# Update on COVID-19 Projections

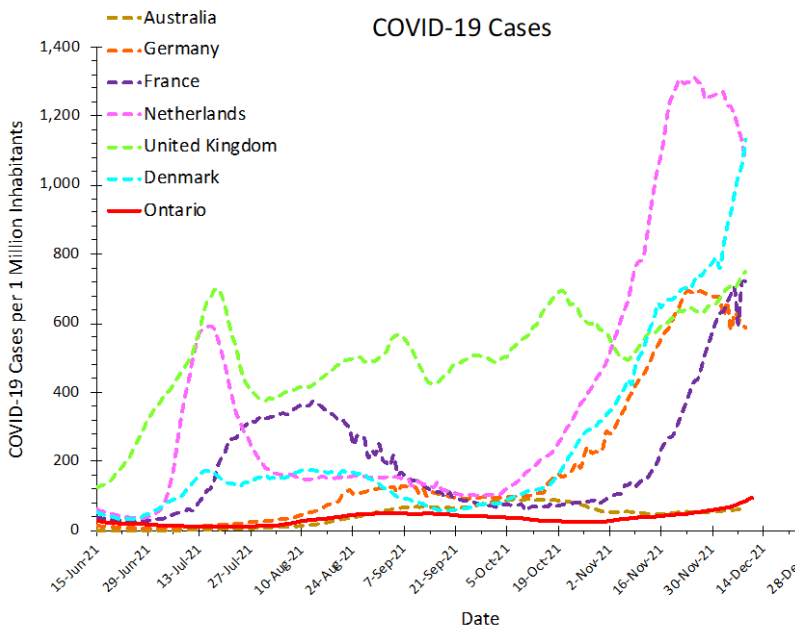
Science Advisory and Modelling Consensus Tables

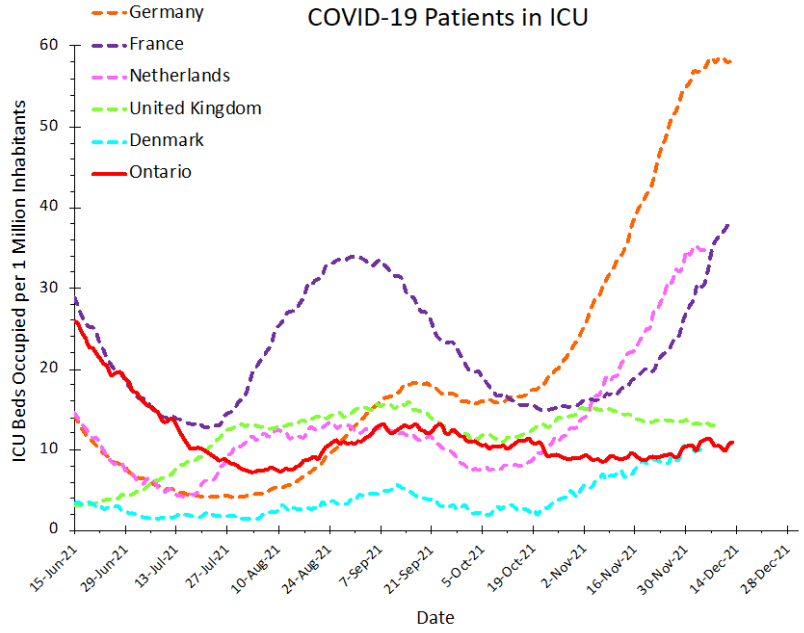
December 16, 2021

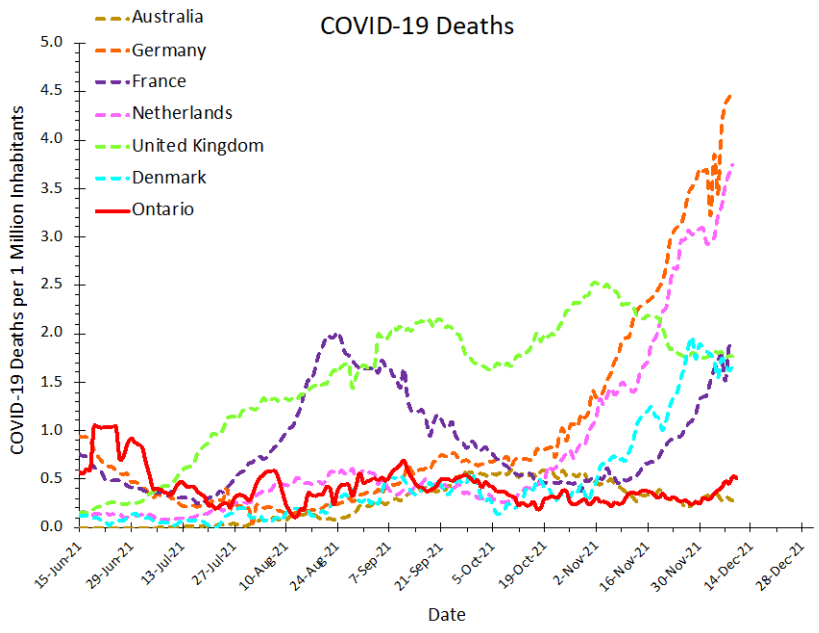
# Key findings

- Cases are climbing across most public health units. The Omicron variant will shortly become the dominant variant.
- Omicron transmits very quickly. Early evidence suggests it can produce severe disease. Without prompt intervention, ICU occupancy could reach unsustainable levels in early January.
- Although vaccines are less effective against Omicron infection, boosters can substantially increase protection. Even 2 doses likely provide strong protection against severe illness. The risk of severe illness is dramatically higher in the unvaccinated.
- We can help protect the most vulnerable with vaccination (children and boosters). Rapid rollout of booster doses is essential, with strong focus on the most vulnerable (e.g. long-term care, shelters, high-risk communities) and healthcare workers.
- Increasing vaccination is not enough to slow this wave. Circuit breakers with strong additional public health measures (at least 50% fewer contacts) and strong booster campaigns (250,000 per day) could blunt the Omicron wave. High-quality masks, physical distancing indoors, improved ventilation, and increased access to rapid testing can help buy time for boosters to take effect and keep schools open.
- Although uncertainty persists, waiting for more information will eliminate the opportunity for action.

