

# Update on COVID-19 Projections

Science Advisory and Modelling Consensus Tables

March 17, 2022

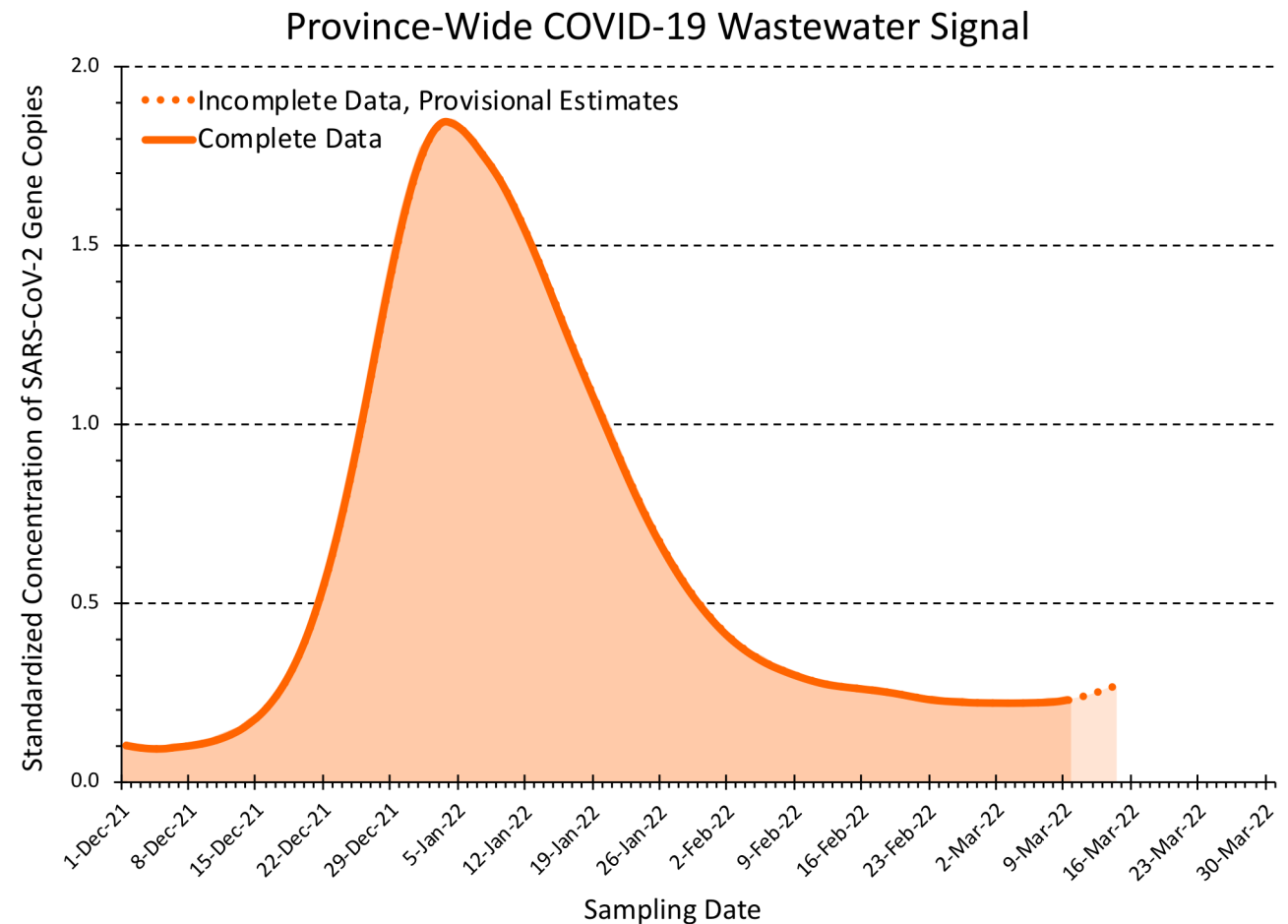


## Key findings

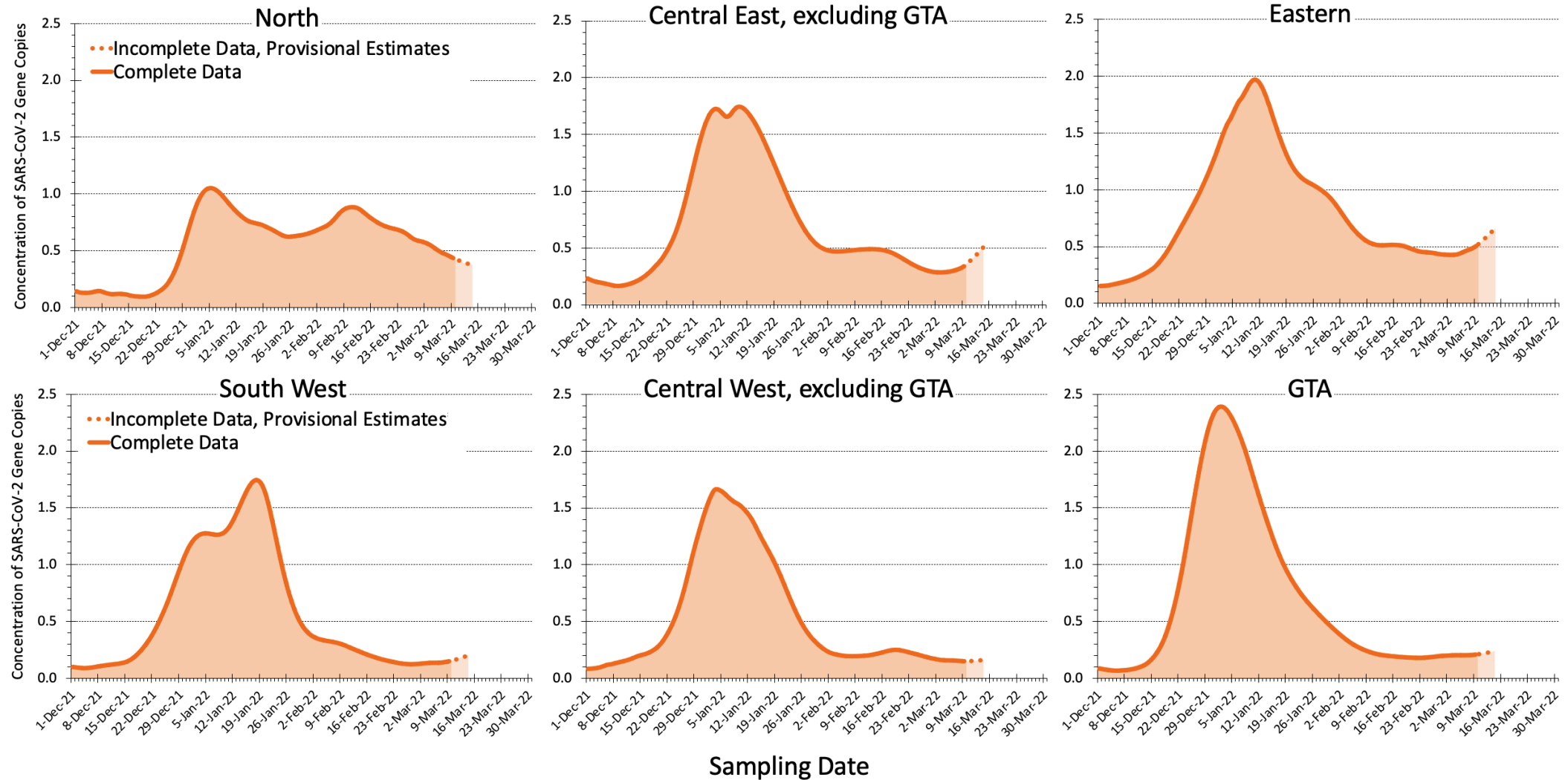
- COVID-19 case numbers, hospital and ICU occupancy have stopped declining; there is considerable regional variation.
- Given the relaxation of public health measures and consequent increase in transmission, hospital and ICU occupancy will likely increase over the next few weeks, but less than in January 2022 and for a limited period of time if changes in behaviour are only moderate.
- The extent of this increase, and of a person's risk of contracting COVID-19, will depend on the number of close contacts (especially indoors without masking), vaccination status, and the spread of the more transmissible BA.2 subvariant.
- Older adults, immunocompromised, unvaccinated and marginalized individuals and groups are still susceptible to severe illness from COVID-19.
- A complete vaccine series (currently two doses in children, three doses in adults, four in long-term care residents and other eligible high-risk groups) is the best defence against getting and spreading COVID-19.

