

# Update on COVID-19 Projections

Science Advisory and Modelling Consensus Tables

April 14, 2022

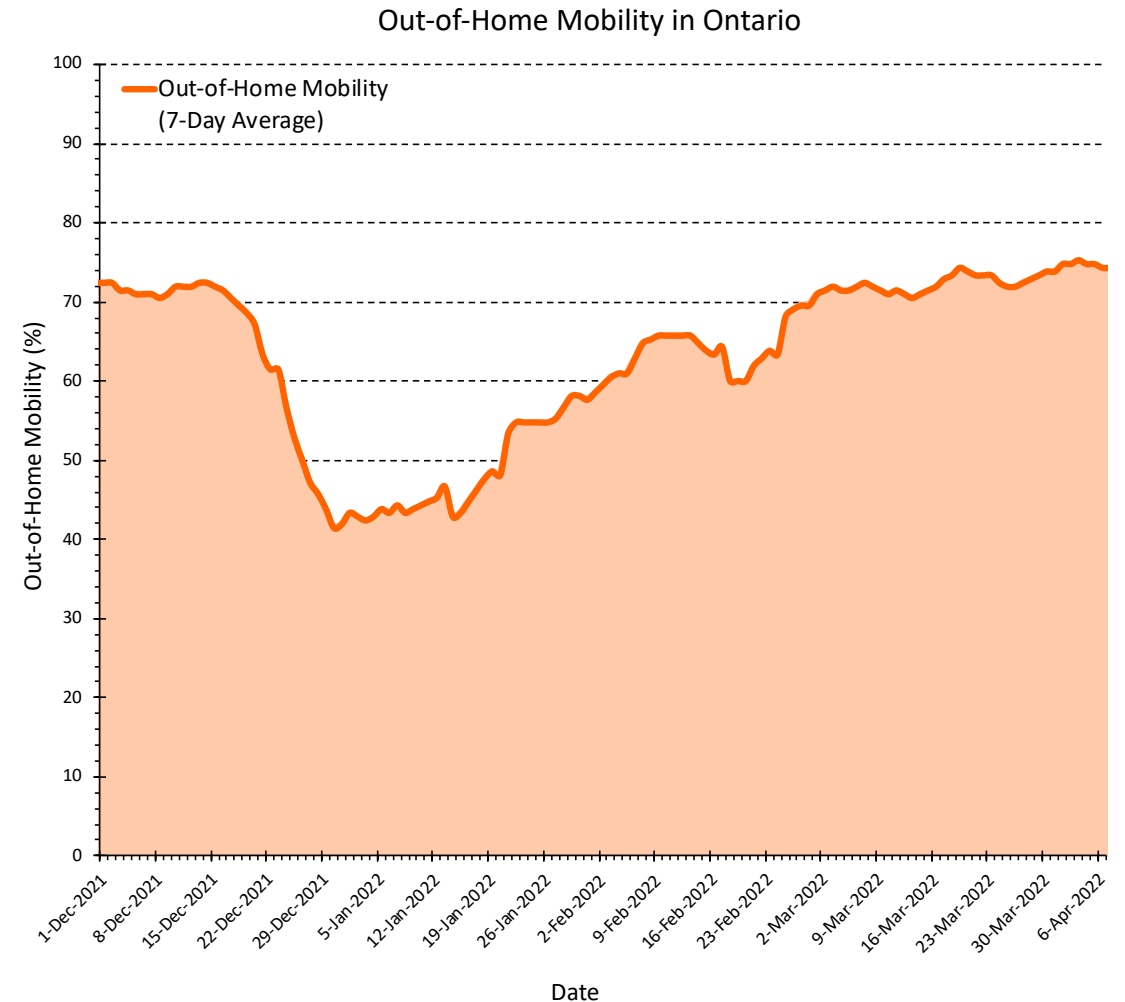


# Key findings

- Ontario is well into wave 6 of the pandemic, driven by the new, more transmissible BA.2 subvariant, waning immunity, and lifting of public health measures.
- There is significant uncertainty around the impact of case growth on our health system and deaths. Wastewater surveillance suggests that community transmission may have peaked. Regardless, modelling indicates that hospital occupancy is likely to continue to rise for some time, with uncertainty in the timing and height of the peak.
- COVID-19 infections in healthcare workers are as high as in the last Omicron wave. High infection rates combined with potentially high hospitalization rates will reduce Ontario's ability to provide care for non-COVID-19 patients.
- Infected individuals are at risk of developing Long COVID, which is associated with serious neurologic illness, heart attacks, stroke, and long-term impairment.
- Individuals with Omicron symptoms should stay home and isolate. At least two negative rapid antigen tests separated by at least 24 hours are required to be confident that an individual is not infected.
- Masking in indoor areas will substantially reduce the risk of getting and spreading COVID-19 as will improvements to ventilation.
- A complete vaccine series (currently 2 doses in children, 3 doses in adolescents and adults, 4 doses in older adults and high-risk groups) provides strong protection against hospital and ICU admission and is the best defence against getting symptoms and spreading COVID-19.
- Access to vaccination, testing and treatment continues to be uneven across socio-economic groups. It is critical that all Ontarians have equitable access.

# As public health measures have been lifted, mobility has increased

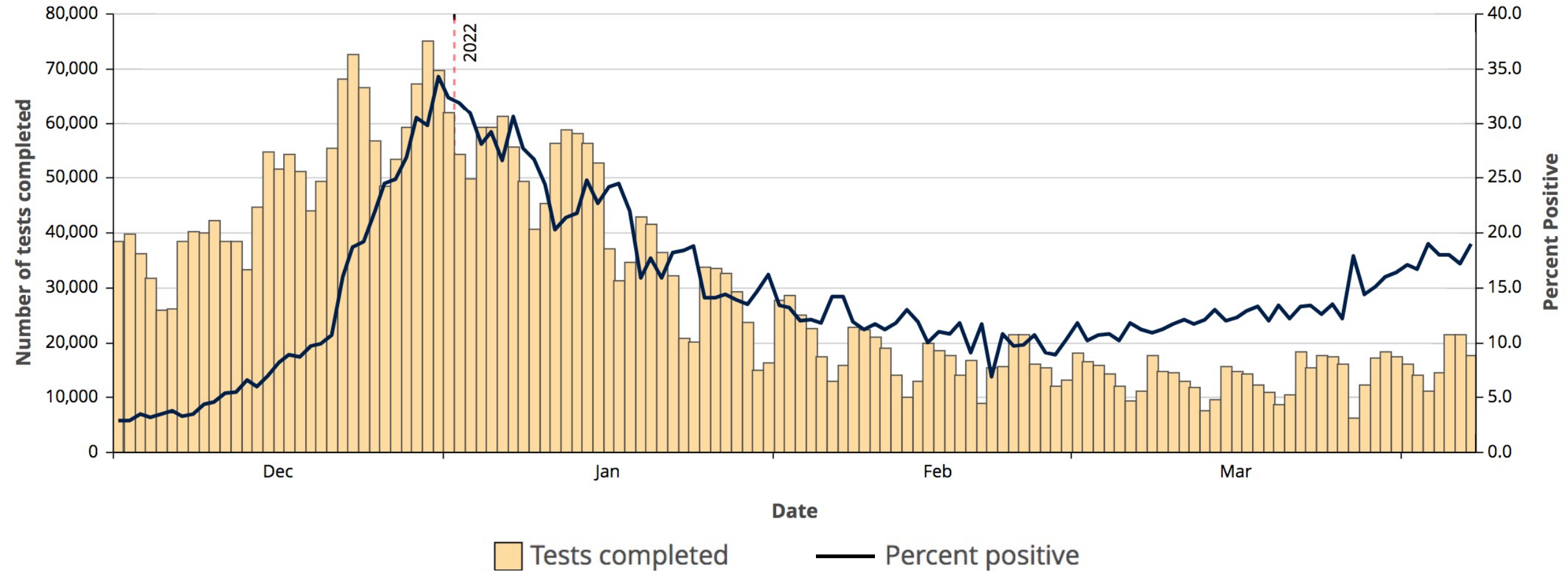
Date	Change
Jan 31	<ul style="list-style-type: none"> <li>• Social gathering limited to 10 people indoors, 25 outdoors</li> <li>• Increasing to 50% or maintaining 50% capacity at: restaurants, retailers, malls, cinemas, event spaces, religious service</li> <li>• Spectator areas of facilities to 50% or 500 people (which ever is less)</li> </ul>
Feb 17	<ul style="list-style-type: none"> <li>• Social gathering limited to 25 indoors, 100 outdoors</li> <li>• No capacity limits in public spaces where proof of vaccination required</li> <li>• Spectator capacity 50% at sporting events/concerts/theatre</li> <li>• Other capacity limited to maintaining 2 metres distance</li> <li>• 25% capacity in high risk setting where proof of vaccination required</li> </ul>
Mar 1	<ul style="list-style-type: none"> <li>• Proof of vaccination requirement lifted (remains voluntary for private organizations)</li> <li>• All remaining capacity limits lifted</li> </ul>
Mar 21	<ul style="list-style-type: none"> <li>• Indoor masking mandates lifted except in health care settings, congregate settings and on public transport</li> </ul>



