Introduction

17:00- 17.10

Prof. Dr. Carmen Faso, MCID Co-Chair
Prof. Dr. med. Nicola Low (Moderator)

Speaker presentation

17:15- Dr. Emma Hodcroft, Institute of Social and Preventive Medicine, UniBern
"What is Omicron and how do we identify it?"

17: 30- Prof. Dr. Volker Thiel, Institute for Virology and Immunology, Vetsuisse, UniBern
"How is Omicron different from other variants?"

17:45- PD Dr. Christian Althaus, Institute of Social and Preventive Medicine, UniBern
"How well does Omicron spread compared to other variants?"

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"What does Omicron mean for international travel?"

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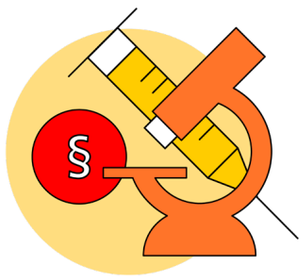
"Why and how does Omicron cause an international economic shock?"

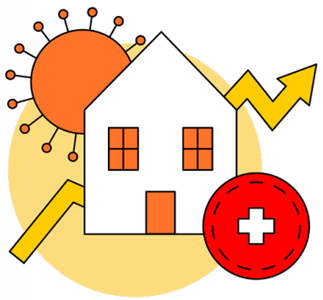


Panel discussion

Including the speakers above, together with:

Prof. Dr. Dr. Claus Beisbart
Institute of Philosophy, UniBern

PD Dr. med. Manuela Funke-Chambour
Department for Biomedical Research, Inselspital



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Multidisciplinary Center for Infectious Diseases

MCID Bern

www.mcid.unibe.ch

How well does Omicron spread compared to other variants?

Multidisciplinary Center for Infectious Diseases (MCID) Event:
The SARS-CoV-2 variant Omicron: a snapshot of where we are
8 December 2021

Christian L. Althaus, Ph.D.

Institute of Social and Preventive Medicine
University of Bern
Mittelstrasse 43
3012 Bern

Image: Nextstrain

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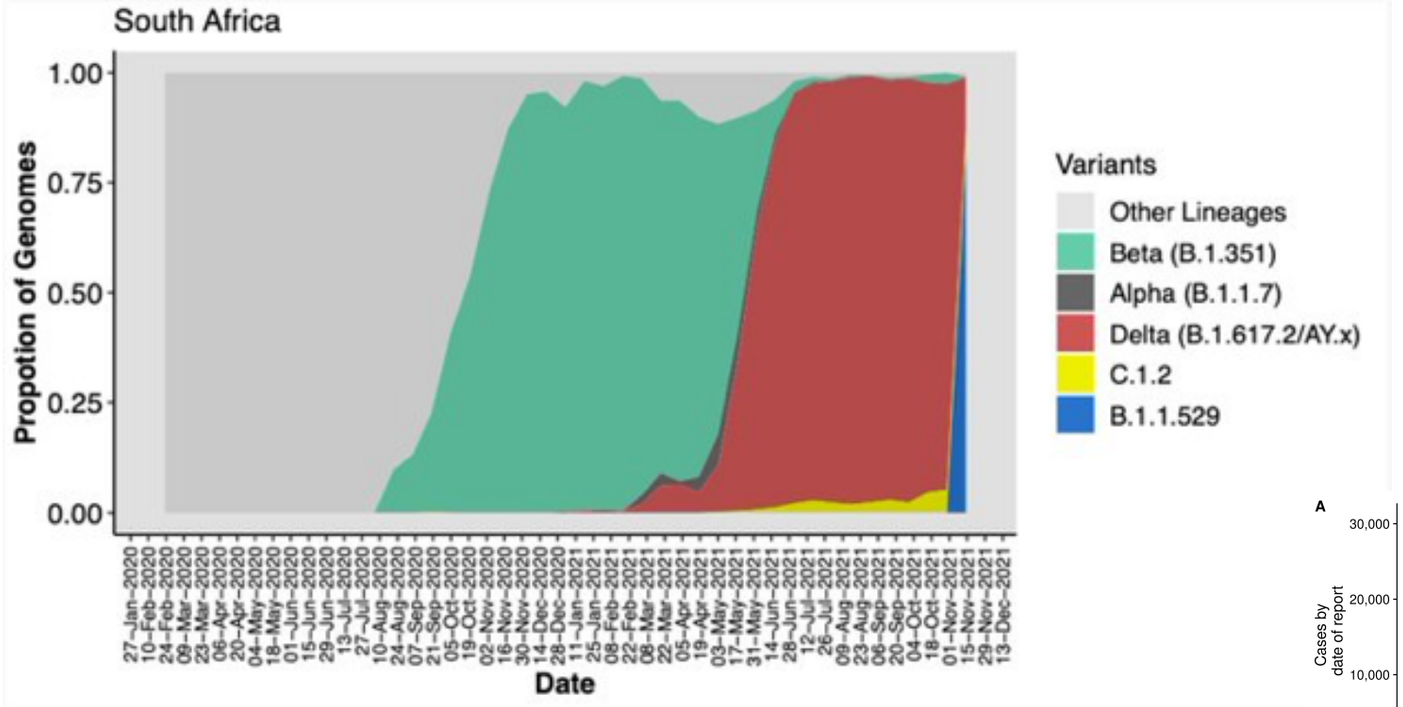
EpiPose project

European Commission | Horizon 2020 European Union funding for Research & Innovation

