Influenza Season, Australia 2022

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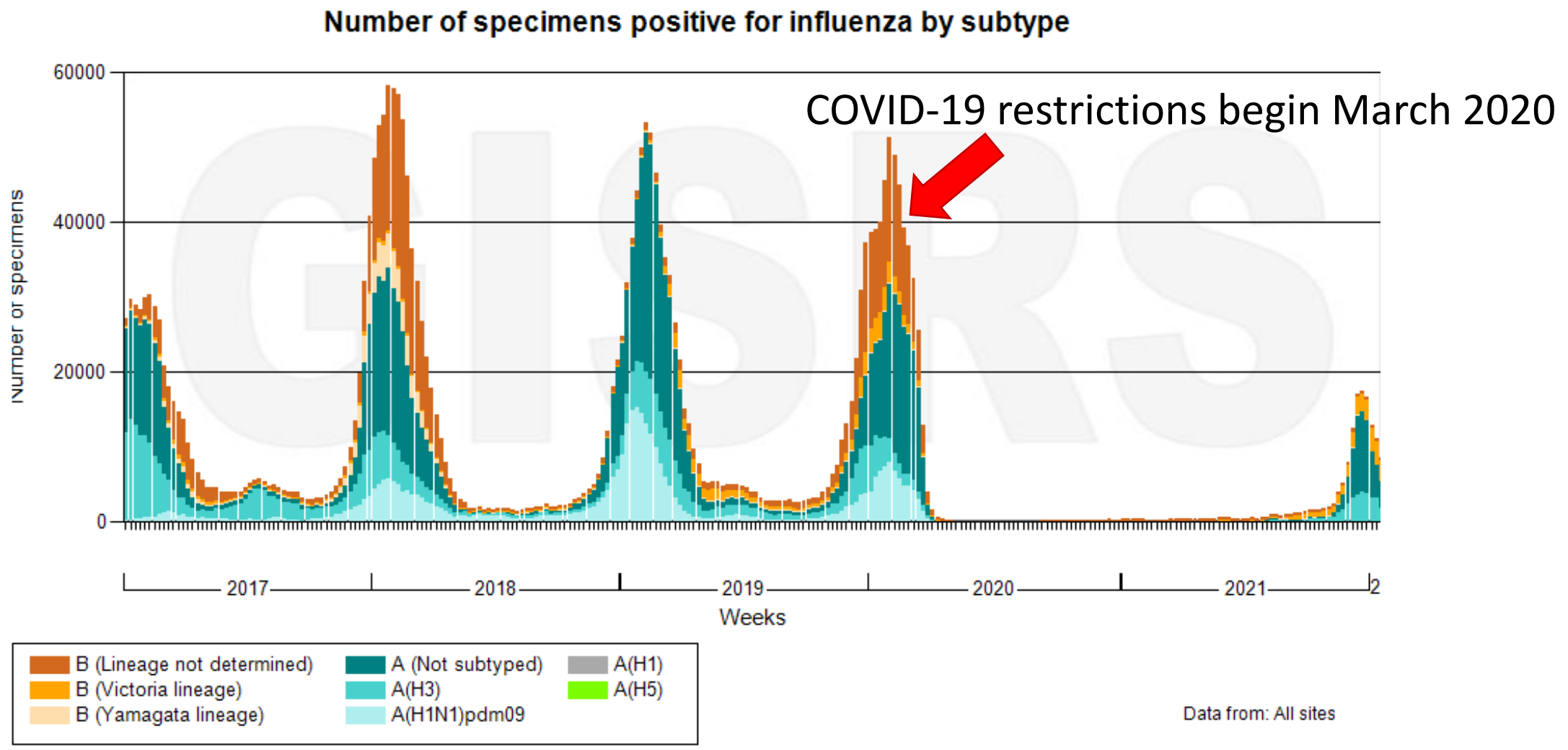
The Royal Melbourne Hospital

A joint venture between The University of Melbourne and The Royal Melbourne Hospital

Global influenza detection decreased sharply in 2020 with the onset of pandemic mitigation measures

