

# Update on COVID-19 Projections

Science Advisory and Modelling Consensus Tables

February 1, 2022

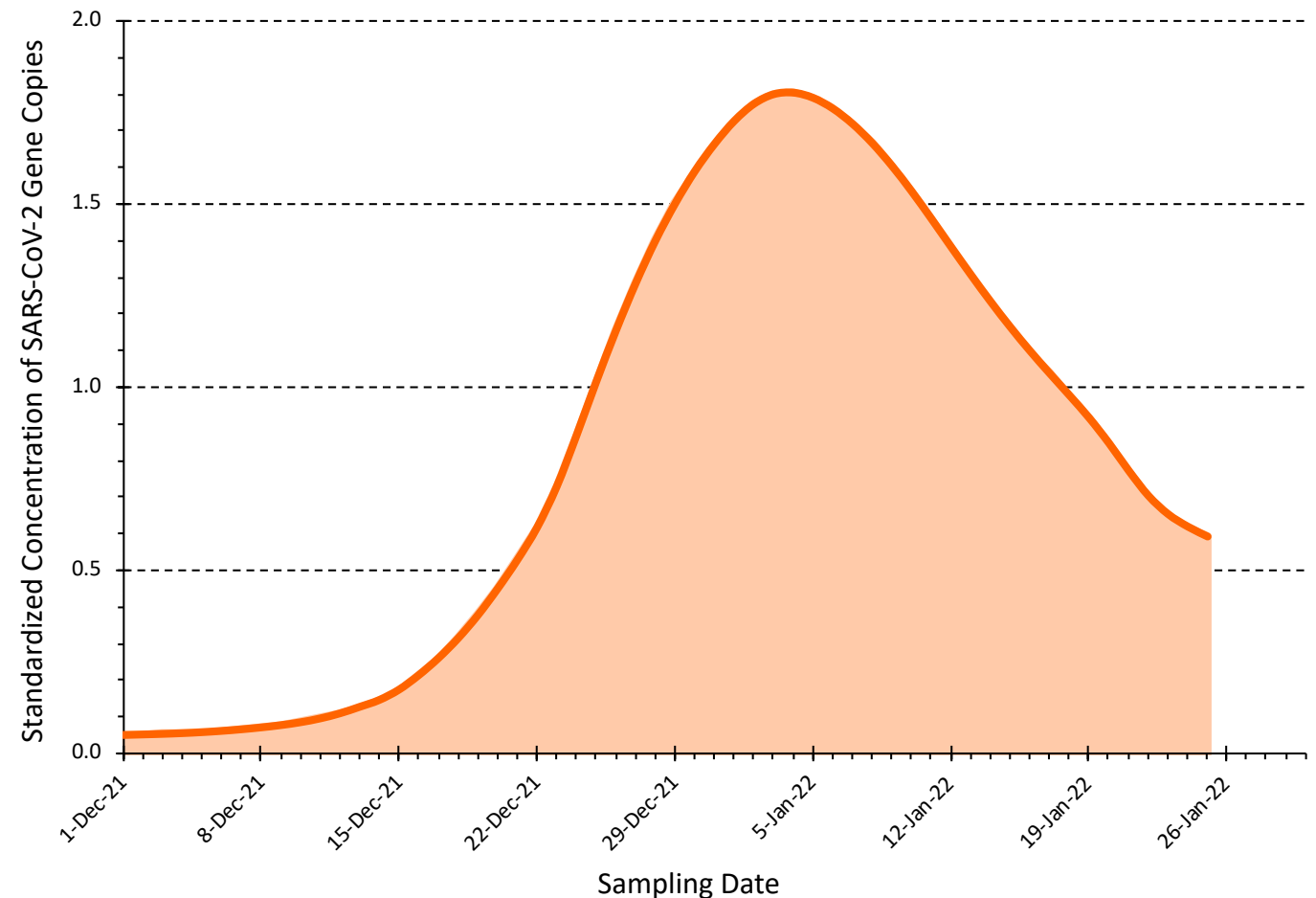


## Key findings

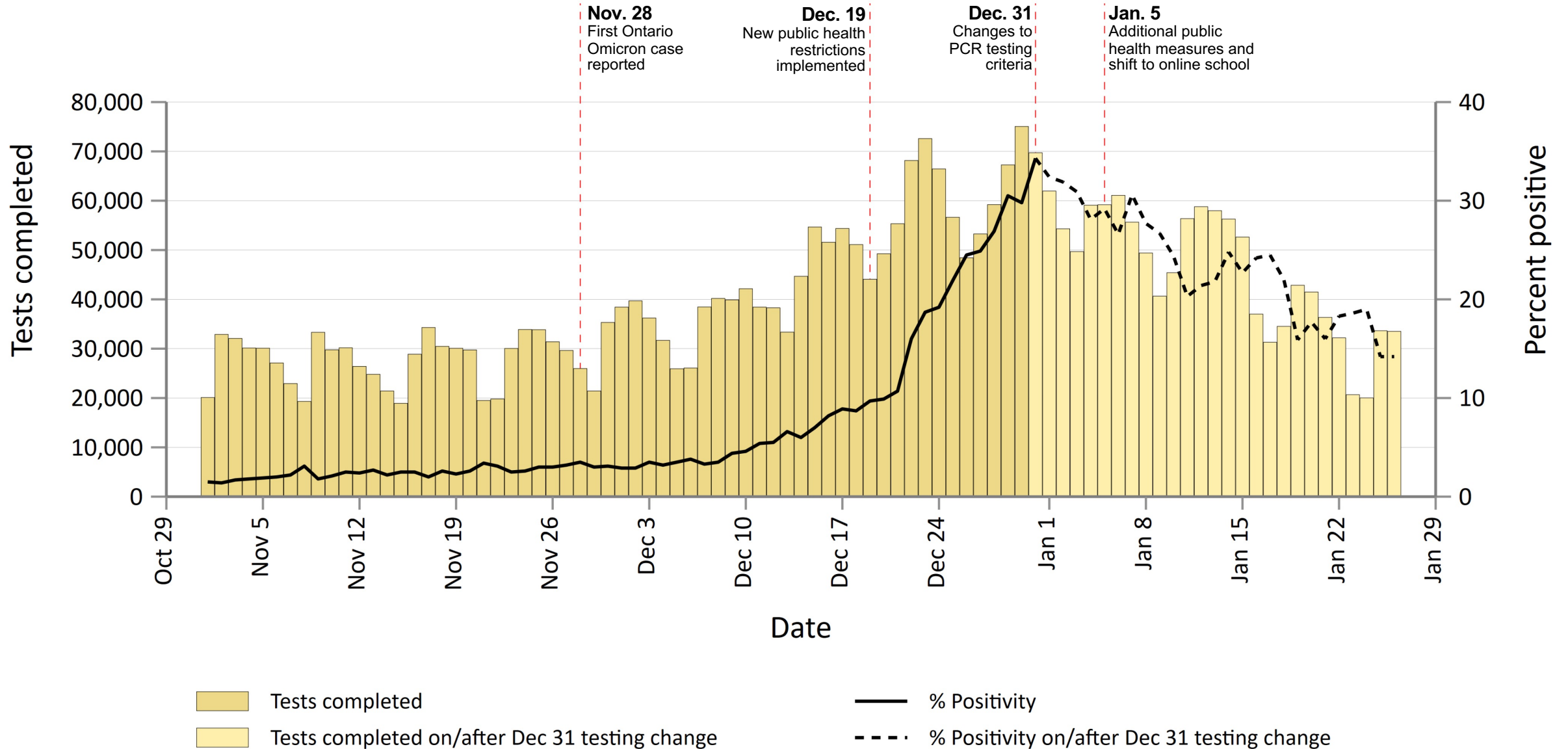
- It is challenging to model the spread of COVID-19 because of changes in testing, but other indicators suggest this phase of the Omicron wave has plateaued or is in decline.
- Public health measures helped control this phase. Relaxation of these measures will increase the spread of COVID-19. The size of any resurgence is difficult to predict and will depend on vaccination, the spread of Omicron, and changes in behaviour (e.g., mobility, masking).
- Surveillance will be important to detect changes in the trajectory of the pandemic.
- Hospitals are now caring for the highest number of people with COVID-19. Admissions are at highest levels across all age groups. ICU occupancy continues to be high. Staffing in hospitals remains critical.
- Ontario data shows that vaccination (including third doses) provides strong protection against serious illness. Increasing vaccine uptake across all groups will reduce the impact of the pandemic.