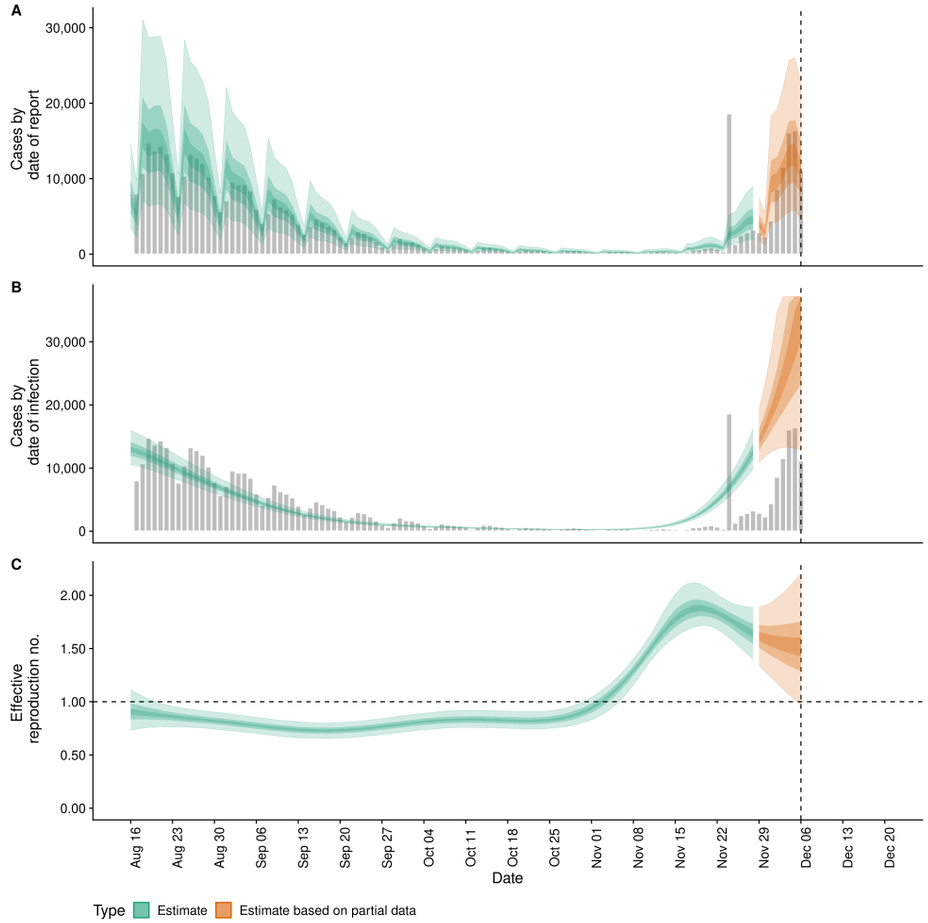
FNSNF
FONDS NATIONAL SUISSE
SCHWEIZERISCHER NATIONALFONDS
FONDO NAZIONALE SVIZZERO
SWISS NATIONAL SCIENCE FOUNDATION

Growth of Omicron in South Africa



Rapid replacement of Delta by Omicron
(*Source: Tulio de Oliveira*)

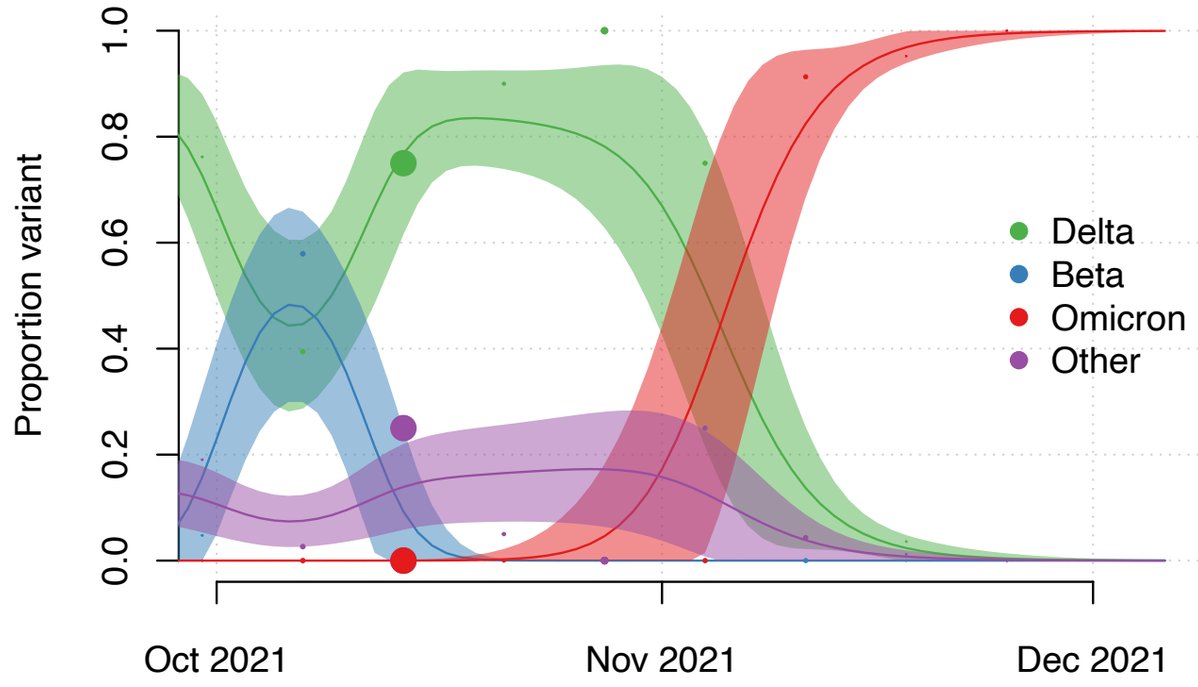
Increase in confirmed cases and effective reproduction number
(*Source: epiforecasts.io*)