# Ontario's COVID-19 wastewater signal stopped declining and is now increasing slightly

- Based on 101 wastewater treatment plants, pumping stations and sewersheds in all 34 public health units
- Plausible range of SARS-CoV-2 infections since Dec 1, 2021, based on wastewater: 3 to 4.5 million
- Current daily number of infections estimated based on daily case growth from wastewater curve: 15,000 to 20,000
- Until mid Dec 2021, an estimated 30 to 45% of infections were reported; after change of testing strategy end of Dec 2021 an estimated 10% of infections are reported

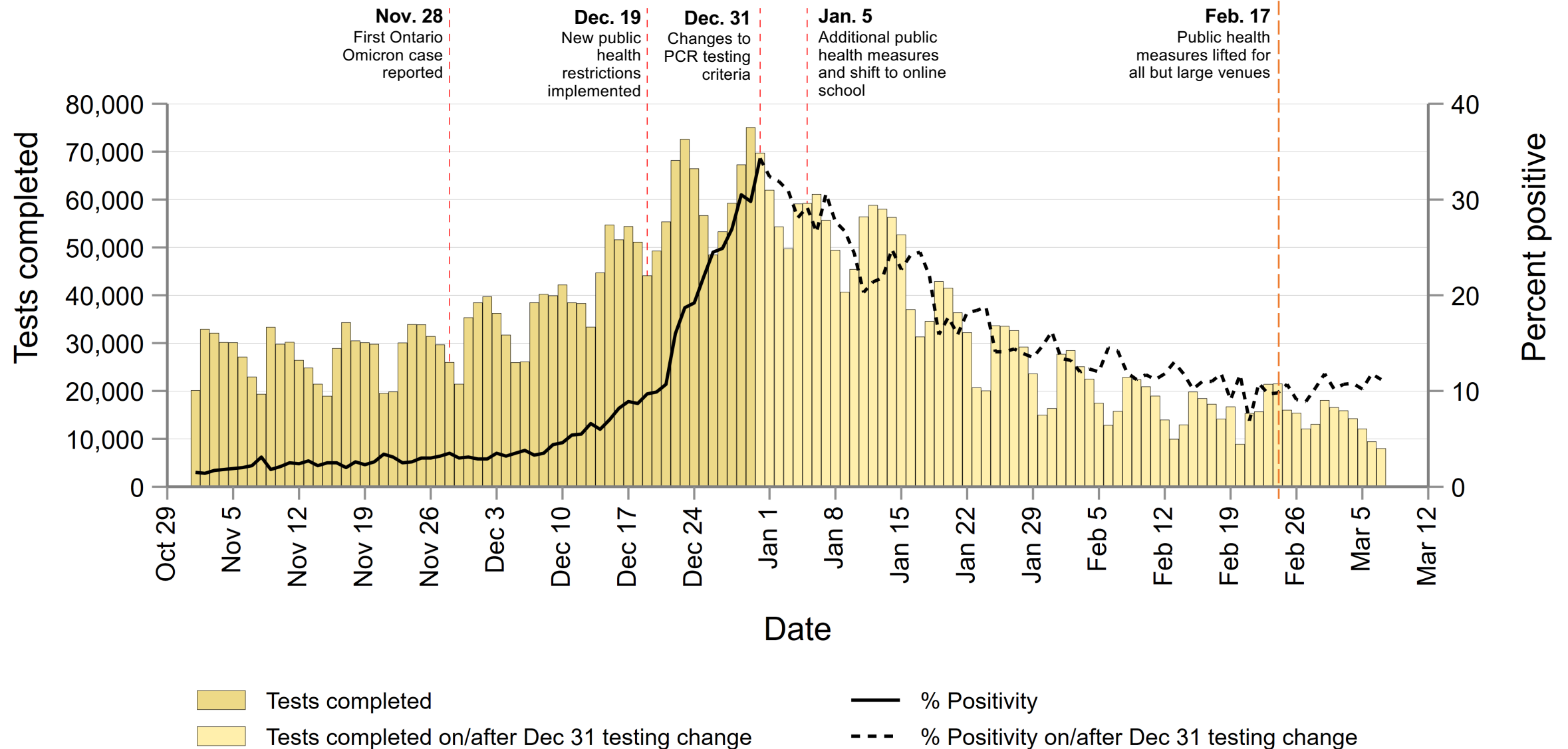


# The wastewater signal shows considerable variation across regions



Data: Wastewater Dashboard hosted by Ontario's Ministry of the Environment, Conservation and Parks (MECP)  
 Analysis: Secretariat of the Science Advisory Table (<https://covid19-sciencetable.ca/ontario-dashboard/>) – see dashboard for explanations of the methods