Global circulation of influenza viruses



Data source: FluNet (www.who.int/flunet), GISRS

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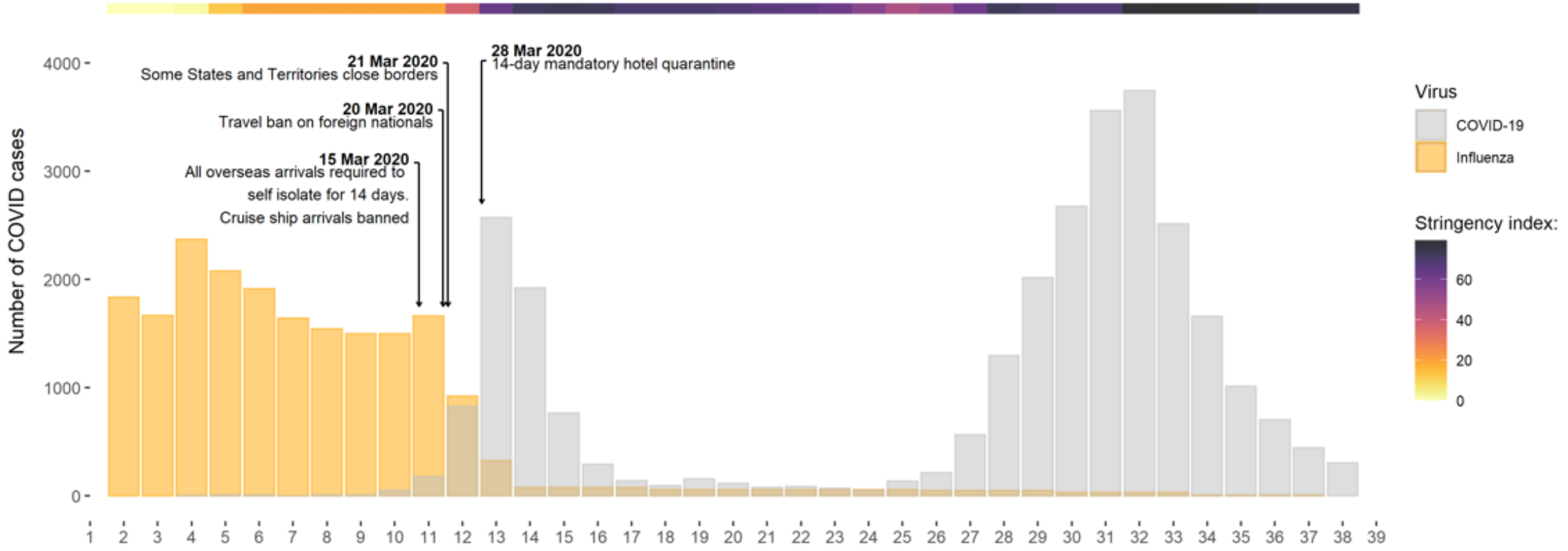
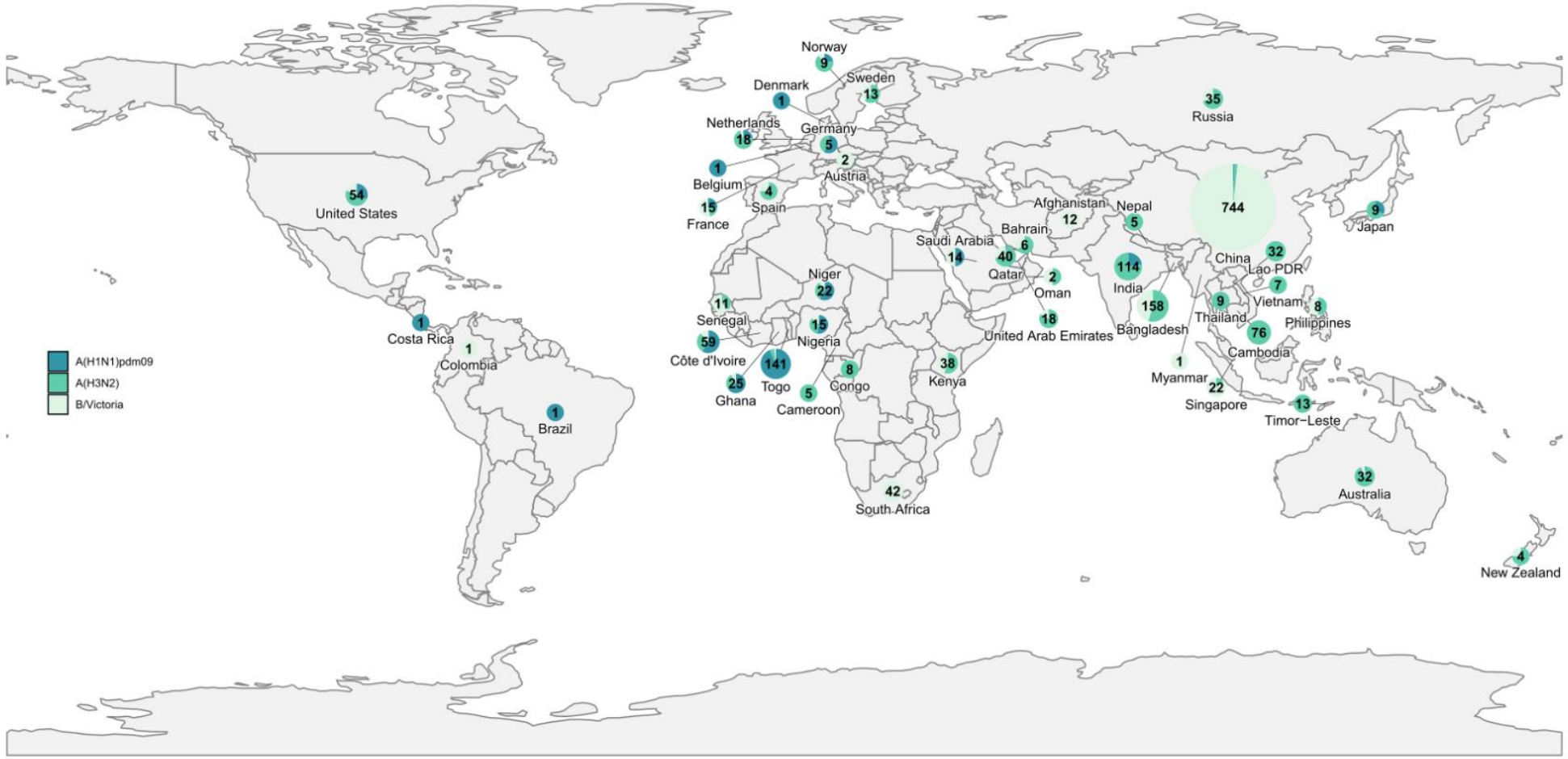
Australia experienced a rapid decline in influenza detection that coincided with border closures

- 28 March 2020: Returning residents required to quarantine for 14 daysin managed hotels
- 14 days is sufficient for limiting onward transmission of influenza



Sullivan et al, 2020, Eurosurveillance

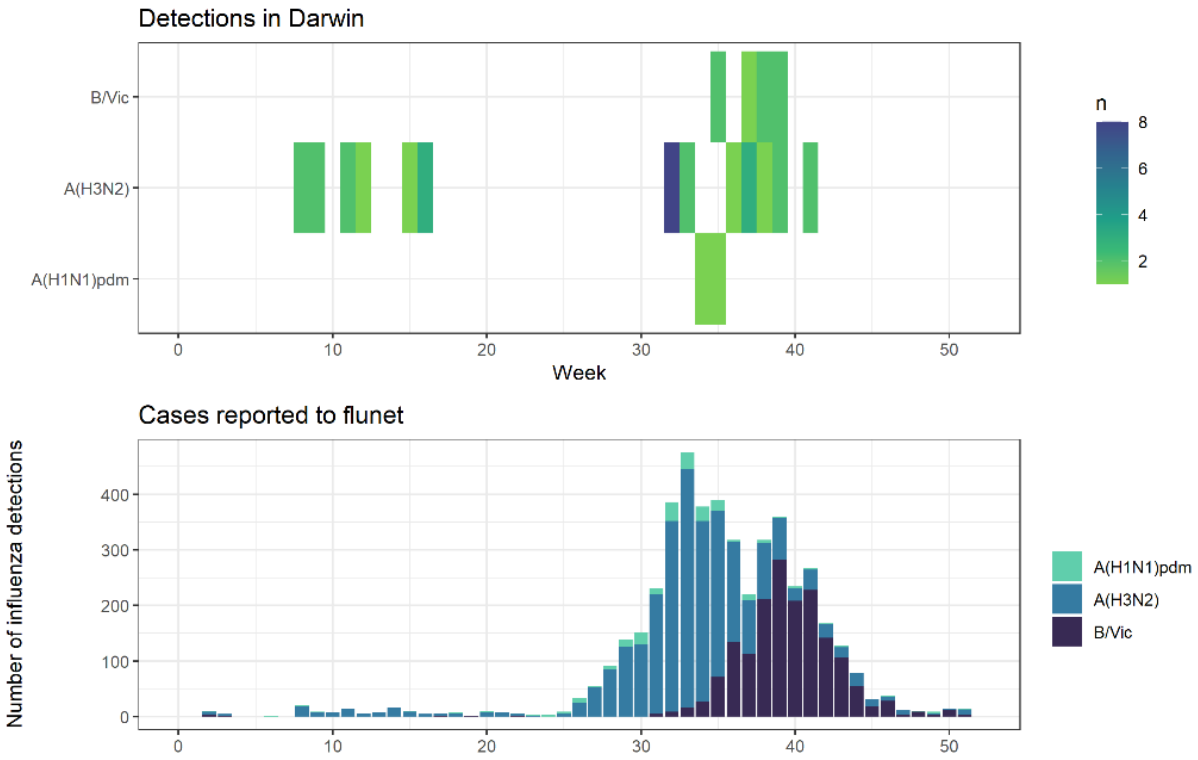
Influenza continued to be detected in isolated pockets globally, April 2020 - October 2021