Omicron vs. Delta in Gauteng, South Africa

- GISAID: 569 sequences from Gauteng, South Africa (1 Sep - 22 Nov 2021)

- Estimated growth advantage: ρ = 0.32 (95% CI: 0.09-0.55) per day



- Caution: Targeted sequencing and stochastic effects (e.g., superspreading) can lead to overestimates of the growth advantage.

- But: Consistent with difference in rate (or R_e) of epidemic decline (Delta, Sep-Oct) and growth (Omicron, Nov-Dec)

Increased transmissibility and immune evasion

Immune against infection
and transmission with earlier variants

Susceptible to infection
and transmission with all variants

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Higher transmissibility of Omicron

Omicron

Delta

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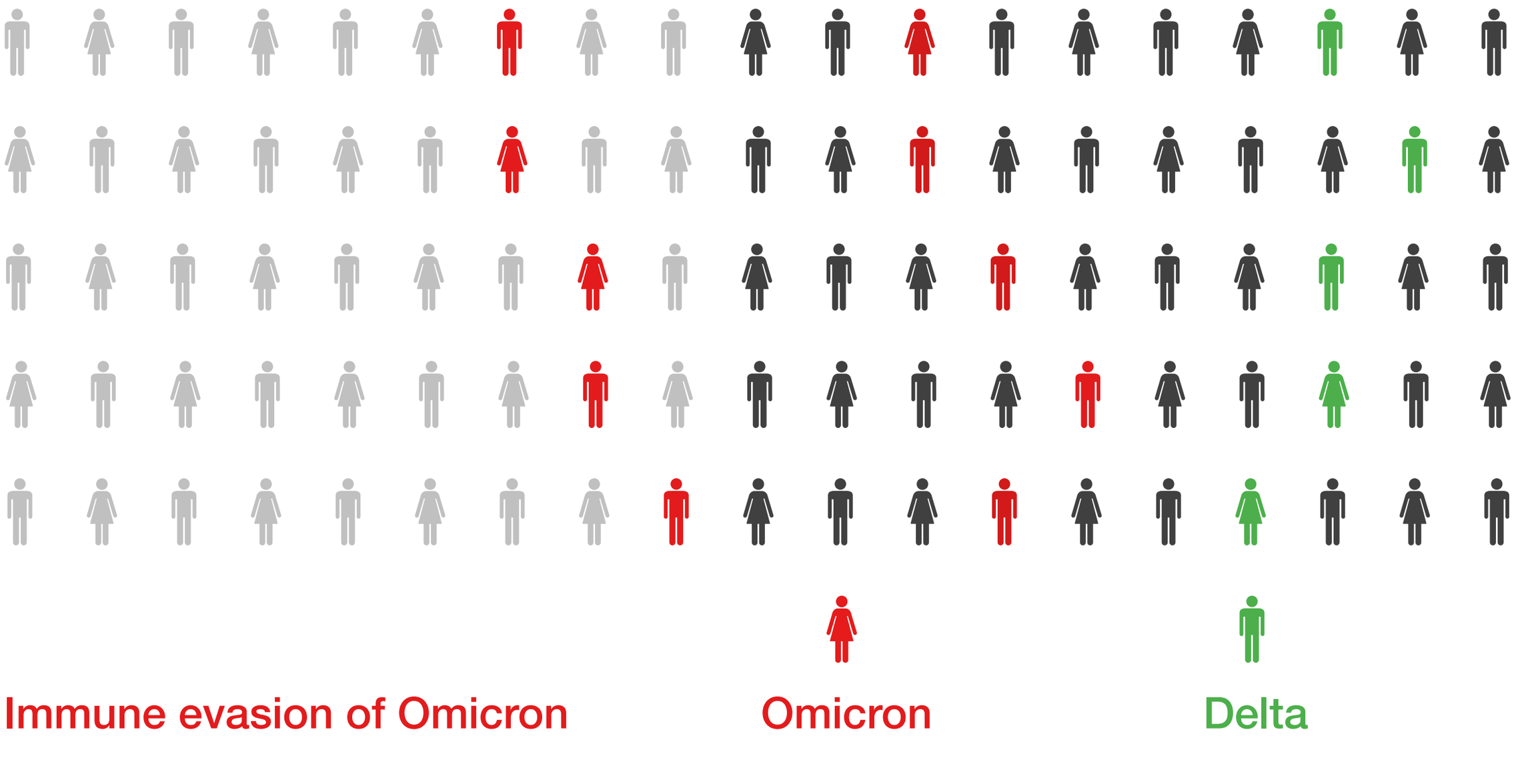

Immune evasion of Omicron

Omicron

Delta

Increased transmissibility and immune evasion

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Higher transmissibility and immune evasion of Omicron