# Rising cases, ICU occupancy, and deaths in European peer jurisdictions show potential risk



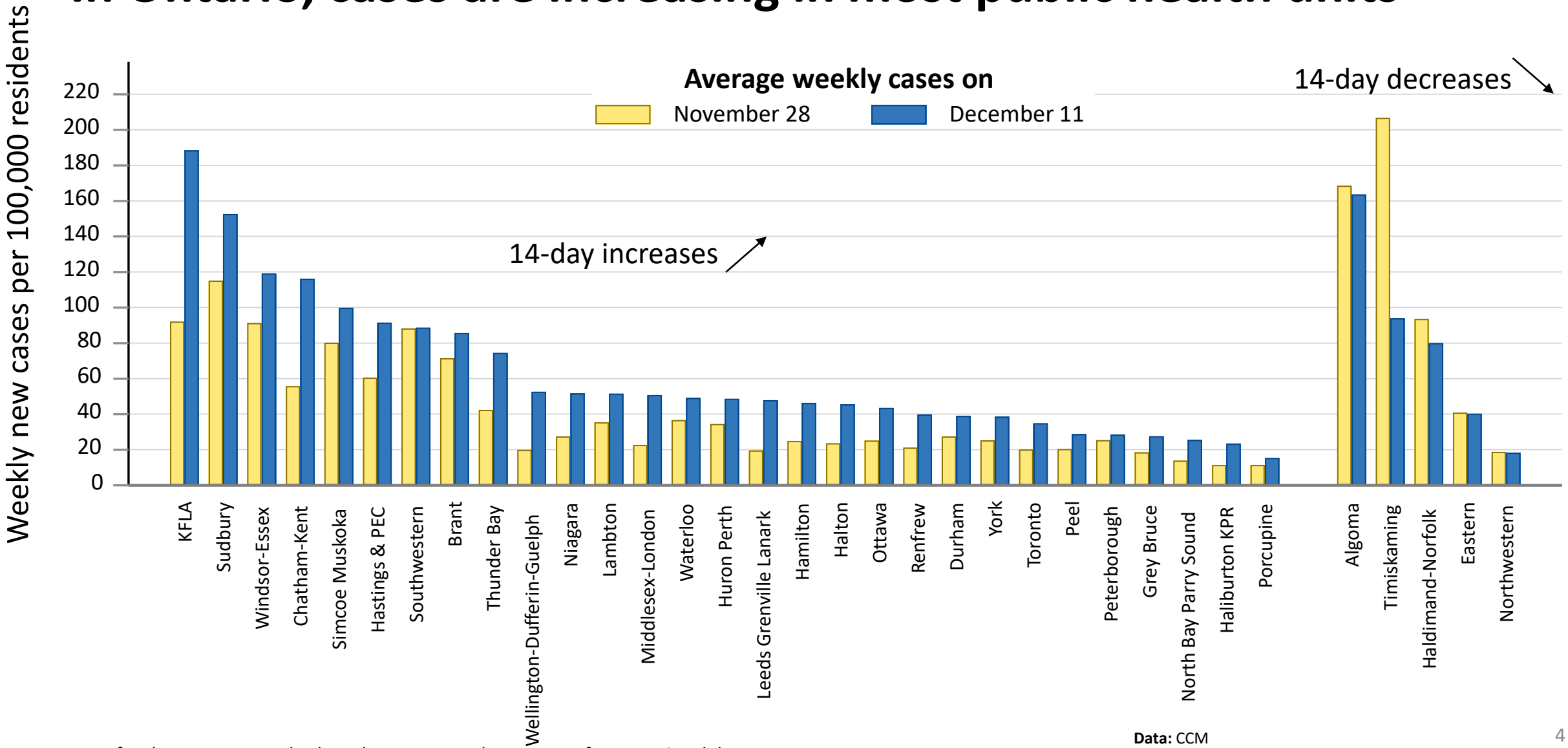




The Ontario Stringency Index (41) is similar to UK (47) and Denmark (44); the Netherlands are at 56, Australia, France and Germany are at ≥67. Ontario vaccine coverage (77% of population fully vaccinated) similar to Netherlands and Australia (~75%) and Denmark (77%), and higher than remaining peer countries (~69%).

**Data**: https://data.ontario.ca/ and https://ourworldindata.org/explorers/coronavirus-data-explorer
**Analysis**: Secretariat of the Science Advisory Table

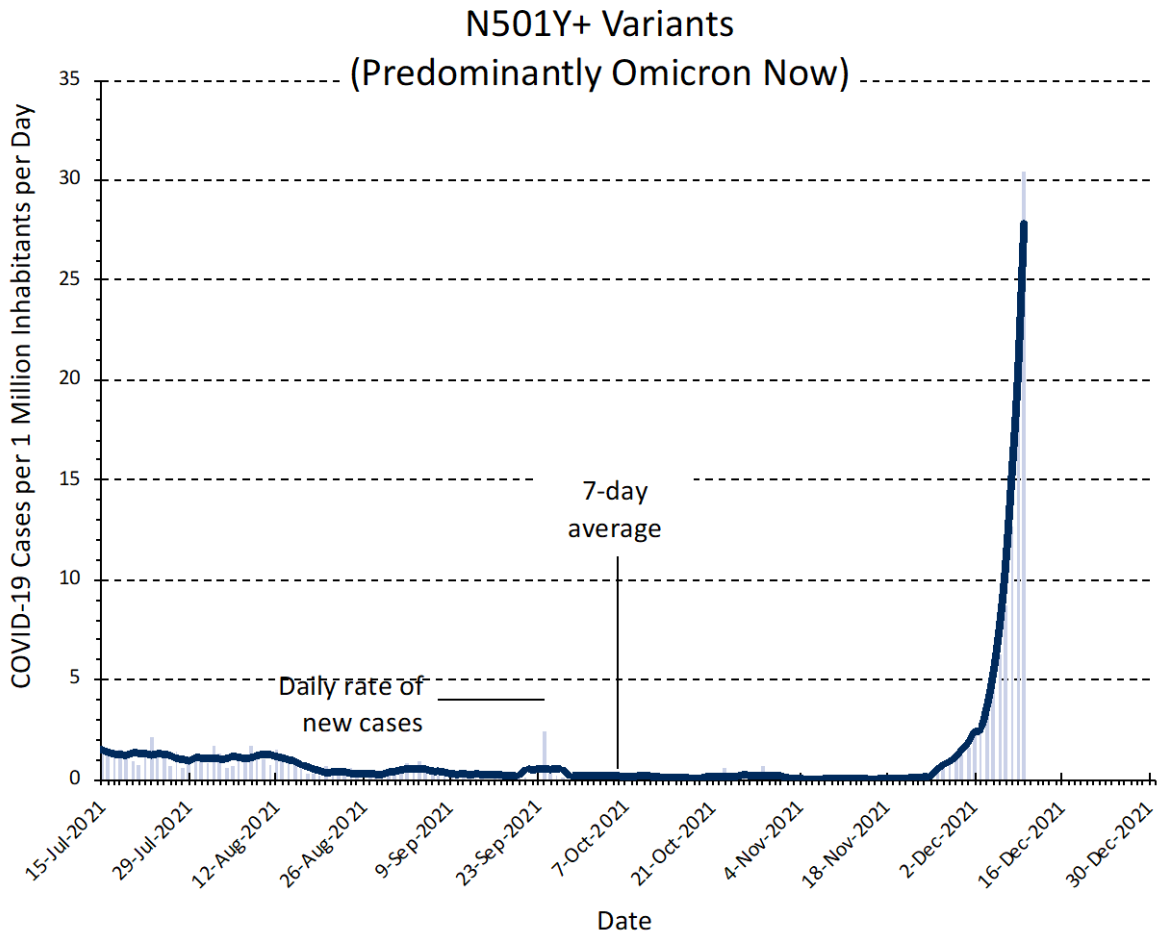
# In Ontario, cases are increasing in most public health units

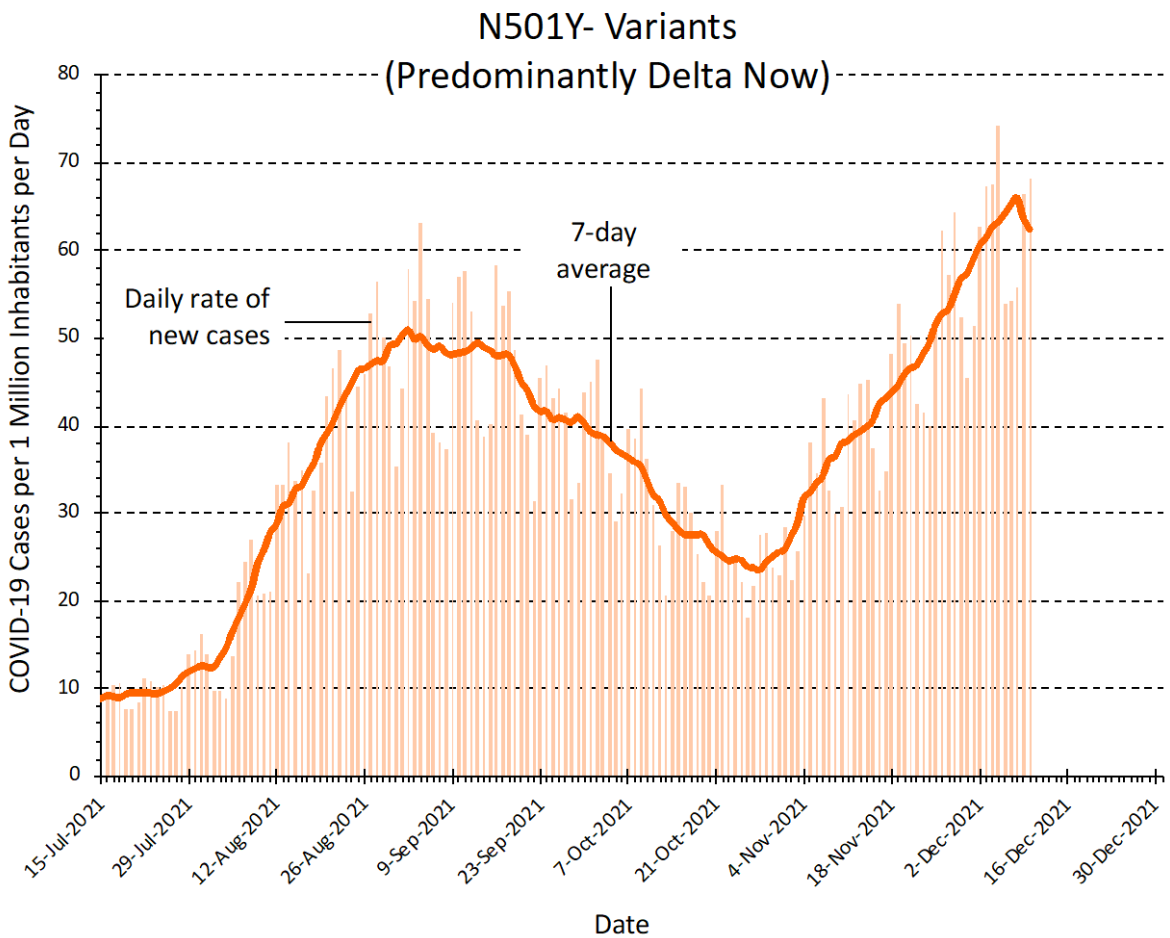



Data note: Data for the most recent day have been censored to account for reporting delays