Sullivan, 2021, MJA

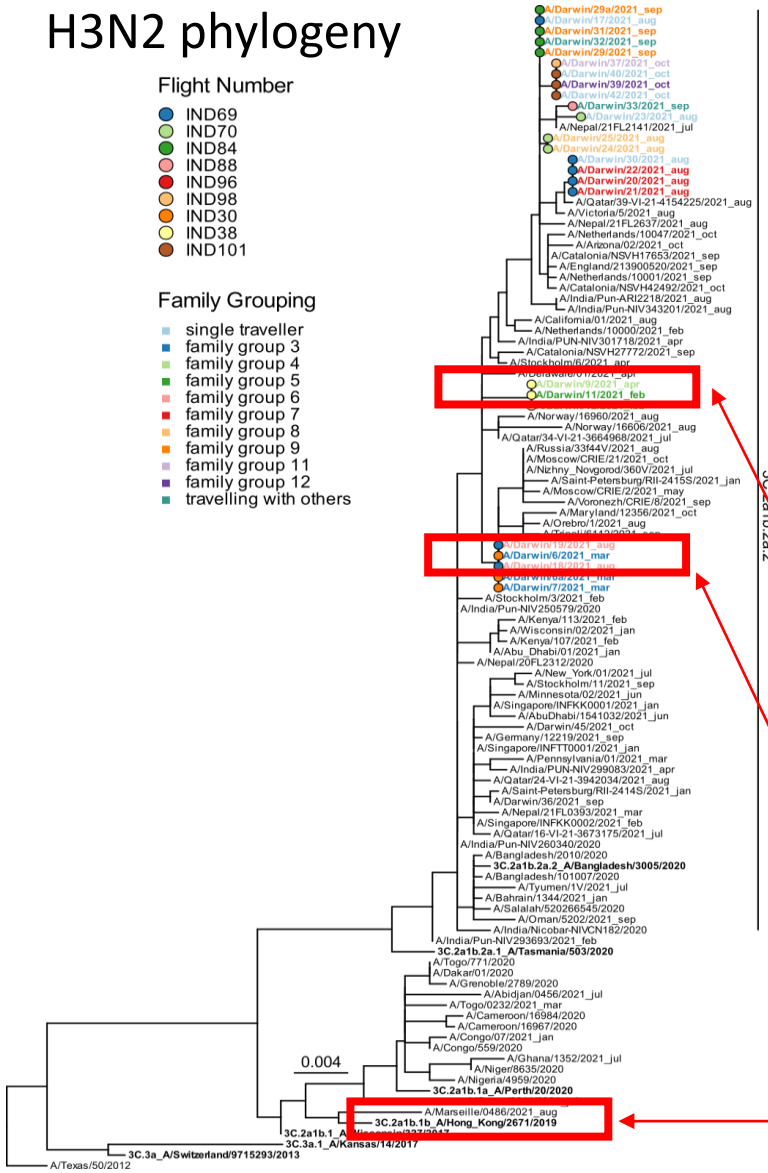
Influenza was identified among returned travelers in hotel quarantine in 2021 in Australia

- Jan to Oct 2021, 42 travelers tested positive:
  - 30 A(H3N2)
  - 2 A(H1N1)pdm09
  - 10 B/Victoria
- Testing quarantined travelers helped to identify influenza activity in source countries where surveillance may have been compromised
  - 41 from India (0.69% positive of 5,968 arrivals)
  - Viruses detected when activity apparently low in India (eg. Delta epidemic in early 2021)



Timeline of influenza detections among travellers returning from India (upper) and cases reported to WHO Flunet (lower)

Influenza viruses isolated from repatriated travellers were used to obtain vaccine seed viruses for the influenza vaccine



- WHO makes recommendations on influenza vaccine composition twice a year
  - February for Northern Hemisphere
  - September for Southern Hemisphere
- Process relies on ability to characterise viruses sent to WHO Collaborating Centres
- In 2021, this was challenging due to decreased global circulation
- 2021 vaccine viruses isolated from repatriated travellers were antigenically distinct from 2020 vaccine viruses