Omicron

Delta

Seroprevalence in South Africa

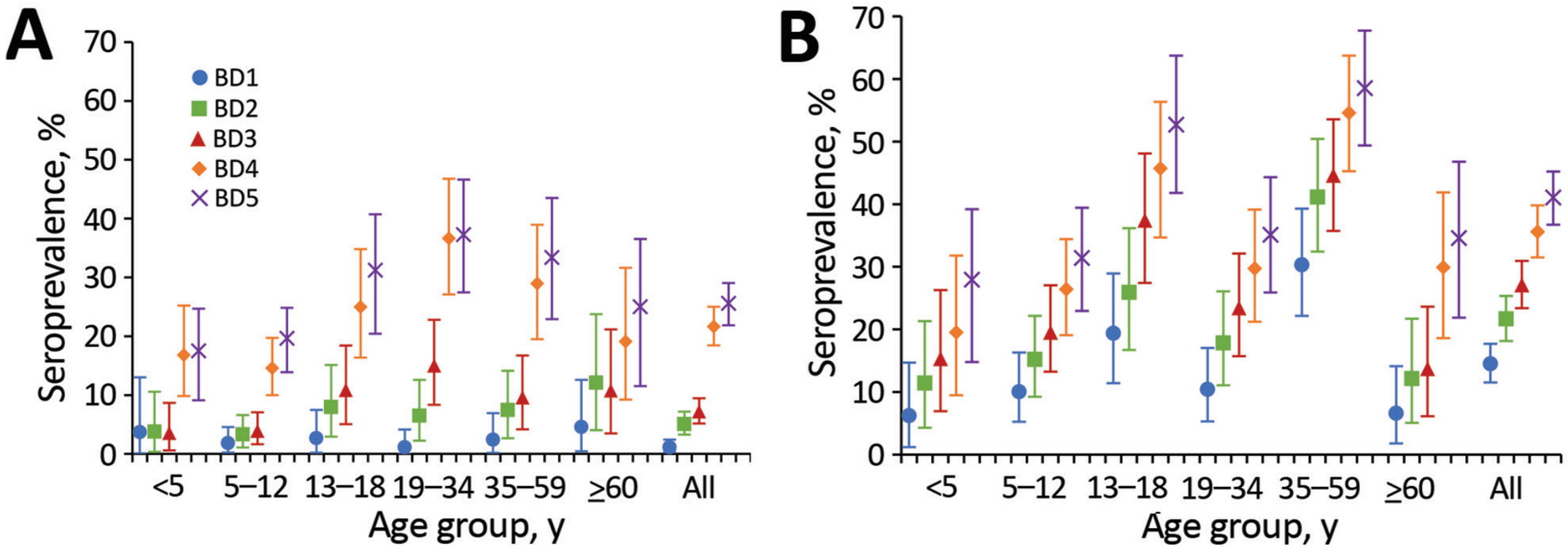
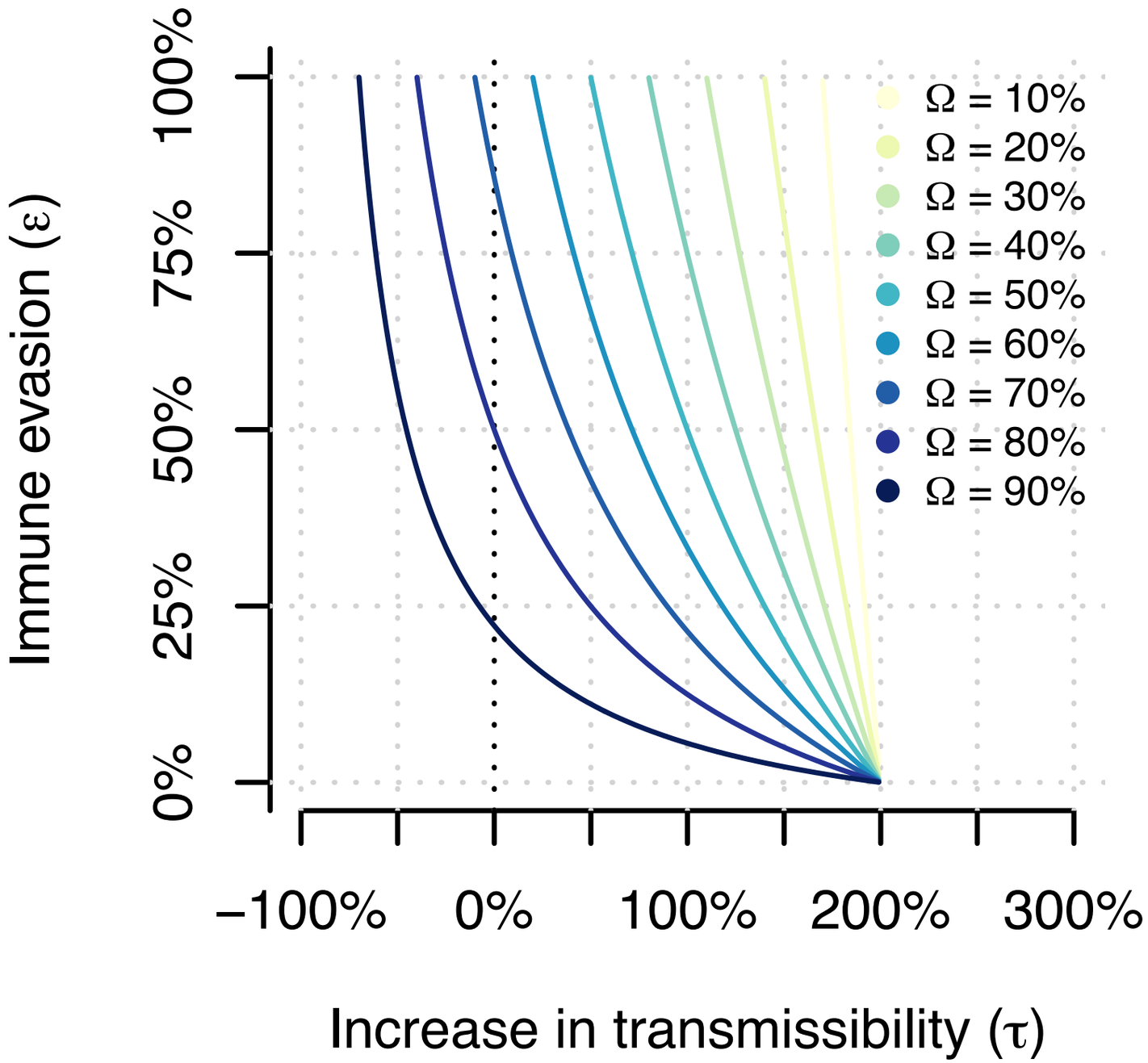