**Data:** CCM
**Analysis:** Ontario Health

# Omicron cases are rising quickly in Ontario. Omicron will be the dominant variant this week.

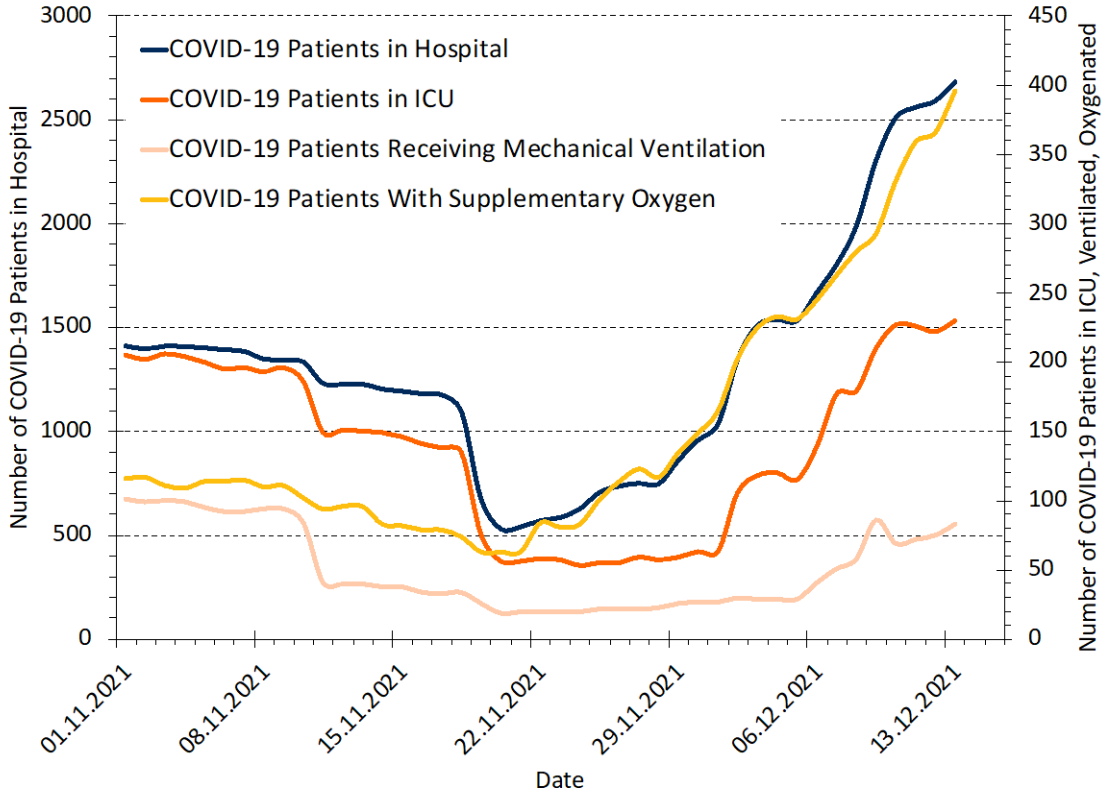


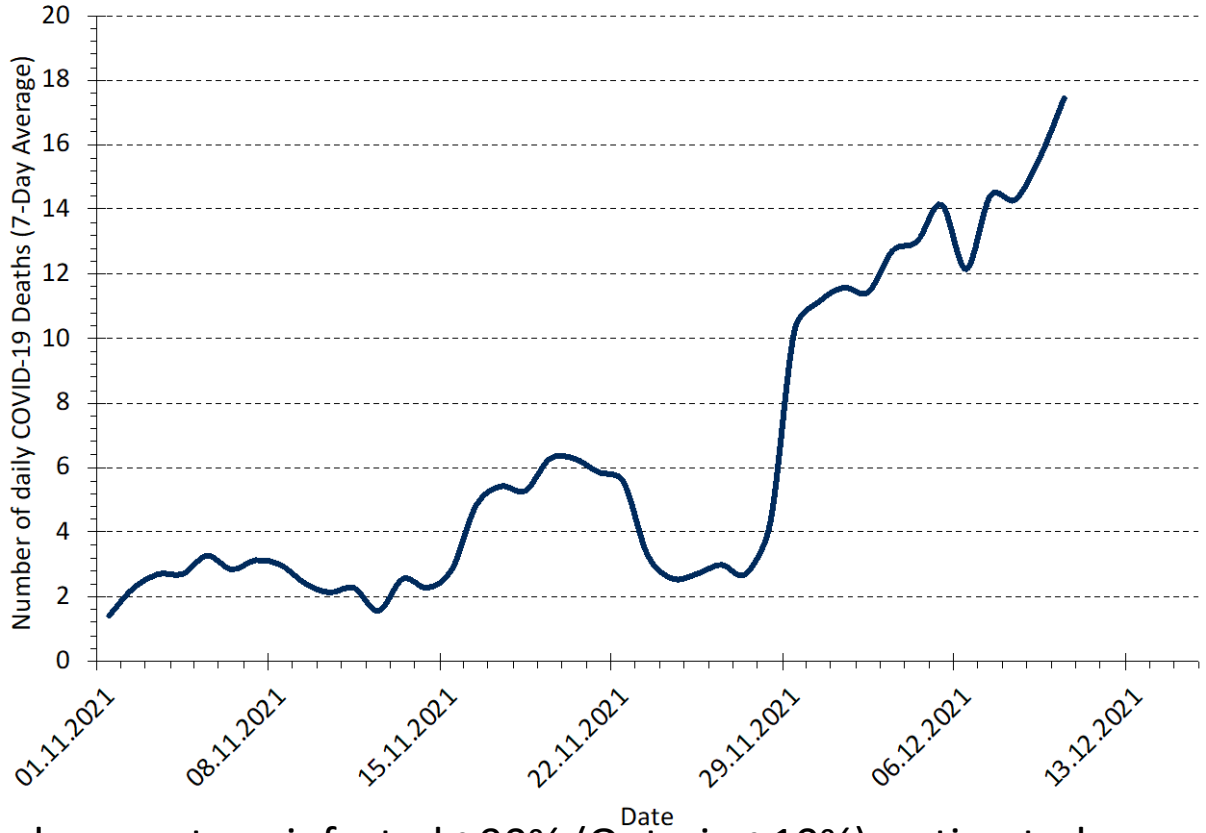

**Data**: https://data.ontario.ca
**Analysis**: Secretariat of the Science Advisory Table (https://covid19-sciencetable.ca/ontario-dashboard/)

# South Africa is cited as evidence of Omicron's lower severity, but hospitalizations, ICU occupancy, and in-hospital deaths are rising despite a younger population with some immunity

In-Hospital COVID-19 Patients in Gauteng, South Africa (15.8 Million Inhabitants)




Number of Daily COVID-19 In-Hospital Deaths in Gauteng, South Africa (15.8 Million Inhabitants)



