



The 2nd Covid-19 wave in South Africa: Transmissibility & a 501.V2 variant

Ministerial Briefing, 18 December 2020

Salim S. Abdool Karim, FRS

Director: CAPRISA

CAPRISA Professor of Global Health, Columbia University

Co-Chair: Ministerial Advisory Committee on COVID-19

Member: African Task Force for Coronavirus

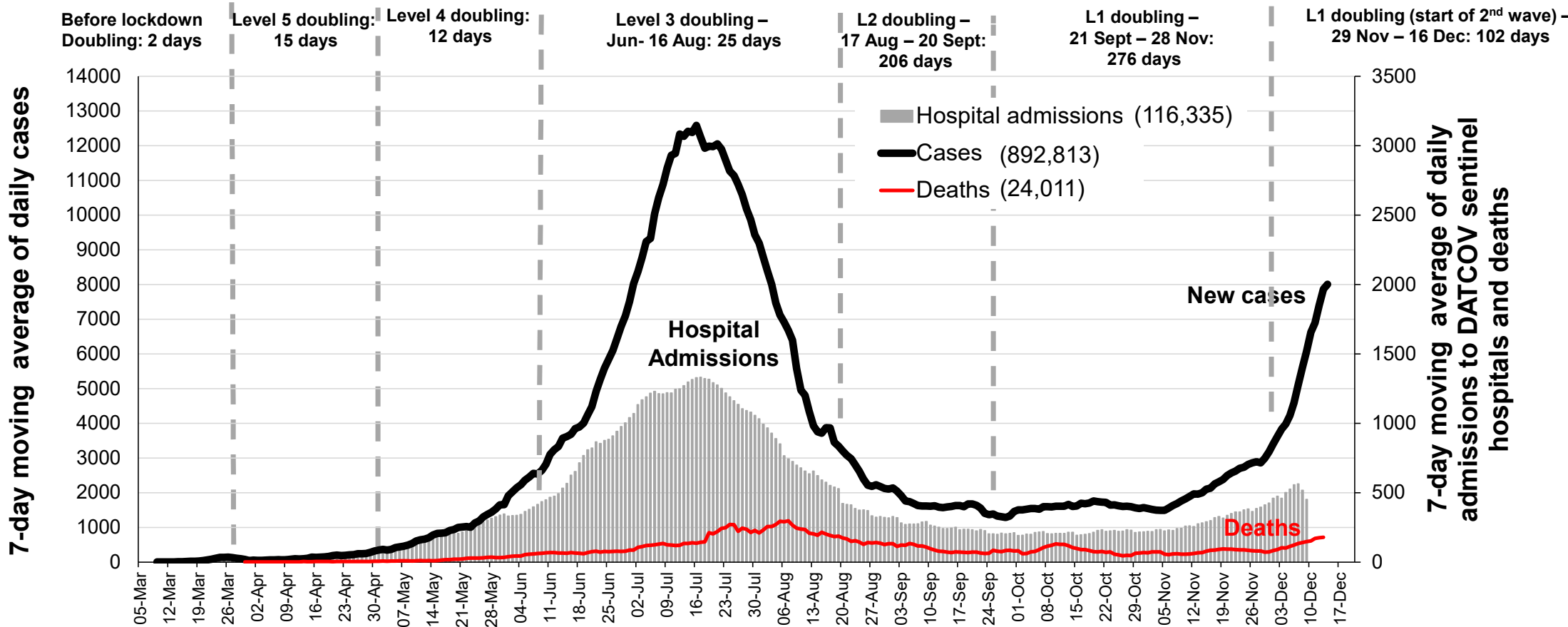
Pro Vice-Chancellor (Research): University of KwaZulu-Natal

Adjunct Professor in Immunology and Infectious Diseases, Harvard University

Adjunct Professor of Medicine: Cornell University

Covid-19 in South Africa

7-day moving average of new cases, sentinel hospital admissions and Covid-19 deaths – to 17 Dec