# Provincial test positivity has stopped declining

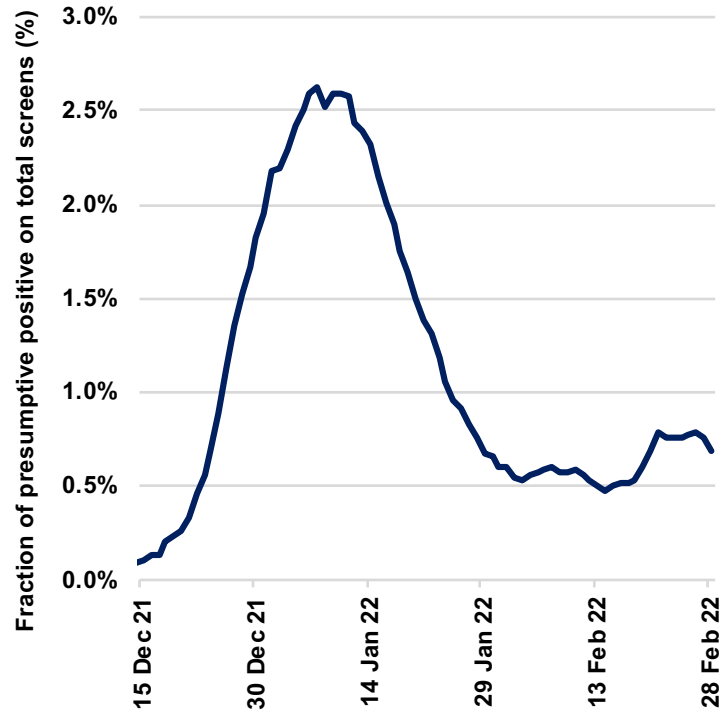


Data source: Public Health Ontario. PDNOC lab reporting

# Test positivity in selected populations is stable or increasing slightly

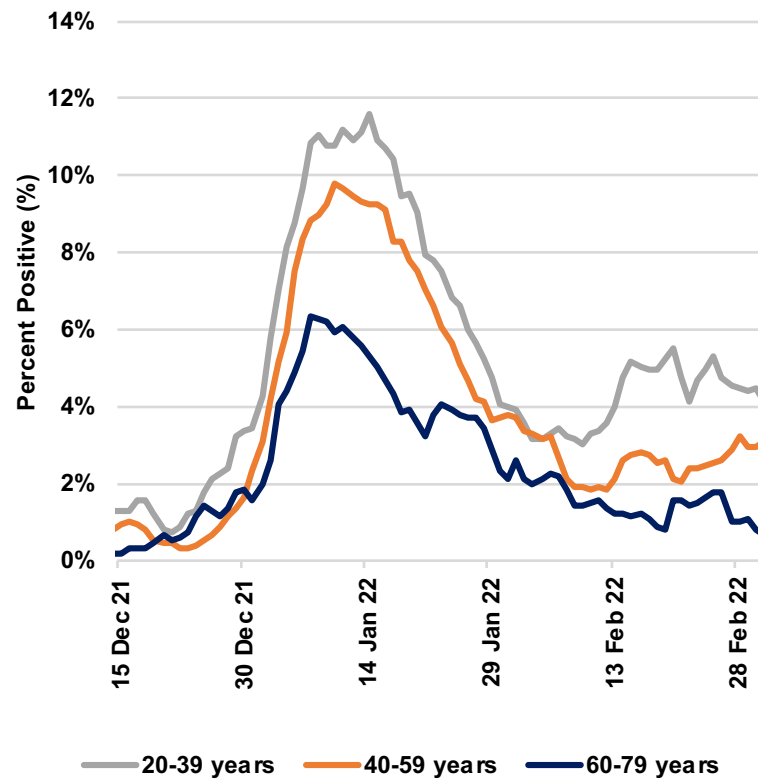
## Workplace screening

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



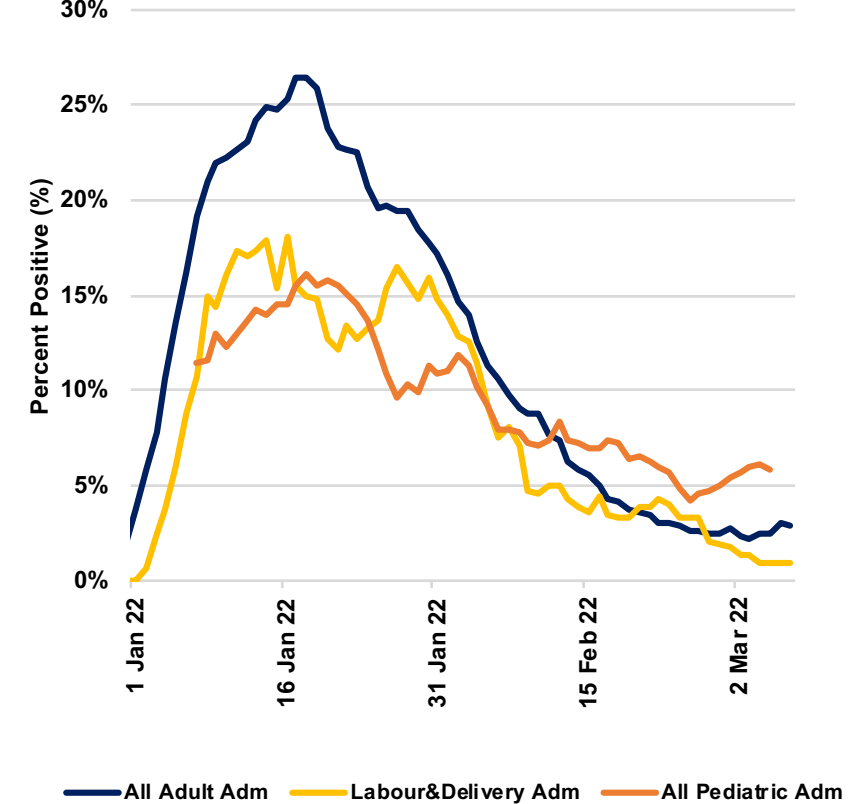
## People requiring frequent testing

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



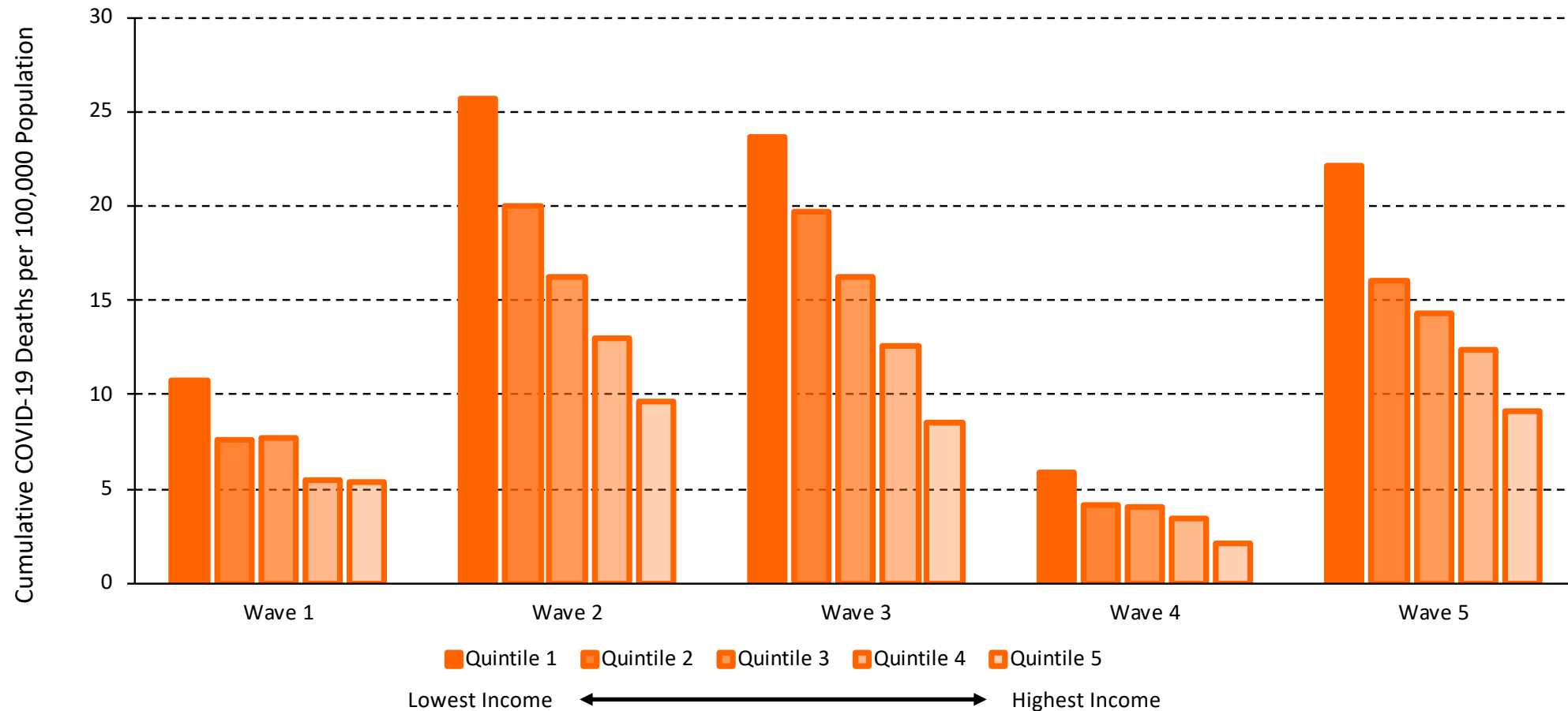
## Hospital Admission Screening

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



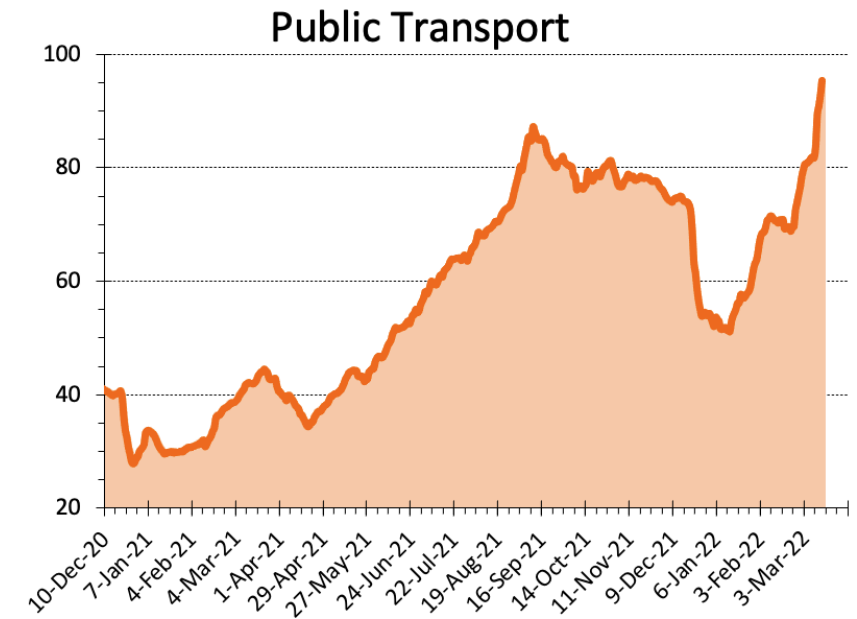
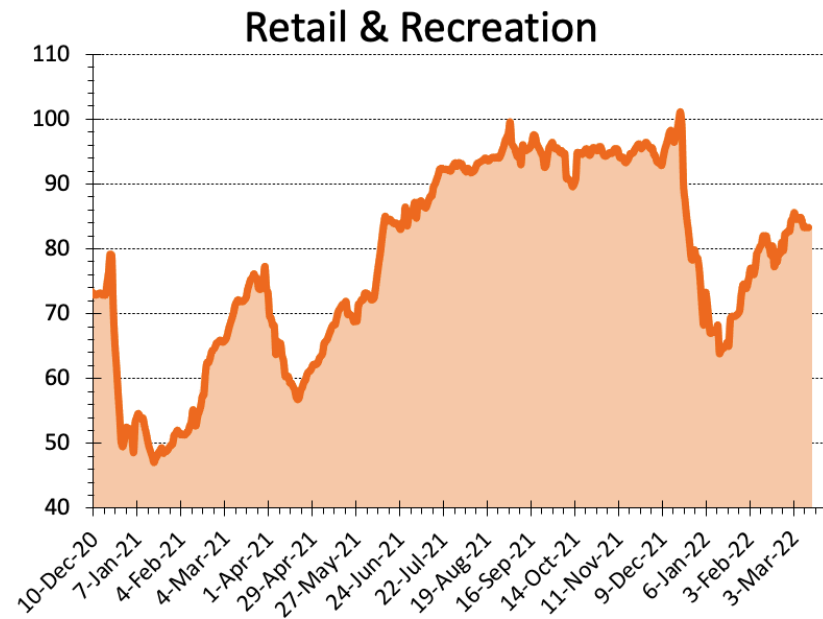
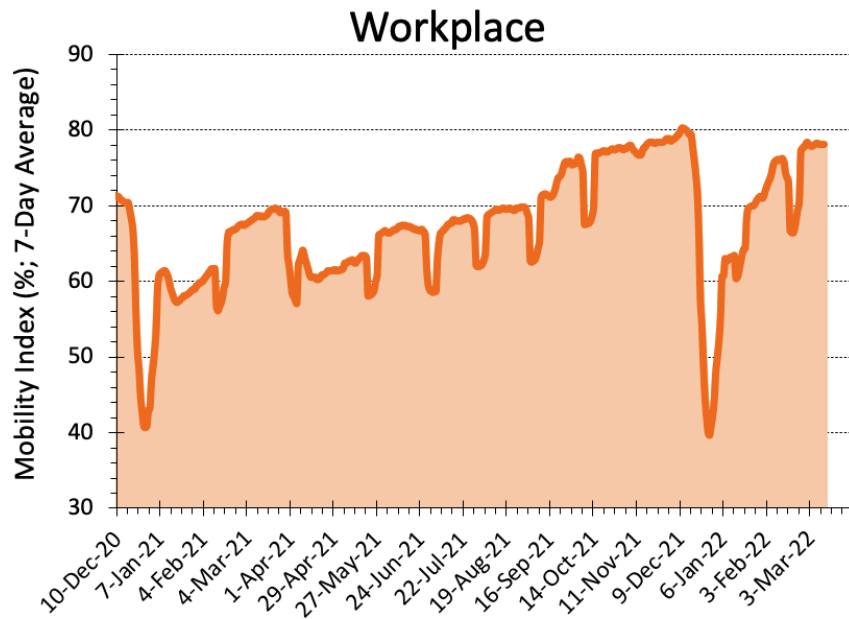
