

# COVID-19 Update

**Sherrill Brown, MD**  
**Medical Director, Infection Prevention**

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**AltaMed**

QUALITY CARE WITHOUT EXCEPTION™


# Main Points of Discussion

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- Omicron Update
- Impact on Testing
- Update on Testing Requirements
- Definitions of Fully Vaccinated
- Update on Therapeutics-Bam/ete approved for pediatric population
- All hands event-don't come if you are sick.
- Why get vaccinated
- Questions

## ***This Week's COVID-19 News***

- 1. FDA VRBPAC recommended emergency use authorization for Molnupiravir; FDA so far has not made a formal statement;*
- 2. A large VA study published online Tuesday in the NEJM found the Moderna vaccine to be slightly more effective than the Pfizer vaccine for documented infection, for symptomatic, for hospitalization for COVID-19, for ICU admission for COVID -19, and for COVID -19 death.*
- 3. A randomized study in Lancet Infectious Diseases found that use of rapid antigen-screening within 3 days, medical mask wearing, and optimized ventilation modulated risks for SARS-CoV-2 infection among attendees at a live, indoor concert.*
- 4. FDA authorizes bamlanivimab/etesevimab for high-risk young children.*
- 5. President Biden came to NIH to unveil a six-point plan to combat COVID.*
- 6. A thoughtful article in the NY Times thoroughly examined the reasons for vaccine hesitancy and provides insight into the factors contributing to this complex problem.*
- 7. The Omicron variant was first detected in South Africa and has subsequently been identified in several countries in the world, including the US.*

A small video thumbnail in the top right corner shows a man with glasses and a dark shirt, identified as David Henders. He is in a room with a ceiling fan visible in the background.

David Henders...

*References available in the chat*

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Clade

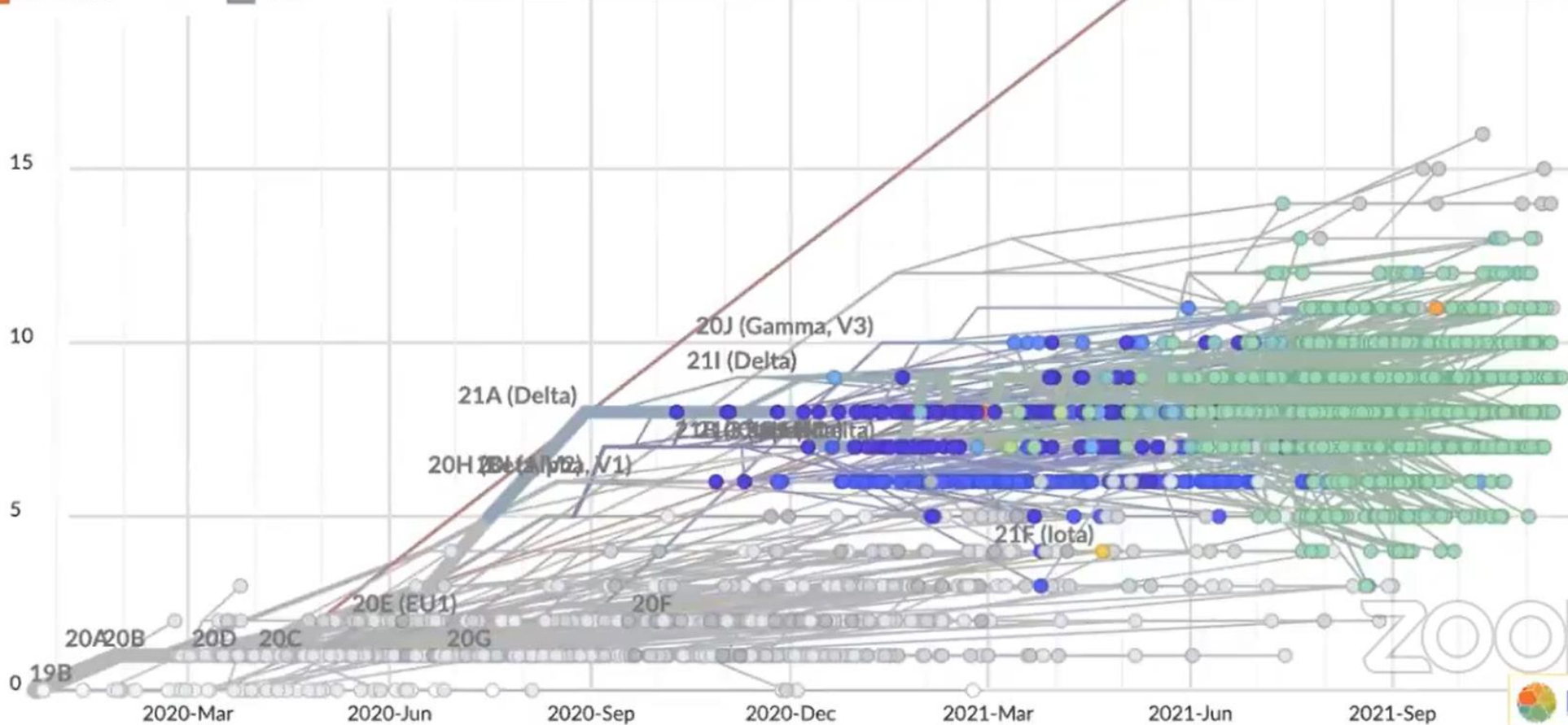


*Omicron didn't descend from previously identified VOCs*

- *emergence in under-surveilled population(s)?*
- *rapid evolution in a chronically infected person?*
- *recent spillover from non-human species?*