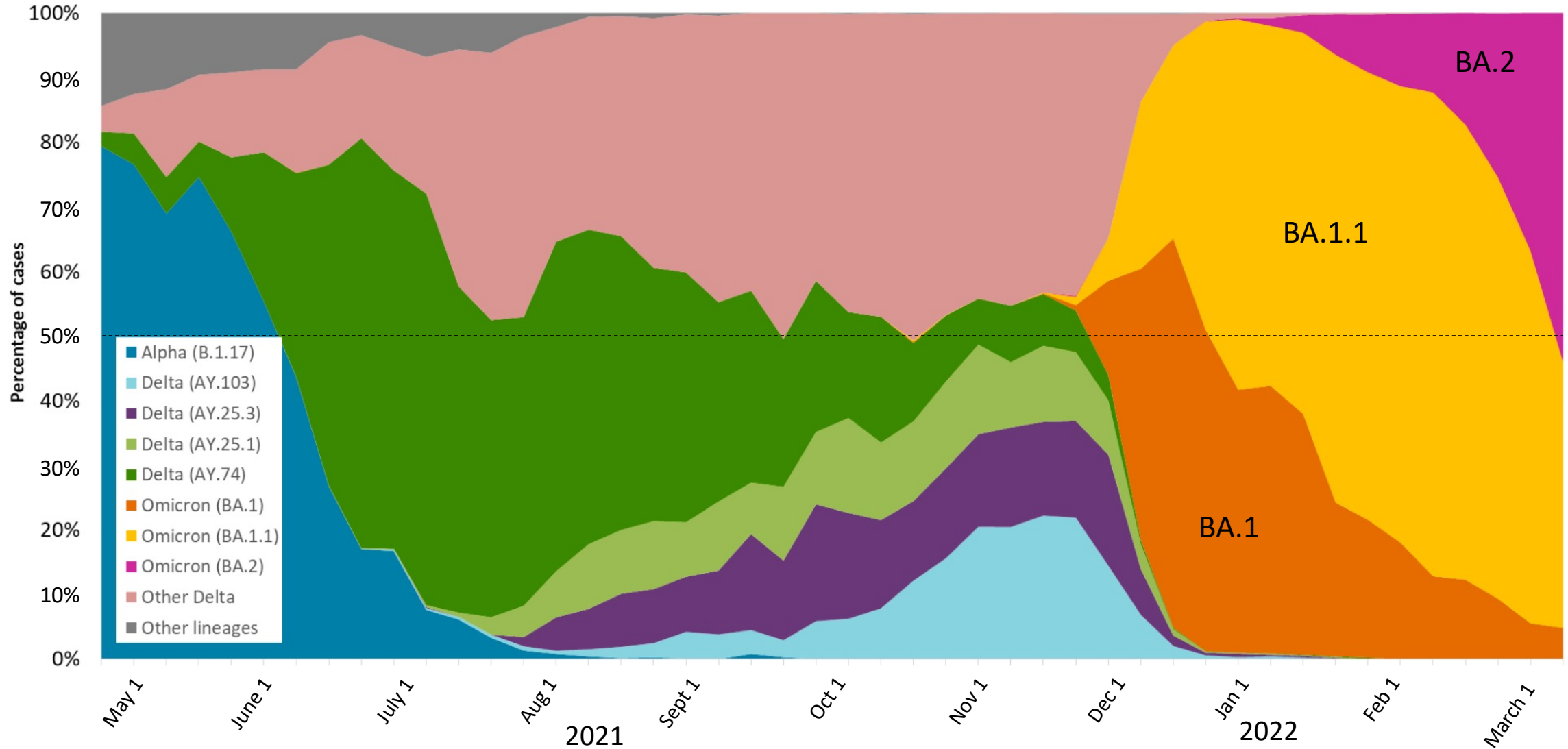
Data: <https://www.google.com/covid19/mobility/>

Analysis: Secretariat of the Science Advisory Table (<https://covid19-sciencetable.ca/ontario-dashboard/>)