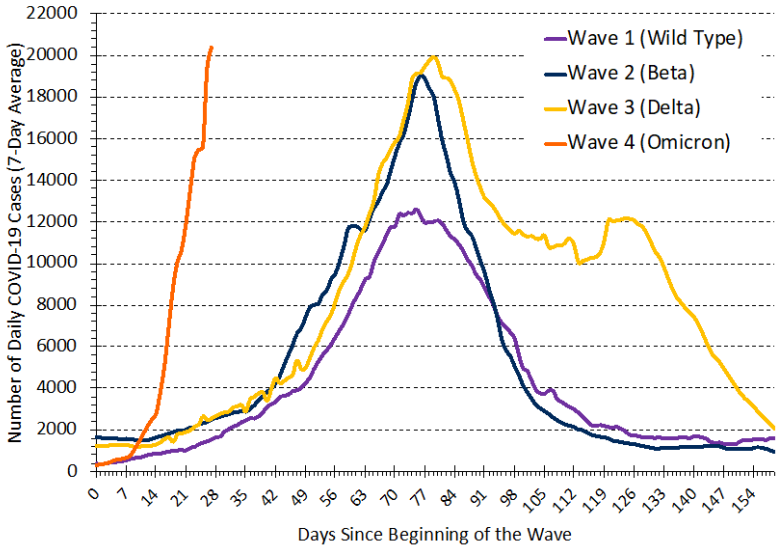

Median age in Gauteng 27 years (Ontario 41 years), estimated percentage infected ~90% (Ontario ~10%), estimated percentage highly immune among adults ~32% (Ontario ~15%)

**Analysis**: Secretariat of the Science Advisory Table

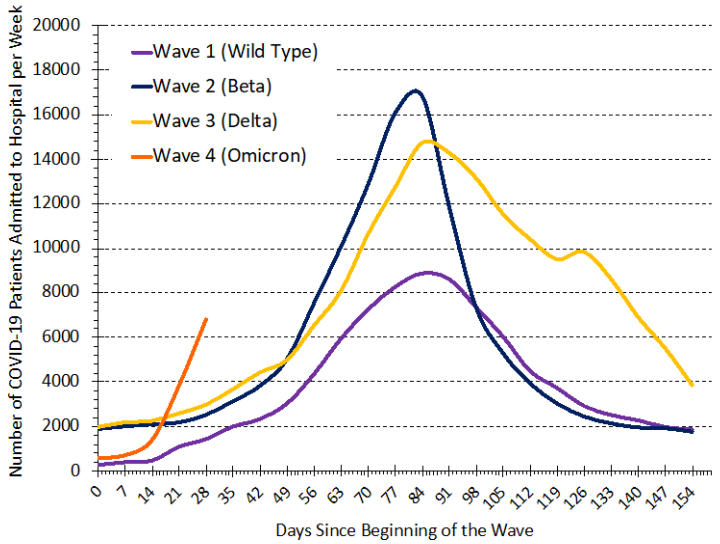
**Data**: https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/surveillance-reports/daily-hospital-surveillance-datcov-report/

# A steep rise in cases in South Africa during the current Omicron wave is followed by a steep rise in hospitalizations, while the rise in deaths currently is less steep than in previous waves

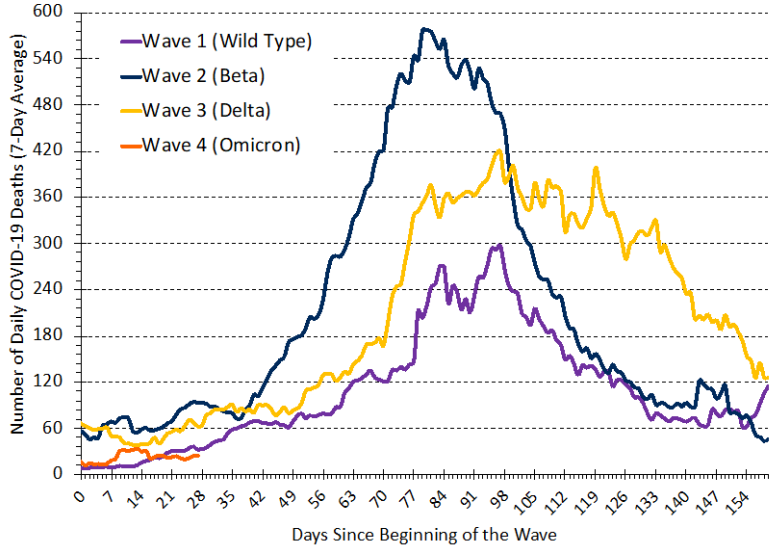
Daily COVID-19 Cases in South Africa




COVID-19 Patients Admitted to Hospital per Week in South Africa




Daily In-Hospital COVID-19 Deaths in South Africa

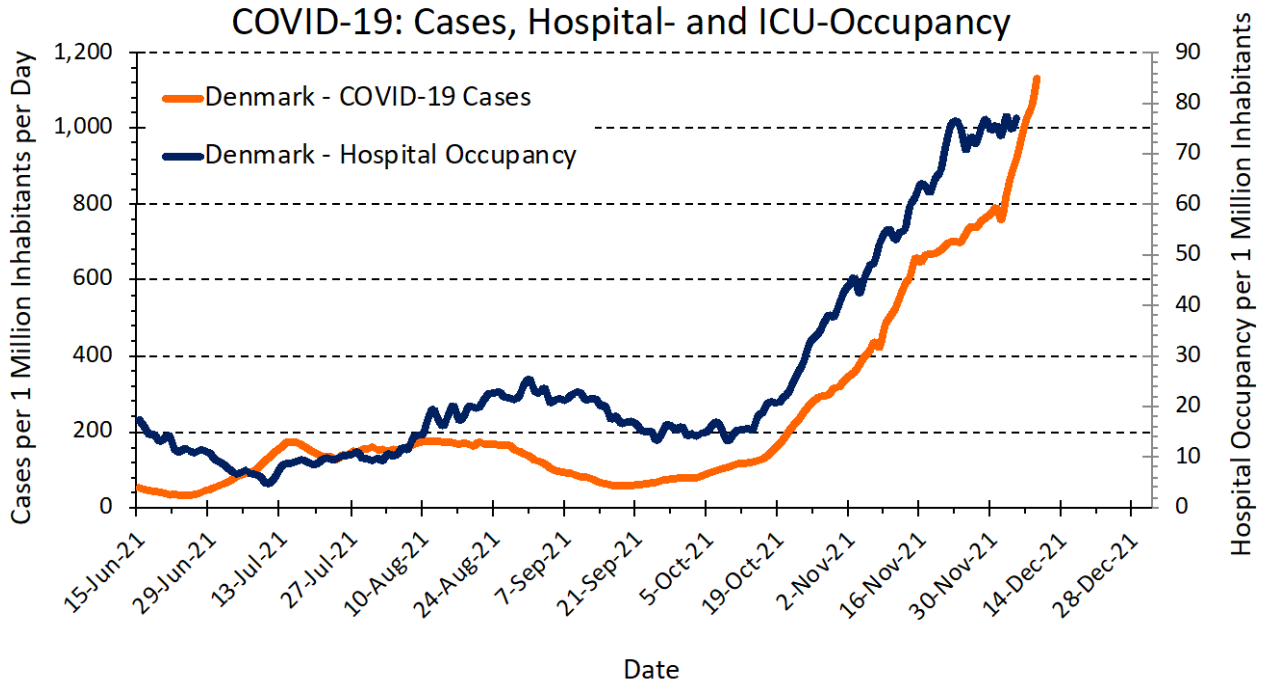



Median age in South Africa 28 years (Ontario 41 years), estimated percentage infected ~90% (Ontario ~10%), estimated percentage highly immune among adults ~32% (Ontario ~15%)

**Analysis**: Secretariat of the Science Advisory Table

**Data**: https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/surveillance-reports/daily-hospital-surveillance-datcov-report/ and https://ourworldindata.org/explorers/coronavirus-data-explorer