S1 mutations

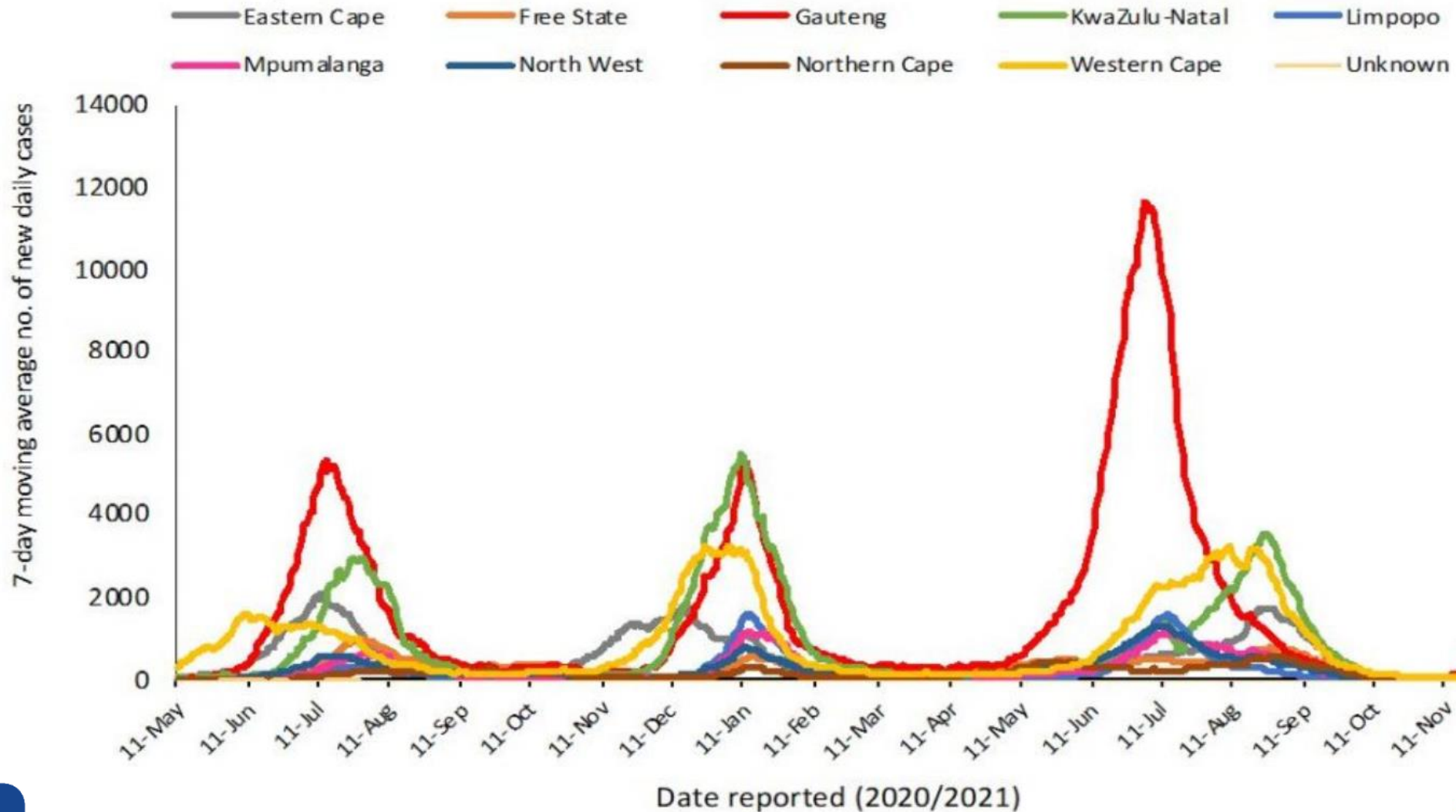


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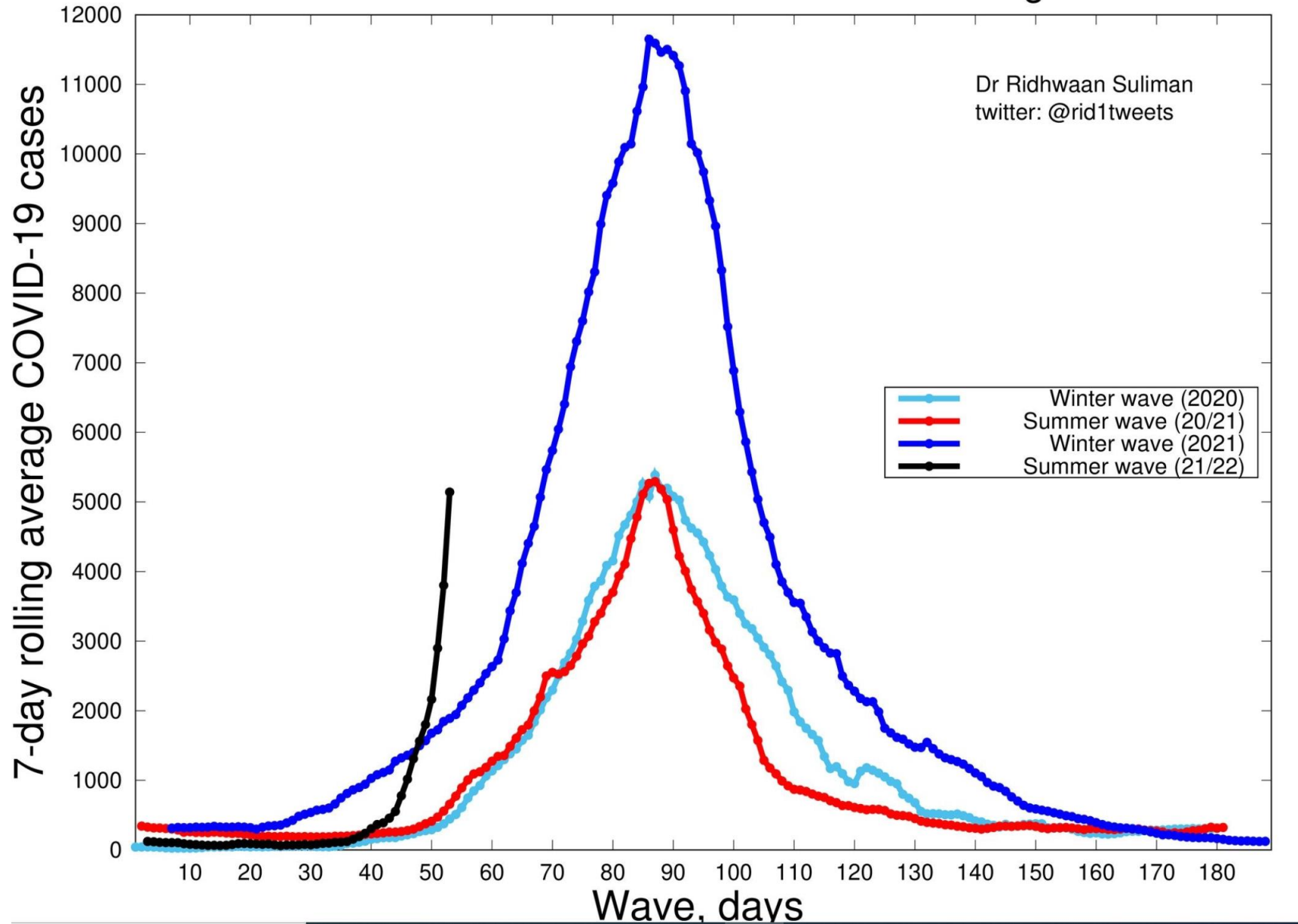
Nextstrain