# Provincial COVID-19 PCR test positivity increased in March, 2022

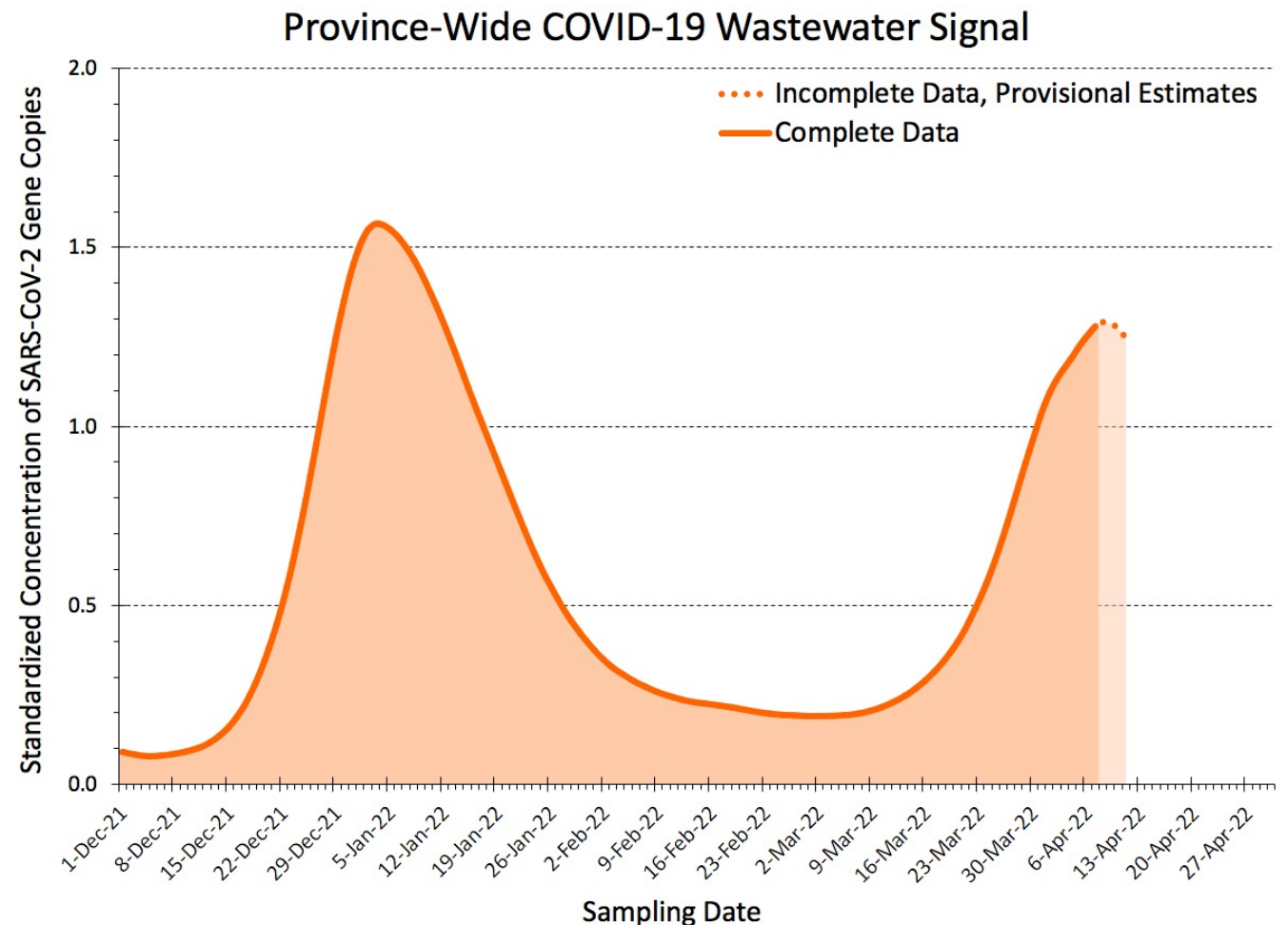


# The more transmissible Omicron subvariant BA.2 became dominant in Ontario around March 10, 2022

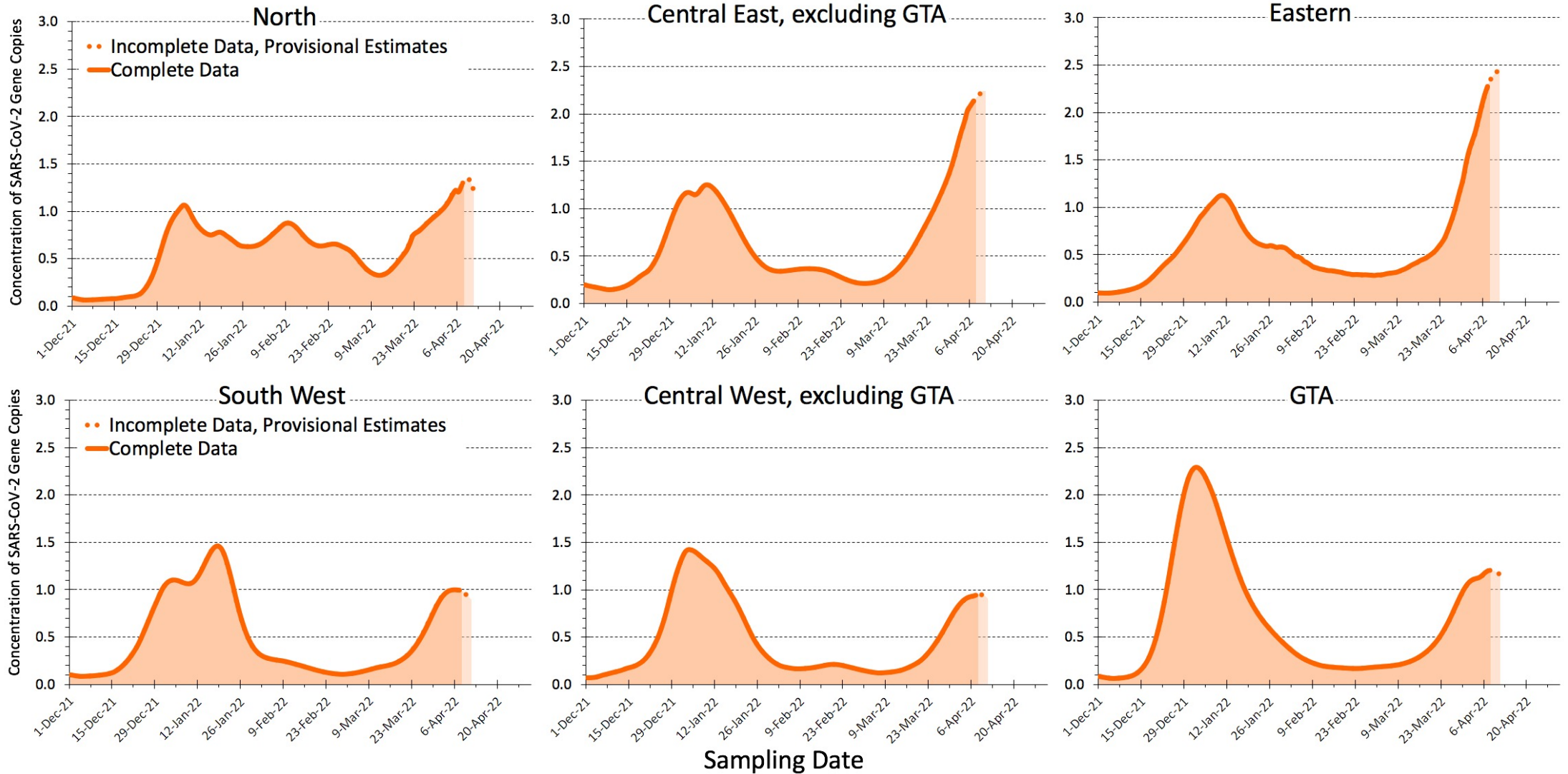


# Ontario's COVID-19 wastewater signal increased substantially but growth has slowed down, and it may have crested

- Ontario's wastewater signal may have crested. It is uncertain yet, whether the current plateau will remain or be followed by an increase after the holidays, or a decrease.
- Plausible range of SARS-CoV-2 infections since Dec 1, 2021, based on wastewater and modelling: 4.5 to 6 million.
- Estimates are based on 103 wastewater treatment plants, pumping stations and sewersheds in all 34 public health units.



# The slow down of growth is variable between regions



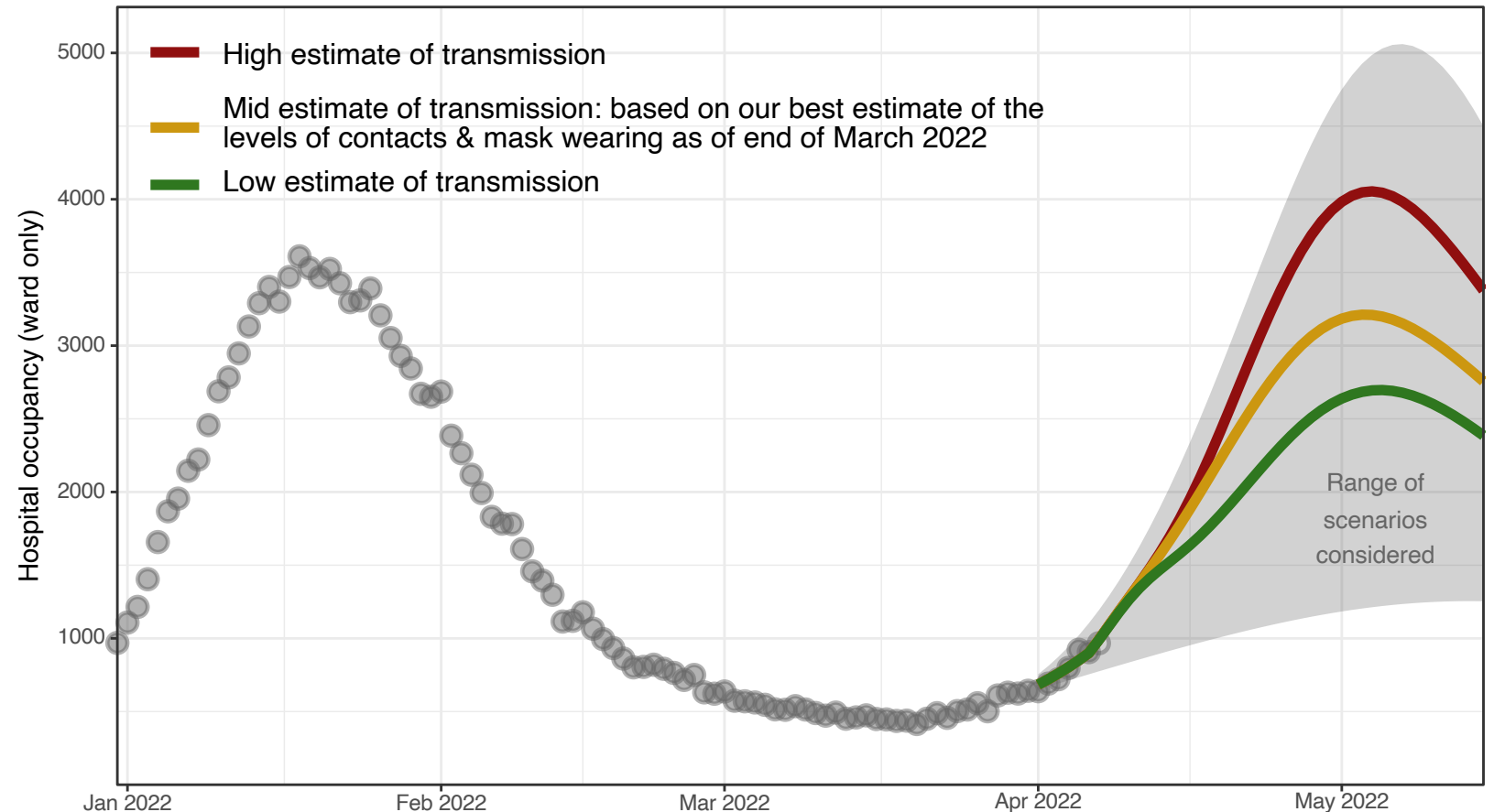
# Hospital occupancy will continue to increase, but the peak will likely be lower than in wave 5

Uncertainty in the impact of lifting public health measures (e.g., masking, capacity limits), number of contacts, age distribution of infections, risk of hospitalization with BA.2, and current community immunity leads to uncertainty in projections of the timing and height of the wave 6 peak.

Peak wave 5 hospital occupancy: 56% of patients with COVID-19 were admitted because of COVID-19. Likely this will be similar in wave 6.

The figure shows projections based on models from two scientific teams:

- Different models use different approaches and assumptions; models are calibrated to hospital occupancy and ICU occupancy.
- Each modelled scenario differs by degree of change as public health measures were lifted. In order to make projections, we assume no further changes occurred in level of contact and mask wearing after the end of March 2022.