# Ontario's COVID-19 wastewater signal peaked around Jan 4, 2022, which would correspond to a peak in cases around Jan 11, 2022.

- Ontario's COVID-19 wastewater signal is a population-weighted mean of concentrations of SARS-CoV-2 gene copies across 99 wastewater treatment plants, pumping stations and sewersheds in all 34 public health units.
- Taking into account the time lag until diagnosis and reporting, the peak of Ontario's wastewater signal around Jan 4, 2022 would correspond to a peak in cases around Jan 11, 2022.
- Plausible range of SARS-CoV-2 infections that have occurred since Dec 1, 2021 based on wastewater signal: 1.5 to 4 million infections



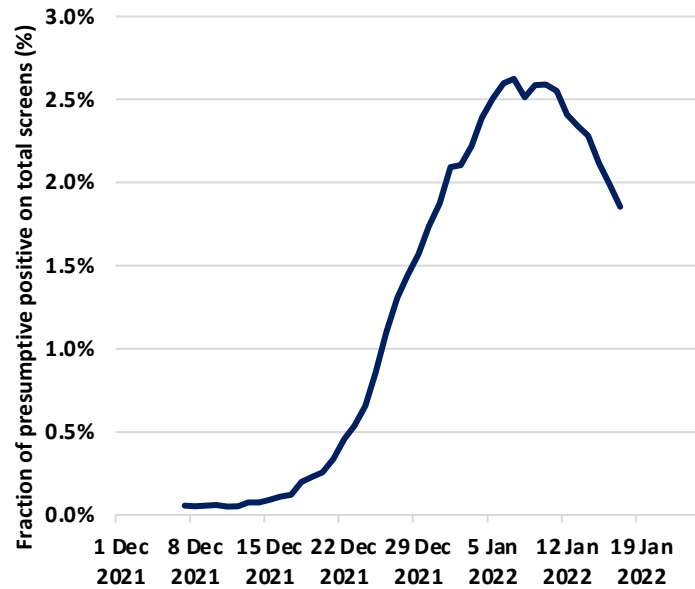
# Provincial % test positivity and testing volumes



# Positivity in selected populations is also declining.

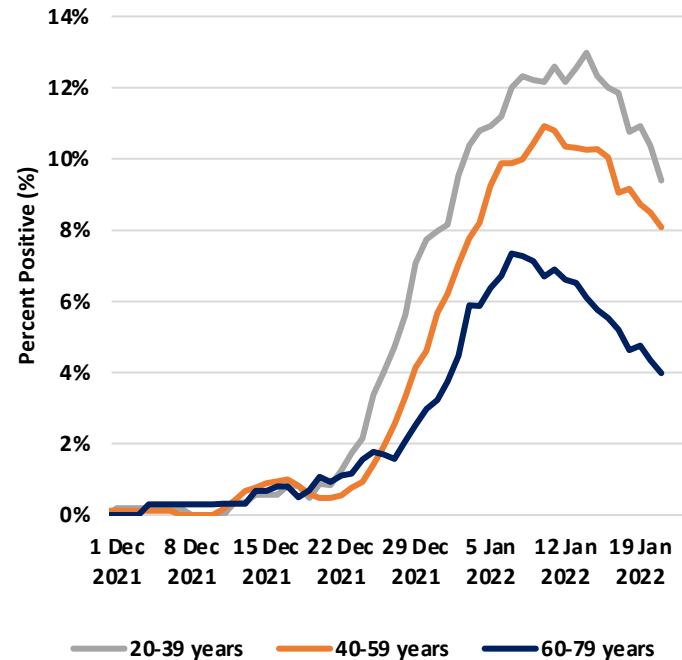
## Workplace screening

(Workplace rapid screening program across Canada, twice per week, Ontario data shown)



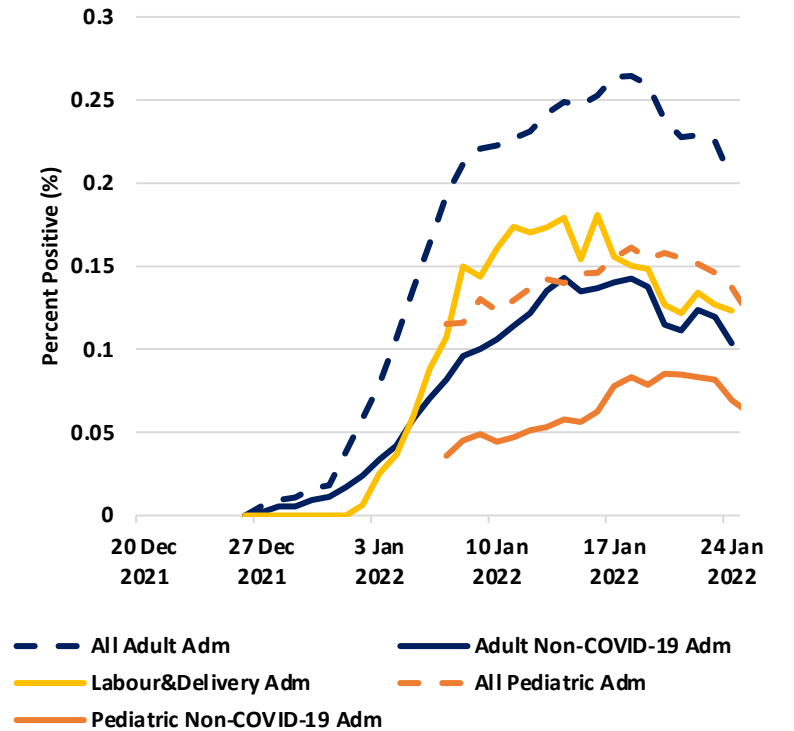
## Repeat Testers

(Individuals with 40+ tests since pandemic start, 20-79 years of age, excluding LTC residents)



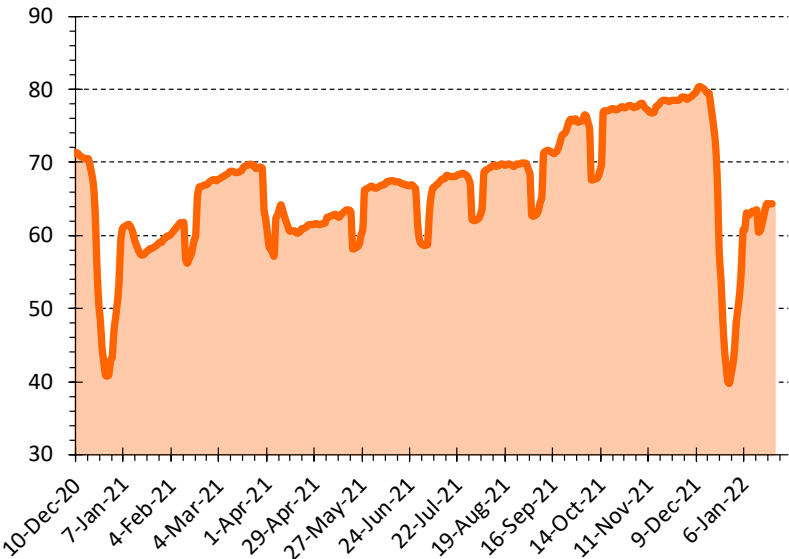
## Hospital Admission Screening

(Selected Ontario hospitals, 4 for adult admissions, 5 for pediatric admissions)