# New cases by province – South Africa, 2020-2021

## December 4, 2021



# Waves of COVID-19 cases in Gauteng



# Confirmed and Presumptive B.1.1.529 Infections

## 04-Dec-2021 @13:00



Confirmed by sequencing



Presumptive by PCR SGTF

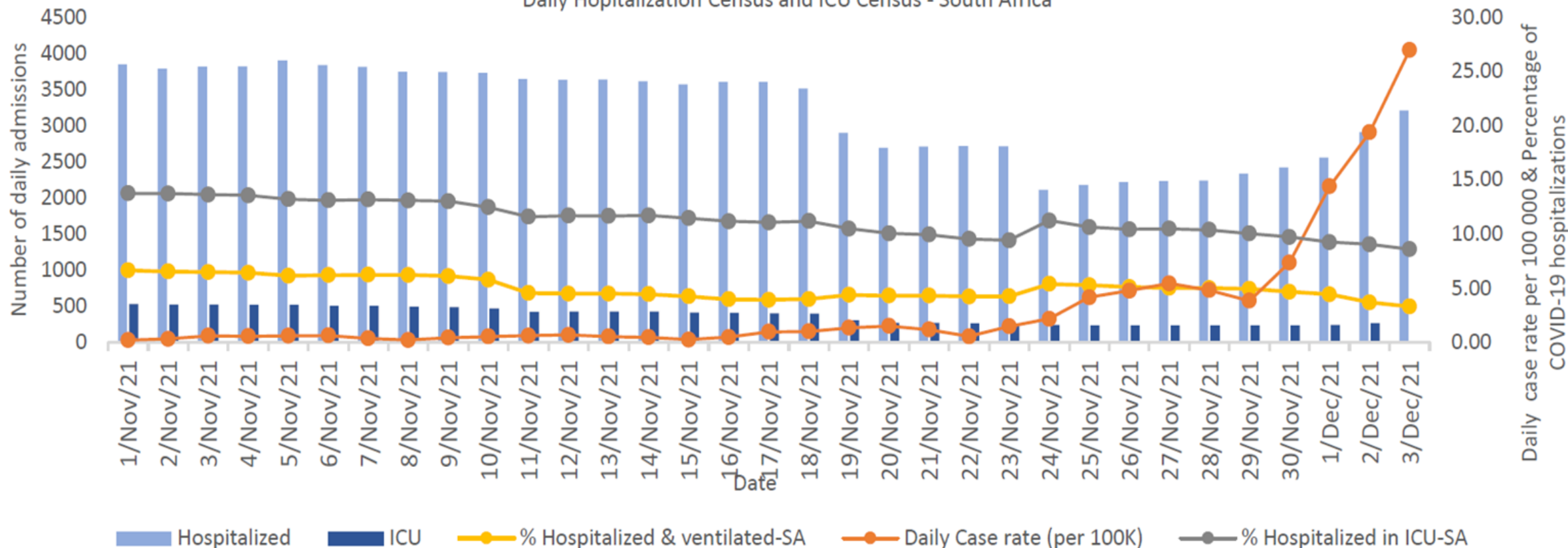


Courtesy of BNO News: [https://newsnodes.com/nu\\_tracker](https://newsnodes.com/nu_tracker)



# COVID-19 Daily Case Rates, Hospitalization Census and ICU Census - South Africa

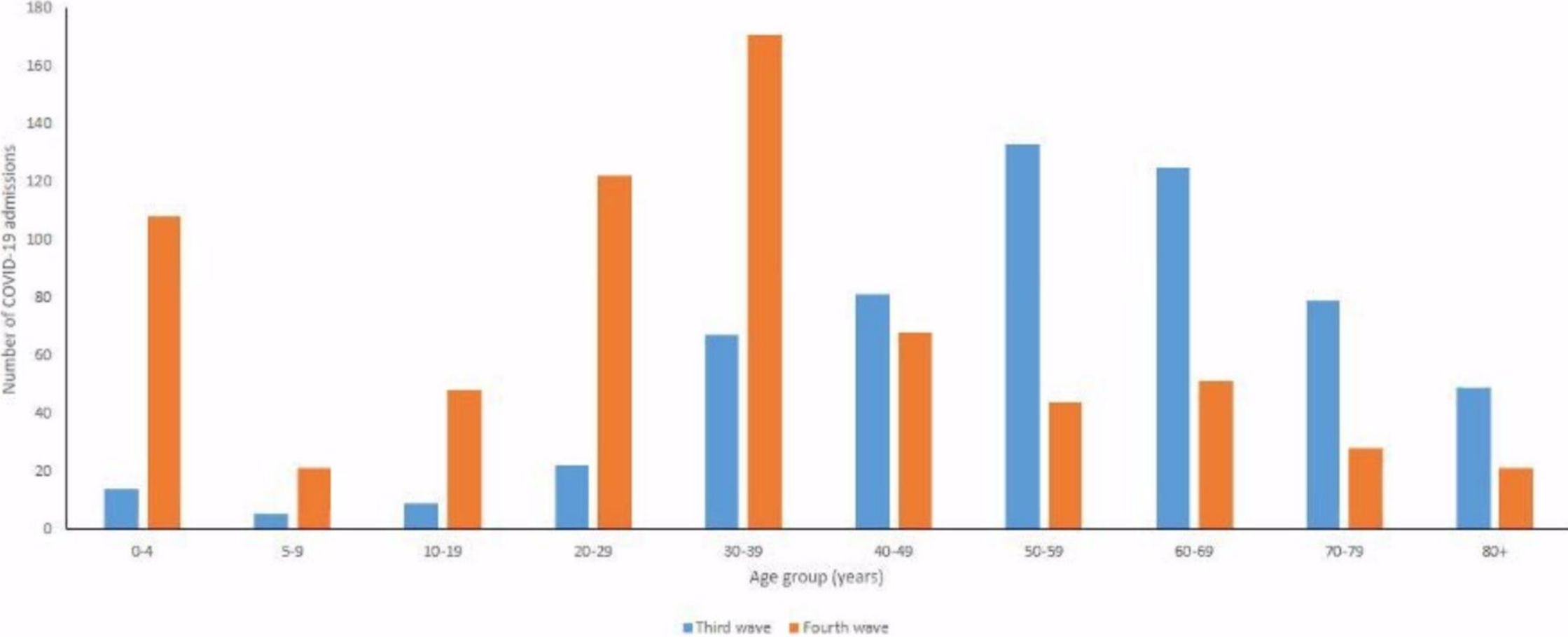
Daily Hospitalization Census and ICU Census - South Africa



<https://www.nicd.ac.za/diseases-a-z-index/disease-index-covid-19/surveillance-reports/national-covid-19-daily-report/>



Number of COVID-19 admissions in first two weeks of third and fourth wave, by age group in years, City of Tshwane Metro, 9-22 May 2021 and 14-27 November 2021



# Vaccines and therapeutics

- Vaccines:
  - Expect decreased neutralization from vaccine and prior infection
  - Expect vaccines to remain effective against severe illness and death
- Monoclonals:
  - No virus-specific data for FDA-authorized and available monoclonals
  - Suggestion for less therapeutic response from RegenCOV and Bam/Ete
- Antivirals:
  - No virus-specific data for remdesivir, molnupiravir, and PAXLOVID™
  - Likely no impact related to activity of oral antivirals