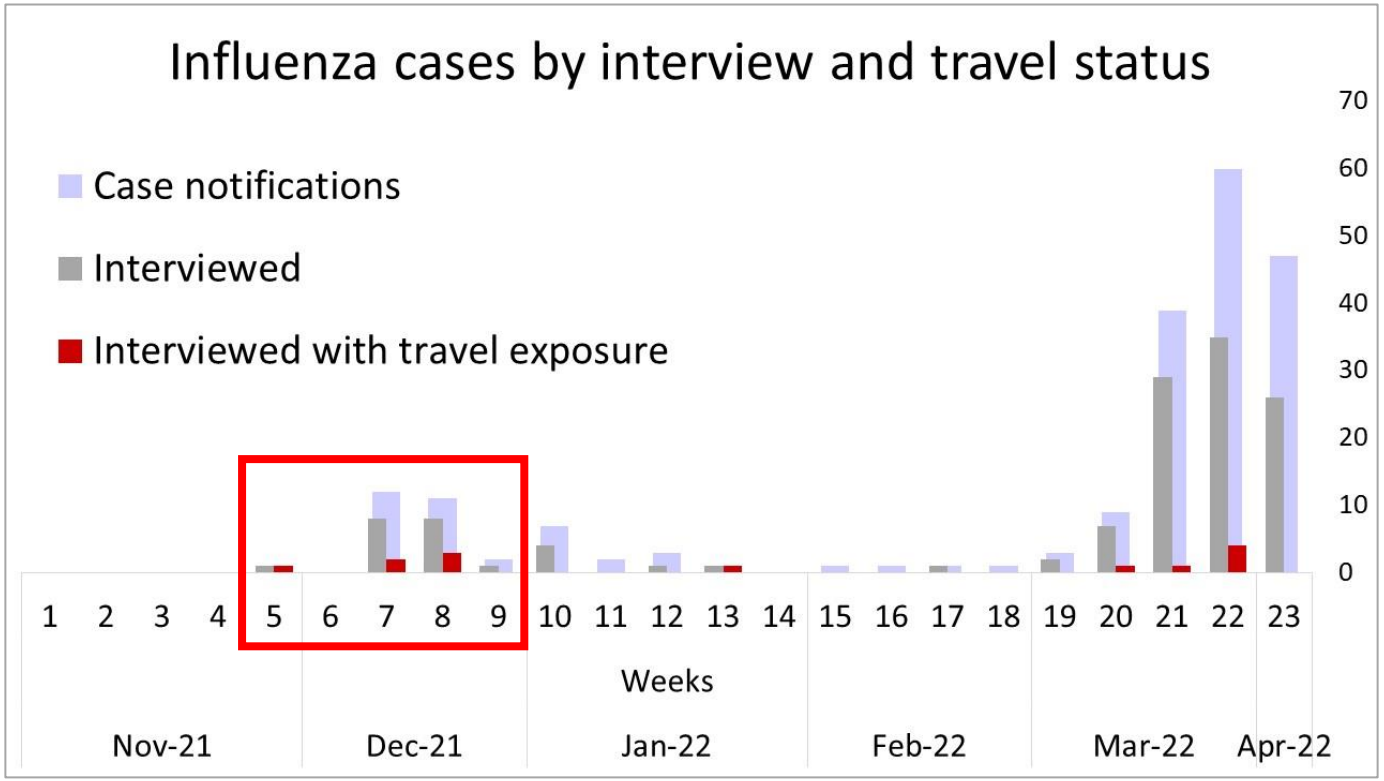
2021 vaccine - A/Darwin/9/2021

2021 vaccine - A/Darwin/6/2021

2020 vaccine - A/Hong Kong/2671/2019

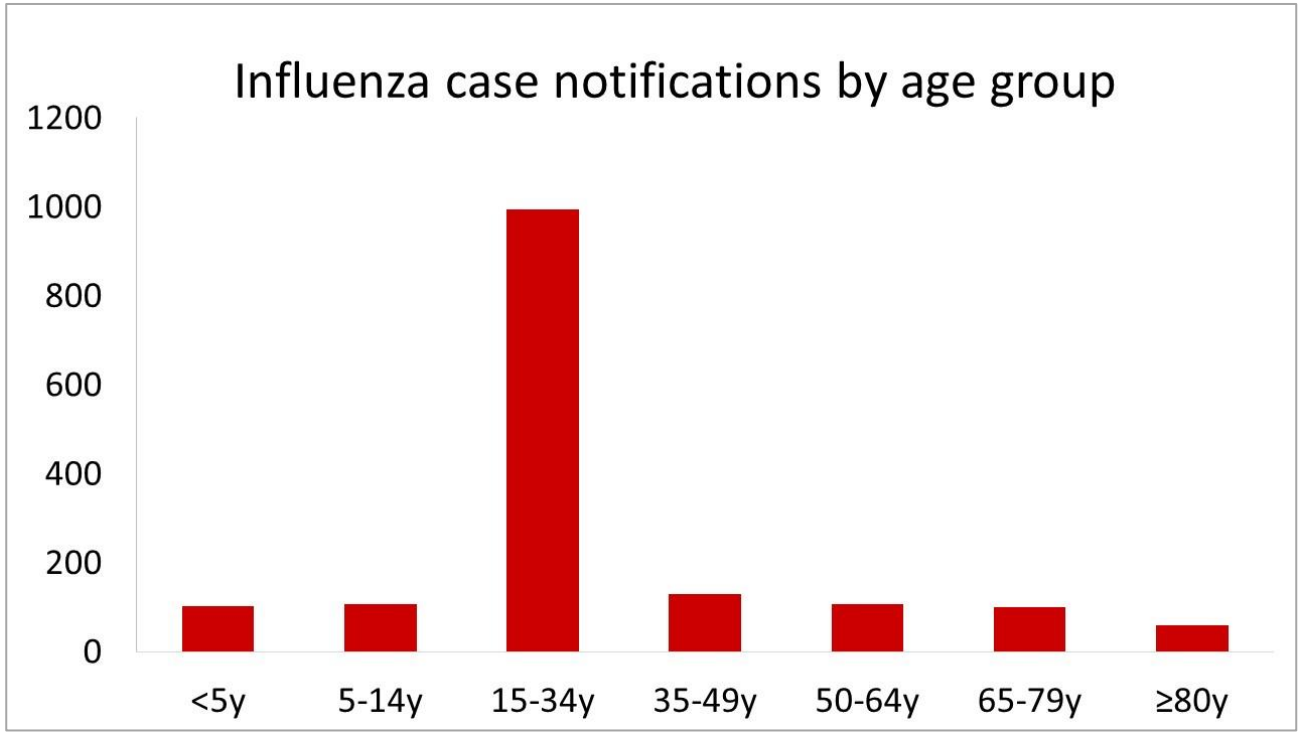
Australia's borders opened on 1 November 2021 permitting resident and virus re-entry

- Cases remained low from Nov 2021 – Feb 2022, potentially due to:
  - Early cases isolating themselves
  - Competition with first Omicron wave
  - Summer and warmer temperatures
  - Lower case detections due to preferential testing for COVID-19
- First 200 influenza cases were interviewed in Victoria, Australia
  - Interviews completed for 124 cases
  - Early cases had travel history



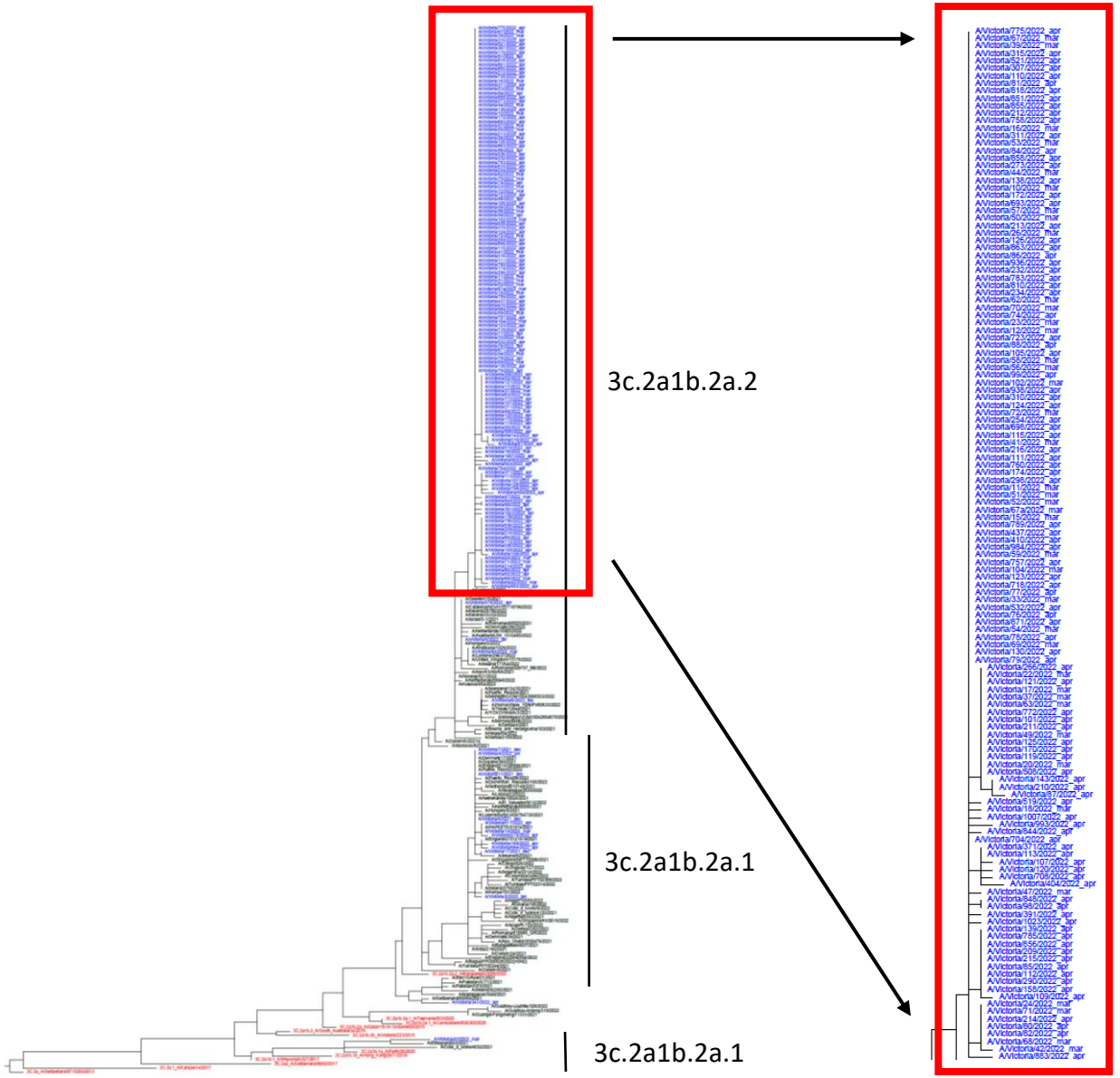
Influenza cases increased from late March (autumn) 2022 in Australia