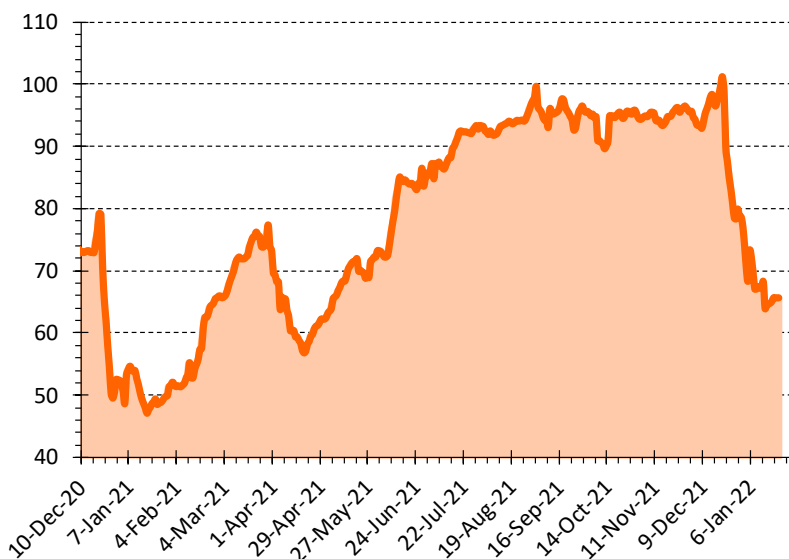


# Mobility, which is correlated with contacts between people, remains below previous levels.

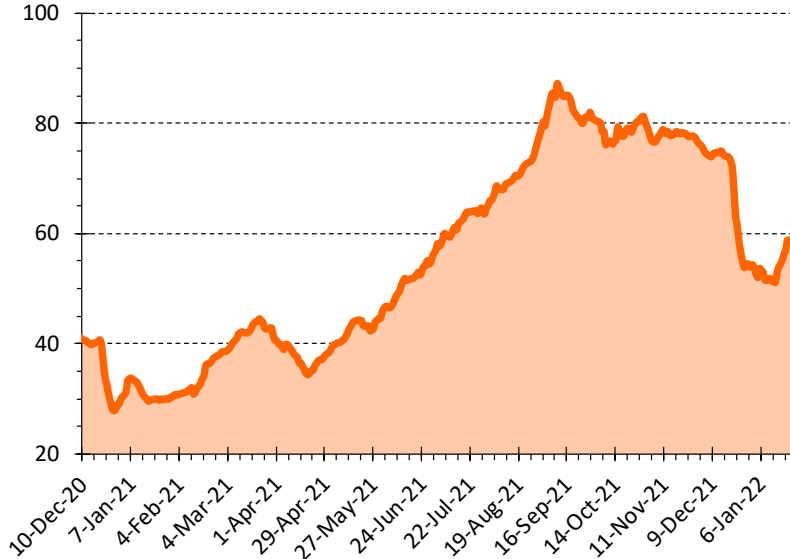
### Workplace



### Retail & Recreation

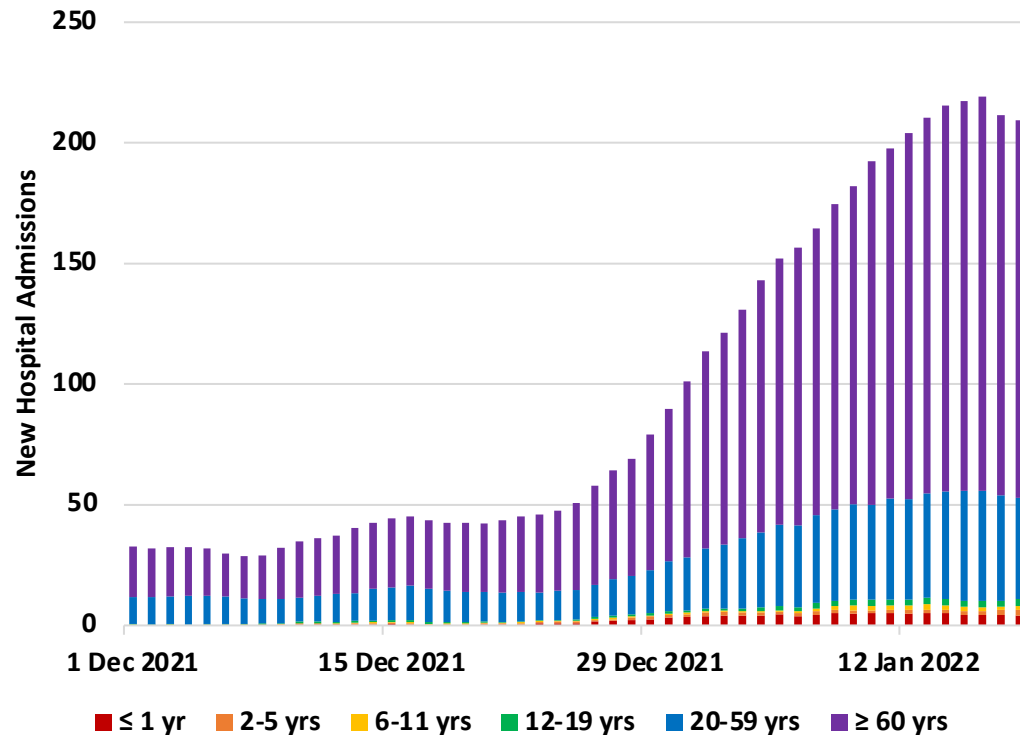


### Transit

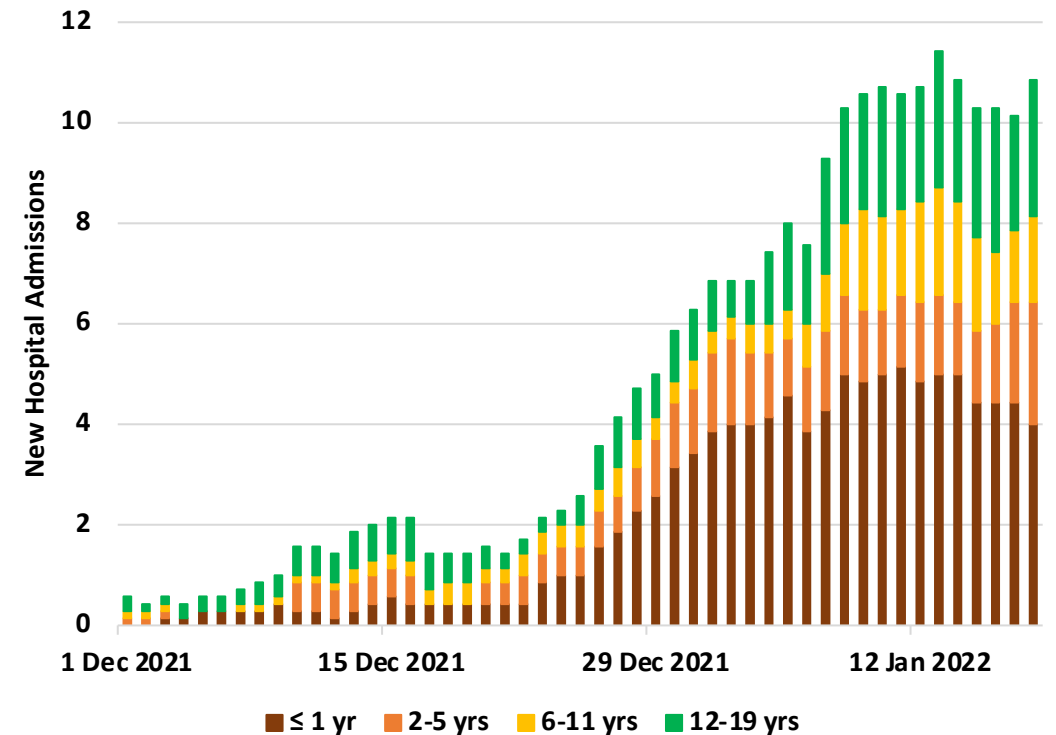