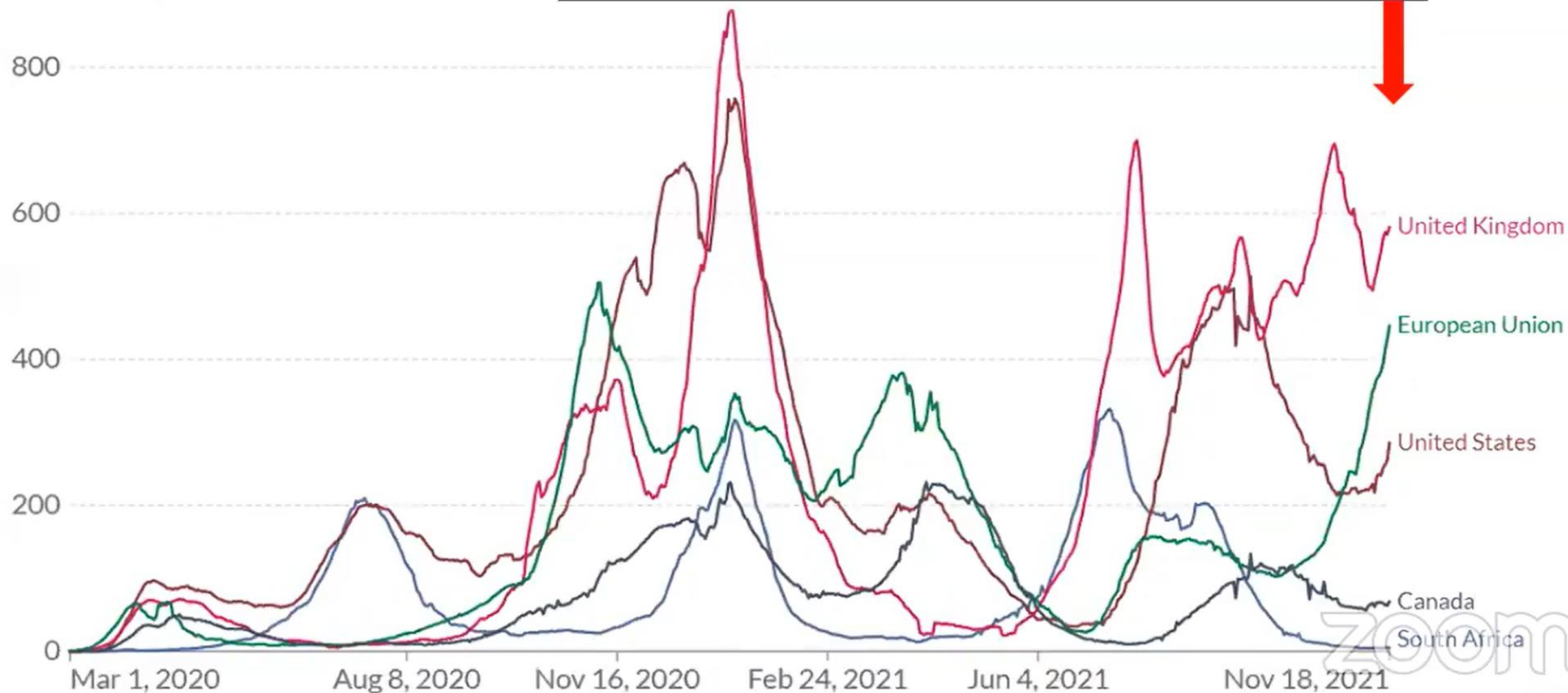
# Daily new confirmed COVID-19 cases per million people

7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.



LINEAR LOG

*Case rates on November 18, 2021*

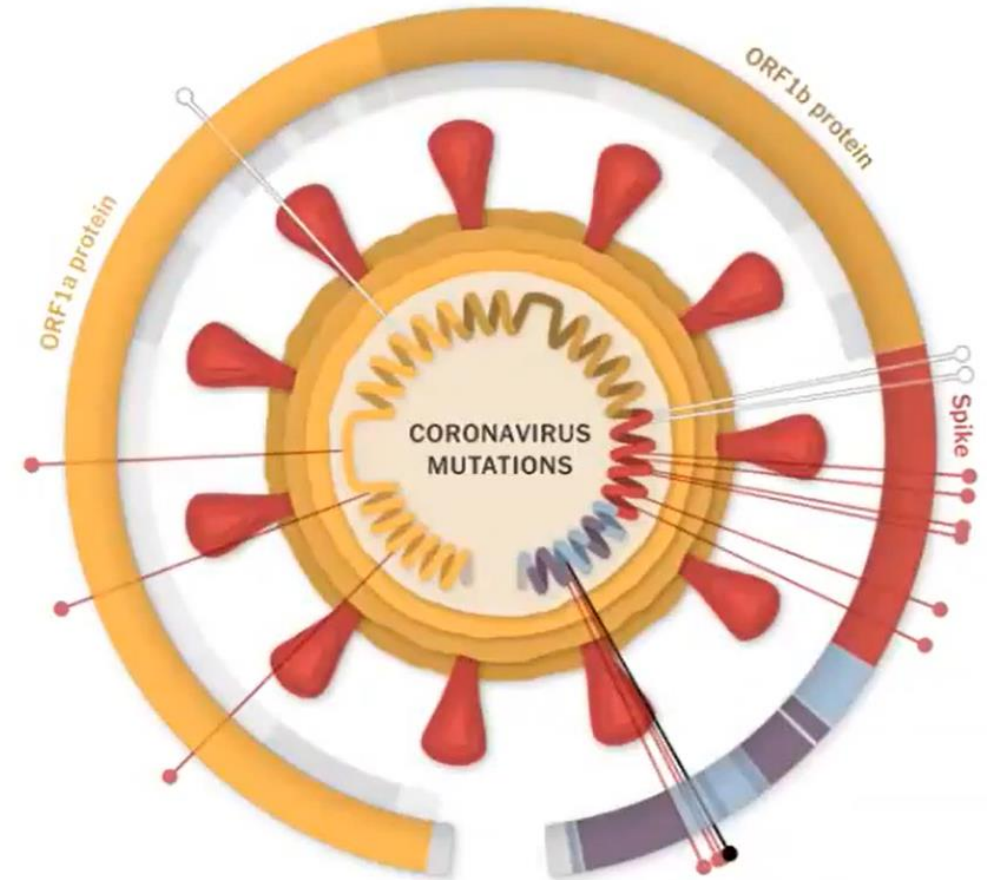


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# Variants are concerning if they impact:



- Transmissibility (intrinsic)
- Immunity (immune evasion)
  - Vaccination
  - Prior infection
  - Monoclonals/CVP
- Effectiveness of treatments
- Severity of illness
- Performance of diagnostics



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# Omicron: Impact on severity of illness?



- Initial reports suggest no increase in severity
  - Many asymptomatic and mild infections
- Caveats
  - Most early cases in younger age groups
  - Time lag between infection onset & disease progression
- Cases vs hospitalizations/ICU stays/deaths