# Lower income neighbourhoods continue to be hit hardest by the pandemic, also during the fifth wave caused by Omicron

Cumulative COVID-19 Deaths per 100,000 Population per Wave



Ontario's population was divided into 5 equally sized groups (quintiles) according to household income measured at neighbourhood level. Analysis excludes residents of long-term care homes. 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 – present.

# Mobility, which is correlated with contacts, continues to increase, but retail & recreation are still below summer 2021 levels



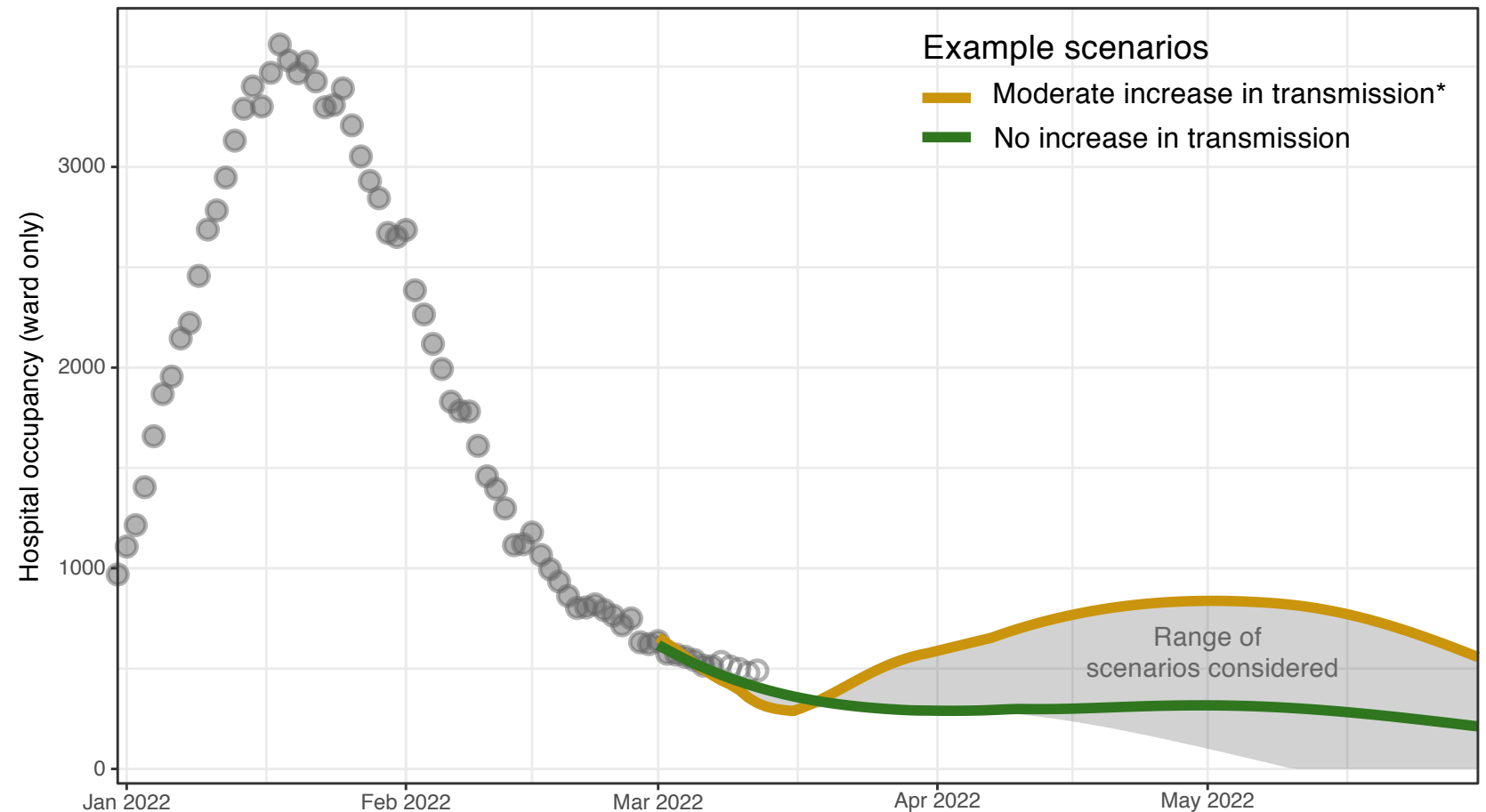
Date



# We expect hospital occupancy to increase when public health measures are lifted and behaviours change

Figure shows projections based on models from two scientific teams.