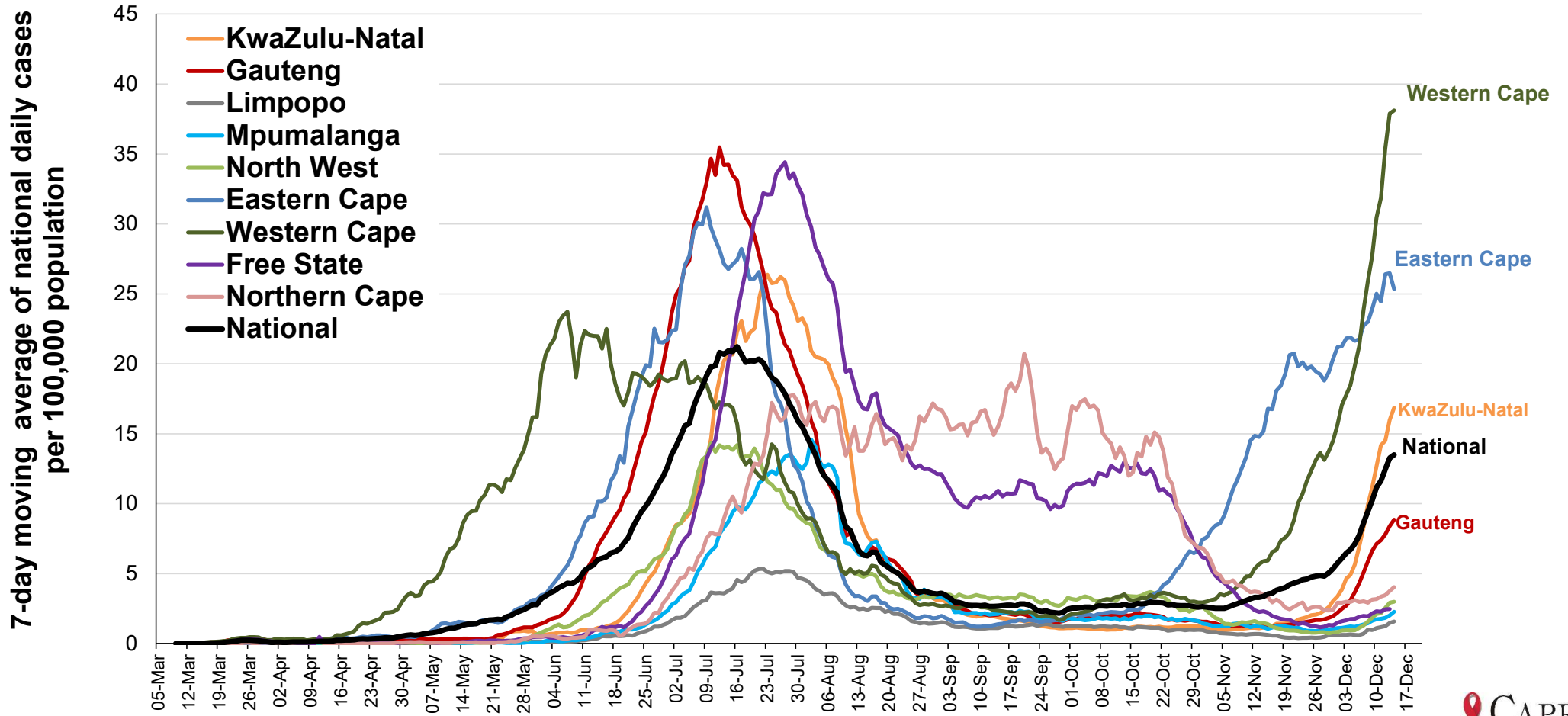


Source of hospital admissions data: Lucille Blumberg and Waasila Jassat – DATCOV, NICD