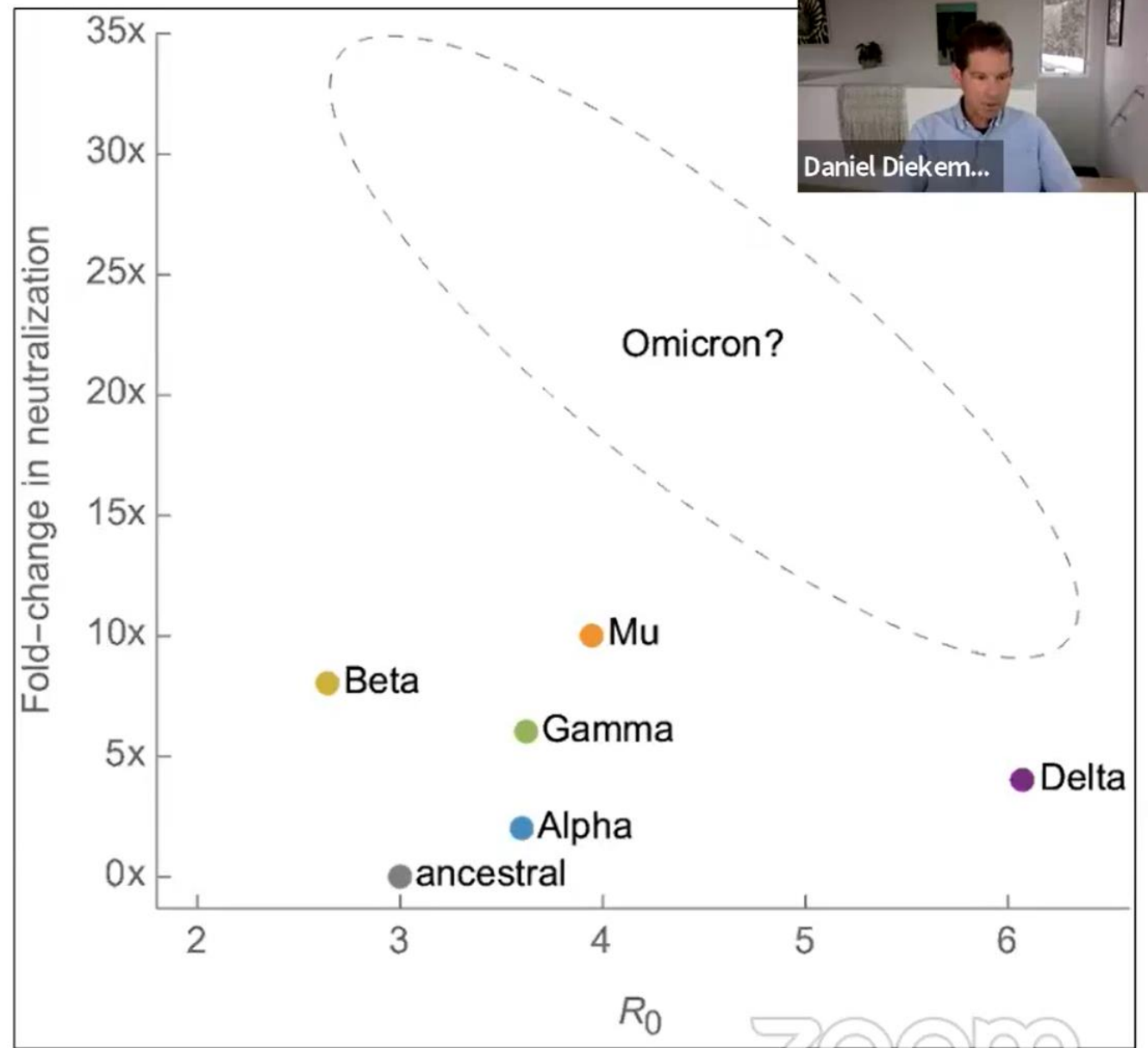
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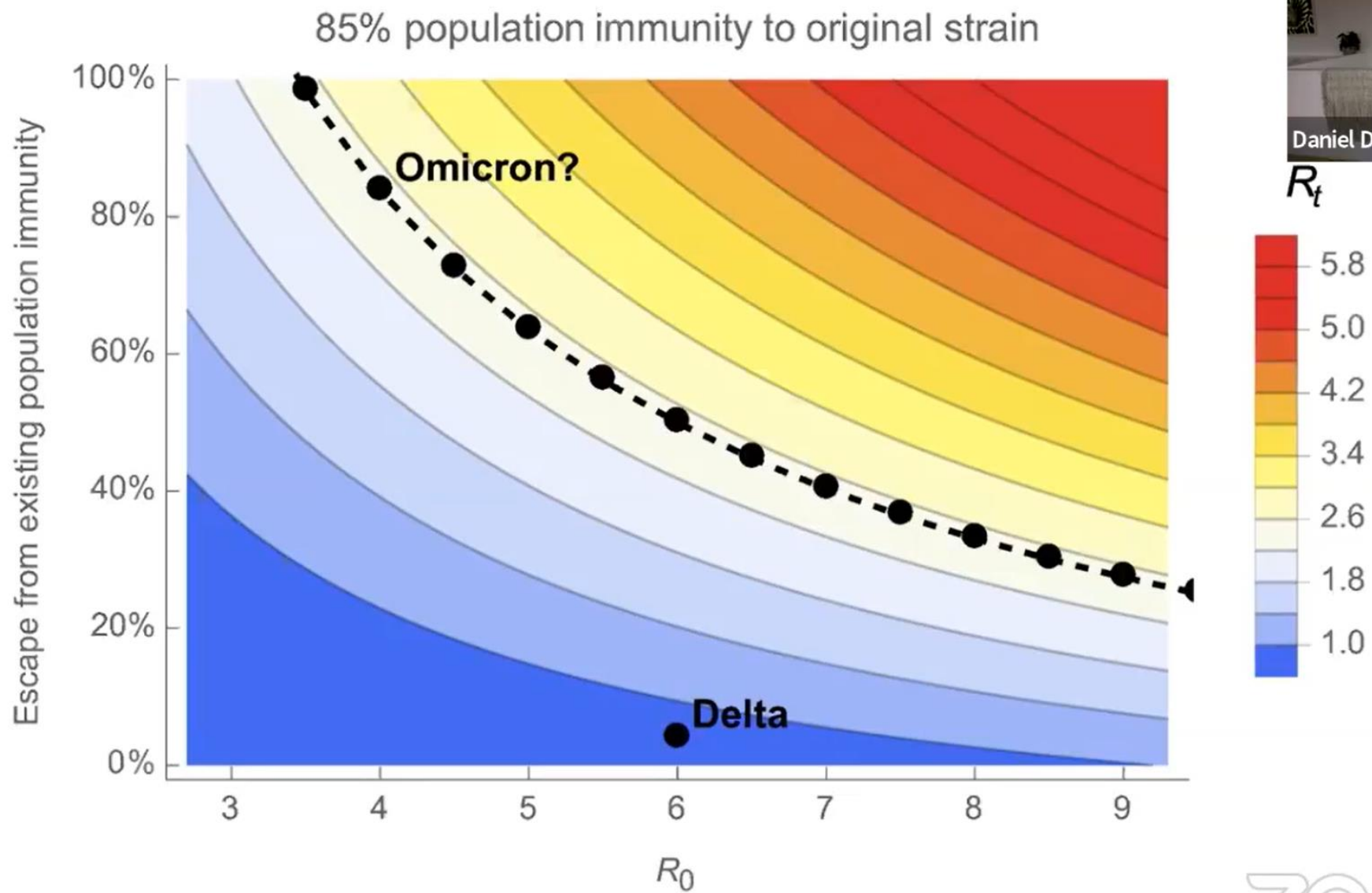
*Spread of VOCs is function of:*

- *Intrinsic transmissibility*
- *Degree of immune escape*

*\* $R_0$  as a measure of intrinsic transmissibility*

*# of secondary cases produced by a single case in immunologically naïve population, making various assumptions about demographics, population mixing, etc.*