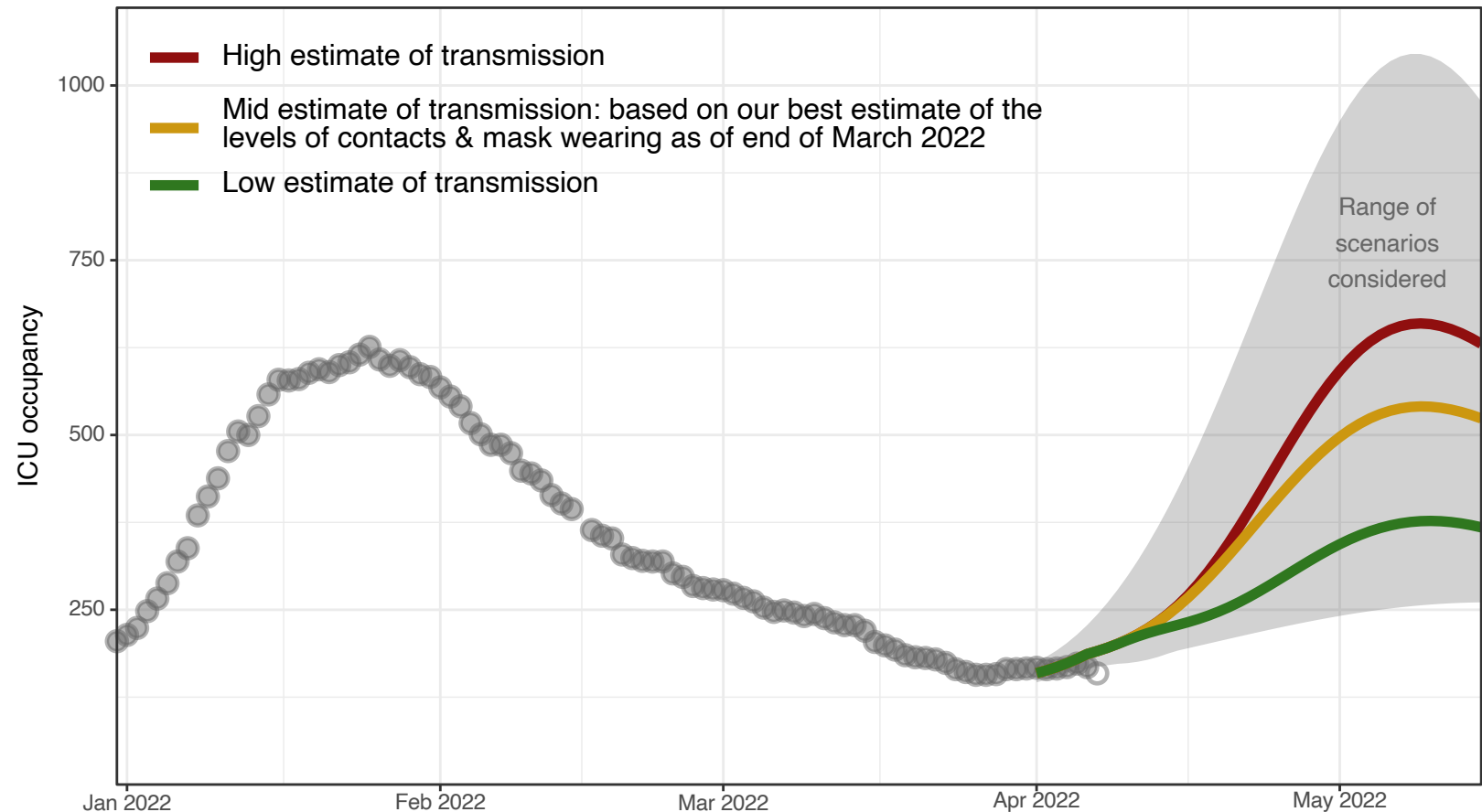
# ICU occupancy will likely increase, but the peak will likely be lower than in wave 5

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Peak wave 5 ICU occupancy: 82% of ICU patients with COVID-19 were admitted because of COVID-19. Likely this will be similar in wave 6.

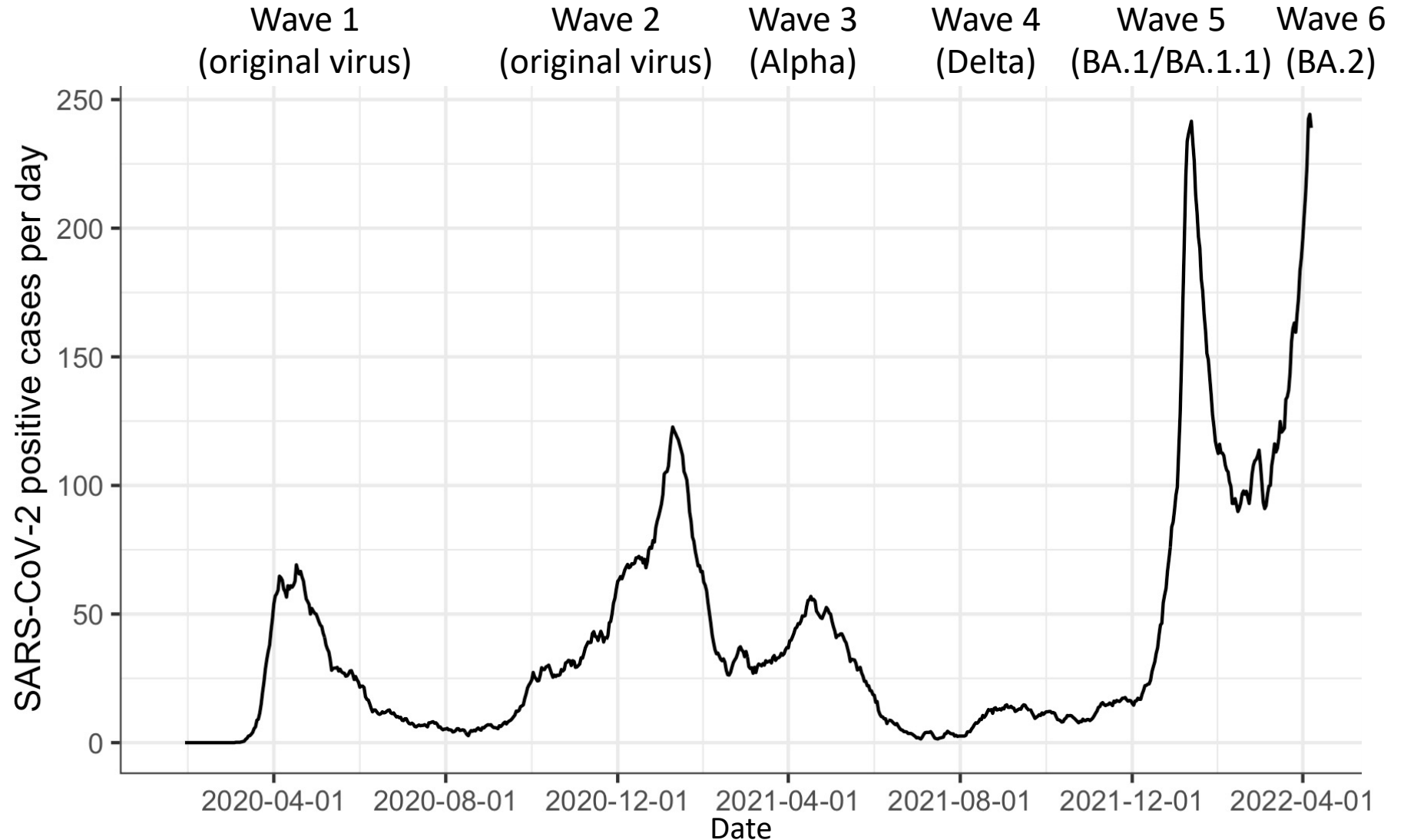
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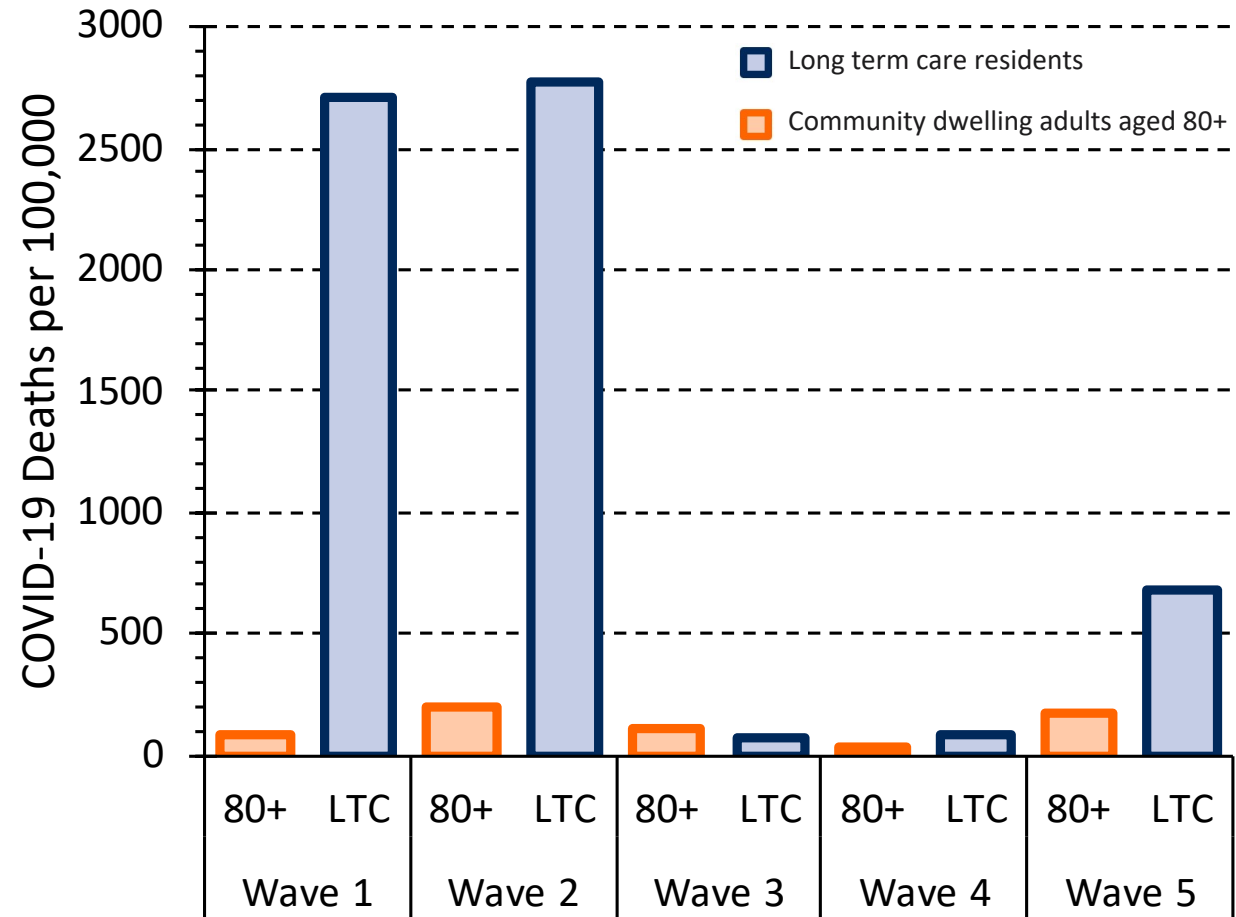
# The number of infected acute care healthcare workers in Ontario has reached the same level as at the peak of wave 5