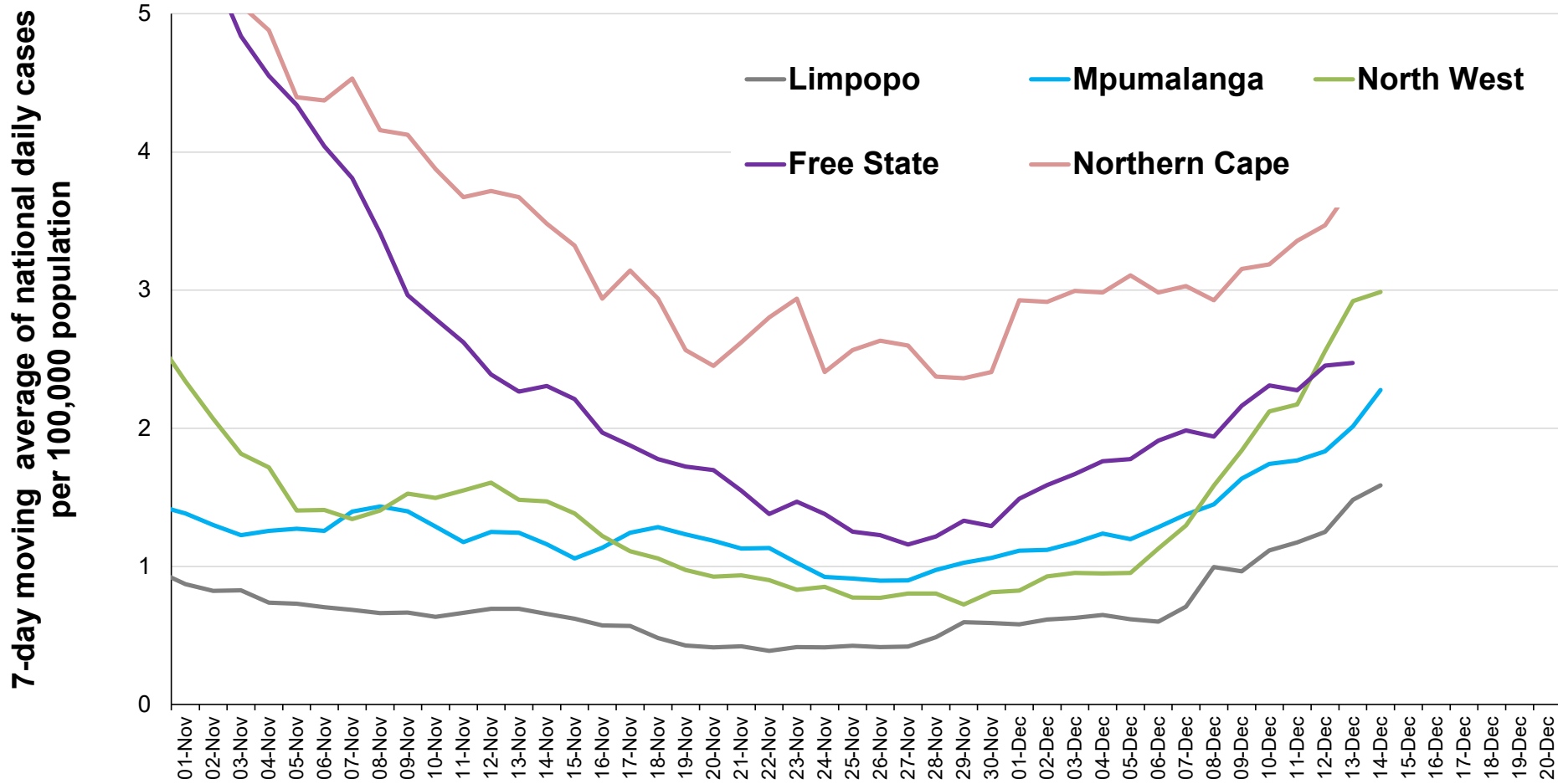
Confirmed SARS-Cov-2 cases by province

(7-day moving average cases per 100,000 population – up to 17 December)