- Insights from Victoria enhanced surveillance program indicated that:
  - Early spread predominantly occurred in young adults
    - 62% cases occurred in 15-34 year age group during first 6 months post border re-opening
  - Universities were an important setting of early spread
    - 30/124 interviewed cases associated with single cluster at single university, 12 in residential colleges
  - Single dominant A(H3N2) lineage



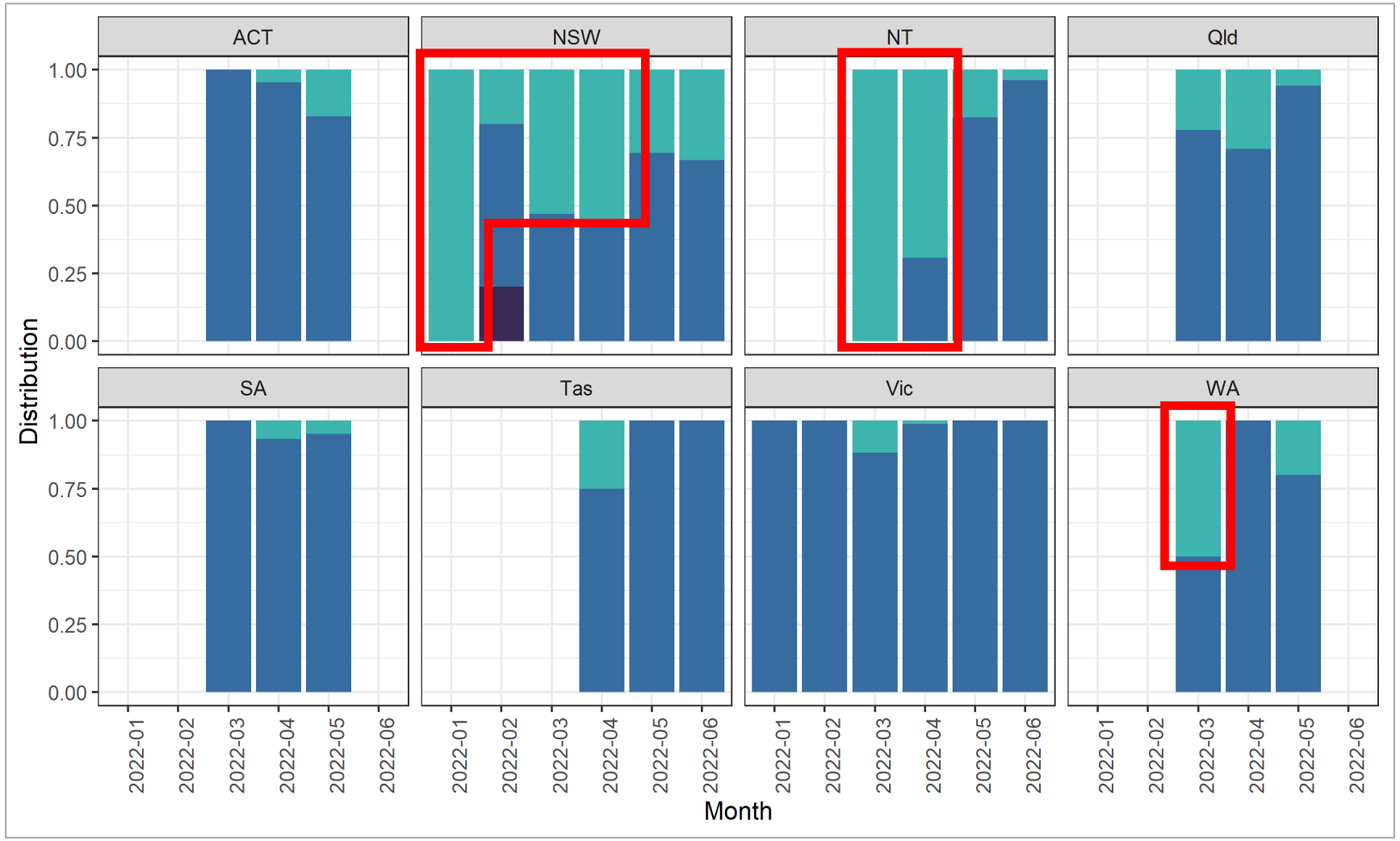
In Victoria, Australia sequencing indicated that a single lineage dominated first 6 months of the influenza season

- Overwhelmingly viruses isolated in March / April in Victoria indicated that a point-source outbreak dominated the early influenza season
- All sequenced cases with identified links to main university cluster were part of dominant lineage