# Report on Omicron Spike mutations on epitopes and immunological/epidemiological/kinetics effects from

SARS-CoV-2 coronavirus | nCoV-2019 Genomic Epidemiology



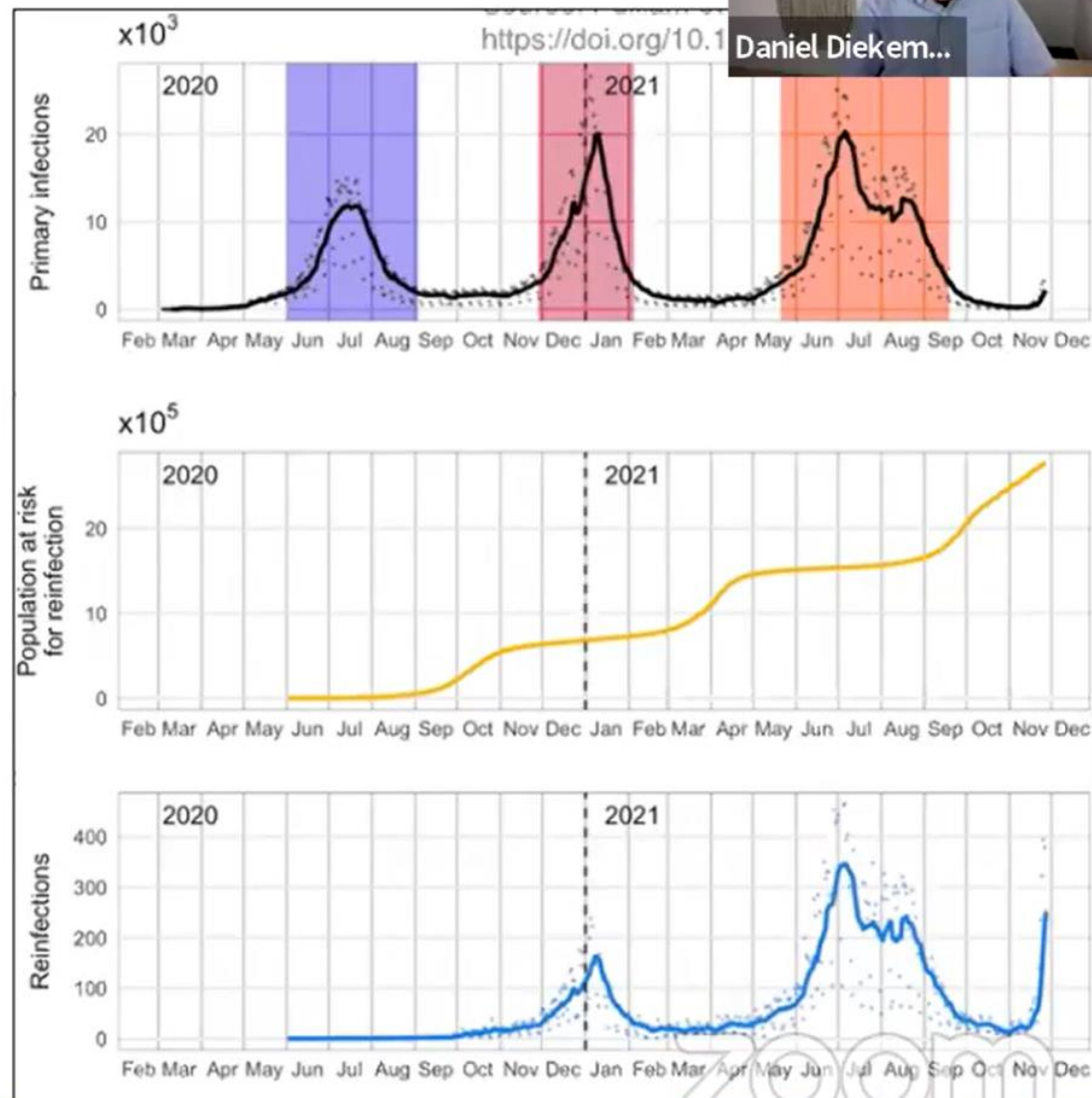
	Omicron	Beta	Gamma	Delta
# Changes on Spike	37	10	12	9
# T cell Epitopes	348	125	159	108
% T cell Epitopes	27.29%	9.80%	12.47%	8.47%
# B cell Epitopes	550	231	273	198
% B cell Epitopes	30.91%	12.98%	15.34%	11.12%

*Omicron S-gene mutations may have a greater impact on immune escape than other variants, given predicted impact on the spike protein*

# Increased risk for reinfection with Omicron?



- Early data from South Africa
- Examined risk for suspected re-infection during each COVID-19 wave
  - Sequential + tests > 90 days apart
- Recent data from Omicron wave shows hazard ratio of 2.4 (1.9-3.1) for reinfection
- **Suggests a degree of immune escape from *prior infection***
- *What about vaccine-induced immunity?*



# Omicron: Impact on diagnostic testing?



- Overall impact should be minimal
- Commonly-used PCR assays likely to be unaffected
  - Manufacturers have done *in silico* analyses
  - No widely used test has S-gene as only target
- Most rapid antigen tests target nucleocapsid

<https://www.fda.gov/medical-devices/coronavirus-covid-19-and-medical-devices/sars-cov-2-viral-mutations-impact-covid-19-tests>

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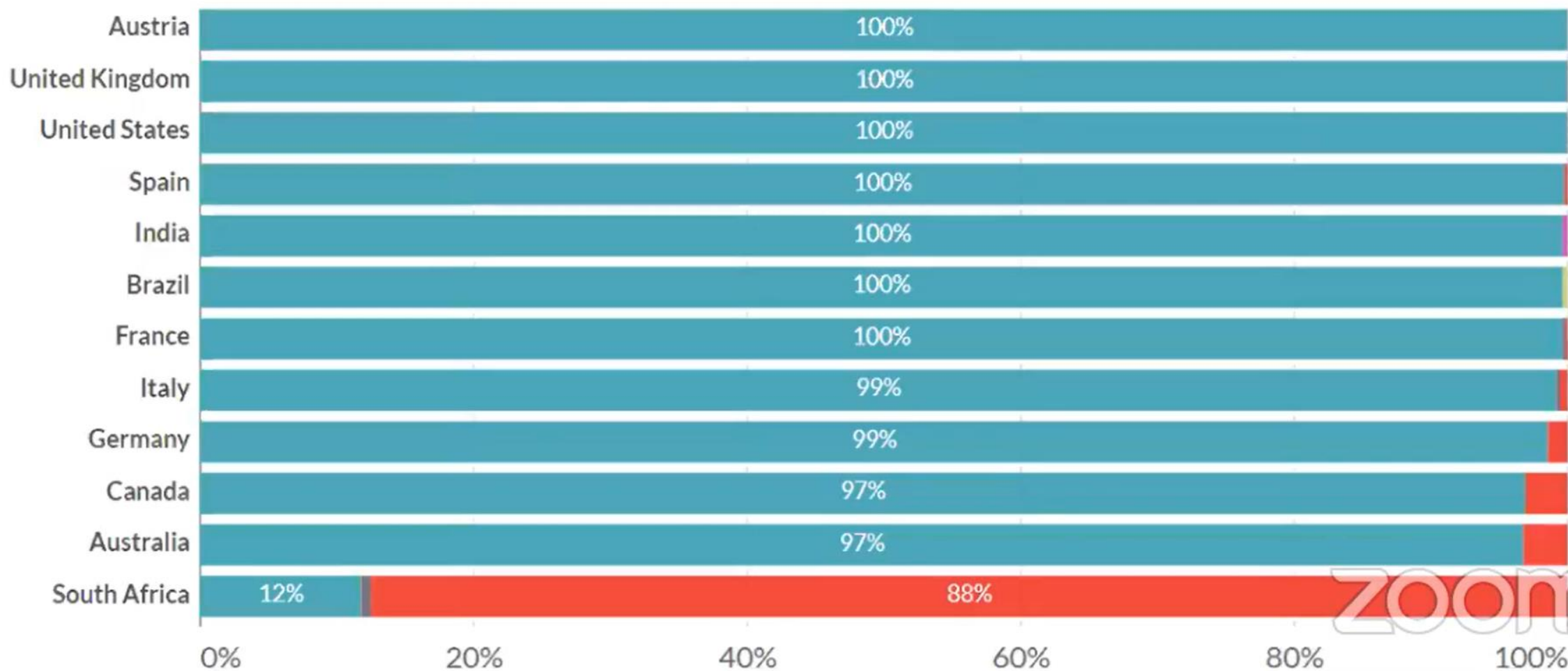
# SARS-CoV-2 sequences by variant, Nov 29, 2021

The number of analyzed sequences, broken down by variant group, in the last two weeks. This may not reflect the complete breakdown of cases since only a fraction of all cases are sequenced.