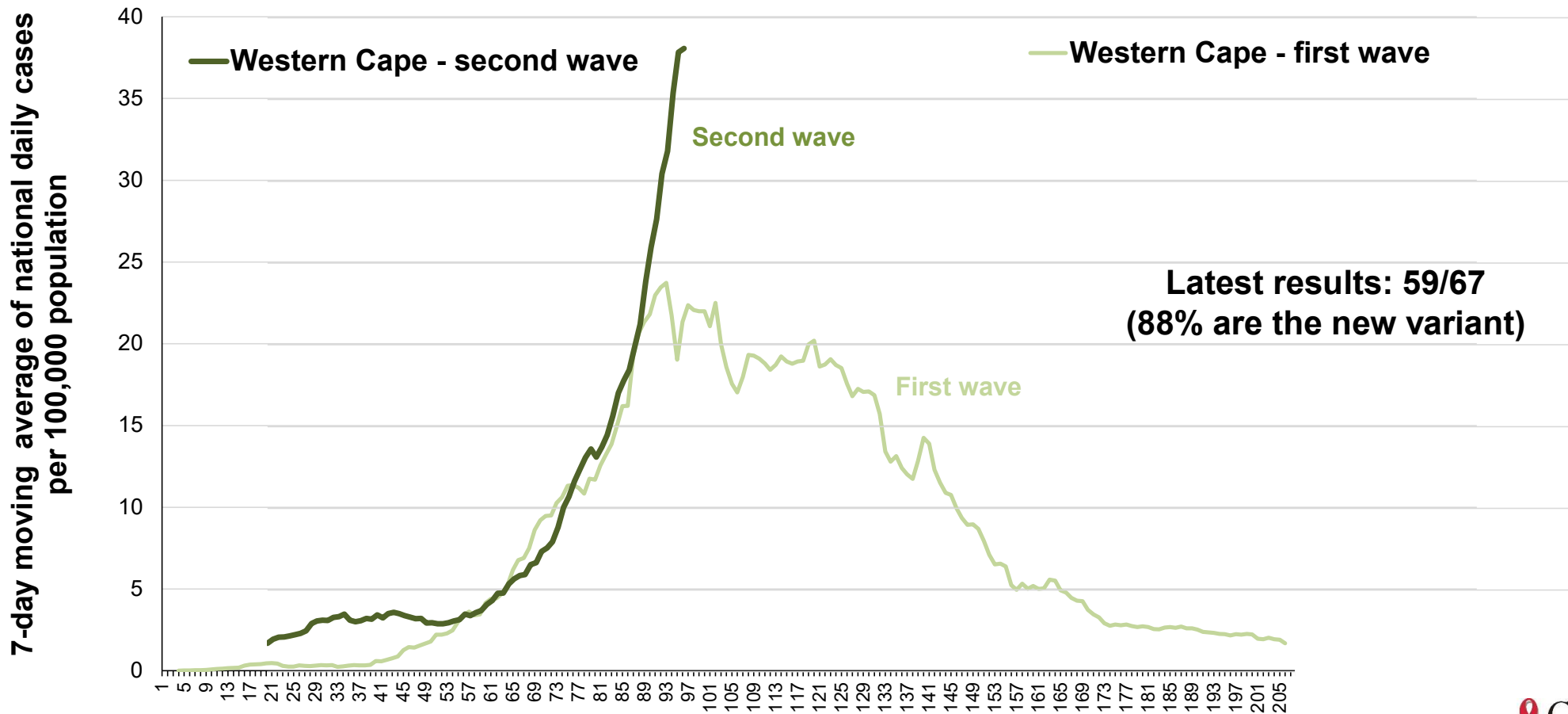
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