# Initial data from Denmark indicate that the percentage of cases requiring hospital admission is not lower with Omicron



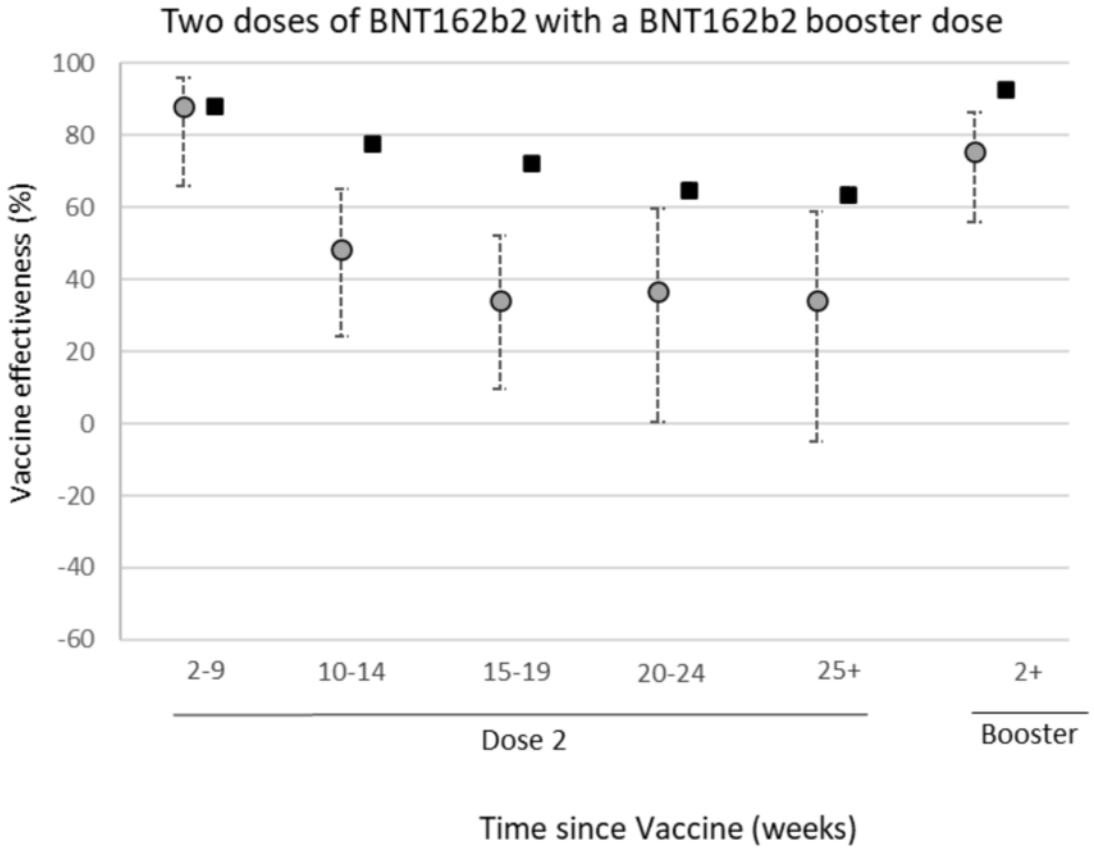

| | Omicron | Other strains |
|---|---|---|
| Cases | 3,437 | 88,940 |
| Hospital admissions | 28 | 665 |
| Percentage hospitalized | 0.81% | 0.75% |

**Analysis**: Secretariat of the Science Advisory Table
**Data**: https://files.ssi.dk/covid19/omikron/statusrapport/rapport-omikronvarianten-13122021-i30w

# Maintaining vaccine effectiveness against Omicron will require aggressive booster campaign

UK real-world surveillance data suggests a significant reduction in vaccine effectiveness (VE) against symptomatic infection for Omicron

- 2 doses of Pfizer vaccine: VE ~35% after 14 weeks
- 3rd dose of Pfizer vaccine: increase VE to ~75% in the 1st month




Vaccine effectiveness against symptomatic diseases by period after dose 2 and dose 3 (booster) of Pfizer vaccine for Delta (black squares) and Omicron (grey circles)



**Source:** UK HAS https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1040076/Technical_Briefing_31.pdf

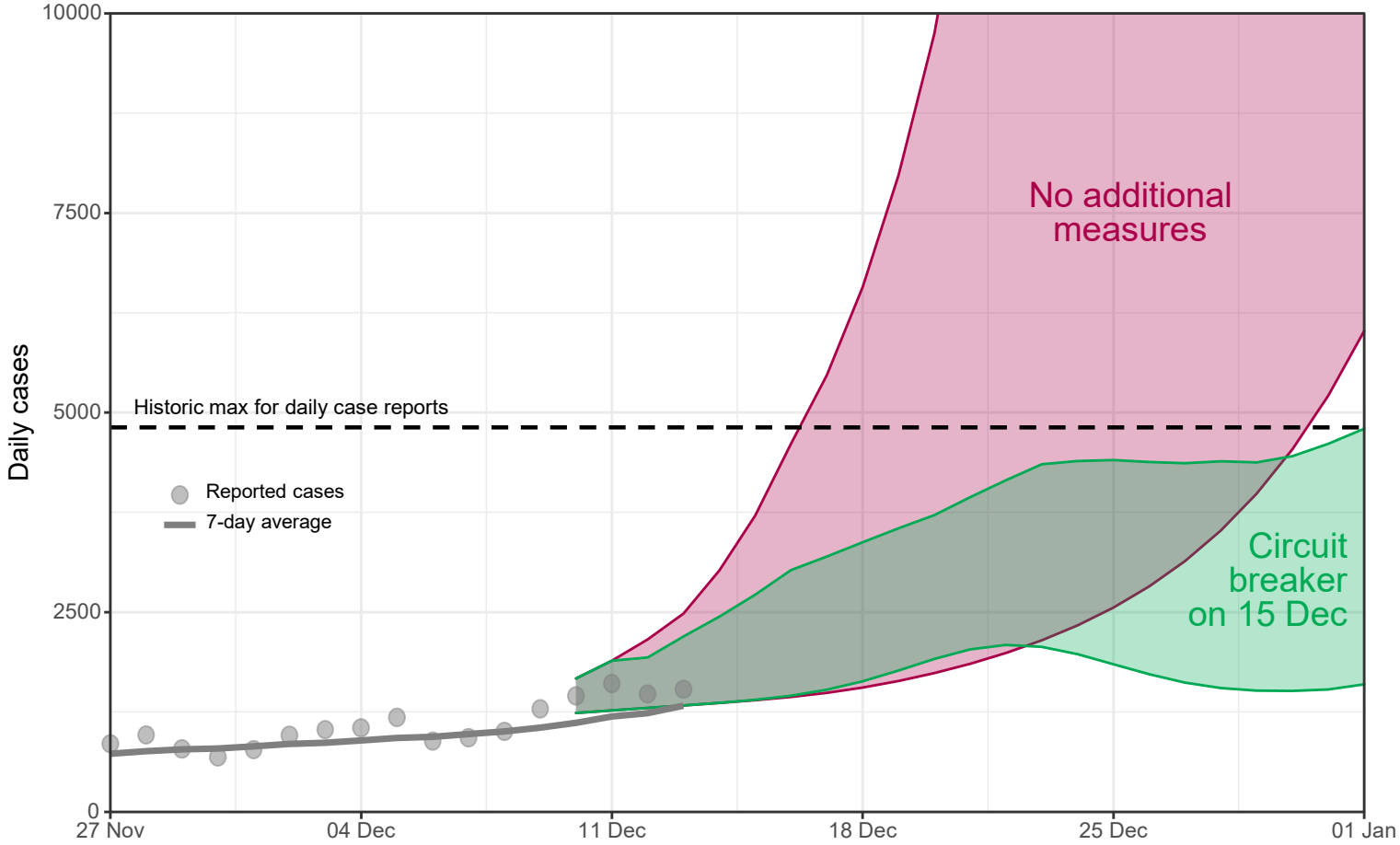
# The Omicron variant requires new assumptions for modelling

| | What we know |
|---|---|
| Infectiousness | Omicron cases double every 2-4 days (UK, Scotland, Denmark ~2 days, South Africa ~3.5 days)<br>We estimate that each case of Omicron is infecting 6.1 times more individuals than Delta<br>There is a high risk for a close contact of a case becoming infected (UK: adjusted odds ratio of 2.09)<br>Omicron will be the dominant strain very quickly (consistent with data from the UK and Denmark)<br>*We modeled infectiousness consistent with Ontario, UK and Danish data* |
| Severity | The severity of Omicron is unclear<br>• Recent data from South Africa suggesting about 25% less severity cannot be extrapolated to northern high-income countries due to differences in population age and degree of immunity/previous infection<br>• Early Danish data suggests the same severity as previous strains<br>*We modelled two options: (i) the same as Delta and (ii) 25% less than Delta* |
| Vaccine Effectiveness | Vaccine effectiveness against Omicron infection is lower than with Delta for 2 doses: 34% (Pfizer, UK); 33% (South Africa)<br>Vaccine effectiveness against Omicron infection is stronger with 3 doses: 75% (Pfizer; UK)<br>Vaccine effectiveness against hospitalization with 2 doses is lower than with Delta but still strong: 70% (South Africa)<br>We modelled a full range of assumptions from 25% vaccine effectiveness with 2 doses against infection through to 100% effective against infection (extreme case)<br>*We modelled vaccine effectiveness against infection with 3 doses at 70%*<br>*We modelled vaccine effectiveness against hospitalization given infection from Omicron at 90% (with 2 or 3 doses)* |