- The analysis only includes health care workers with positive PCR tests (rapid tests excluded); the true number of infected healthcare workers is therefore considerably higher than shown
- High rates of infection in health care workers are stressing hospital operations, contribute to burnout, and affect the ability to provide health care services



# It remains important to protect long-term care homes through infection prevention and control and maintaining full vaccination

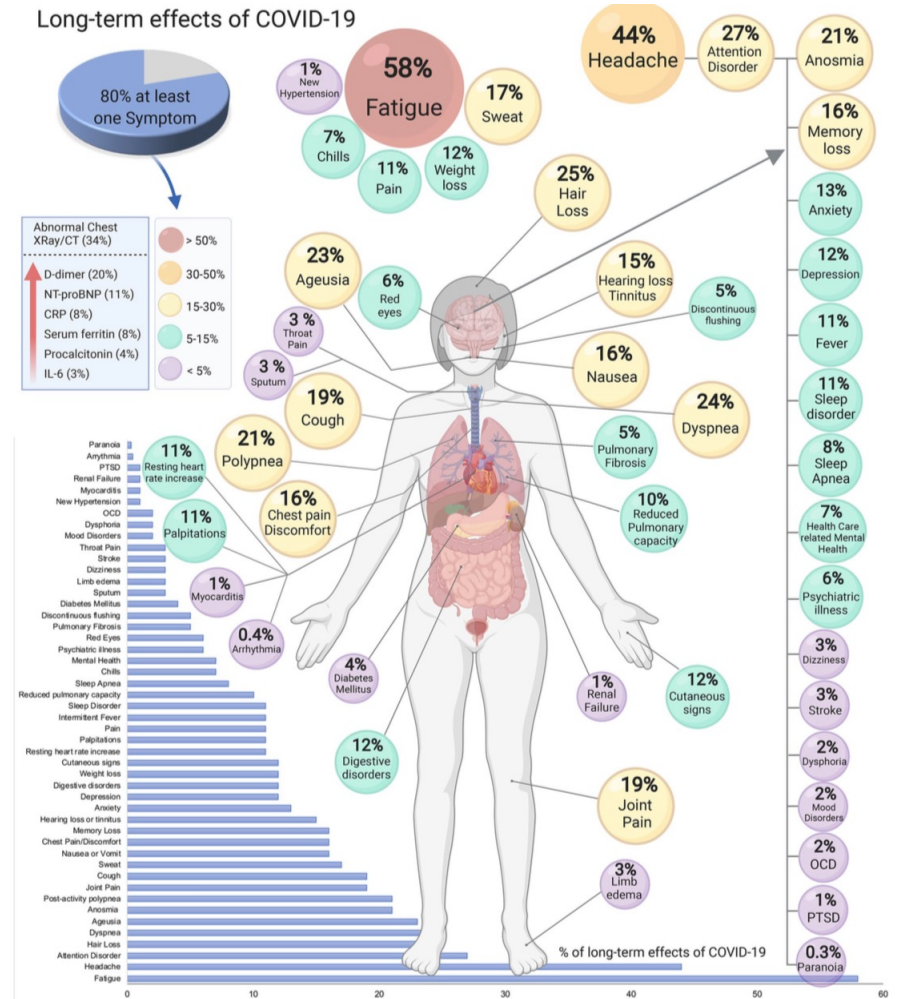
- The figure shows the risk of death among people aged 80 years and older in the community and long-term care residents.
- After introduction of vaccines, the risk of death during waves 3 and 4 decreased strongly among long term care residents.
- Wave 5, caused by Omicron, was again associated with a disproportionate impact on long term care residents.



LTC, long term care; 80+, community dwelling adults aged 80 years or more. Wave 1: Feb 26 – Aug 31, 2020; Wave 2: Sep 1, 2020 - Feb 28, 2021; Wave 3: Mar 1 – Jul 31, 2021; Wave 4: Aug 1 – Dec 14, 2021; Wave 5: Dec 15, 2021 – Mar 15, 2022.

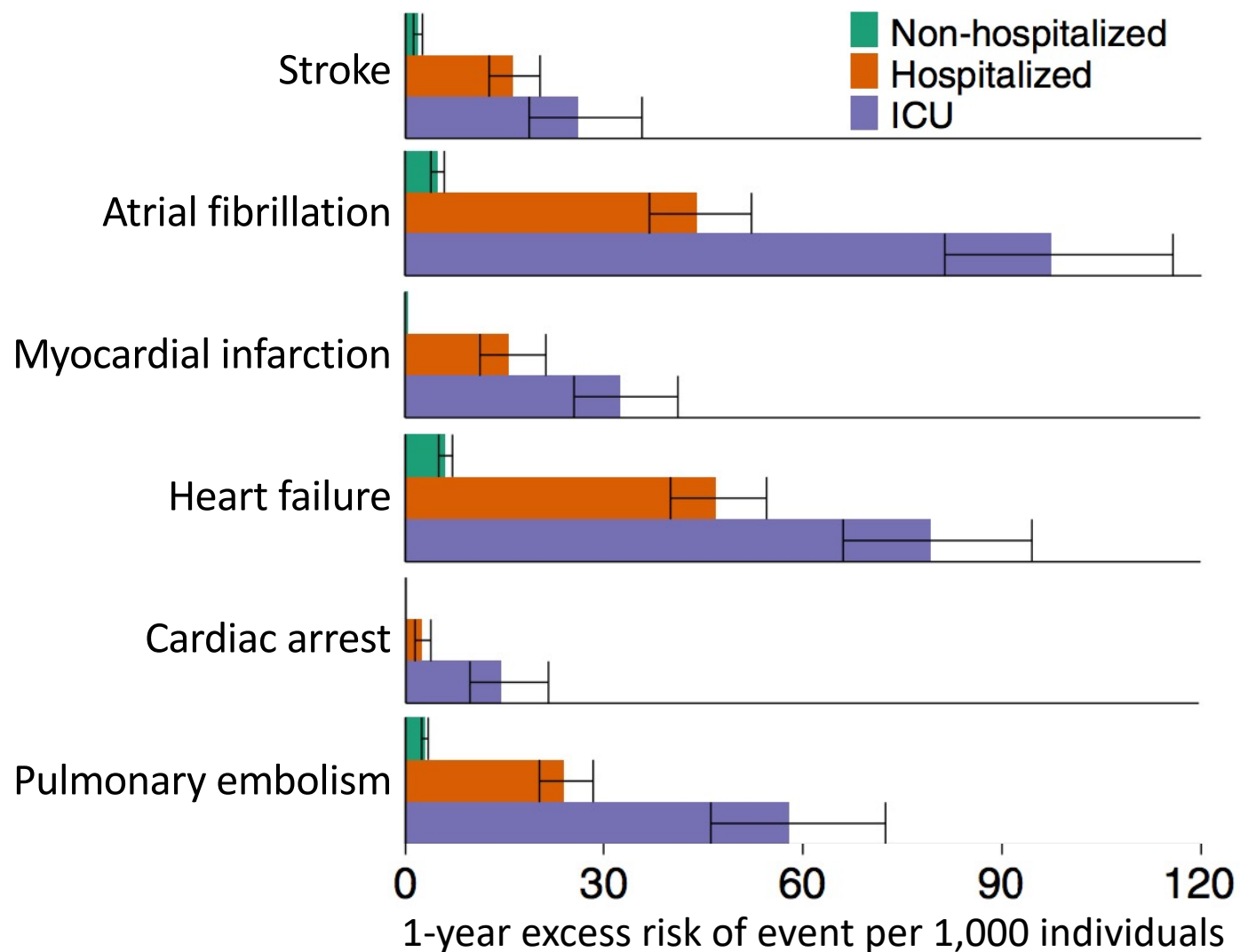
# The risk of post COVID condition (Long COVID) remains high, particularly among unvaccinated people

- Post COVID-19 condition occurs in individuals with a history of SARS-CoV-2 infection, usually within 3 months of infection, with symptoms lasting for longer than 2 months with no alternative diagnosis.
  - Common symptoms include fatigue, shortness of breath and cognitive dysfunction.
  - For many individuals this results in significant work and family life disruptions.
- The ongoing large COVID-19 infection burden will have an impact beyond the current acute stress on hospital system:
  - Conservative estimates suggest at least 10% of all unvaccinated people who get infected will develop the post COVID condition.
- This will likely have important impact on economy, health care system and society for years to come.
- There are no established treatments for the post COVID condition and prevention of infection via public health measures and vaccination is key.
- We are still learning about the impact of the post COVID condition in children.