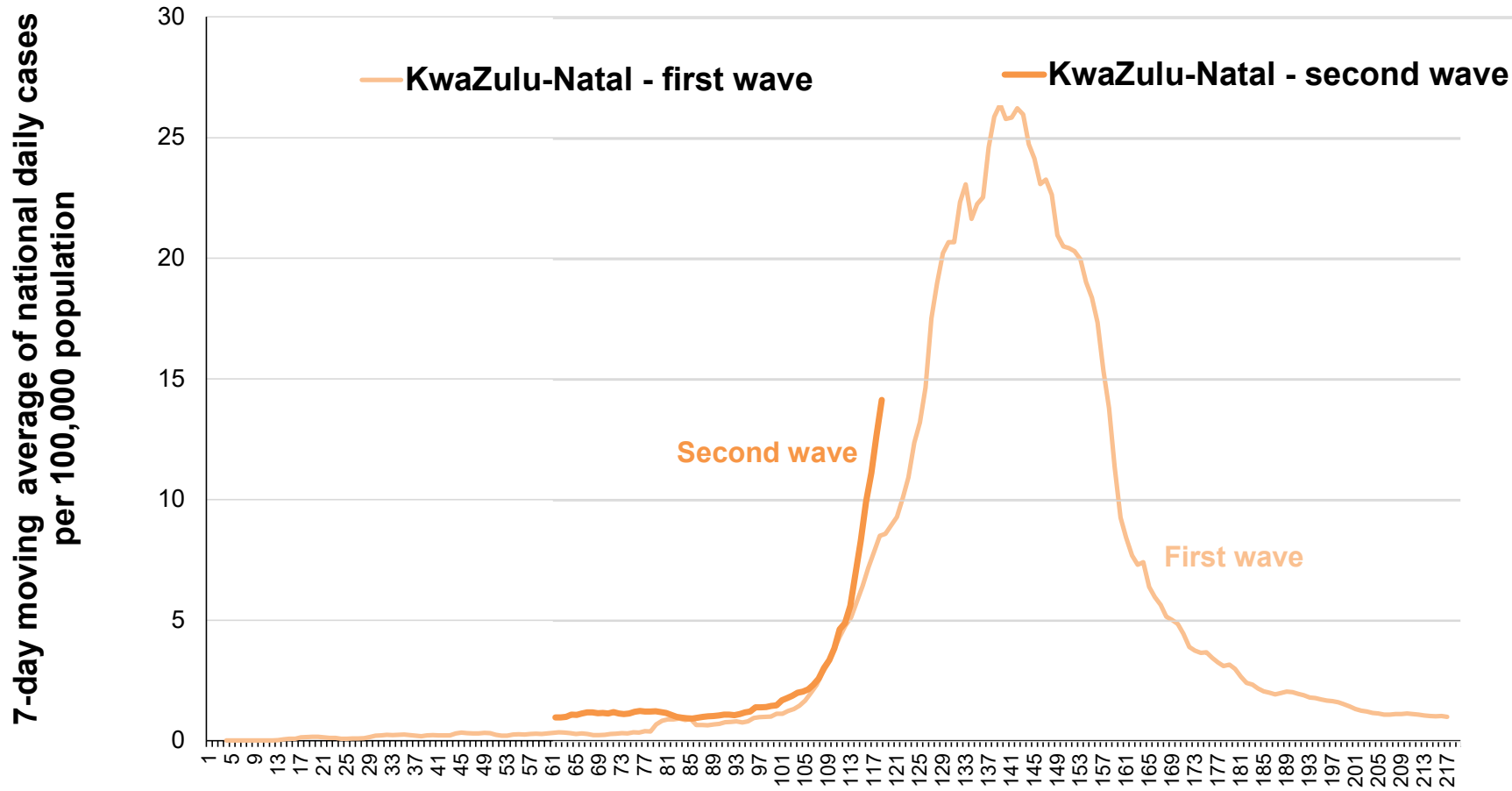
Comparison of SARS-Cov-2 cases in first and second wave in Western Cape