Add country  Relative

Delta Alpha Eta Iota Beta Epsilon Gamma Kappa Other Lambda Mu Omicron



# Implications of Omicron emergence



- Continue layered approaches to prevention
- Vaccinate with greater urgency, including boosters
- Expand test availability, both for dx and prevention
- Increase genomic surveillance capacity
- If immune escape substantial:
  - Reformulate vaccine, alter approach to monoclonals
  - Greater focus on early use of new/existing oral tx

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# How will Omicron impact Diagnostic Testing-Fulgent PCR?

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## 1. Will the mutations in Omicron affect our RT-PCR testing?

We have determined that the Omicron mutations, if present in the sample, should not have any effect on the RT-PCR amplification or sensitivity. RT-PCR tests should still accurately identify presence or absence of SARS-CoV-2 in a sample regardless of variant.

## 2. Will the mutations in Omicron affect our sequencing analysis?

We are monitoring this closely and have compared the Omicron mutations to our NGS primers. Based on this, we do not expect to have any issues sequencing the Omicron variant. Notably, Fulgent uses a proprietary primer set and not the ARTIC primer sets, and should not have the possible amplicon dropout issue that might occur in the S gene region with ARTIC primers. We will continue to monitor NGS coverage and accuracy as more information becomes available to us.

# How will Omicron impact Diagnostic Testing-Abbott ID Now?

## From Abbott:

To date, no variants have impacted the ID NOW COVID-19 test including Omicron. Abbott has a global surveillance team dedicated to monitoring variants which is pretty unique. See attached for official communication for your records.

Also see link: [Evaluating Omicron and Other COVID Variants to Ensure Test Effectiveness | Abbott Newsroom](#)

As stated in the article, “Abbott has been intently monitoring the mutations of COVID-19 so we can ensure our tests can detect them. We have already conducted an assessment of the Omicron variant and we’re confident our rapid and PCR tests can detect the virus. While the Omicron variant contains mutations to the spike protein, Abbott’s rapid and PCR tests do not rely on the spike proteins to detect the virus.”

**Table 1: Predicted Impact of Variants on Abbott SARS-CoV-2/COVID-19 Diagnostic Tests:**

Abbott SARS-CoV-2/COVID-19 Test	Detected Target(s)	Test Performance
Panbio™ COVID-19 Ag Rapid Test Device	N* protein	No Predicted Impact
Panbio™ COVID-19 Antigen Self-Test	N protein	No Predicted Impact
Panbio™ COVID-19 IgG/IgM Rapid Test Device	N protein	No Predicted Impact
BinaxNOW™ COVID-19 Ag Card	N protein	No Predicted Impact
BinaxNOW™ COVID-19 Antigen Self Test	N protein	No Predicted Impact
ID NOW™ COVID-19 Test	RdRp** gene	No Predicted Impact
Alinity m SARS-CoV-2	RdRp and N genes	No Predicted Impact
Alinity m Resp-4-Plex	RdRp and N genes	No Predicted Impact
RealTime SARS-CoV-2	RdRp and N genes	No Predicted Impact

\*N – Nucleocapsid; \*\*RdRp – RNA dependent RNA polymerase

# Updates to Testing Recommendations

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- **Test before and after you go.**
  - Test 1-3 days prior to gathering/travel.
    - Home antigen ok for domestic travel.
    - Especially necessary for undervaccinated people.
  - Test upon arrival home and 3-5 days after travel.
    - Home antigen test ok for domestic travel.
    - Especially important for undervaccinated people.
  - International travelers will need to test within 24 hours of coming back to US
    - Same testing recommendations when you come back home.
    - Need to quarantine for 7 days if tested negative after coming back if undervaccinated. Quarantine 10 days if not tested.

# Other updates on Testing

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- **Fulgent reports that they do not share any PHI with China. False news about this has come out by Sheriffs Dept.**
- **We will be receiving rapid antigen at home tests to give to our patients.**
  - Perfect to give to our patients prior to domestic travel and prior to gathering.
  - Not appropriate for prior to international travel or needing release to go back to work/school.

# Fully Vaccinated Definition

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- **Get people their boosters. Does not impact full vaccination definition yet but likely soon to come.**
- **If have had 2 doses of a WHO approved vaccination, mix and match ok then they are considered fully vaccinated.**

# Approval for Bam/Ete for Pediatrics including Neonates

## Treatment

This EUA is for the use of the unapproved products bamlanivimab and etesevimab administered together for the treatment of mild to moderate COVID-19 in adults and pediatric patients, including neonates, with positive results of direct SARS-CoV-2 viral testing, and who are at high risk for progression to severe COVID-19, including hospitalization or death [see Limitations of Authorized Use (1.1)].

For treatment of COVID-19, bamlanivimab and etesevimab should be administered together as soon as possible after positive results of direct SARS-CoV-2 viral testing and within 10 days of symptom onset.

## Post-Exposure Prophylaxis

This EUA is for the use of the unapproved products bamlanivimab and etesevimab administered together in adults and pediatric individuals, including neonates, for post-exposure prophylaxis of COVID-19 in individuals who are at high risk for progression to severe COVID-19, including hospitalization or death, and are:

- not fully vaccinated<sup>1</sup> or who are not expected to mount an adequate immune response to complete SARS-CoV-2 vaccination (for example, individuals with immunocompromising conditions including those taking immunosuppressive medications)

and

- have been exposed to an individual infected with SARS-CoV-2 consistent with close contact criteria per Centers for Disease Control and Prevention (CDC)<sup>3</sup>

or

- who are at high risk of exposure to an individual infected with SARS-CoV-2 because of occurrence of SARS-CoV-2 infection in other individuals in the same institutional setting (for example, nursing homes, prisons) [see Limitations of Authorized Use (1.2)].

For post-exposure prophylaxis, bamlanivimab and etesevimab should be administered together as soon as possible following exposure to SARS-CoV-2.

## **Treatment**

**Approved for 12 and over (weighing at least 40kg) with +COVID, high risk for developing severe COVID and within 10 days of sx onset.**

## **Prophylaxis**

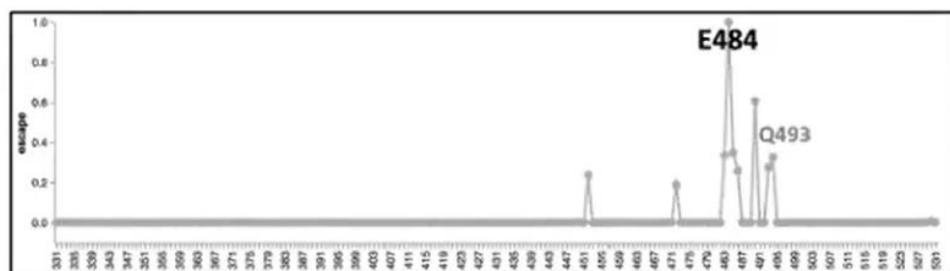
**Also prophylaxis for people at high risk for developing severe COVID and exposure to COVID.**



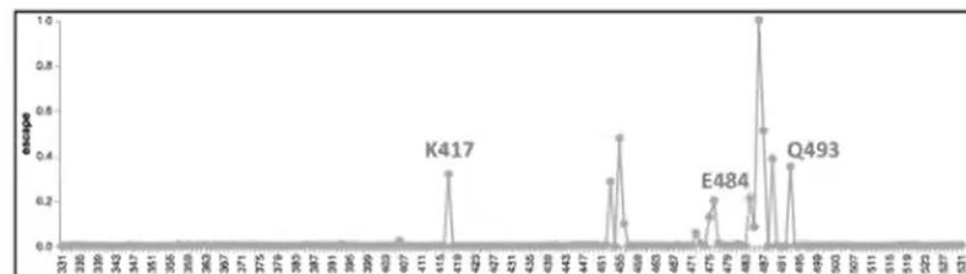
Daniel Diekem...