# With Omicron, cases are predicted to increase at a rapid pace but an immediate circuit breaker can blunt impact.

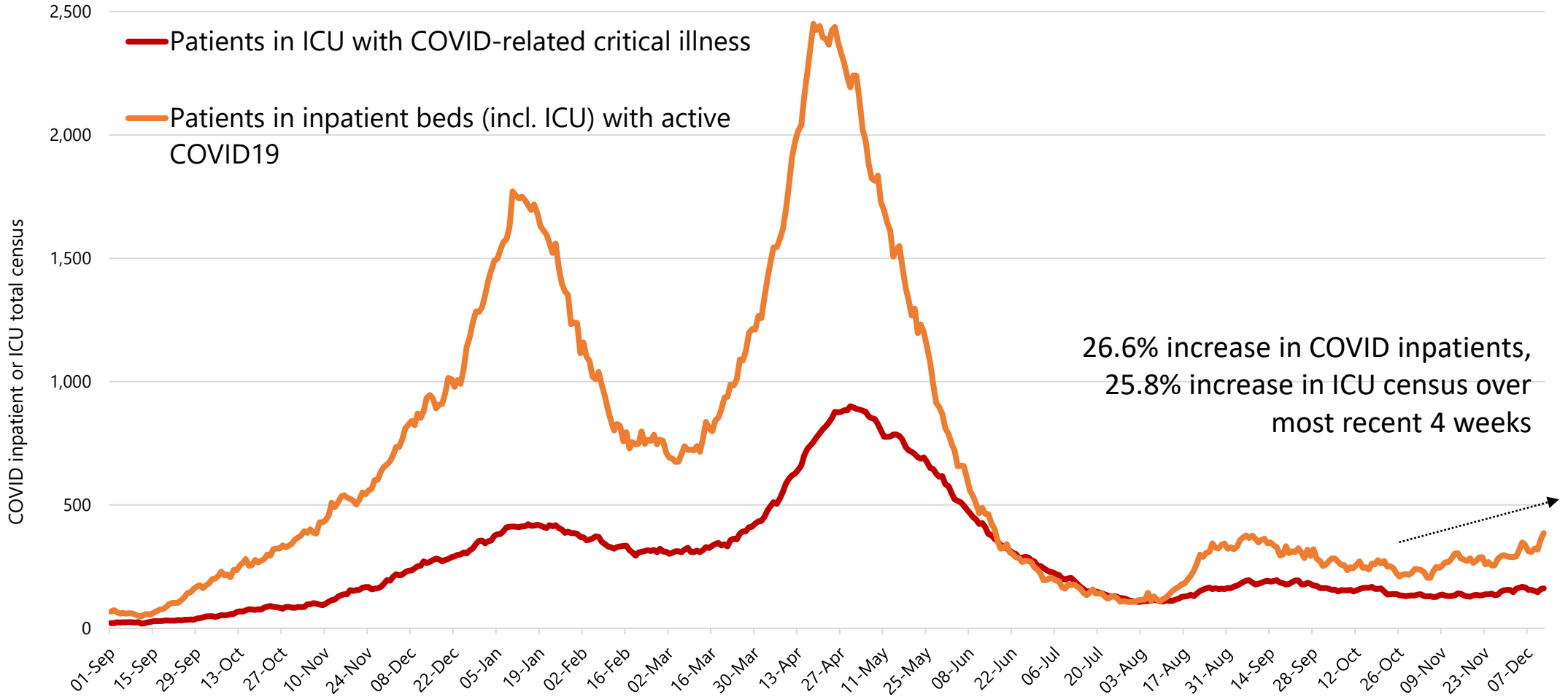
Figure shows predictions based on a consensus across models from 5 scientific teams.

- Different models use different approaches and assumptions.
- All scenarios assume continuing current public health measures.
- Circuit breaker scenarios are assumed to start December 15 and include additional strong public health measures (reducing contacts by at least 50%) that substantially reduce contacts and rapid roll-out of booster doses.




**Predictions** informed by modeling from COVID-19 ModCollab, McMasterU, PHO, WesternU, YorkU
**Data** (Observed Cases): covid-19.ontario.ca