- Different models use different approaches and assumptions.
- Models are calibrated to different data including case counts, hospital occupancy, and ICU occupancy.
- Models assume 7M to 8M Ontarians will have received booster dose by end of March.
- Scenarios differ by levels of immunity and changes in contacts and behaviour.
- COVID-19 transmission, which drives hospital occupancy, can be reduced by wearing high-quality masks, full vaccination and not increasing contacts.
- There remains uncertainty on current community levels of immunity, future changes in behaviour, and future spread of the more transmissible BA.2 subvariant.

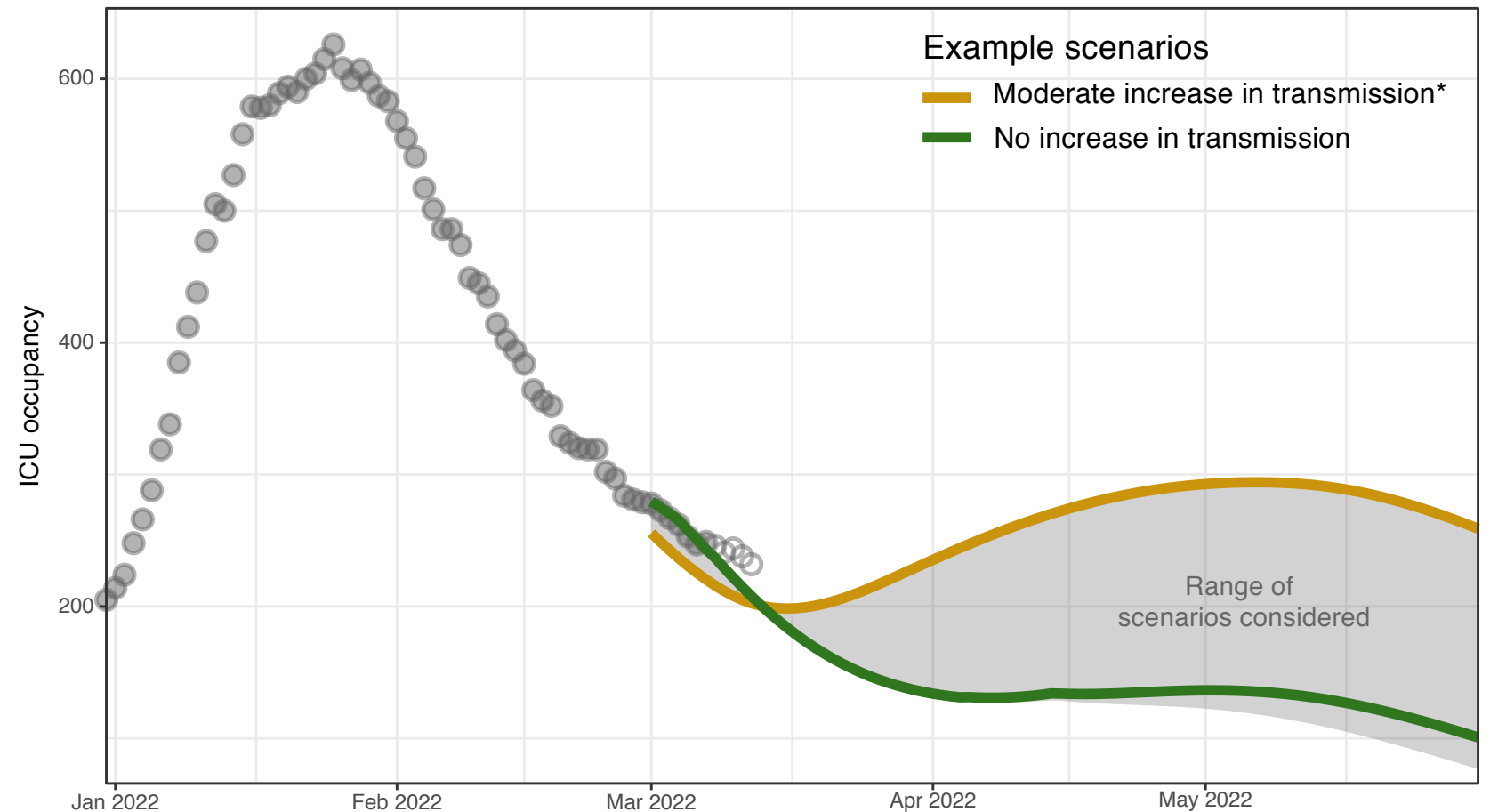


\*Examples of scenarios that could result in a moderate increase in transmission include an approximate increase in contacts of 40%, with half of contacts maskless, or an approximate 30% increase in contacts if BA.2 becomes dominant, with half of contacts maskless.