Figure 2. Seroprevalence of severe acute respiratory syndrome coronavirus 2 at each blood collection, by age group, in a rural community (A) and an urban community (B), South Africa, March 2020–March 2021.

Seroprevalence (and level of protective immunity against infection and subsequent transmission) arguably higher after Delta wave in South Africa. In addition, almost 30% of the population has been vaccinated.

Reference: Kleynhans et al. (2021, Emerg Infect Dis)

Relationship between potential increase in transmissibility and immune evasion for Omicron in Gauteng, South Africa



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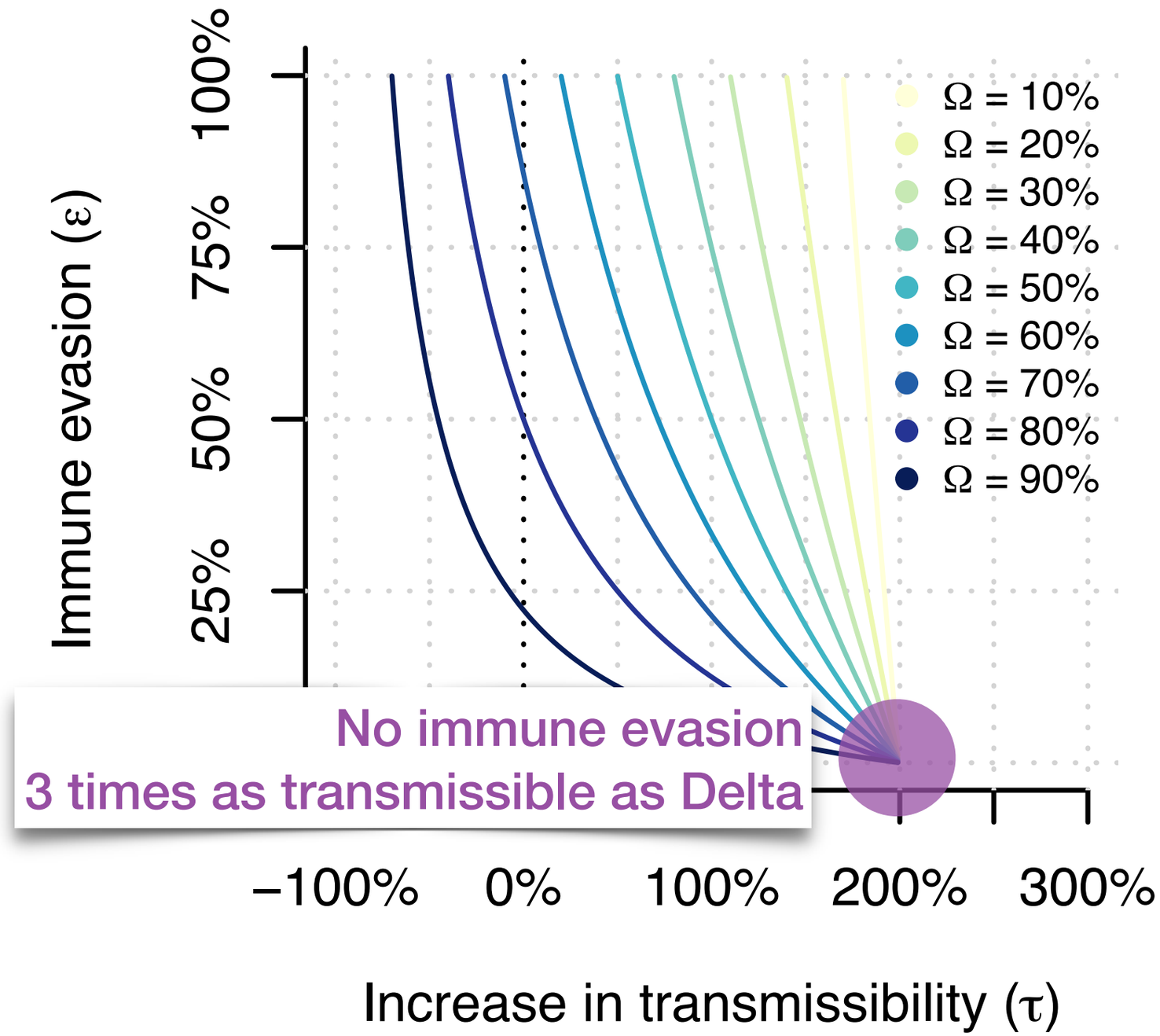