# Hospitalizations have increased across all age groups.

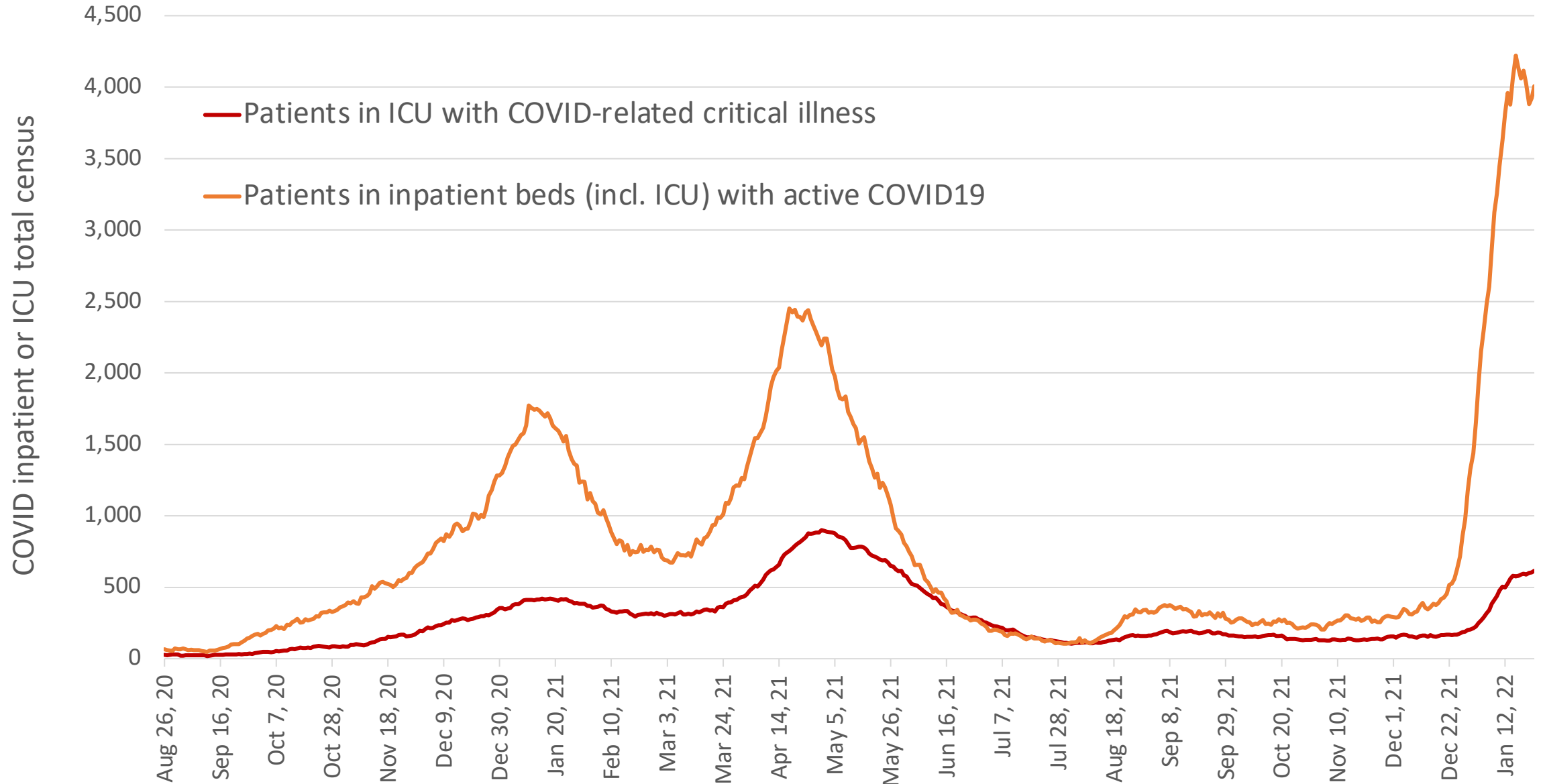
## New hospital admissions, all ages



## New hospital admissions, ≤ 19 years of age



# COVID-19-positive hospitalizations are at a pandemic high.





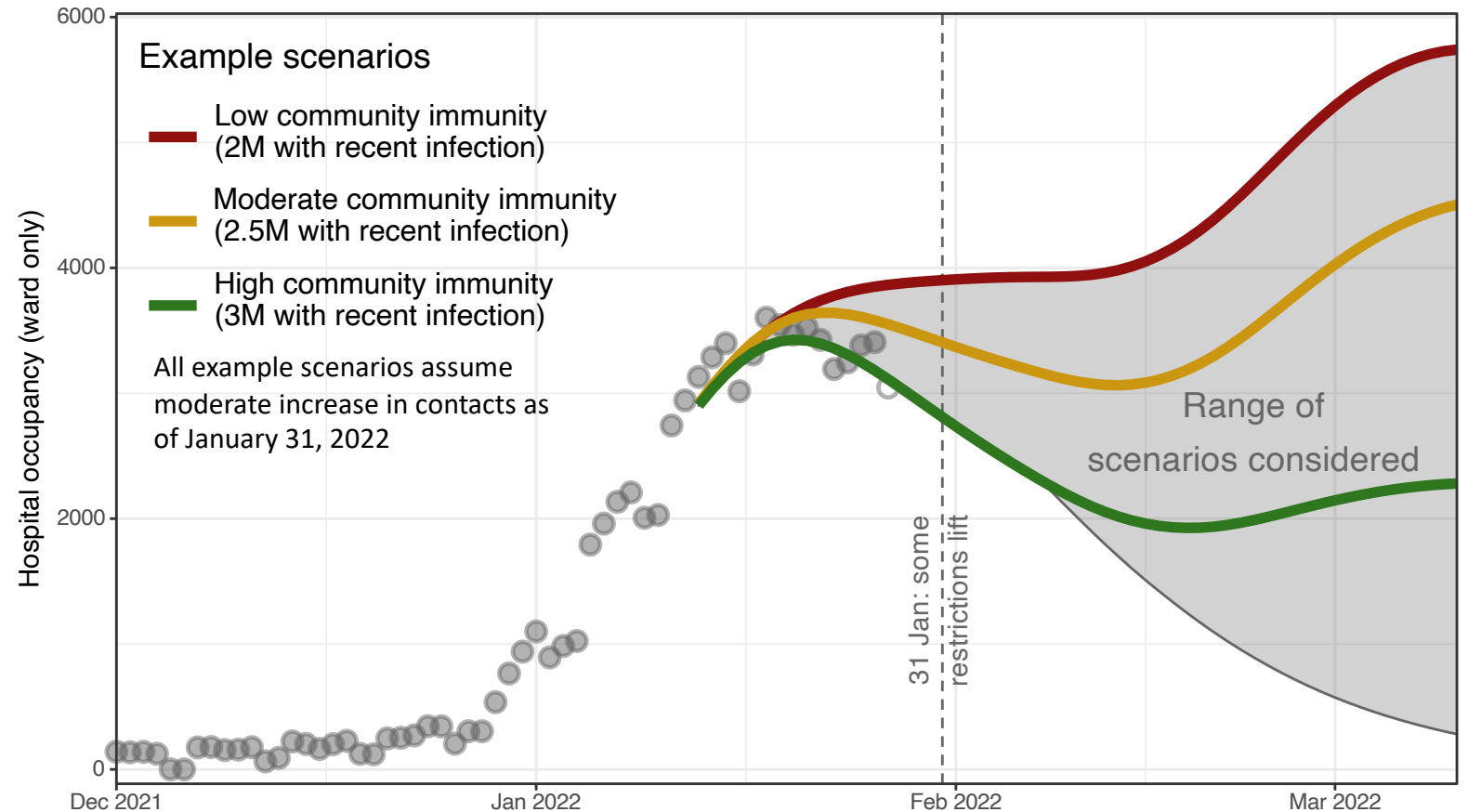
# The context for modelling continues to be challenging.