# Omicron: Impact on therapeutics?

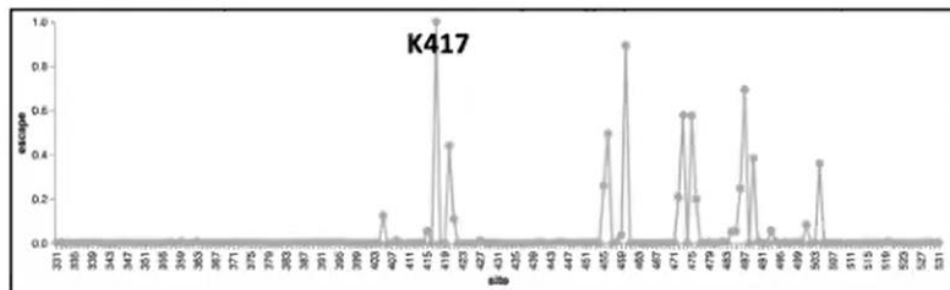
- Mutation profile predicts impact on monoclonals
  - Bam/Etesevimab, perhaps also REGEN-COV
  - Sotrovimab and new A-Z product less likely to be affected



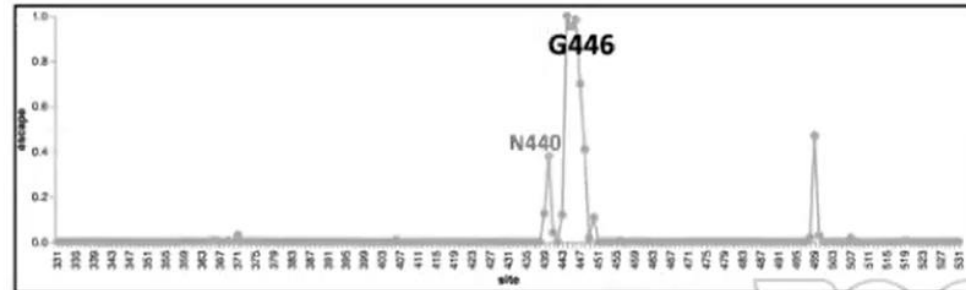
LY-CoV555  
(bamlanivimab)



REGN10933



LY-CoV16  
(etesevimab)



REGN10987



# New Oral Therapeutics

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- **Molnupirivir narrowly approved by FDA VRBPAC**
  - Risk reduction 30% for severe disease
  - Concern regarding risk for mutagenicity. Nucleoside analogue.
  - Likely approved for unvaccinated individuals, >65, at high risk for developing severe COVID.
  - Distributed by County.
  - Refer to local site that is offering the medication.
  - More info once approved and distributed.
- **Astrazeneca oral med preapproval for COVID prophylaxis will be distributed initially to transplant centers**
- **Paxlovid, 89% reduction of risk hospitalization/death.**
  - Protease Inhibitor, will have some drug drug interactions.
  - Similar distribution.
  - Expected approval by end of the year.
- **All oral meds Not replacement for vaccination**
- **Theoretically will remain effective with Omicron**

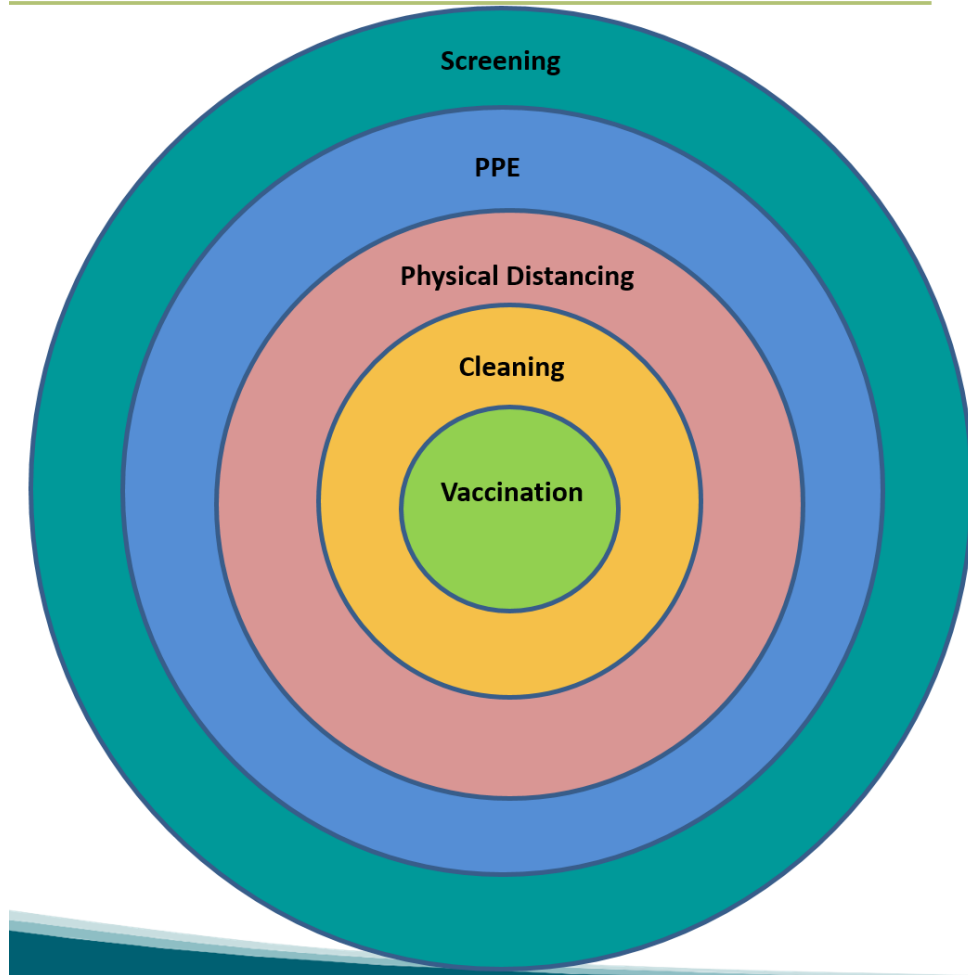
# What to do with adverse reactions?

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- **Myocarditis/Pericarditis, hold on further COVID vaccinations, would get consultation via immunology and or cardiology.**

# All Hands Event

- **Know how COVID is spread**
  - Respiratory aerosols
  - Higher risk in smaller indoor settings,
    - 6 foot distancing is not magic if no ventilation.
  - Higher risk if people are talking loud/singing
  - Higher risk if not masked
  - Higher risk if people are not vaccinated
- **Stay home if you are sick**
  - If you are unsure, call Employee Health
  - Virtual meeting.



# Why get vaccinated with Omicron?

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- **Will likely still keep safe from severe disease.**
- **Kids may be more impacted if unvaccinated by Omicron.**
- **Delta is still >99% of cases**