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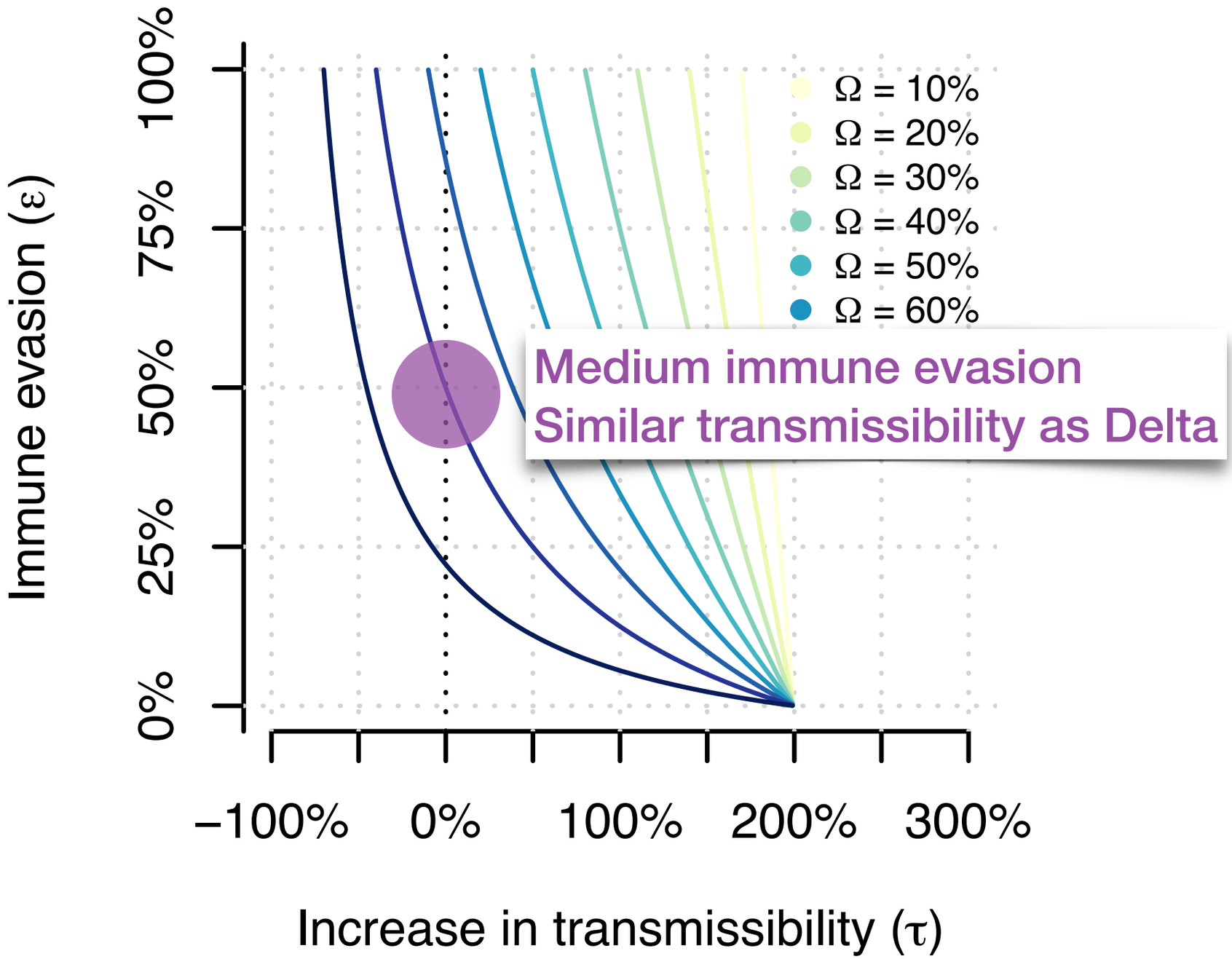