(7-day moving average cases per 100,000 population – up to 17 December)

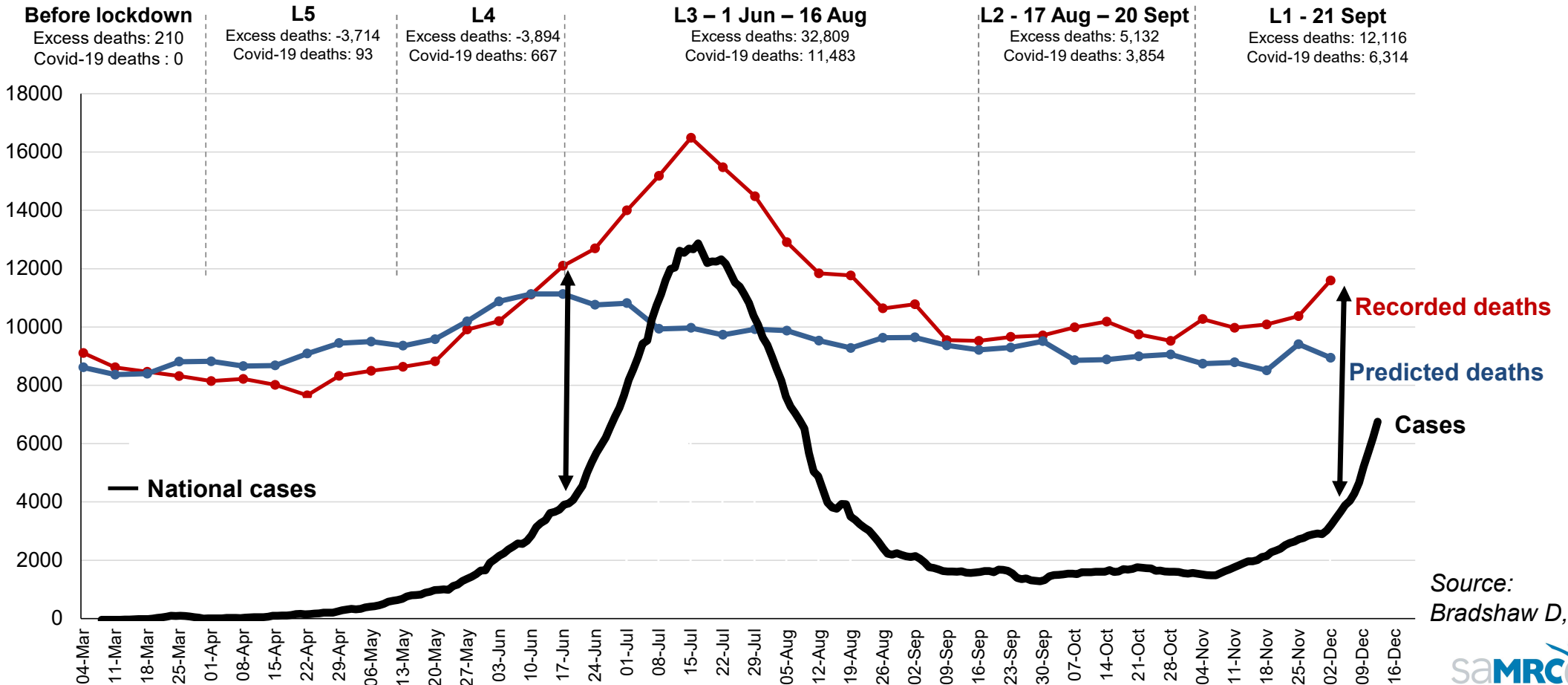


Comparison of SARS-Cov-2 cases in first and second wave in KwaZulu-Natal

(7-day moving average cases per 100,000 population – up to 17 December)