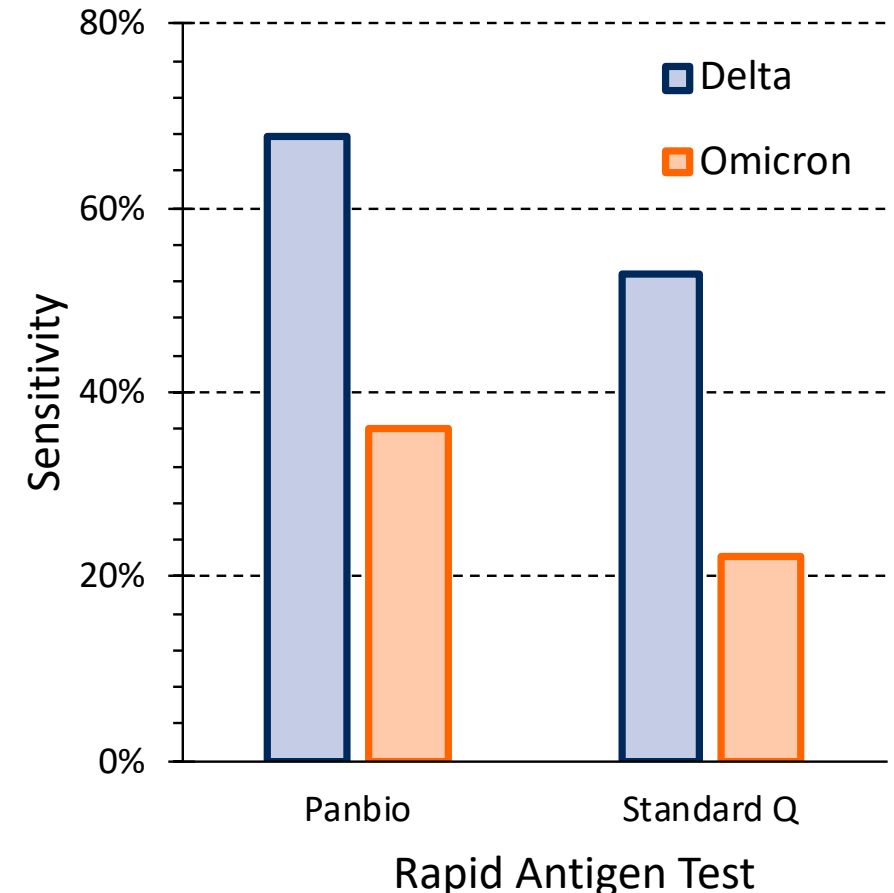
# The excess risk of a range of medical conditions is increased considerably in the first year after SARS CoV2 Infection

- Data are emerging to demonstrate a link between infection and a range of medical illnesses such as: diabetes, psychiatric conditions, neurologic disease, and cardiovascular disease.
- For example, the excess risk of cardiovascular events in the year after recovery from acute COVID-19 is substantial (Figure) and increases with the severity of the acute COVID-19 symptoms.



# Most common symptoms of infection with Omicron differ from those of previous variants and rapid antigen tests are less reliable

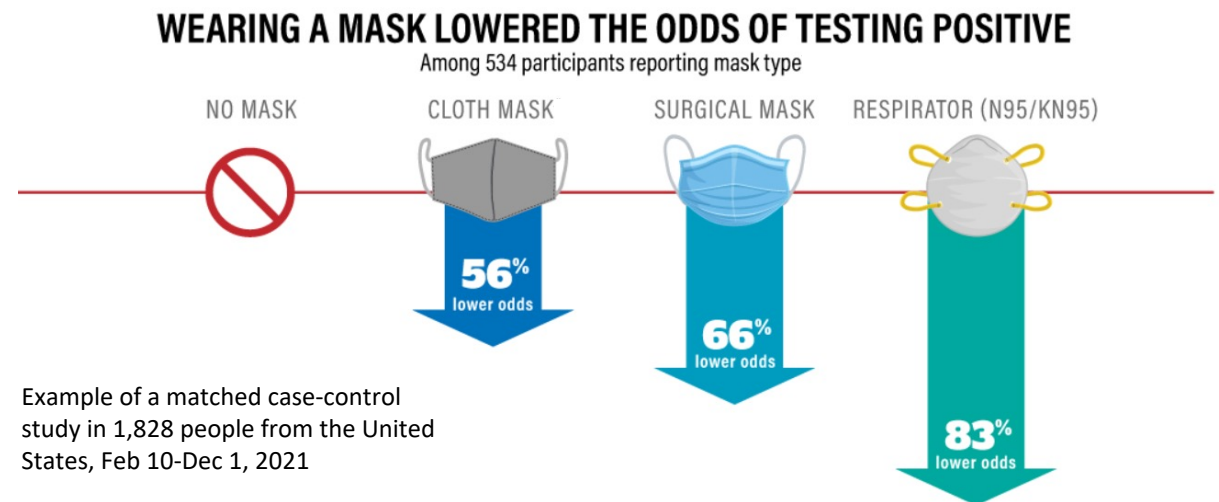
- The most important symptoms of an Omicron infection:
  - Headache
  - Runny nose or sneezing
  - Sore throat
  - Cough
  - Fever
  - Gastrointestinal symptoms
  - Loss of smell
- Rapid antigen tests have lost some of their sensitivity, especially early during an infection (Figure).
- During the first 3 days after symptom onset, rapid antigen tests should not be used to rule out an infection. Individuals with Omicron symptoms should stay home and isolate.
- At least two negative tests using proper sampling (mouth, throat, and nose, see link to video below) separated by at least 24 hours are required to be confident that an individual is not infected.



Sensitivity for two rapid antigen tests available in Ontario for Delta and Omicron infections (see Science Brief on rapid antigen tests during Omicron wave).