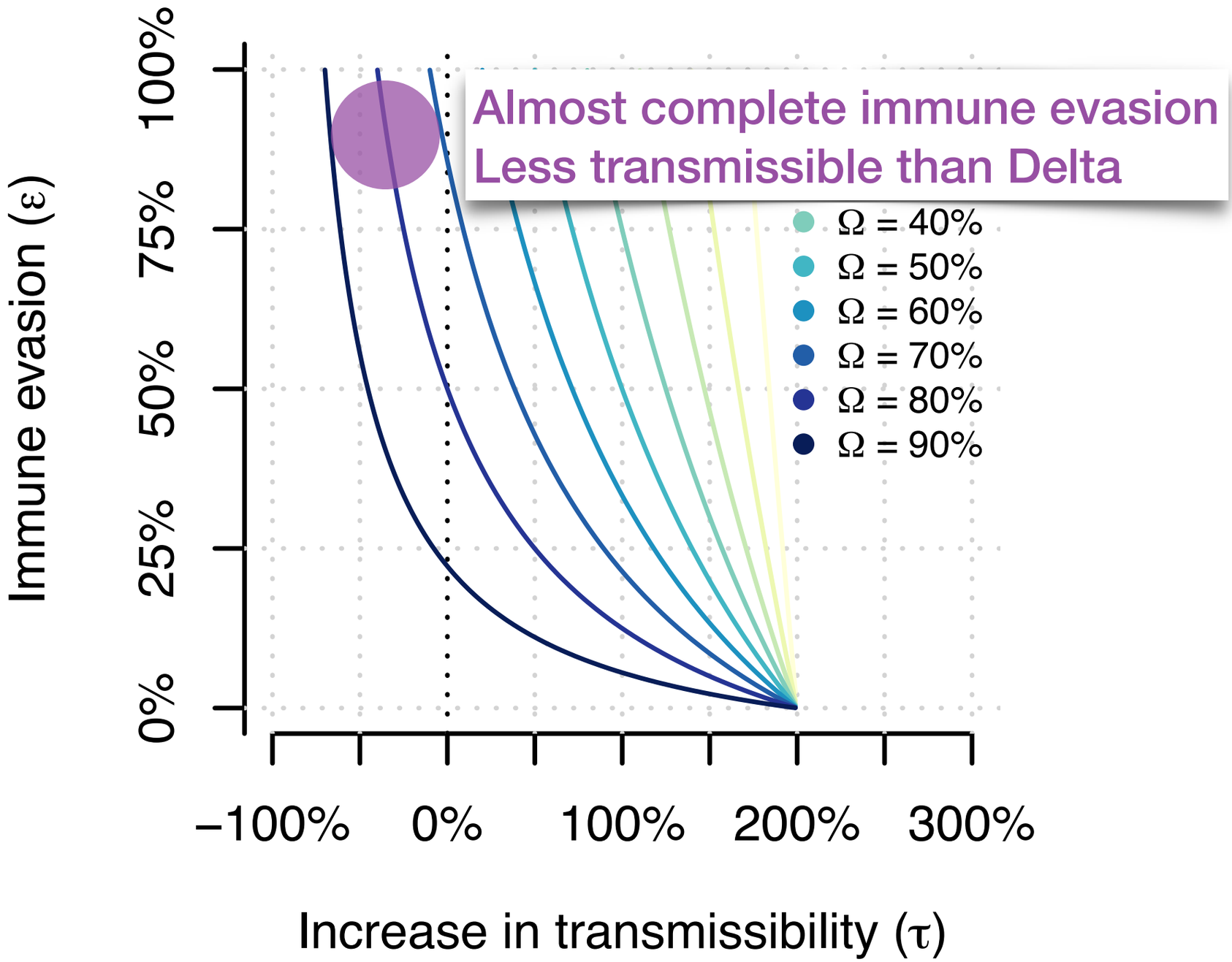
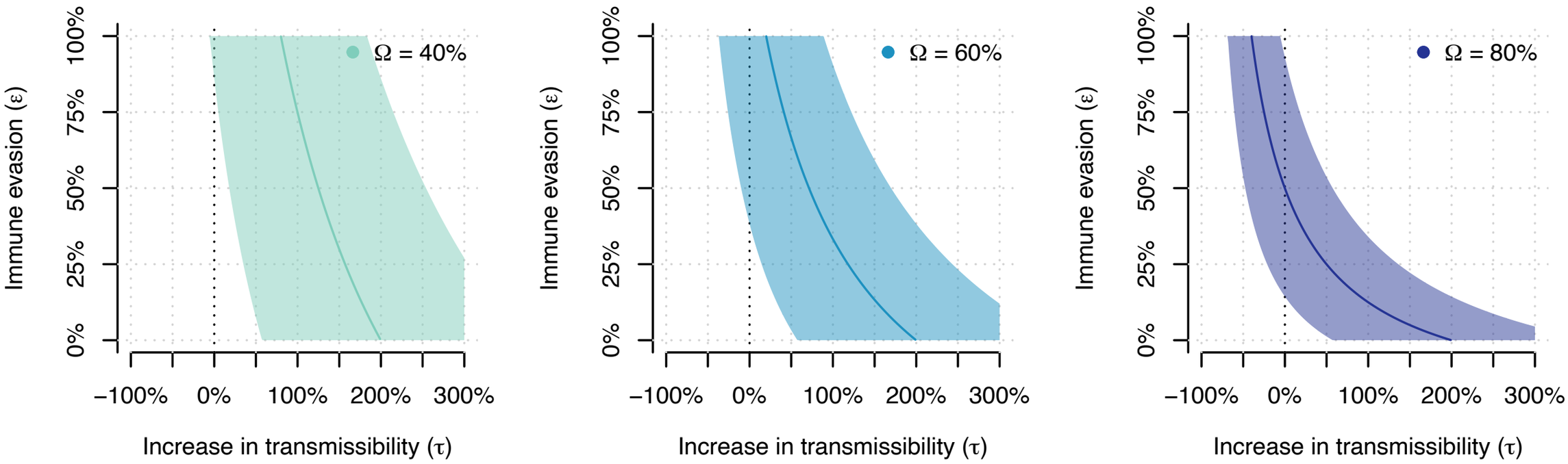