# We expect ICU occupancy to increase when public health measures are lifted and behaviours change

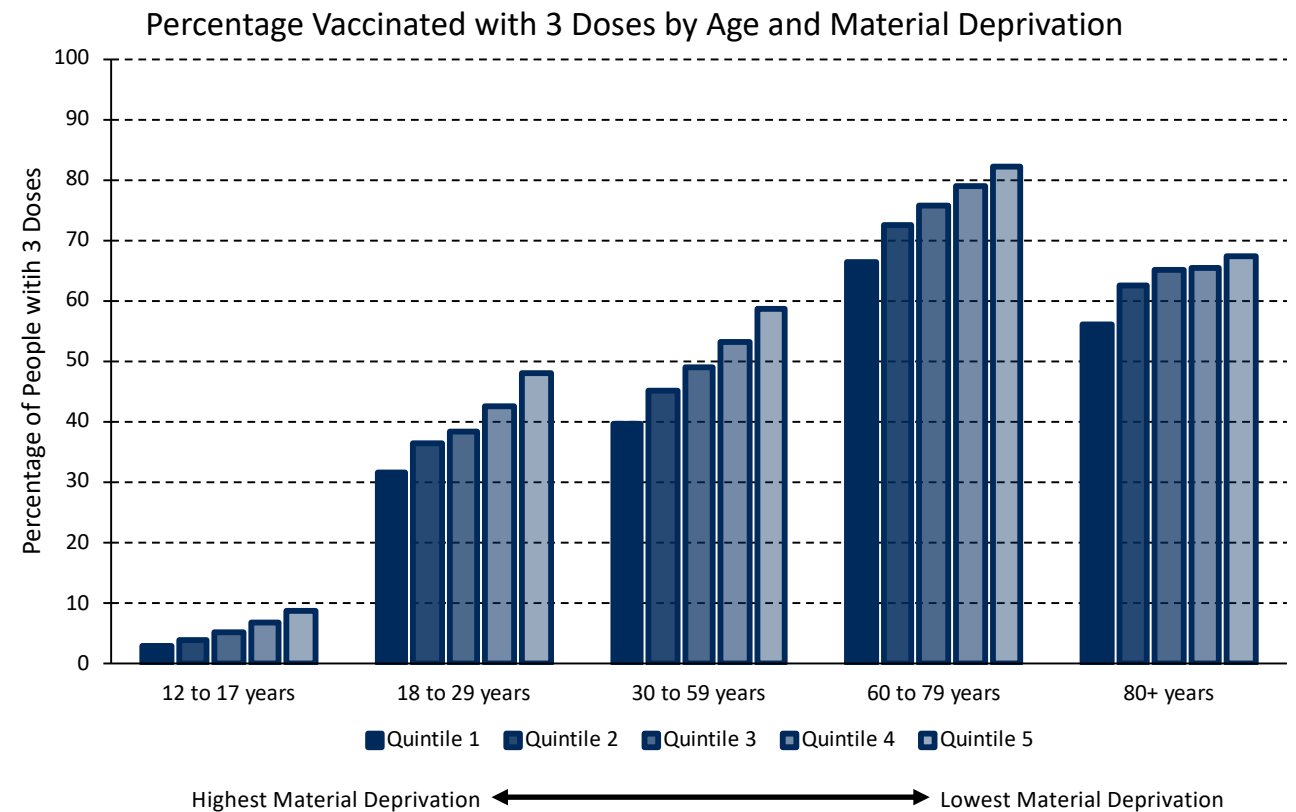
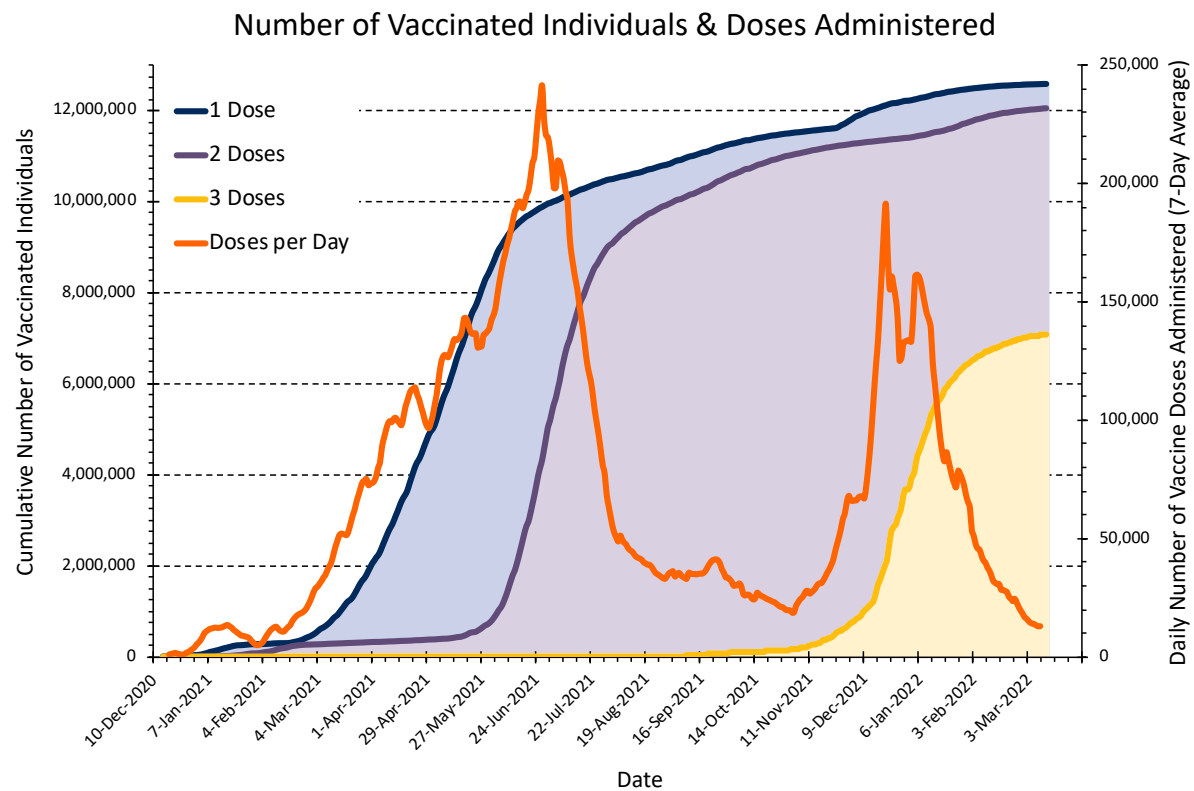
Figure shows projections based on model from two scientific teams.

- Models are calibrated to different data including case counts, hospital occupancy, and ICU occupancy.
- Models assume 7M to 8M Ontarians will have received booster dose by end of March.
- Range of scenarios shown correspond to scenarios in previous slide on hospital occupancy.
- COVID-19 transmission, which drives ICU occupancy, can be reduced by wearing high-quality masks, full vaccination and not increasing contacts.
- There remains uncertainty on current community levels of immunity, future changes in behaviour, and future spread of the more transmissible BA.2 subvariant.



\*Examples of scenarios that could result in a moderate increase in transmission include an approximate increase in contacts of 40%, with half of contacts maskless, or an approximate 30% increase in contacts if BA.2 becomes dominant, with half of contacts maskless.

# Vaccine coverage with 3<sup>rd</sup> doses has plateaued in all age groups and is lower in marginalized communities

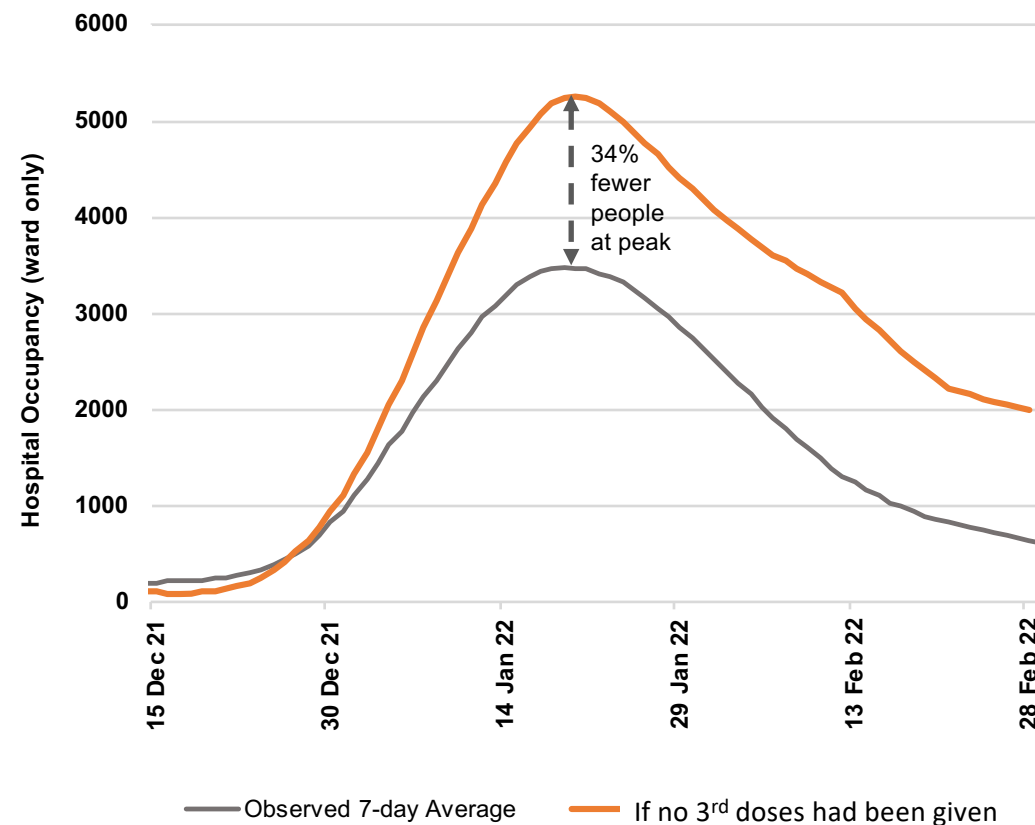


Ontario's population was divided into 5 equally sized groups (quintiles) according to material deprivation measured at neighbourhood level. Analysis excludes residents of long-term care homes.

