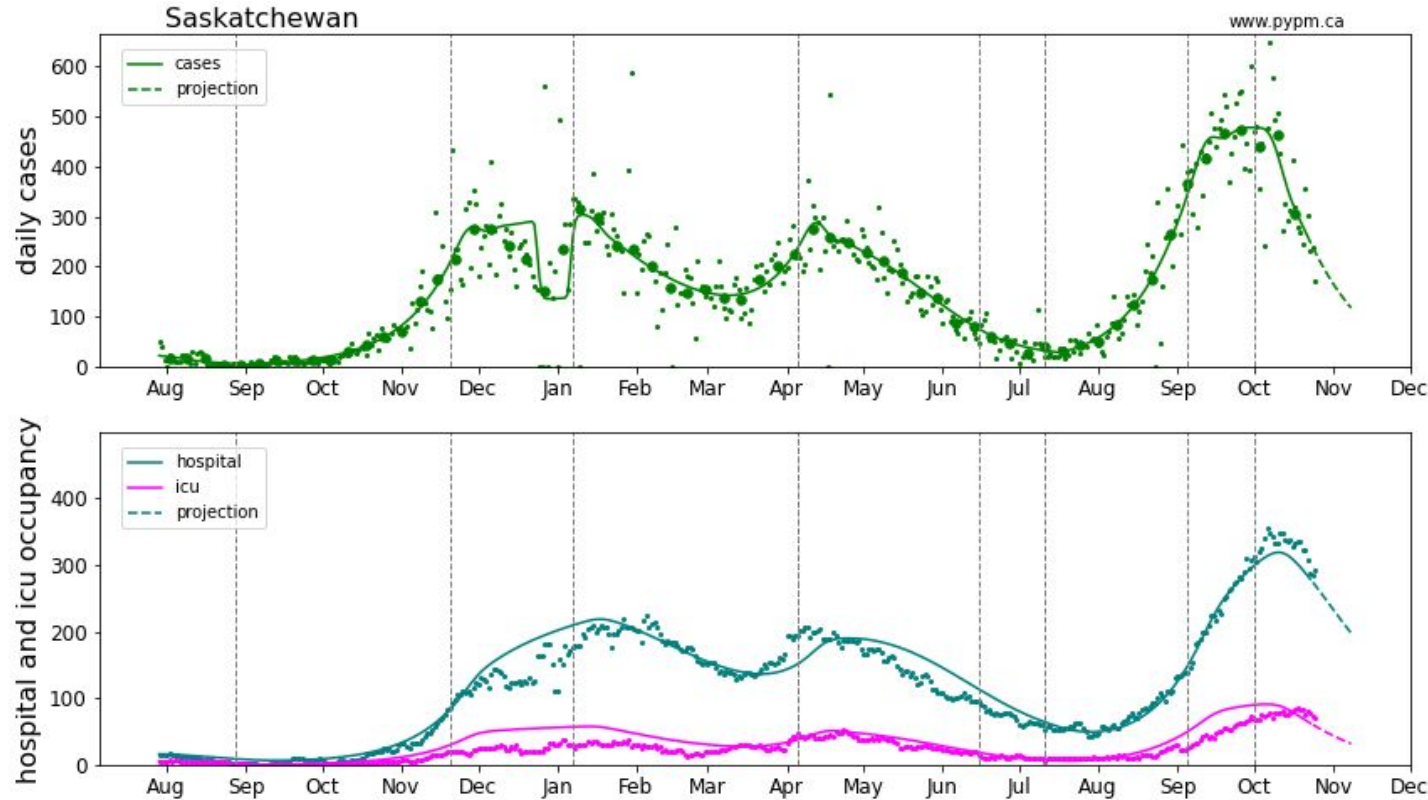
The previous report showed that case rates could no longer be relied upon to track infection rates, likely due to changes in testing practice. Hospital admission data indicated a significant reversal in growth, coinciding with measures announced on September 15.

Data from past 3 weeks confirms the turnaround.

Analysis indicates that many more infections have gone undetected since August.