Relationship between potential increase in transmissibility and immune evasion for Omicron in Gauteng, South Africa:



Considerable uncertainty around the estimates remain



Further evidence for immune evasion of Omicron: Increased reinfection in South Africa

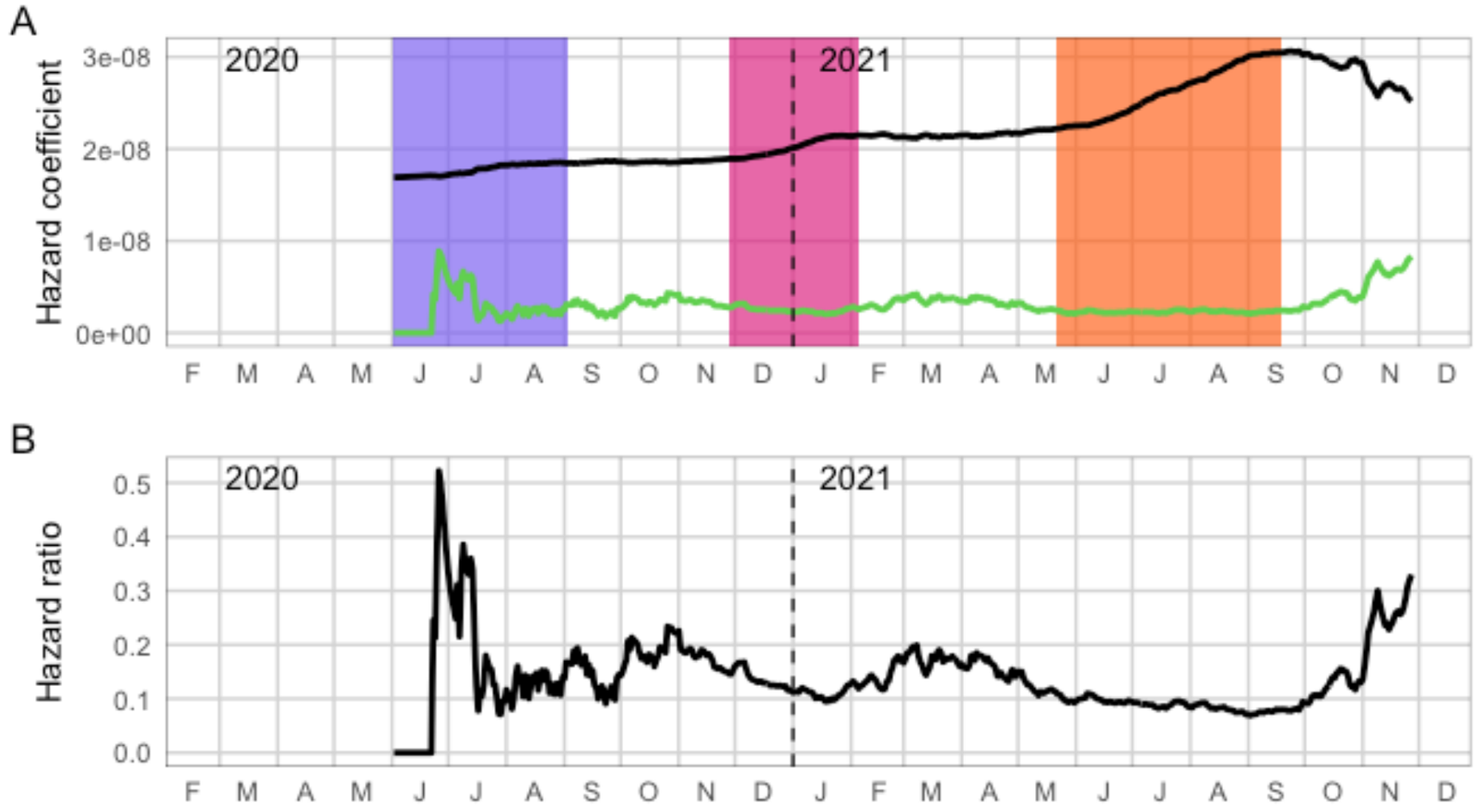


Figure 5. *Empirical estimates of infection and reinfection hazards. A: Estimated time-varying hazard coefficients for primary infection (black) and reinfections (green). Colored bands represent wave periods, defined as the period for which the 7-day moving average of cases was at least 15% of the corresponding wave peak (purple = wave 1, pink = wave 2, orange = wave 3). B: Ratio of the empirical hazard for reinfections to the empirical hazard for primary infections*

Reference: Pulliam et al. (2021, medRxiv)

Summary

- Early evidence suggests that the SARS-CoV-2 variant Omicron has a **considerable growth advantage** compared to Delta in South Africa (~ 0.3 per day).

- **Partial evasion of protective immunity against infection and transmission** with previous variants can explain the observed dynamics, particularly when population immunity is high.

- An increase - or decrease - of the intrinsic transmissibility of Omicron compared to Delta cannot be excluded, however.

- Close monitoring of the spread of Omicron in countries outside South Africa will be necessary to better understand the potential of this variant to evade naturally acquired and vaccine-elicited immunity.

Thanks

- **Emma Hodcroft, Martina Reichmuth**
  Institute of Social and Preventive Medicine, University of Bern, Bern, Switzerland

- **Houriiyah Tegally, Richard J. Lessells, Tulio de Oliveira**
  KwaZulu-Natal Research Innovation and Sequencing Platform (KRISP), Department of Laboratory Medicine & Medical Sciences, University of KwaZulu-Natal, Durban, South Africa

- **Richard Neher**
  University of Basel, Basel, Switzerland

Nextstrain

- GISAID

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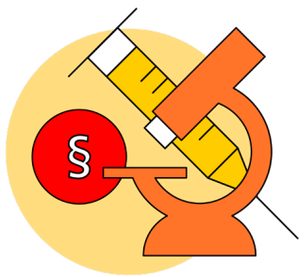

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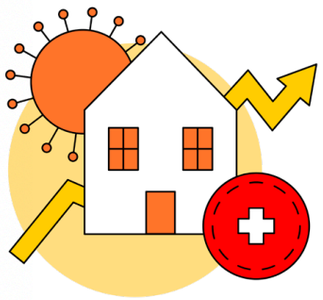

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