# COVID-19 hospitalizations and ICU admissions are increasing

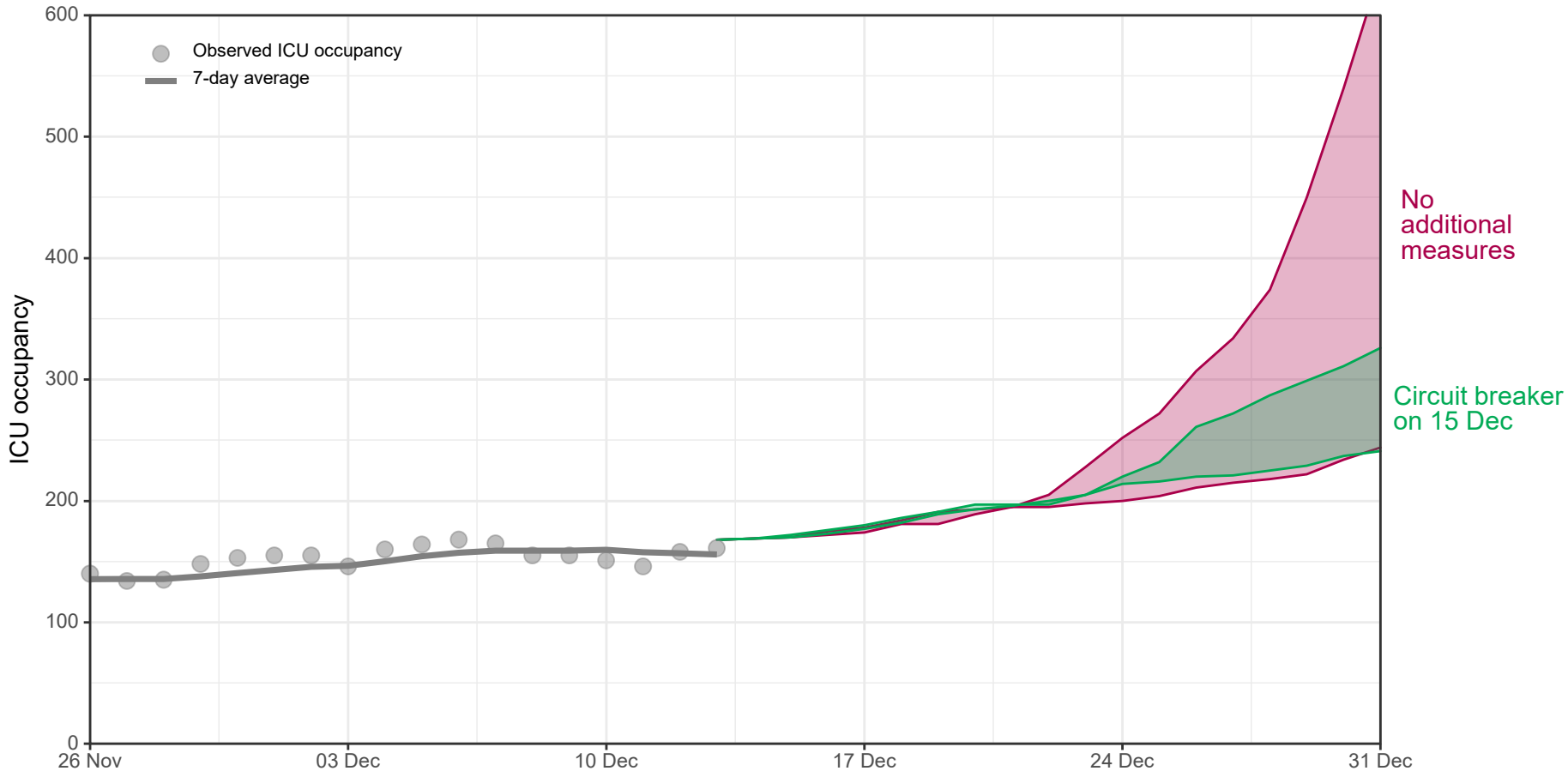





**Analysis:** Ontario Health

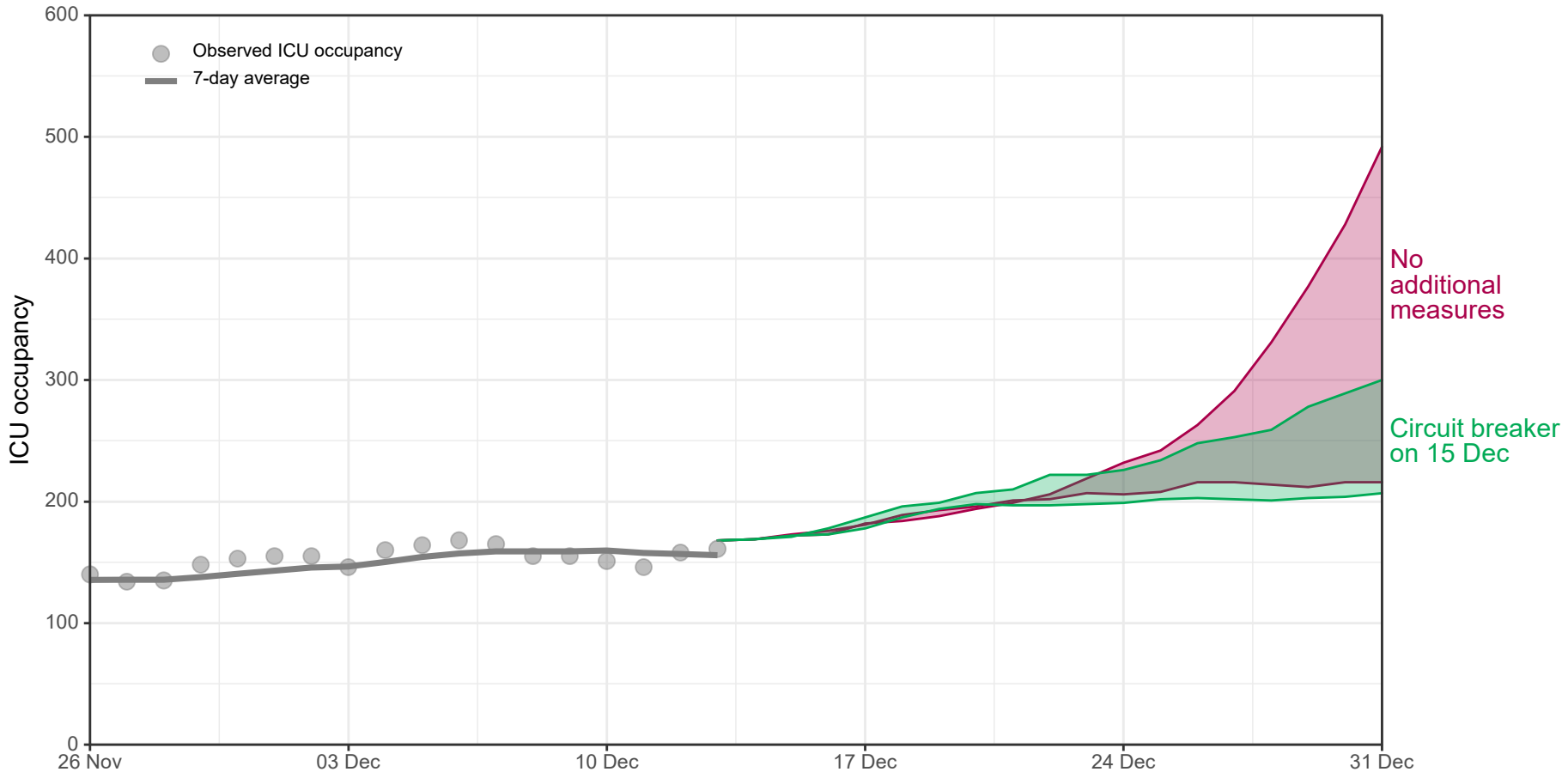
# ICU occupancy is likely to rise substantially

**Assumption: Omicron has same severity as Delta**




**Predictions:** COVID-19 ModCollab based on case predictions in previous slide
**Data** (Observed ICU Occupancy): CCSO

# ICU occupancy is likely to rise even if Omicron is less severe (25%) than Delta




**Predictions:** COVID-19 ModCollab based on case predictions in previous slide
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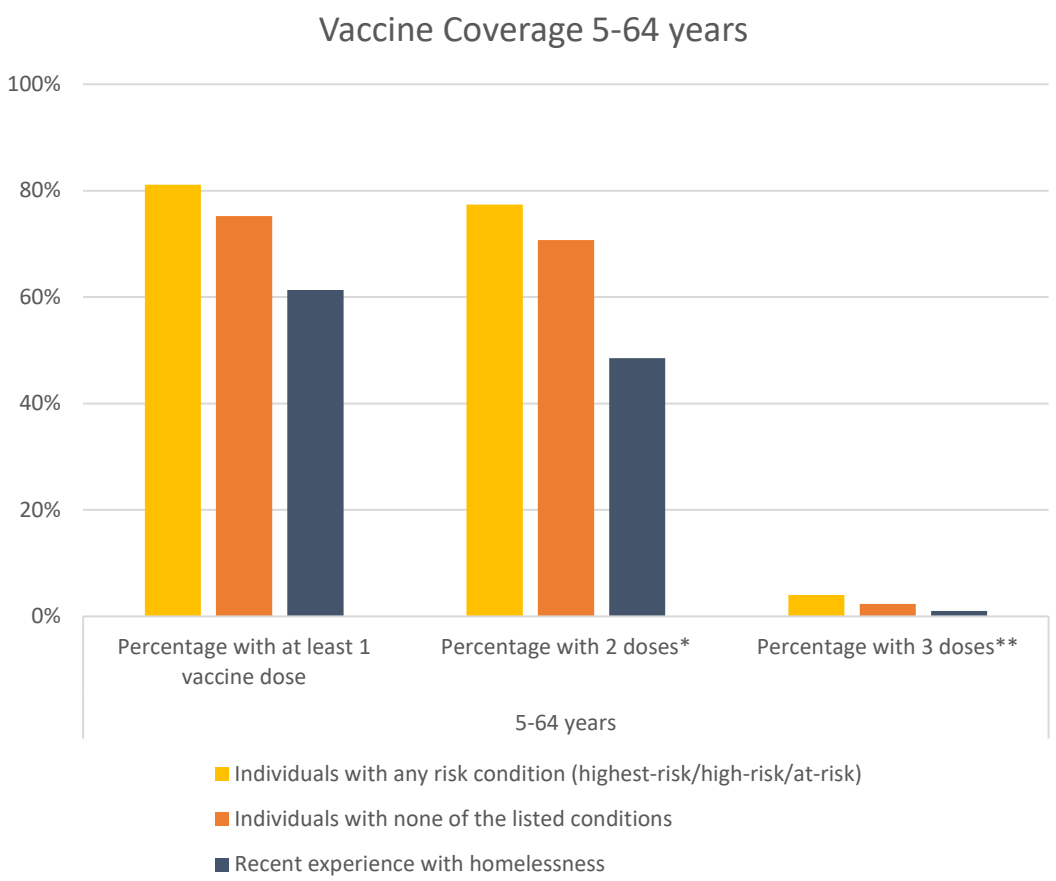
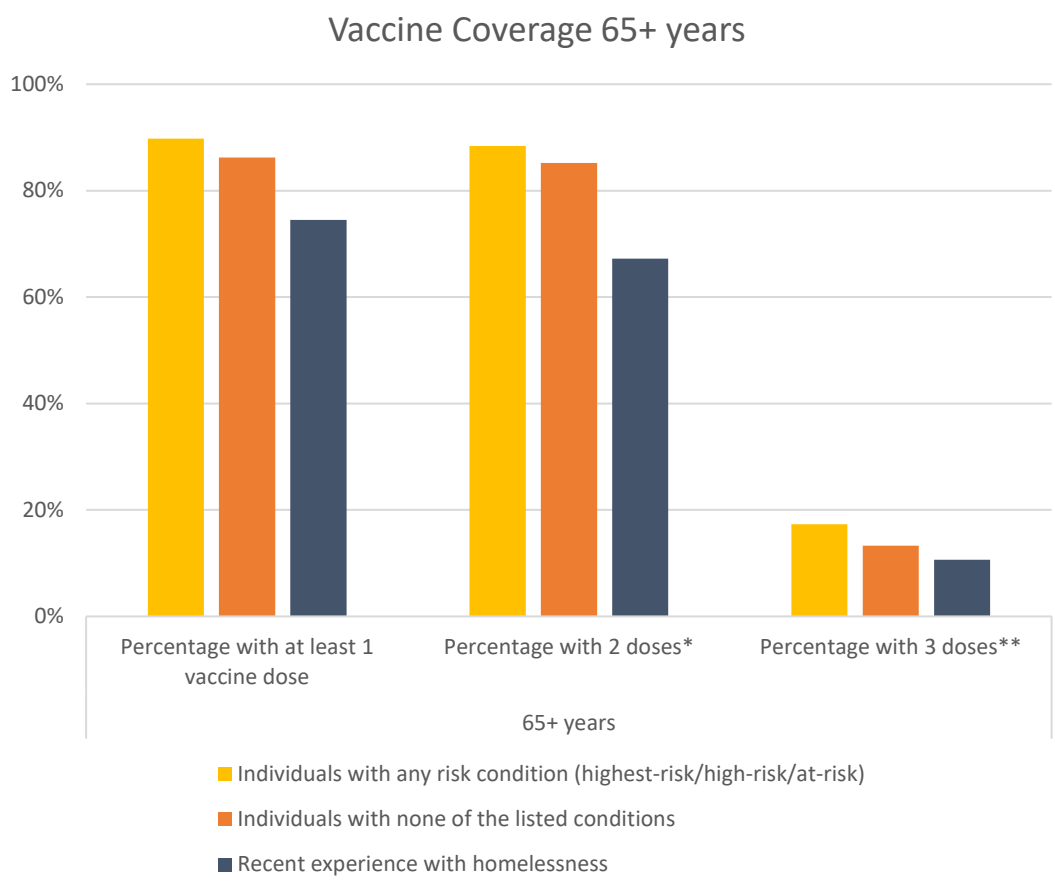
# Third dose coverage will be important to protect the vulnerable. This should be accelerated.