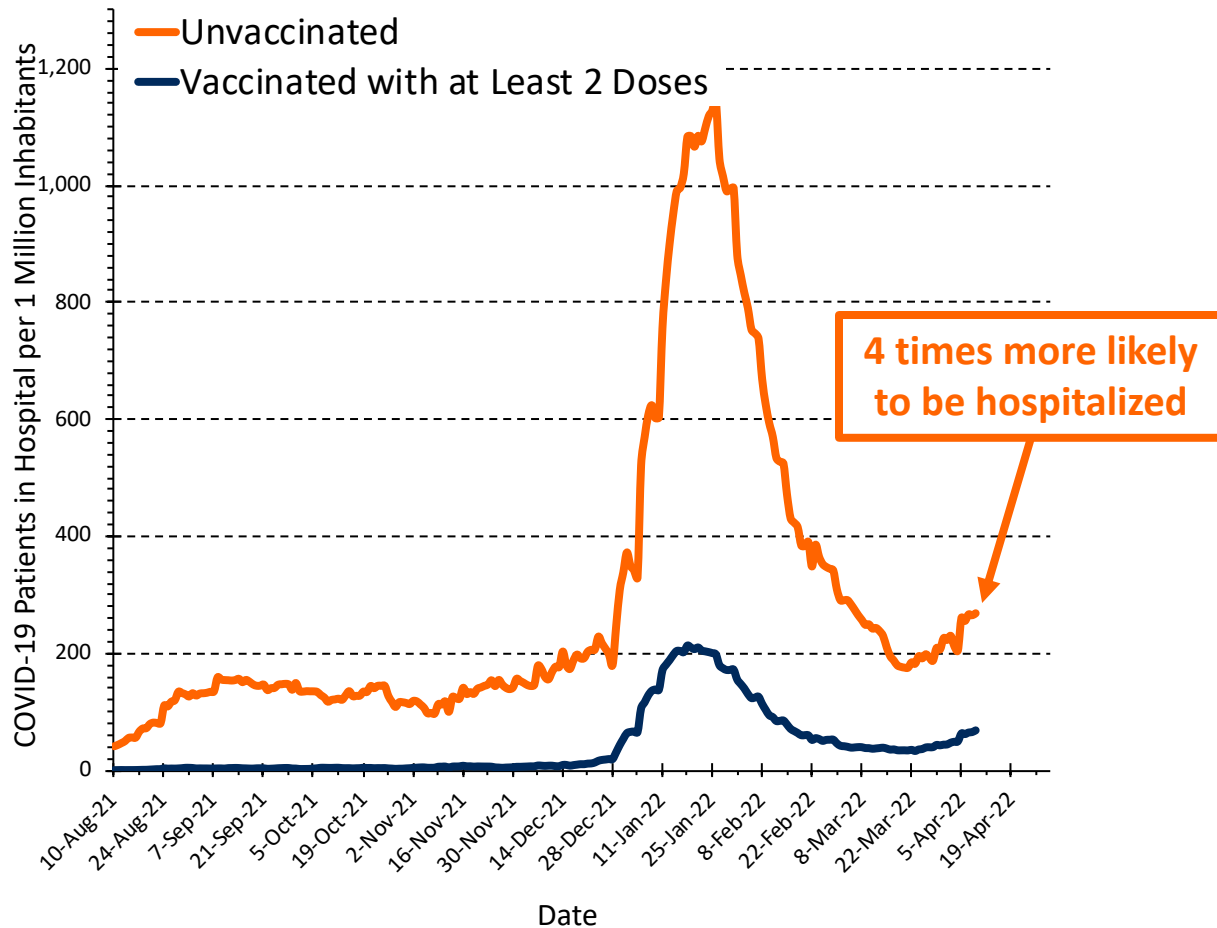
# Masks reduce COVID-19 transmission

- Public health measures, including increased ventilation and filtration, physical distancing and wearing a well-fitted, high quality mask can help reduce Omicron transmission in places where people gather indoors.
- Recent studies from the United States analysed the impact of masking policies on SARS-CoV-2 community transmission: mandatory masking reduced the incidence of SARS-CoV-2 infection consistently.
- Masking protects both the person who wears the mask and their contacts.
- Community benefits from masking are most pronounced when adopted widely in public spaces, schools and workplaces.