Expected & actual all-cause deaths during Covid-19



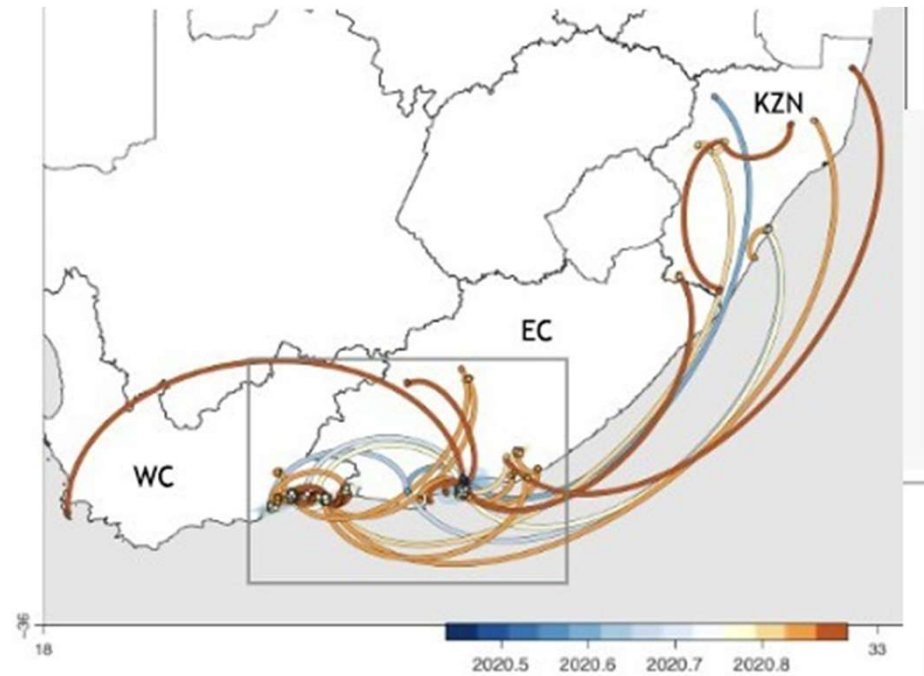
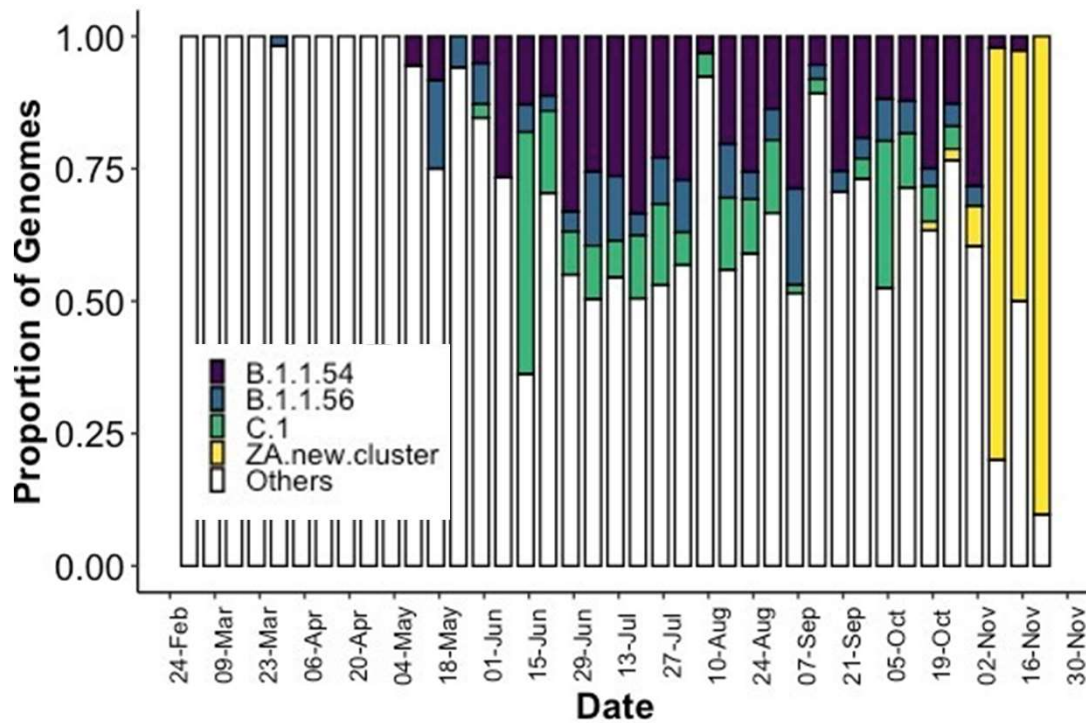
5 Mar – 31 May: 7,608 less deaths (all-causes) than expected, mostly from fewer non-natural deaths
1 Jun – 16 Aug: 32,809 excess deaths (all-causes) - 11,483 reported Covid-19 deaths



The fine balance between virus and host

- **Viruses usually evolve to become more transmissible & less severe (less pathogenic or less lethal)**
 - **Mostly within humans in response to immune pressure**
 - **Sometimes when they pass through another species**
- **SARS-CoV-2 relatively stable in 1st wave – SA recorded about 35 lineages (most were the more transmissible D614G variant from Europe with minor variations)**
- **2nd wave now in all provinces with some early signs of it spreading faster than 1st wave**
- **Not clear if 2nd wave has more or less deaths (severity unclear)**