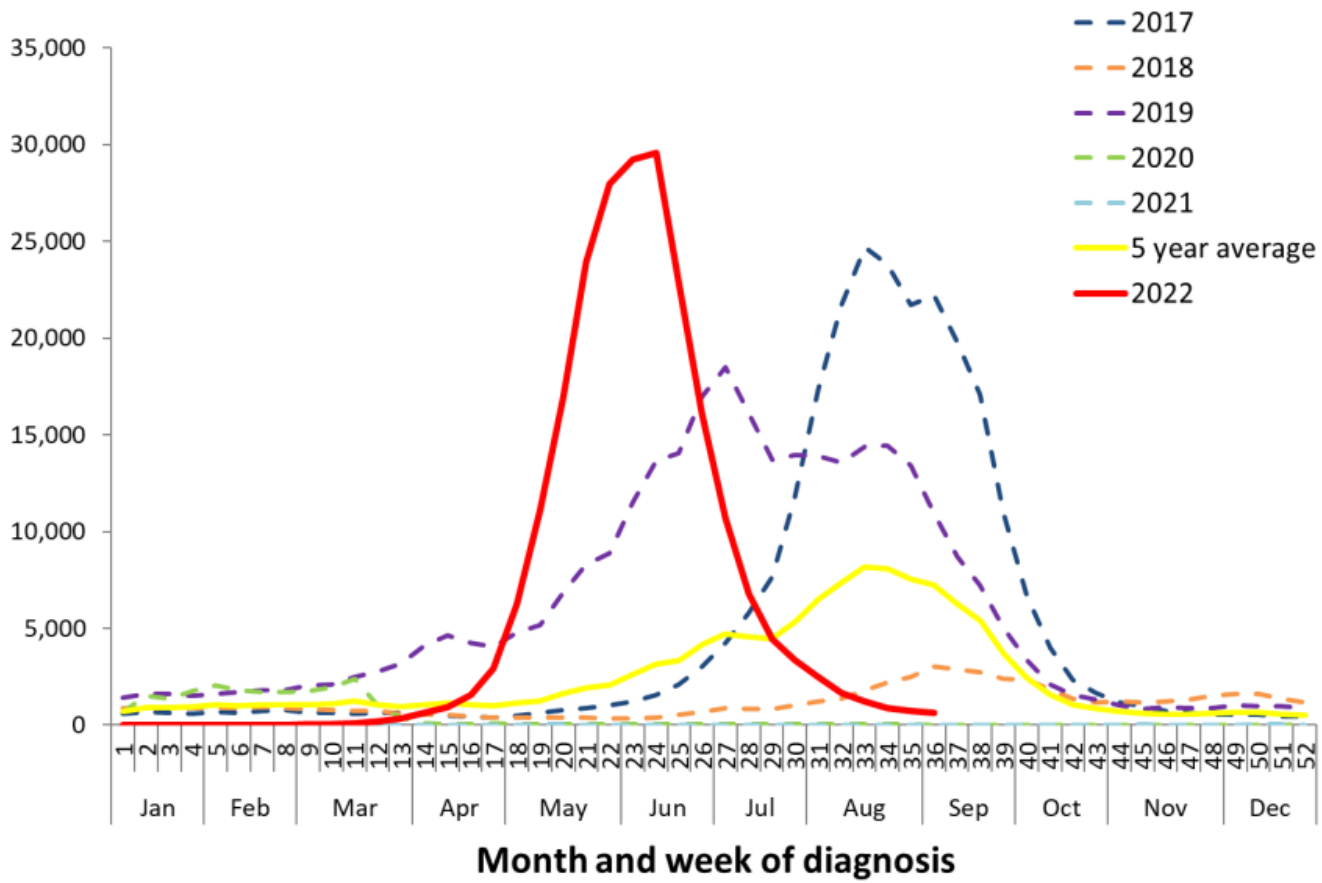
In other states, NSW and NT, the early influenza season was initially H1, later H3

- Early H1 in NSW associated with high numbers of paediatric hospitalisations
- Many H1 outbreaks in regional and remote NT communities



Influenza case detections rapidly increased in April and May 2022, then rapidly reduced from July

- Altered testing patterns as a result of the pandemic make comparison to previous years challenging
  - Suspected lower case detection early
    - Prolonged absence of influenza
    - Preferential testing for COVID-19
  - Introduction of respiratory multiplex likely resulted in higher testing rates
- Free influenza vaccination program expanded in June in response to concern rapid rise in case numbers would overwhelm health system

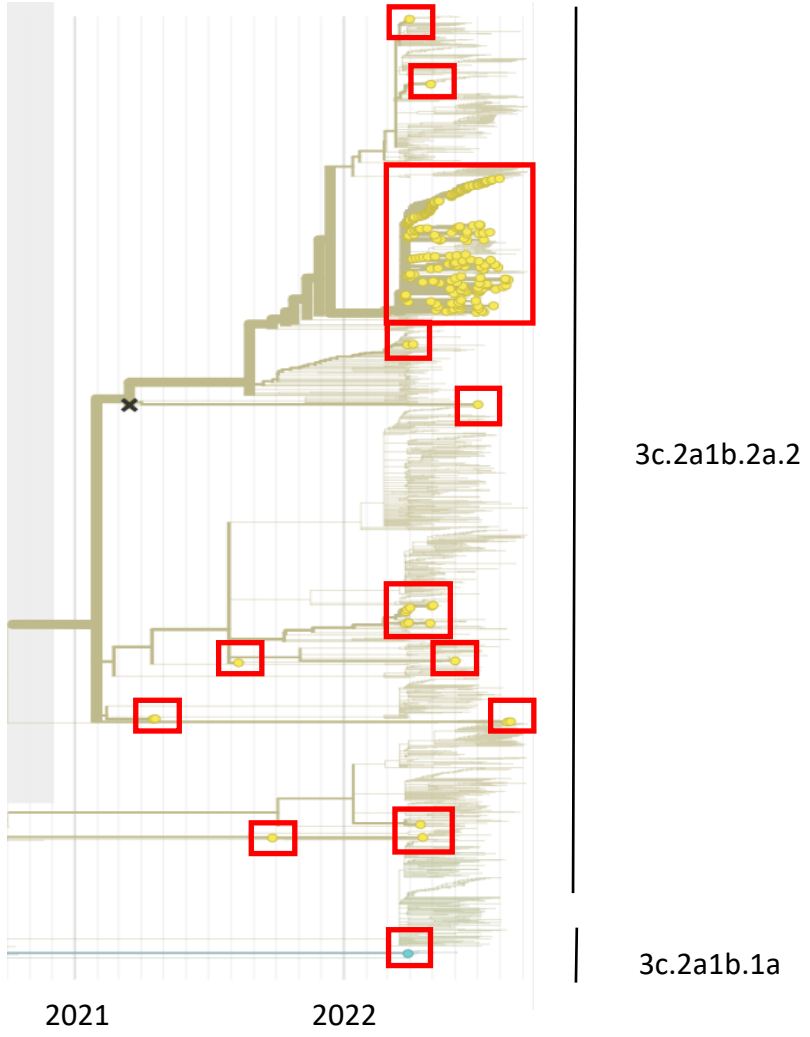


Australian Influenza Surveillance Report, 29 Aug -11 Sep 2022, Notifications of laboratory-confirmed influenza, 1 Jan 2017 - 11 Sep 2022. Source NDSS.