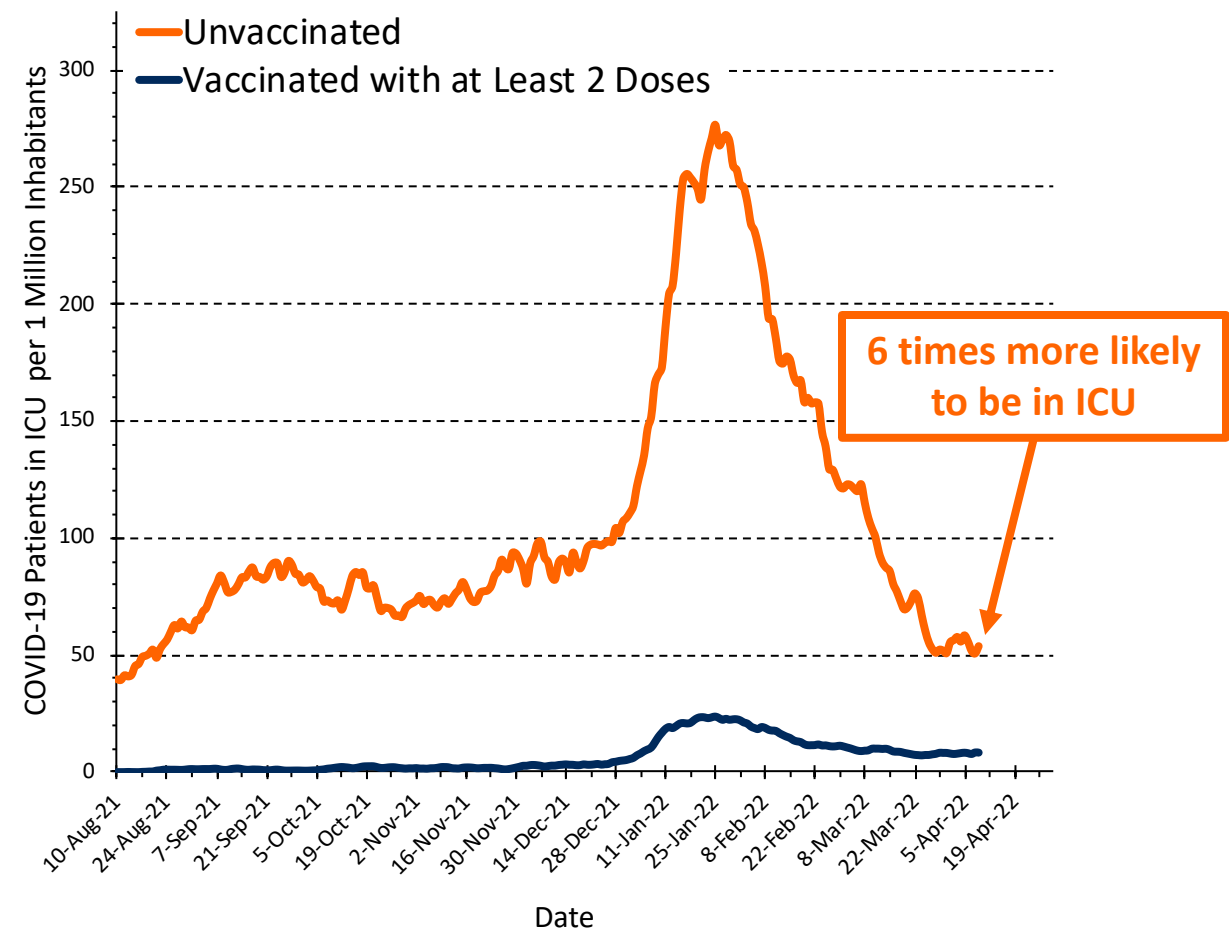


# COVID-19 vaccines provide substantial protection against hospitalizations and ICU admissions

## COVID-19 Patients in Hospital

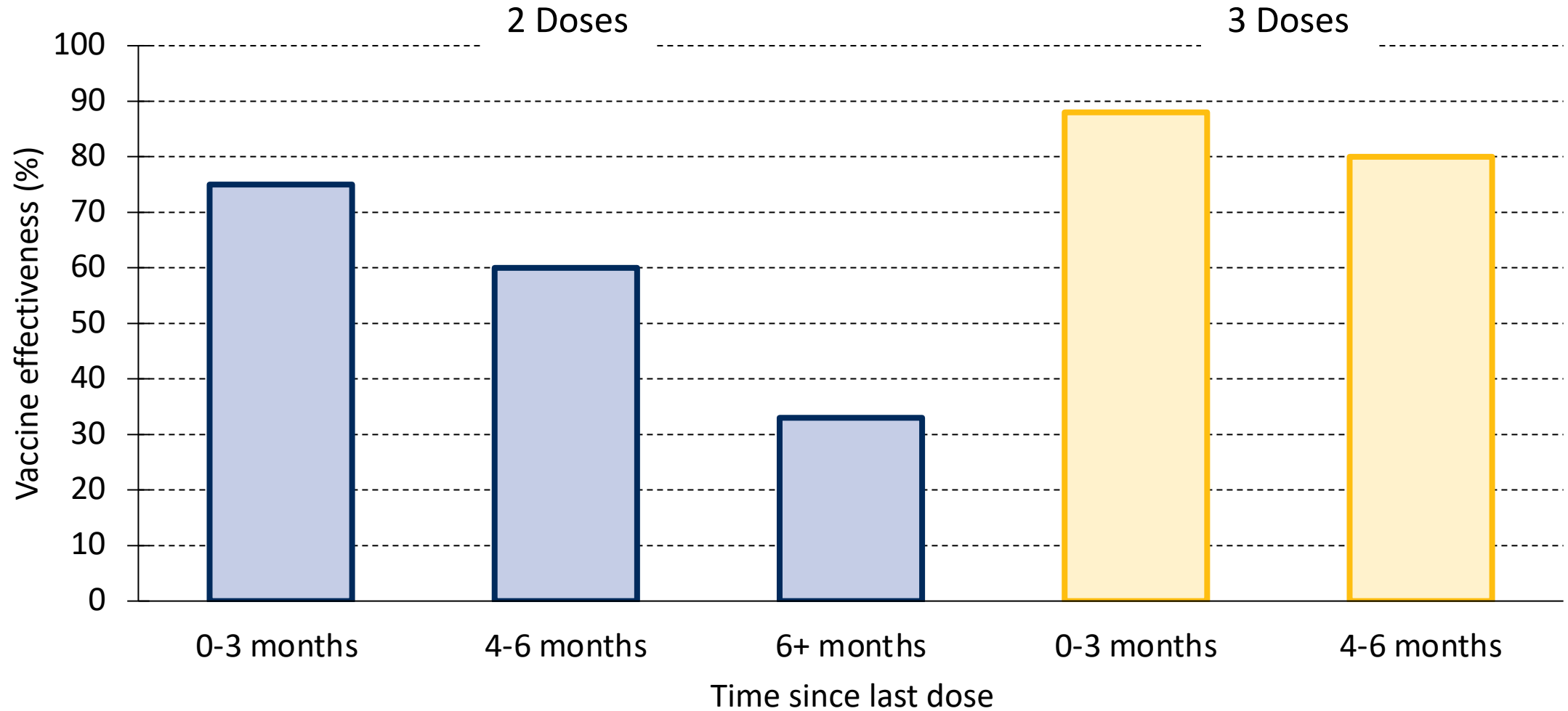


## COVID-19 Patients in ICU



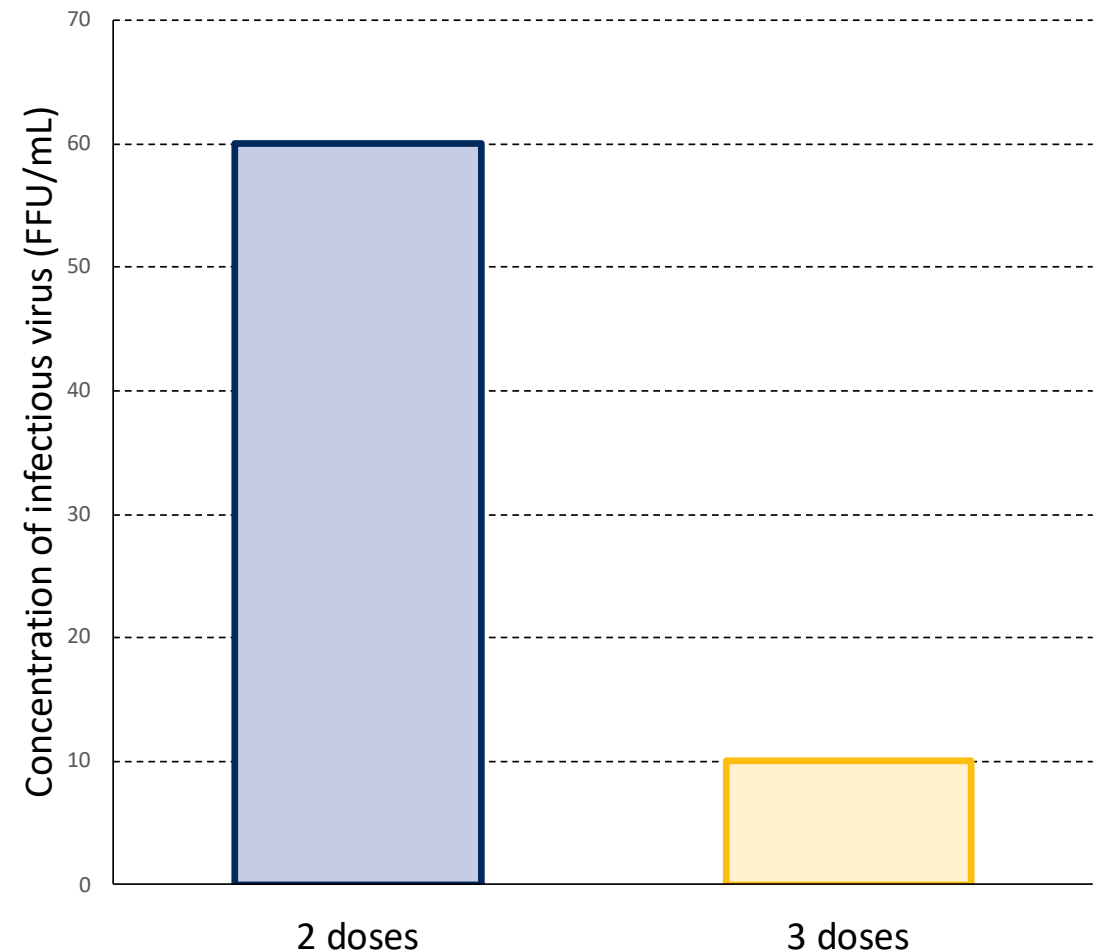


# A 3<sup>rd</sup> COVID-19 vaccine dose offers better protection against hospital admission due to Omicron than 2 doses



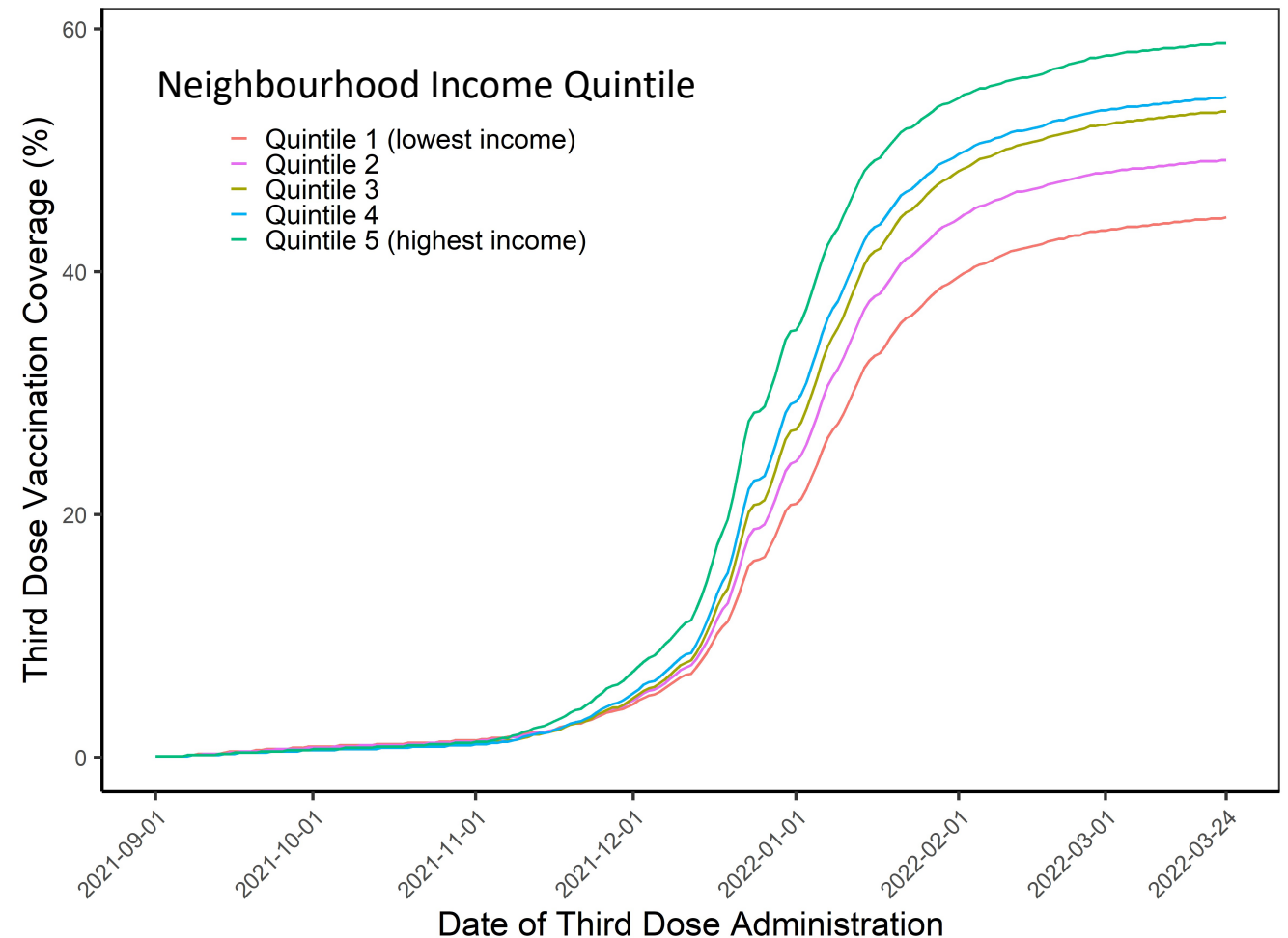
# In vaccinated people who are infected, a 3<sup>rd</sup> COVID-19 vaccine dose is likely associated with a lower probability of transmission than 2 doses

- The figure shows the average concentration of infectious virus found in samples from 91 people with Omicron infection who had received 2 COVID-19 vaccine doses and 30 people with Omicron infection who had received 3 COVID-19 vaccine doses.
- The lower concentration of infectious virus suggests that people vaccinated with 3 doses are less likely to transmit Omicron to others than people vaccinated with 2 doses.
- Shown are median concentrations of focus forming units (FFU/mL) as a measure of the viral concentration of infectious virus that could be cultivated. The higher the concentration, the more likely transmission.



# People from lower income neighbourhoods are least likely to have received a 3<sup>rd</sup> COVID-19 vaccine dose in Ontario

- The figure shows the cumulative vaccination coverage with 3<sup>rd</sup> doses from Sept 1, 2021 onwards by neighbourhood income quintile.
- Ontario's population was divided into 5 equally sized groups (quintiles) according to household income measured at neighbourhood level.
- People from lower income neighbourhoods are less likely to have received a 3<sup>rd</sup> COVID-19 vaccine dose than those from higher income neighbourhoods.



# Key findings

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# Contributors

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