2nd wave – new 501.V2 variant with 3 RBD mutations has spread & become predominant

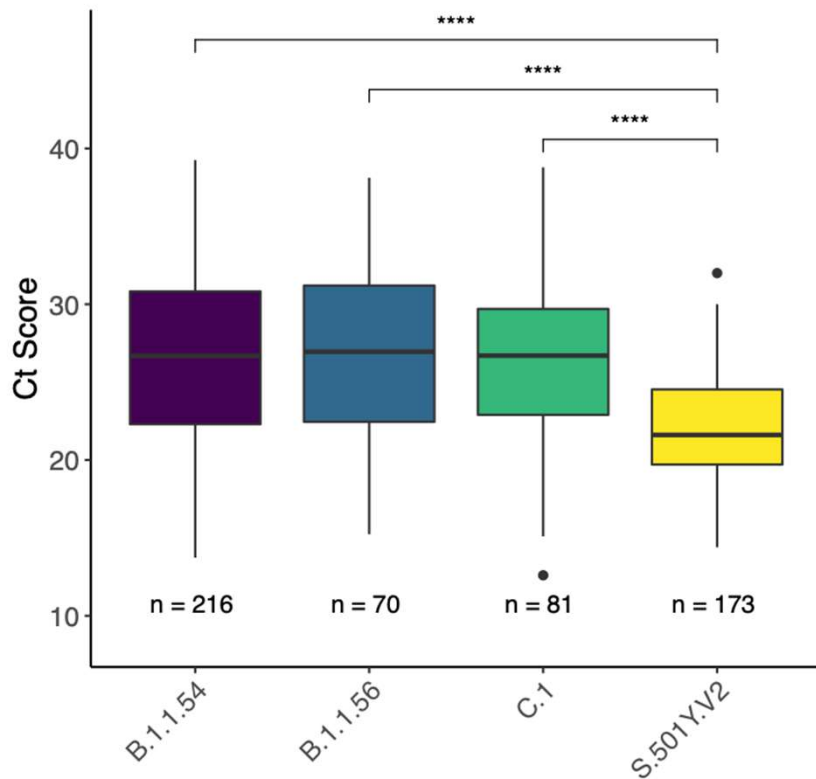


3 RBD mutations: K417N, E484K, N501Y
 - ↑ affinity to ACE2 receptor & potential Ab escape

Source: Tyler N et al, Cell 2020

Probably originated in NMB – spread to EC, Garden route, KZN & Cape Town

Preliminary results: 501.V2 variant associated with higher viral load



Speculate the following:

- Higher viral load in swabs may translate to higher efficiency of transmission ie. Higher transmissibility
- This may translate into a higher R_0
- While other viruses are transmitting, this variant is transmitting faster
- This may translate into a 2nd wave that will have many more cases than 1st wave

What **do** & **don't** we know about the 501.V2 variant?

1. Unusual for a new variant to contain several mutations – 3 in RBD incl. N501Y – which alters ACE2 affinity & ?Ab effects
2. N501Y is being reported in other countries (0.2%) e.g. UK
3. Early signs that the new variant is spreading fast – sometimes faster than 1st wave viruses
4. It is widespread – probably across most of SA by now

1. Where did it come from & why did it form? Why NMB? – we have a few hypotheses to investigate
2. Is it more severe? – too early to tell
3. Is it re-infecting people who got infected in the 1st wave
4. Will the current vaccines work against this variant?
– currently being studied by KRISP, AHRI, NICD & CAPRISA

What should we do next?

- 1. There is reason for concern that we have a virus that seems to be spreading rapidly; but it is something we can deal with.**
- 2. Same prevention measures & treatment work for 501.V2**
- 3. Similar 501 variants are in other countries e.g. Australia, UK**
- 4. Inform key role-players & the public about the 501.V2 variant**
- 5. Publish the data in a prominent journal**
- 6. Urgently increase phylogenetic screening – need to sequence 100-200 viruses every month from across SA**
- 7. Complete the studies to answer the 4 unknowns – fortunately, there are vaccine trials underway in SA e.g. J&J**