Influenza virus diversity increased during the 2022 season in Australia

- Influenza A
  - H1PDM09 - 824 (8.8%)
  - H3 - 4,472 (48%)
  - No subtype - 4,080 (43%)
- Influenza B
  - Victoria - 5 (<0.1%)
  - No lineage - 15 (0.2%)

Influenza viruses, Australia, March – September 2022

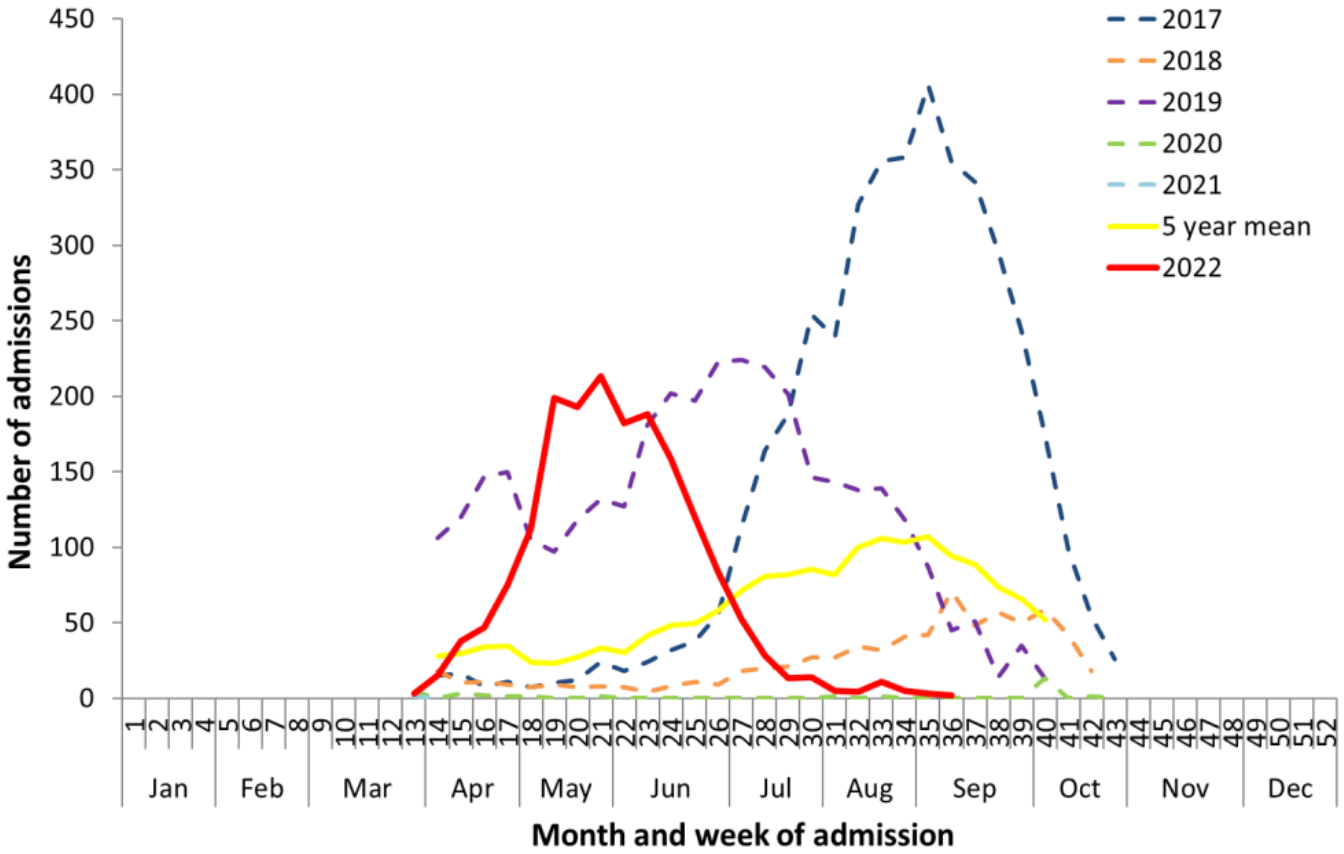


Source: GISAID, Nextstrain

Surveillance of influenza-associated hospitalisations and deaths indicated a moderately severe season

- 223,678 cases (until 11 September)
  - Higher than 5-year average of 149,832
- 295 influenza-associated deaths
- 1,763 hospital admissions to sentinel surveillance hospitals
  - 55.1% of people admitted with confirmed influenza across sentinel hospital sites were <16 years
- Burden in addition to COVID-19

Influenza hospitalisations at sentinel hospitals Apr to Oct 2017-2022



Australian Influenza Surveillance Report, 29 Aug -11 Sep 2022, Notifications of laboratory-confirmed influenza, 1 Jan 2017 - 11 Sep 2022. Source NDSS.

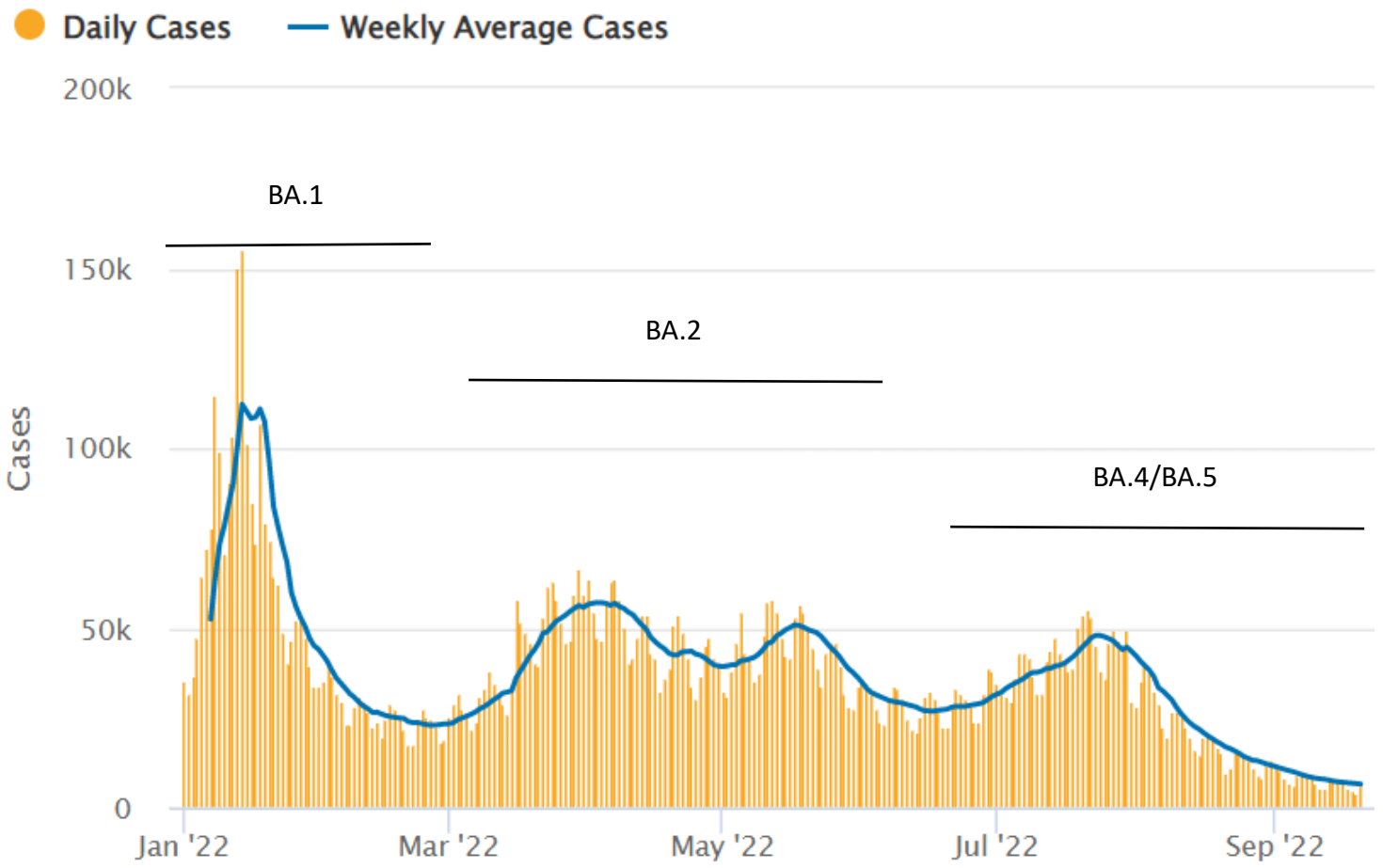
Overall viruses were well-matched to the 2022 Southern hemisphere / Australian vaccine