- Population-level case counts have not been reliable since approximately Dec 24, 2021. Hence, there is substantial uncertainty on transmissions over the past month given decline in testing and high transmissibility of Omicron. This impacts estimates of prior infection and degree of immunity.
- We have no clear estimates on the spread of SARS-CoV-2 during previous waves beyond identified cases. This impacts estimates of the number of people with prior infection and degree of immunity.
- Omicron appears to affect the upper respiratory tract more than the lower respiratory tract, and therefore may have a different clinical course than previous variants, which may affect hospital and ICU admissions and lengths of stay.
- Hospital and ICU admission data have been used to calibrate the models and to estimate the case counts following the change in testing strategy. However, use of hospital and ICU data presents challenges:
  - Hospitalizations and ICU use are lagging indicators
  - Limited data on length of stay for patients with Omicron
  - It is difficult to separate hospitalizations for COVID-19 from hospitalizations with COVID-19, particularly given ongoing uncertainty on Omicron severity and changing patterns of non-primary COVID-19 admissions
- All these factors make it challenging to model the current wave and estimate the impact of re-opening.

# We expect hospitalizations to rebound after reopening on January 31, and to remain at a prolonged peak, except under the most favourable assumptions.

Figure shows projections based on models from *two* scientific teams.

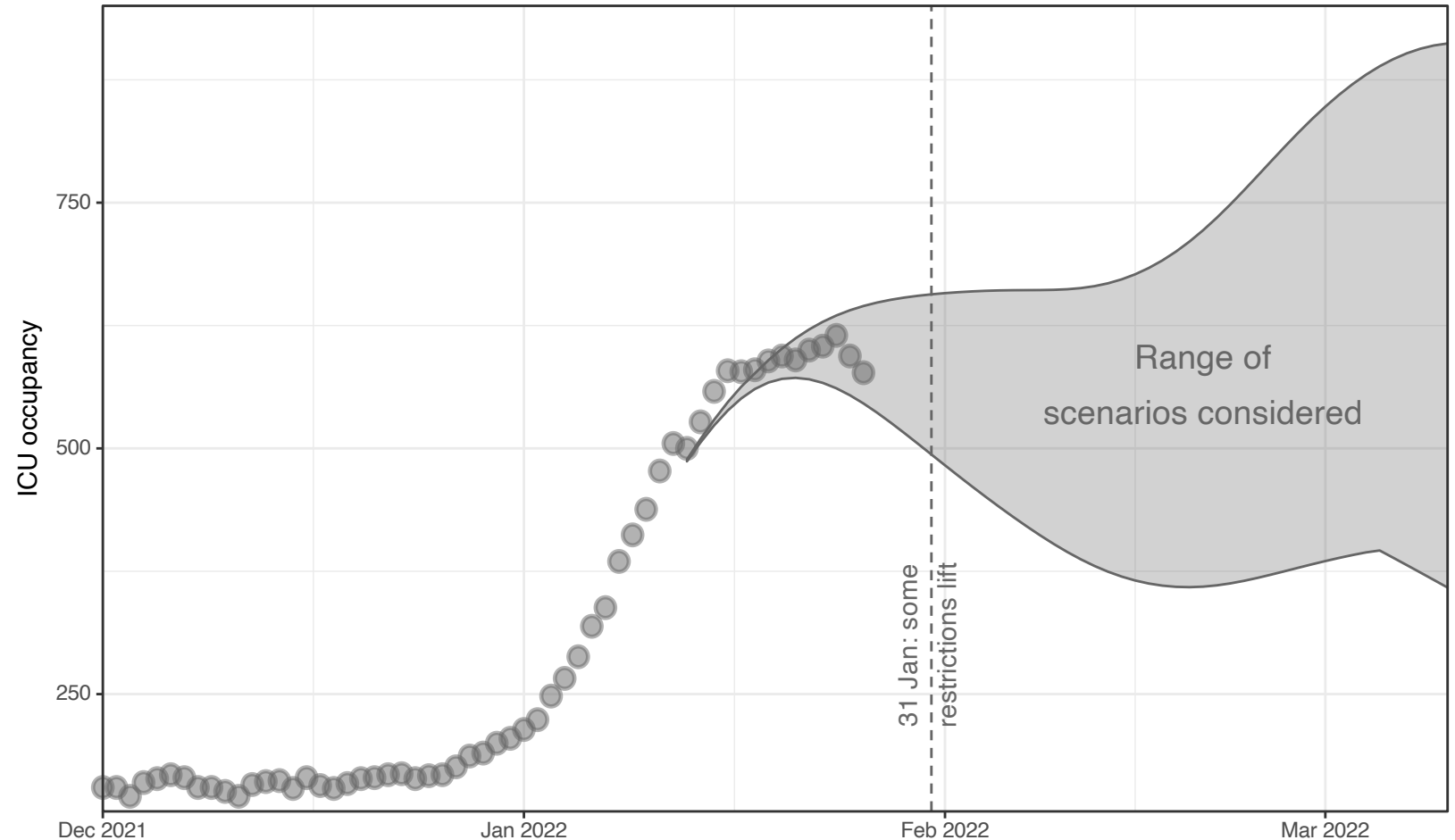
- Different models use different approaches and assumptions.
- Both models are calibrated to case counts (to mid-December 2021) and hospital occupancy (one model), or ICU occupancy (one model).
- Models assume 8M Ontarians will have received booster dose by end of February.
- Scenarios differ by level of community immunity and changes in contacts as of January 31, 2022.
- Considerable uncertainty on current community immunity and changing clinical presentation with Omicron.
- Accelerating uptake of vaccination, including boosters, will reduce hospital admissions.
- Expected increased supply of existing therapeutics may reduce hospital admissions.