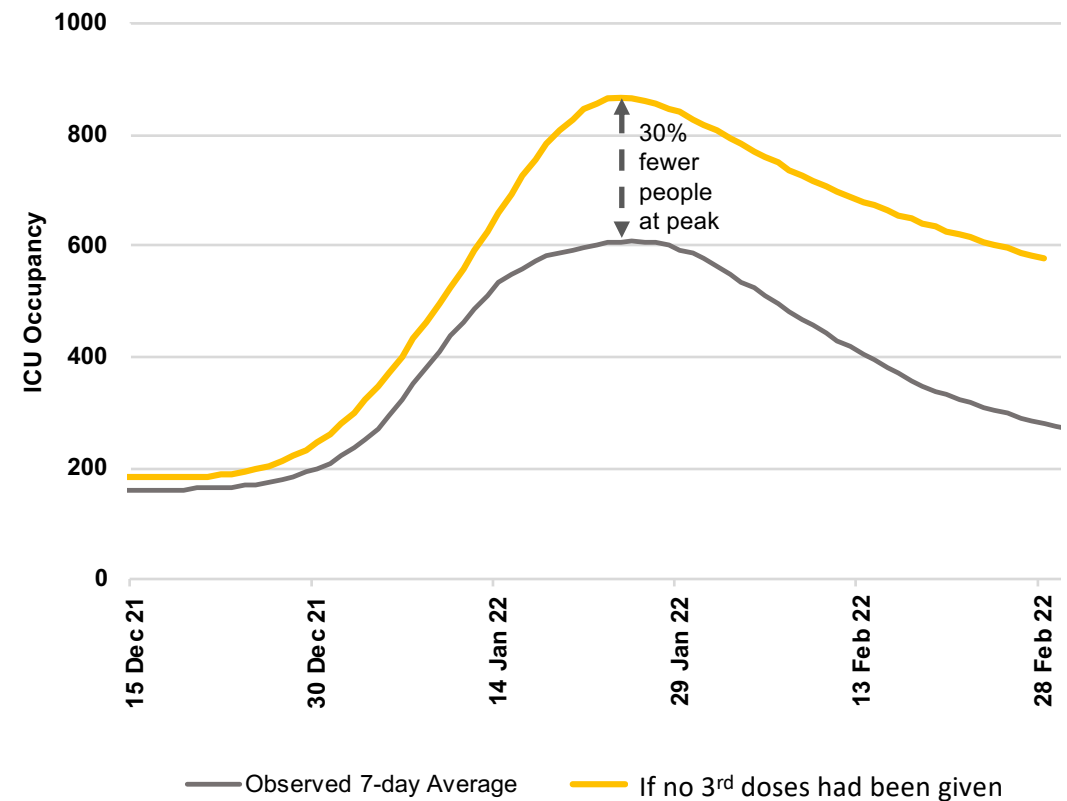
Data: <https://data.ontario.ca> and Public Health Ontario  
 Analysis: Secretariat of the Science Advisory Table (<https://covid19-sciencetable.ca/ontario-dashboard/>)

# Modelling suggests that 3<sup>rd</sup> doses substantially reduced COVID-19 hospitalization and ICU occupancy

## COVID-19 hospital occupancy

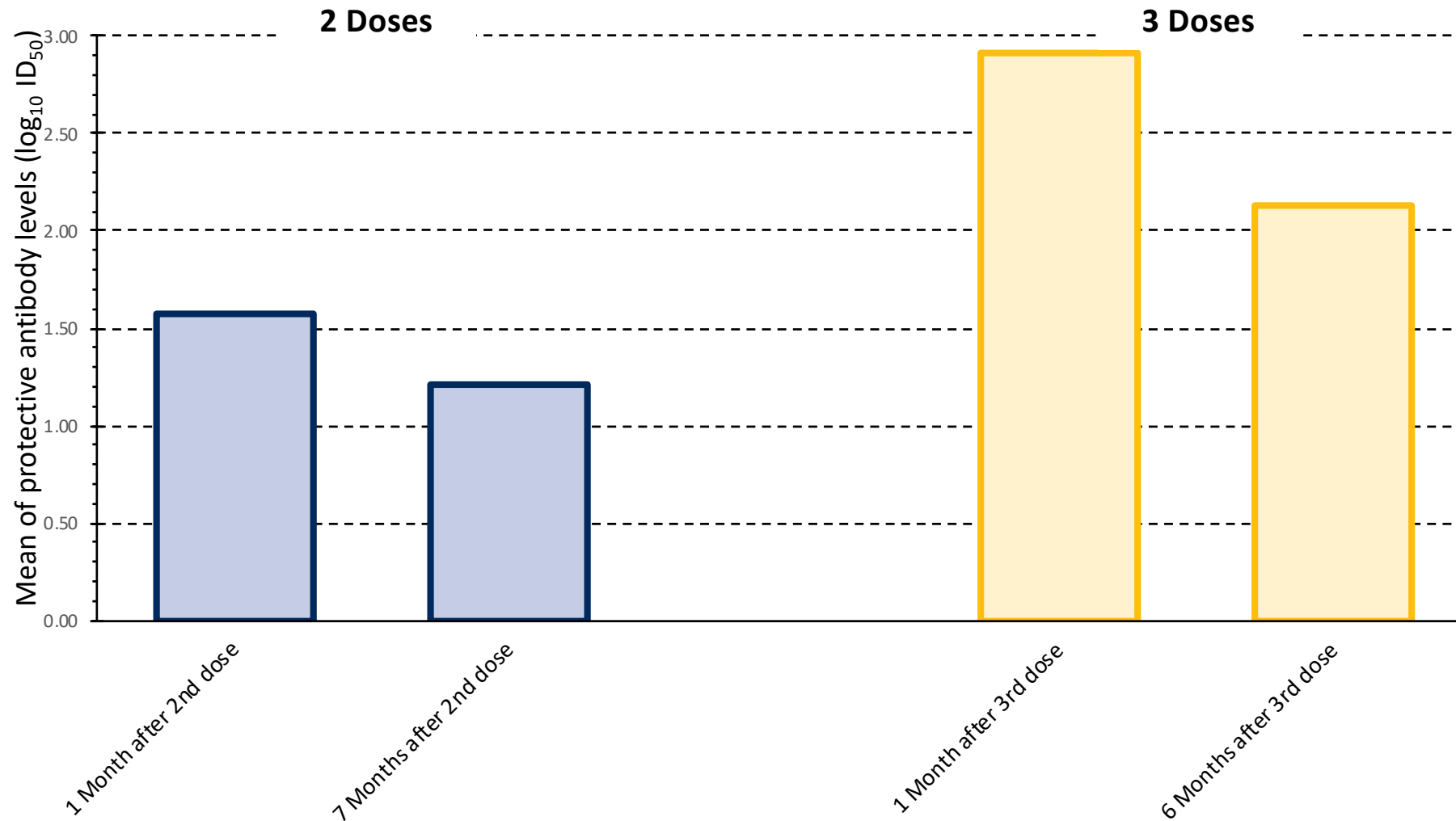


## COVID-19 ICU occupancy



The orange and yellow curves show the estimated hospital occupancy (wards only) and ICU occupancy in Ontario that would have occurred if no 3<sup>rd</sup> doses had been given. The grey curves show the 7-day average of hospital and ICU occupancy observed in Ontario during the Omicron wave.