- Proportion of influenza isolates antigenically similar to the corresponding vaccine components
  - 92.4% A(H1N1)pdm09 isolates
  - 94.3% A(H3N2) isolates
  - 6 of 6 B/Victoria isolates
- Early reports indicate low-moderate levels of vaccine effectiveness based on test negative study design in sentinel hospitals

Image credit: Royal Australia College of General Practitioners

Despite the resurgence of influenza, COVID-19 has continued to dominate during 2022

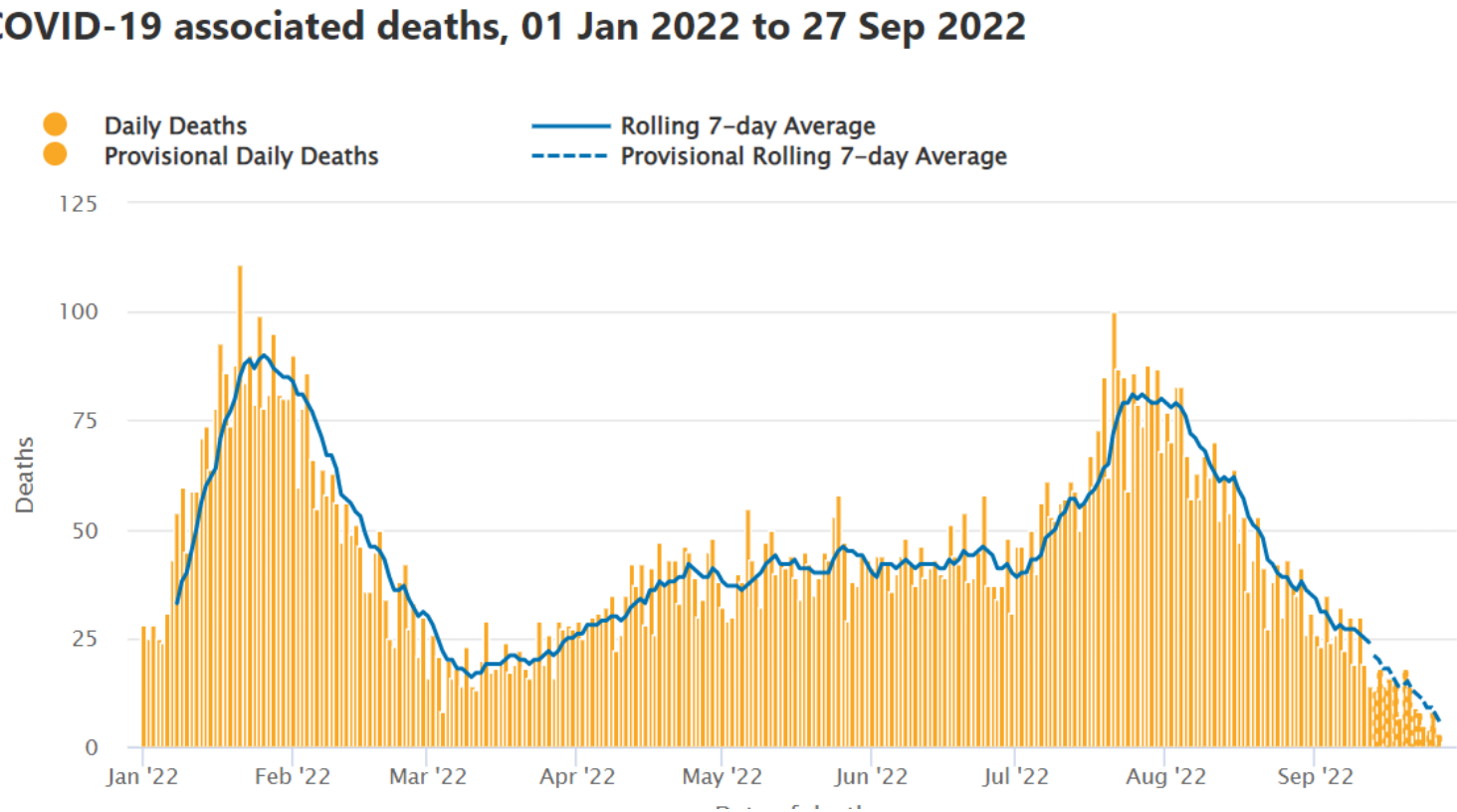
- Omicron epidemic (15 December 2021 to 28 August 2022)
  - 8,386,519 cases
  - 10,789 deaths
- 1,963 hospitalisations - 7 day rolling average to 20 September



Coronavirus (COVID-19) case numbers and statistics, Australian Government Department of Health and Aged Care

COVID-19 cases, hospitalisations and deaths have decreased and minimal restrictions remains

- September 2022 - easing of mask mandates in many jurisdictions
- 9 September 2022 - isolation period for COVID-19 positive cases reduced from 7 to 5 days
- 14 October 2022 – mandatory isolation to end
  - Health and aged care workers excluded from work for 5 days



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Conclusions

- Recommencement of international travel allowed recirculation of influenza in Australia
  - Unusually early and brief influenza season characterised by a rapid increase, then fall in cases
  - Challenges comparing case numbers to previous years
- A(H3N2) was the predominant subtype during the 2022 season in Australia
  - Influenza virus diversity increased during the season
- A high proportion of viruses were antigenically well matched to 2021 vaccine viruses
- Early reporting indicates vaccine effectiveness at the lower end of the moderate range
- COVID-19 case numbers and hospitalisations have decreased from the most recent omicron peak, but remain a significant burden on the Australian health system

Acknowledgements

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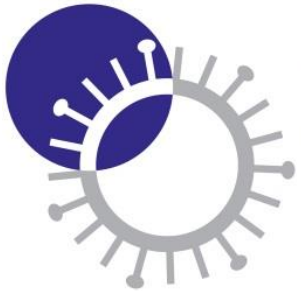
Janet Strachan



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