# ICU occupancy will likely rebound after reopening on January 31. Regardless, the pressure on ICUs will be prolonged.

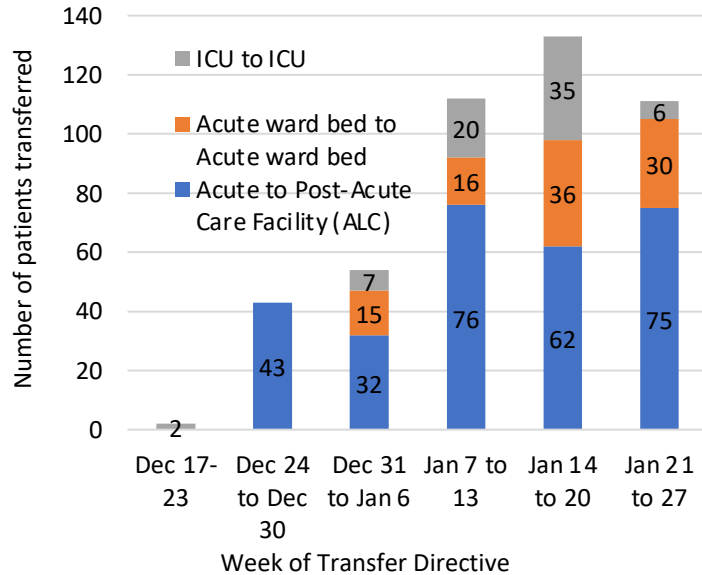
Figure shows projections based on model from *one* scientific team.

- Model is calibrated to case counts (to mid-December 2021) and ICU occupancy.
- Range of scenarios shown corresponds to example scenarios in previous slide (hospitalizations).
- Considerable uncertainty due to changing clinical presentation with Omicron, which may result in lower proportion of patients needing ICU care compared to Delta.
- Expected increased supply of existing therapeutics may further reduce ICU admissions.



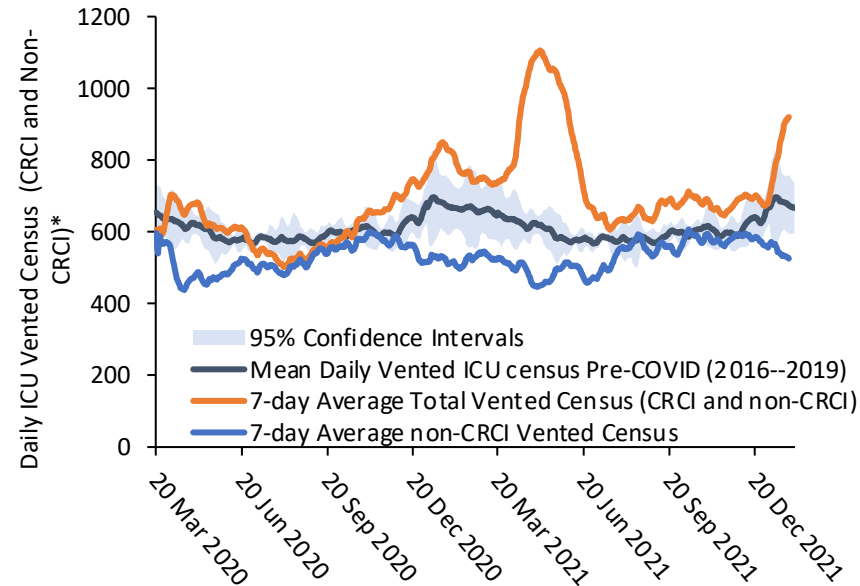
# Acute care capacity is strained.

**Patient Transfers by 7-Day Period Required to Redistribute Patient Volumes Across Province**



Patient transfers have resumed as hospital capacity in hardest hit regions becomes threatened. Thus far during wave 5, over 450 patients with COVID-19 have been transferred to prevent hospital resources being overwhelmed.

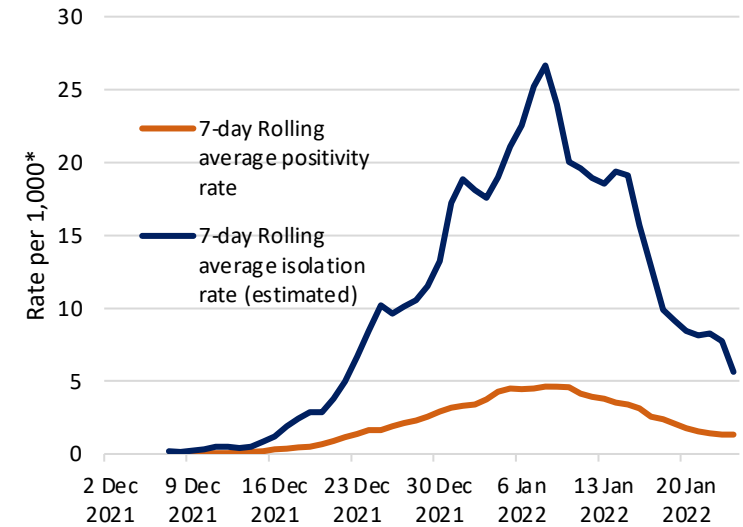
**Pandemic Period Vented Census Compared to Pre-Pandemic (2016-2019) Average**



On January 25, 2022, the total number of patients receiving mechanical ventilation was 138% of the historic average, and the total number of patients in Ontario ICUs was 111% of historic averages.

\*CRCI: COVID-19 related critical illness

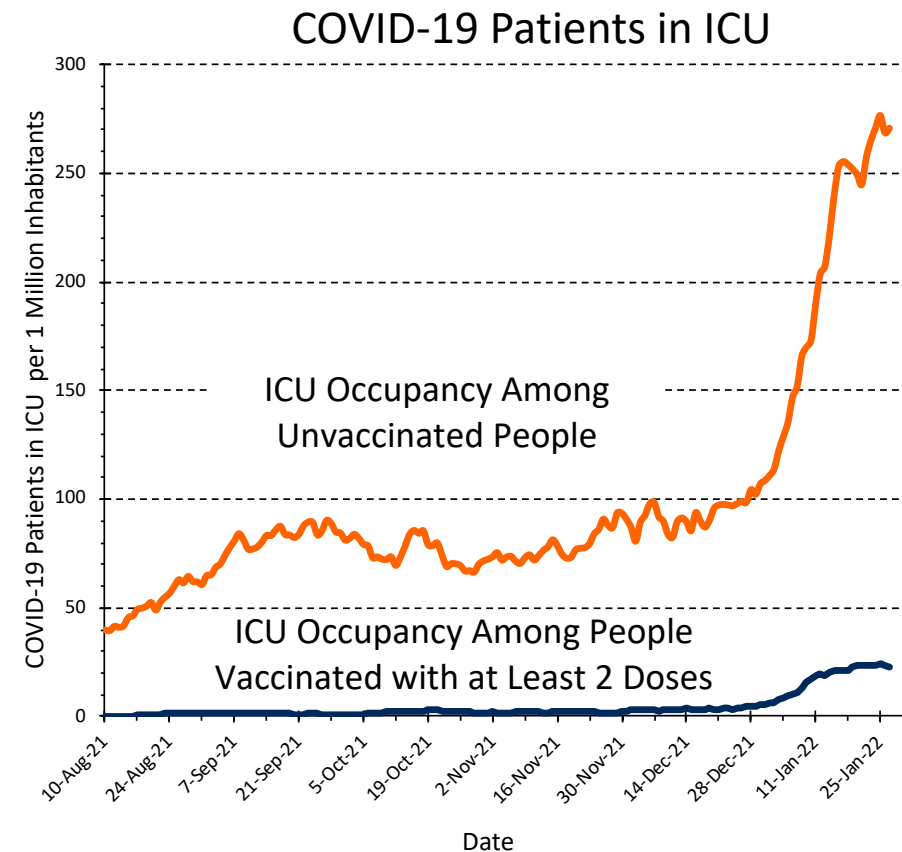
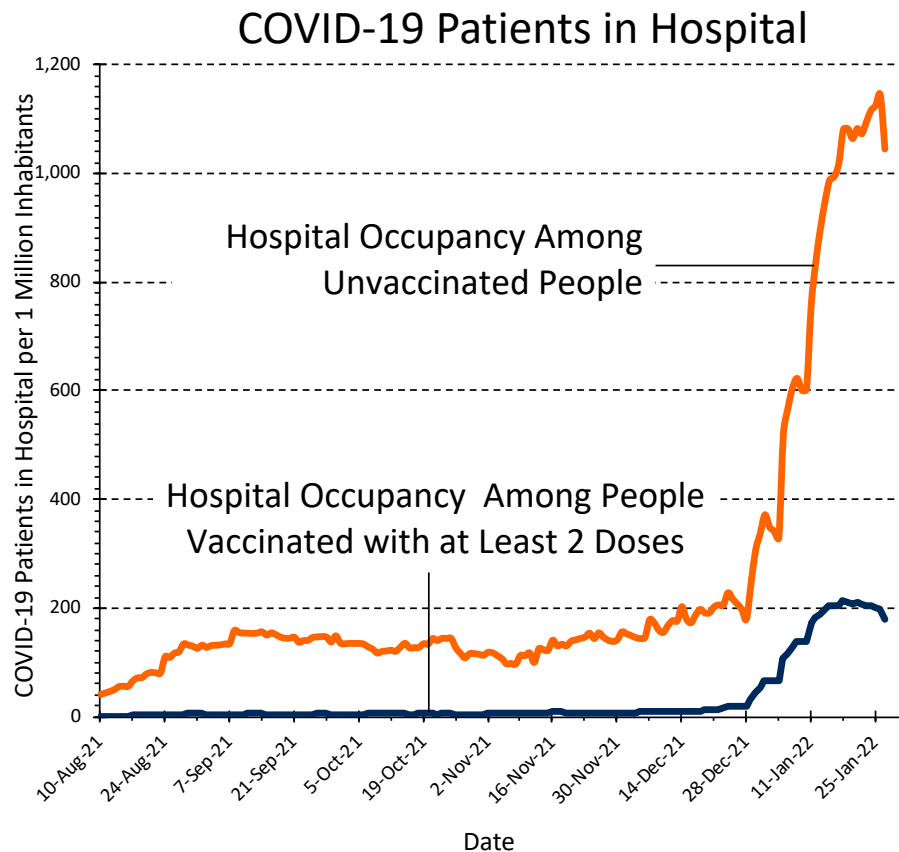
**Hospital Worker Positivity and Isolation Rates**