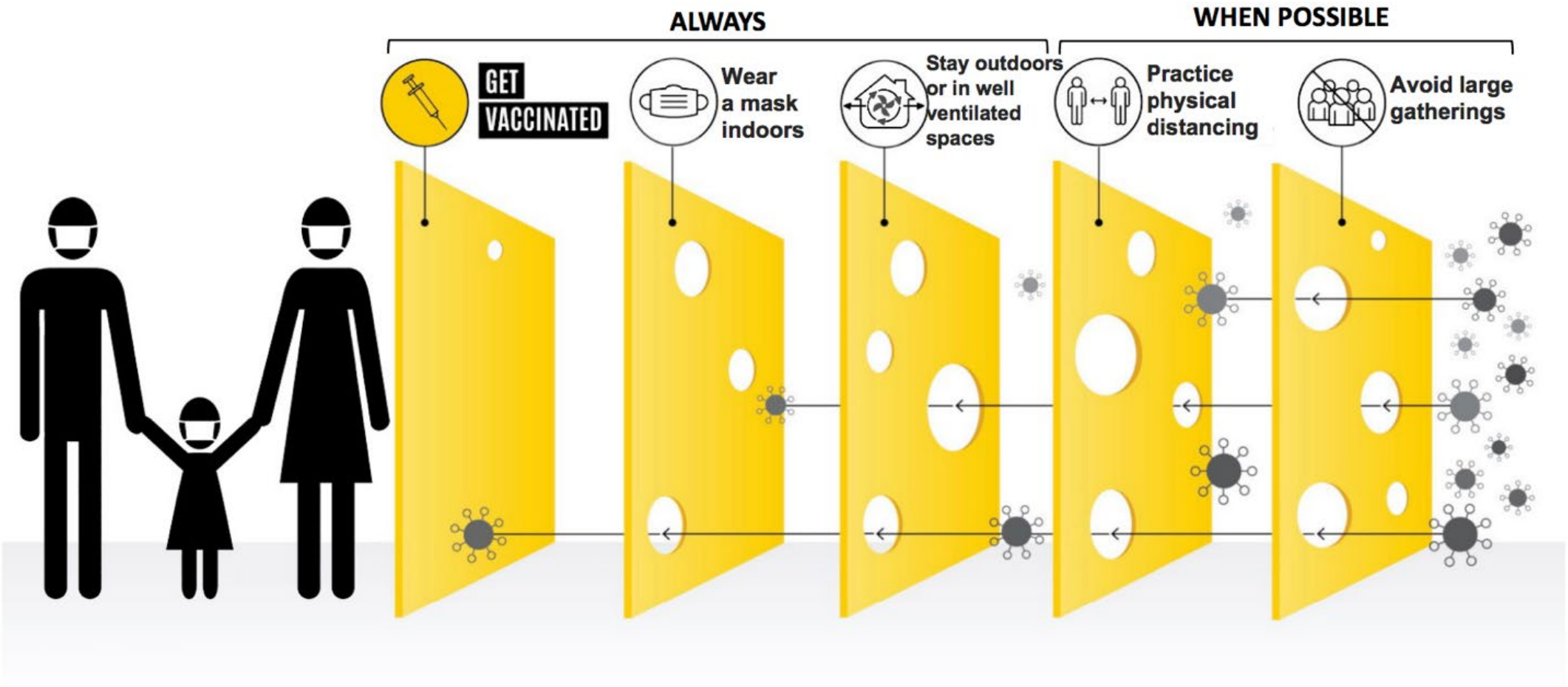



**Source:** ICES

# With prompt action we can slow down and reduce some of the impact of the Omicron wave

- Circuit breakers with public health measures that cut contacts by 50% and rapid roll-out of booster doses could blunt the Omicron wave.
- Accelerated boosters for the most vulnerable and healthcare workers and their families, and caregivers will help reduce transmission to vulnerable people and help protect the health workforce.
- Help keep schools, workplaces and places where people gather indoors safe by reinforcing the importance of key behaviors & public health measures:
  - Wear a well-fitted high-quality mask
  - Physical distance and avoid indoor spaces where there is crowding
  - Increase ventilation in all indoor spaces
  - Increase access to rapid testing
- Match distribution of therapeutics to where they are needed most to mitigate the impact of potential shortages.
- Although uncertainty persists, waiting for more information will eliminate the opportunity for action.

# Current public health measures are effective against Omicron




**Adapted from**: https://uihc.org/health-topics/why-swiss-cheese-may-be-key-keeping-you-safe-covid-19

# Key findings

- Cases are climbing across most public health units. The Omicron variant will shortly become the dominant variant.
- Omicron transmits very quickly. Early evidence suggests it can produce severe disease. Without prompt intervention, ICU occupancy could reach unsustainable levels in early January.
- Although vaccines are less effective against Omicron infection, boosters can substantially increase protection. Even 2 doses likely provide strong protection against severe illness. The risk of severe illness is dramatically higher in the unvaccinated.
- We can help protect the most vulnerable with vaccination (children and boosters). Rapid rollout of booster doses is essential, with strong focus on the most vulnerable (e.g. long-term care, shelters, high-risk communities) and healthcare workers.
- Increasing vaccination is not enough to slow this wave. Circuit breakers with strong additional public health measures (at least 50% fewer contacts) and strong booster campaigns (250,000 per day) could blunt the Omicron wave. High-quality masks, physical distancing indoors, improved ventilation, and increased access to rapid testing can help buy time for boosters to take effect and keep schools open.
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For table membership and profiles, please visit the About and Partners pages on the Science Advisory Table website.