Source (D. Karlen): COVID-19 Alberta Statistics,
www.pympm.ca

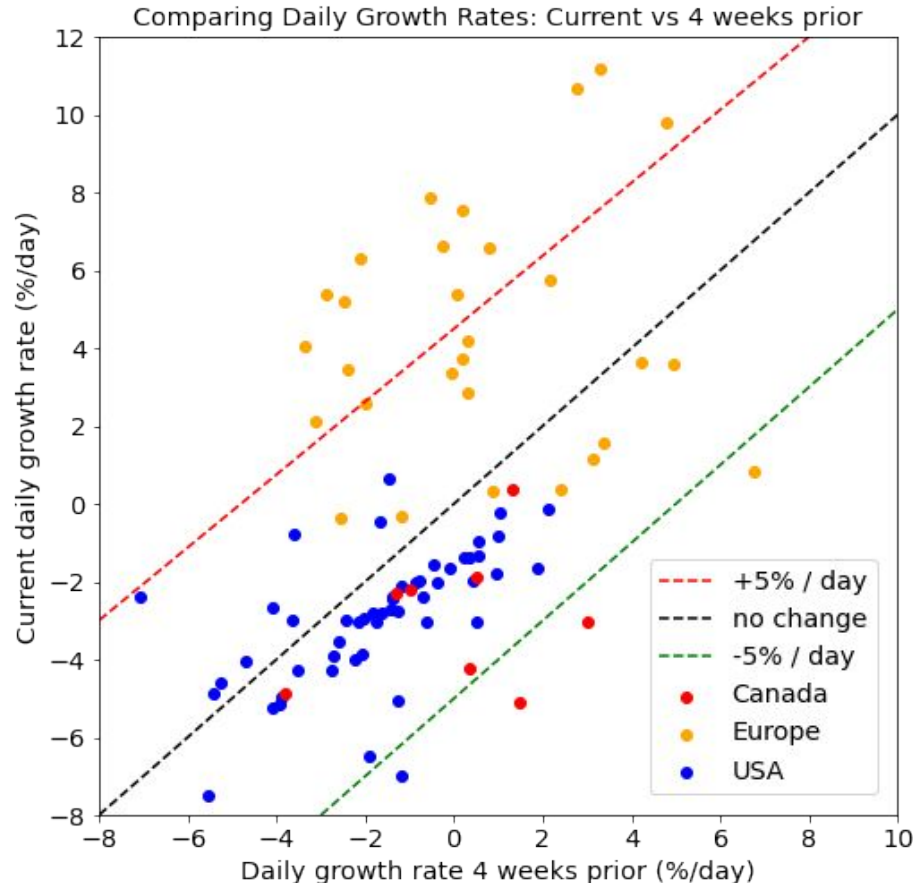
Saskatchewan update



The rapid growth in infections in August has been reversed.

Hospital occupancy is declining, as projected from the case history.

Recent trends in Canada, USA, and Europe



Over the past 4 weeks, growth rates have reduced in all Provinces and most US states.

- The daily growth rates are now typically about 2%/day less than they were a month ago, consistent with the effect of increasing immunity of the populations.

In the past few weeks, most European countries have seen dramatic increases in growth rates.

- Cases now growing 5%/day (or more) faster than they were a month ago.
- This could be due in part to seasonal changes in behaviour.
- Serves as a warning that the situation in BC could take a turn for the worse.

Source (D. Karlen): www.pybm.ca

Key messages

State of the pandemic:

- The COVID-19 pandemic is largely stable in BC, with a slow predicted decline rate of 2% per day
- Measures in effect are preventing cases from growing but at a high daily case rate, with an average of 628 daily cases in October (averaging 500-700 daily cases in October)
- 6 at a high in at a high case stabilized
- Whistabilized through September due to masking, other public health measures and vaccination.
- Cases in children rose steeply in Fraser Health, Interior Health and Vancouver Island.
- ICU demand remains near peak levels, but hospital and ICU occupancy have begun to stabilize.
- A new analysis reveals that the number of tests performed is a multiple of the number of cases plus a constant background number. The multiplicative factor differs by Health Authority.
- Recent testing rates in ages 0-4 are higher than expected given the number of cases.

Vaccination:

- Vaccine uptake continues but at a low rate.
- Areas with high vaccination levels have lower case numbers.
- Children account for nearly 50% of the unvaccinated and are seeing rising case numbers in some health authorities in BC. Changes in transmission in children affect the cases' growth rate more than changes in other groups, because children are less vaccinated and have high contacts.
- Vaccinating children 5-11 is likely to bring benefits to children if the Pfizer vaccine is approved.
- This would have both direct benefits to children, and indirect benefits to adults.