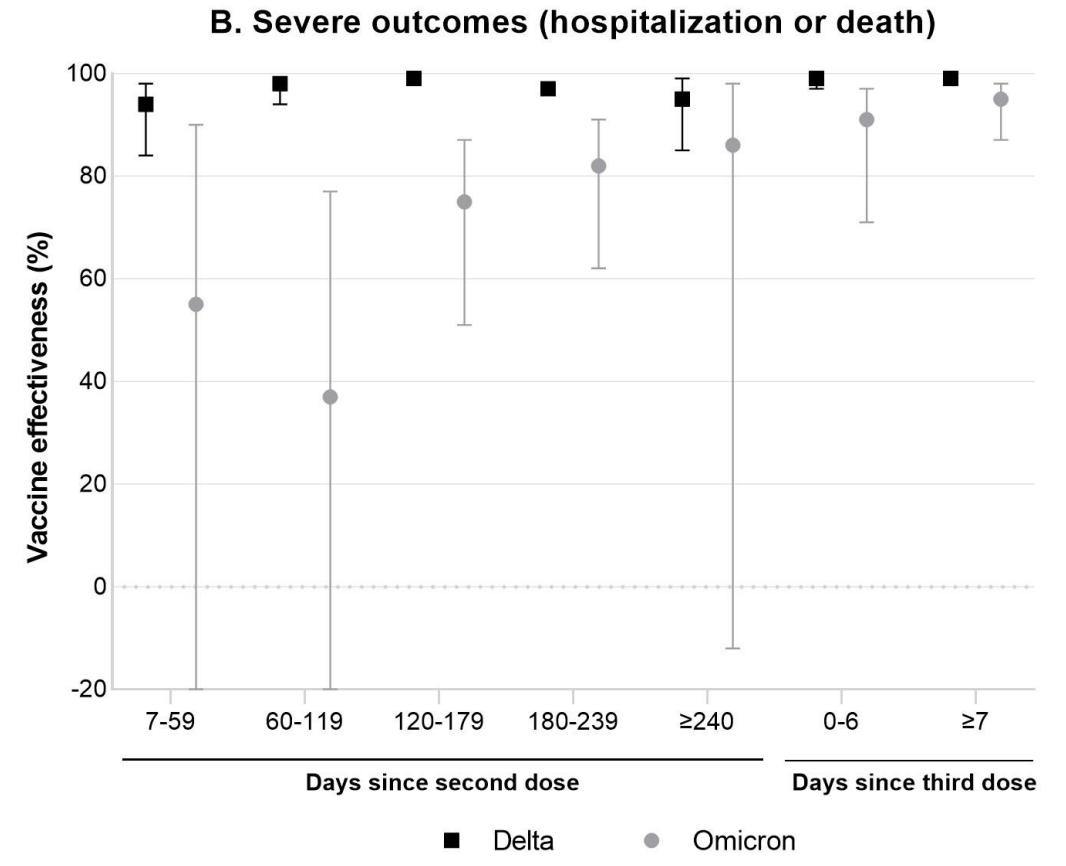
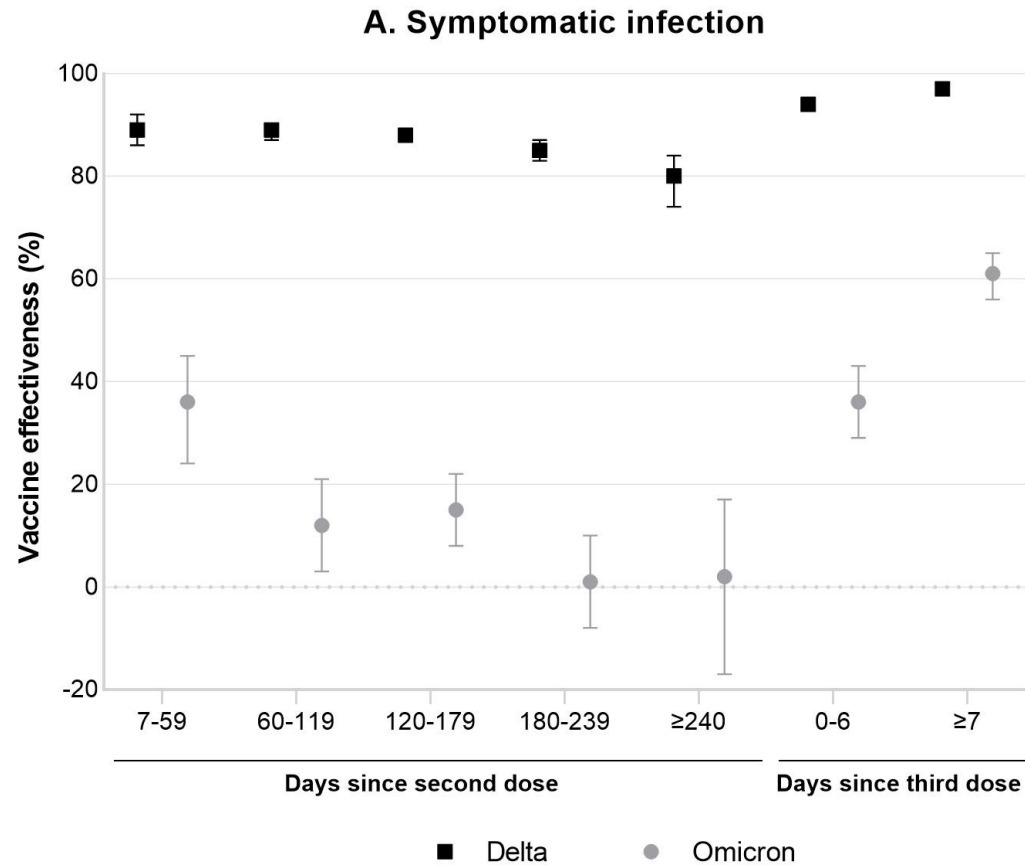
Spread of COVID-19 affects healthcare workers with resulting reduction in staffing. \* Rate includes hospital workers tested positive, but not those exposed and quarantined, and is therefore an underestimate of staffing challenges. Data do not indicate where infection was acquired. The vast majority of hospital workers acquire COVID-19 in the community and not in the hospital setting.