# A 3<sup>rd</sup> COVID-19 vaccine dose offers better protection against Omicron infection over time than 2 doses



Shown are mean log<sub>10</sub> neutralizing antibody titers against Omicron over time after Moderna COVID-19 mRNA vaccine  
Adapted from: Pajon et al, N Engl J Med 2022 (<https://www.nejm.org/doi/full/10.1056/NEJMc2119912>)

# Future scenarios in Ontario will depend on population immunity, the virulence and severity of future variants

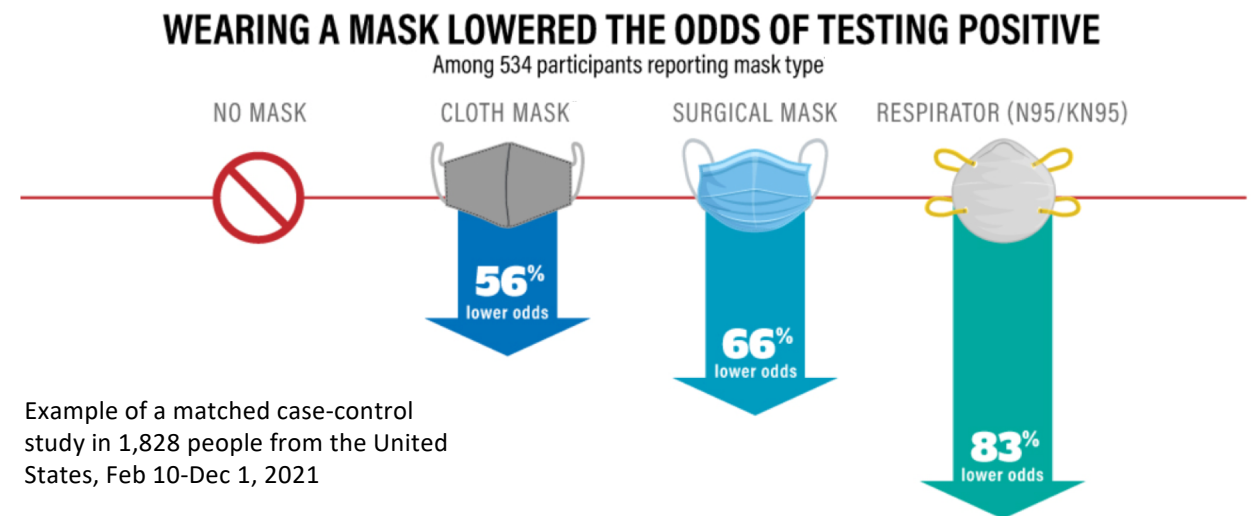
The severity of COVID-19 experienced in a population (risk of serious outcomes: hospitalization, ICU admission and death) will depend on:

1. The immunity of the population resulting from vaccination and previous infection
2. The virulence of the variant (the likelihood that the variant will cause serious outcomes)



# Masks are still an effective public health measure to 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 SARS-CoV-2 transmission in places where people gather indoors.
- Recent studies from the United States analysed the impact of mask wearing 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 others.
- Community benefits from masking are most pronounced when adopted widely.



# Ontario built strong pandemic control tools, which can be used to maintain readiness

Ontarians should:

- Ensure that they have a complete vaccine series (includes three doses in adults, four in eligible, high-risk groups).
- Use high-quality masks whenever necessary to protect vulnerable people or themselves.
- Stay home when sick or symptomatic.

Ontario should:

- Continue improvement of ventilation and air filtration in public indoor spaces.
- Create rapid paths to testing and treatment (e.g. Paxlovid, antibodies) with a focus on equity.
- Be prepared to renew mass COVID-19 vaccination campaigns if needed.
- Be prepared to renew vaccine certificates requiring a recent booster dose for high-risk settings if needed.
- Be prepared to reintroduce mask mandates if needed.
- Maintain protective measures that are appropriate for the general health and wellbeing of those living and working in congregate care settings such as long-term care.



# Ontario remains vulnerable as long as the global pandemic continues

- New variants are more likely to develop if a large number of people who are immune-compromised do not receive appropriate treatment and vaccination
  - 2-3% of global population is immunosuppressed
  - Many of the more than 40 million people living with HIV/AIDS are not appropriately treated
- Although 56% of the world population has now received two COVID-19 vaccine doses, that is still too few to build sufficient immunity globally.
  - Broad-acting and intranasal vaccines now under development could play a key role in the future.
- Global surveillance and public health controls remain insufficient.
  - Global wastewater surveillance and genomic sequencing will continue to be essential in the future.
  - Improved ventilation, air filtration and adoption of high-quality masks will continue to be important worldwide.

## Key findings

- COVID-19 case numbers, hospital and ICU occupancy have stopped declining; there is considerable regional variation.
- Given the relaxation of public health measures and consequent increase in transmission, hospital and ICU occupancy will likely increase over the next few weeks, but less than in January 2022 and for a limited period of time if changes in behaviour are only moderate.
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- Older adults, immunocompromised, unvaccinated and marginalized individuals and groups are still susceptible to severe illness from COVID-19.
- A complete vaccine series (currently two doses in children, three doses in adults, four in long-term care residents and other eligible high-risk groups) is the best defence against getting and spreading COVID-19.

# Contributors

- **Creative Destruction Lab-Rapid Screening Consortium**
- **Hospital Infection Prevention And Control (IPAC) Teams and Data Analytics:** Suhair AlShanteer, Michelle Barton Forbes, Steven Bernard, Craig Campbell, Michael Chow, Robert Crawford, Gerald Evans, Jayvee Guerrero, Kevin Katz, Erin Kelleher, Sarah Khan, Ethel Lagman, Melanie Lavigne, Kirk Leifso, Sheri Levesque, Reena Lovinsky, Tracy Macleod, Jennifer McCallum, Dominik Mertz, Vydia Nankoosingh, Kasey Parker, Paul Sandor, Michelle Science, Shawna Silver, Celia So, Rachel Solomon, Nisha Thampi, Alon Vaisman, Elisa Vicencio, Eugene Wong
- **ICES:** Sarah Buchan, Hannah Chung, Kevin Brown, Peter Austin, Deshayne Fell, Jonathan Gubbay, Sharifa Nasreen, Kevin Schwartz, Maria Sundaram, Mina Tadrous, Kumanan Wilson, Sarah Wilson, Jeff Kwong
- **McMasterU:** Irena Papst, Ben Bolker, Jonathan Dushoff, David Earn
- **Modelling Consensus Table:** Kali Barrett, Isha Berry, Sharmistha Mishra, Ashleigh Tuite, Beate Sander
- **Ontario Health:** Erik Hellsten, Stephen Petersen, Anna Lambrinos
- **Science Advisory Table:** Peter Jüni, Nicolas Bodmer, Karen Born, Shujun Yan, Pavlos Bobos
- **TAHSN Human Resources Network:** Sunnybrook Health Sciences Centre, North York General Hospital, Trillium Health Partners, Women's College Hospital, Hospital for Sick Children, Unity Health Network, Humber River Regional Hospital, Scarborough Health Network
- **Western University/London Health Sciences Centre:** Lauren Cipriano, Wael Haddara
- **St. Michael's Hospital/University of Toronto:** Bruno R. da Costa
- **COVID-19 Heterogeneity Research Group:** Huiting Ma, Adrienne Chan, Stefan Baral, Beate Sander, Sharmistha Mishra

# Content and review by Modelling Consensus and Scientific Advisory Table members and secretariat

Beate Sander,\* Peter Jüni, Brian Schwartz,\* Upton Allen, Vanessa Allen, Kali Barrett, Isha Berry, Pavlos Bobos, Nicolas Bodmer, Isaac Bogoch, Karen Born, Kevin Brown, Sarah Buchan, Swetaprovo Chaudhuri, Yoojin Choi, Lauren Cipriano, Troy Day, David Earn,\* Gerald Evans, Jennifer Gibson, Anne Hayes,\* Michael Hillmer, Jessica Hopkins, Jeff Kwong, Fiona Kouyoumdjian, Audrey Laporte, John Lavis, Gerald Lebovic, Brian Lewis, Stephanie Lockert, Linda Mah, Kamil Malikov, Doug Manuel, Roisin McElroy, Allison McGeer, Michelle Murti, John McLaughlin, Sharmistha Mishra, Andrew Morris, Samira Mubareka, Christopher Mushquash, Ayodele Odutayo, Menaka Pai, Alyssa Parpia, Samir Patel, Anna Perkhun, Bill Praamsma, Justin Presseau, Fahad Razak, Rob Reid, Paula Rochon, Laura Rosella, Michael Schull, Arjumand Siddiqi, Chris Simpson, Arthur Slutsky, Janet Smylie, Robert Steiner, Ashleigh Tuite, Tania Watts, Ashini Weerasinghe, Scott Weese, Xiaolin Wei, Jianhong Wu, Diana Yan, Emre Yurga

\*Chairs of Scientific Advisory, Evidence Synthesis, and Modelling Consensus Tables

For table membership and profiles, please visit the [About](#) and [Partners](#) pages on the Science Advisory Table website.