# Vaccination continues to be highly effective against severe outcomes (hospital and ICU admission).

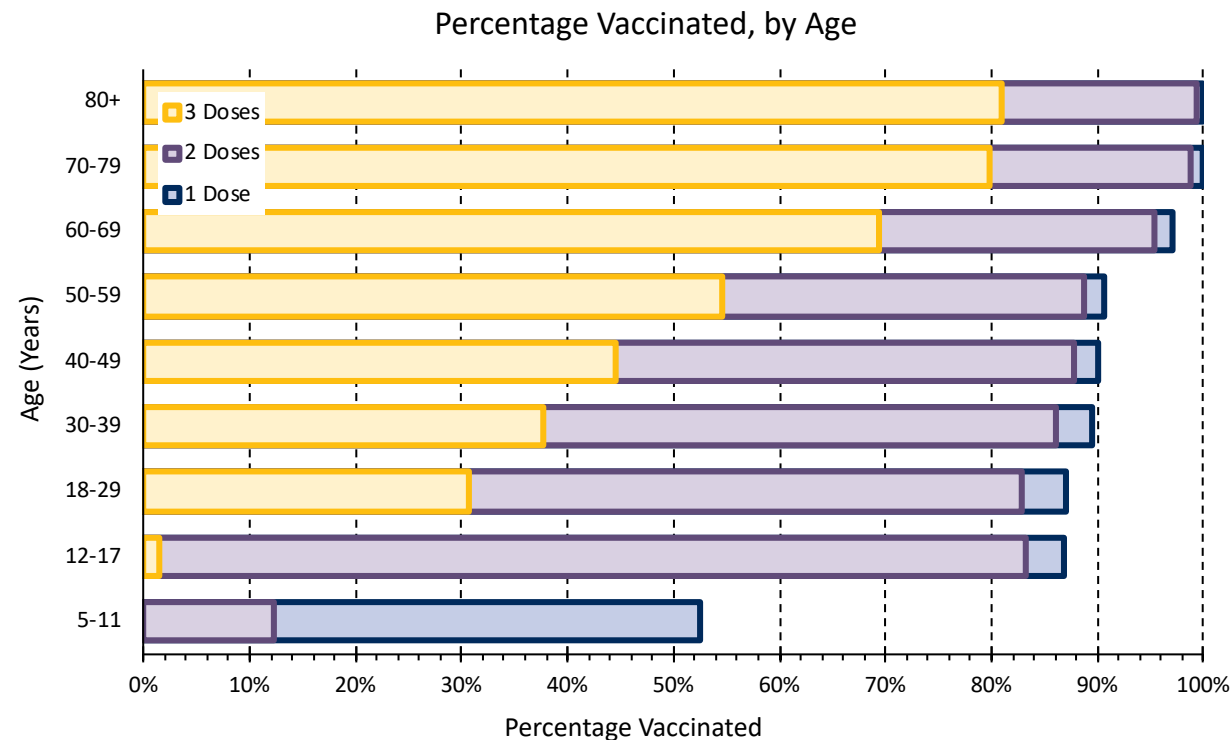
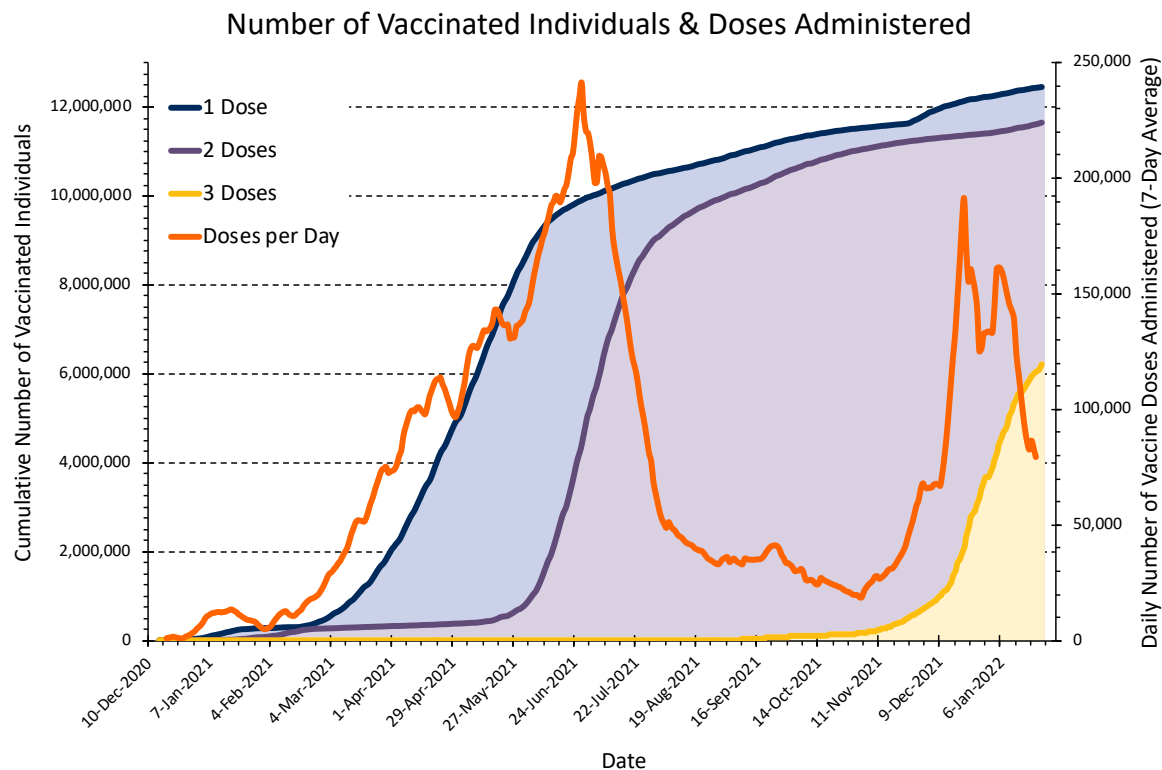
Unvaccinated people currently have a 6-fold higher risk of being in the hospital and 12-fold higher risk of being in the ICU compared to people who received 2 or 3 doses of a COVID-19 vaccine.



# New vaccine effectiveness data from Ontario shows strong protection against severe outcomes with vaccination and the importance of boosters.



# Vaccine coverage with 3<sup>rd</sup> doses in adults and with 1<sup>st</sup> and 2<sup>nd</sup> doses has increased, but is slowing down in all age groups.



## Key findings

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- Public health measures helped control this phase. Relaxation of these measures will increase the spread of COVID-19. The size of any resurgence is difficult to predict and will depend on vaccination, the spread of Omicron, and changes in behaviour (e.g., mobility, masking).
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