Health Care Worker
Flu Study

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DOES REPEATED INFLUENZA VACCINATION CONSTRAIN INFLUENZA IMMUNE RESPONSES AND PROTECTION?

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on behalf of the NIH influenza vaccination study team

The Kids Research Institute Australia acknowledges Aboriginal and Torres Strait Islander people as the Traditional Custodians of the land and waters of Australia. We also acknowledge the Nyoongar Wadjuk, Yawuru, Kariyarra and Kaurna Elders, their people and their land upon which the Institute is located and seek their wisdom in our work to improve the health and development of all children.

Study Aims

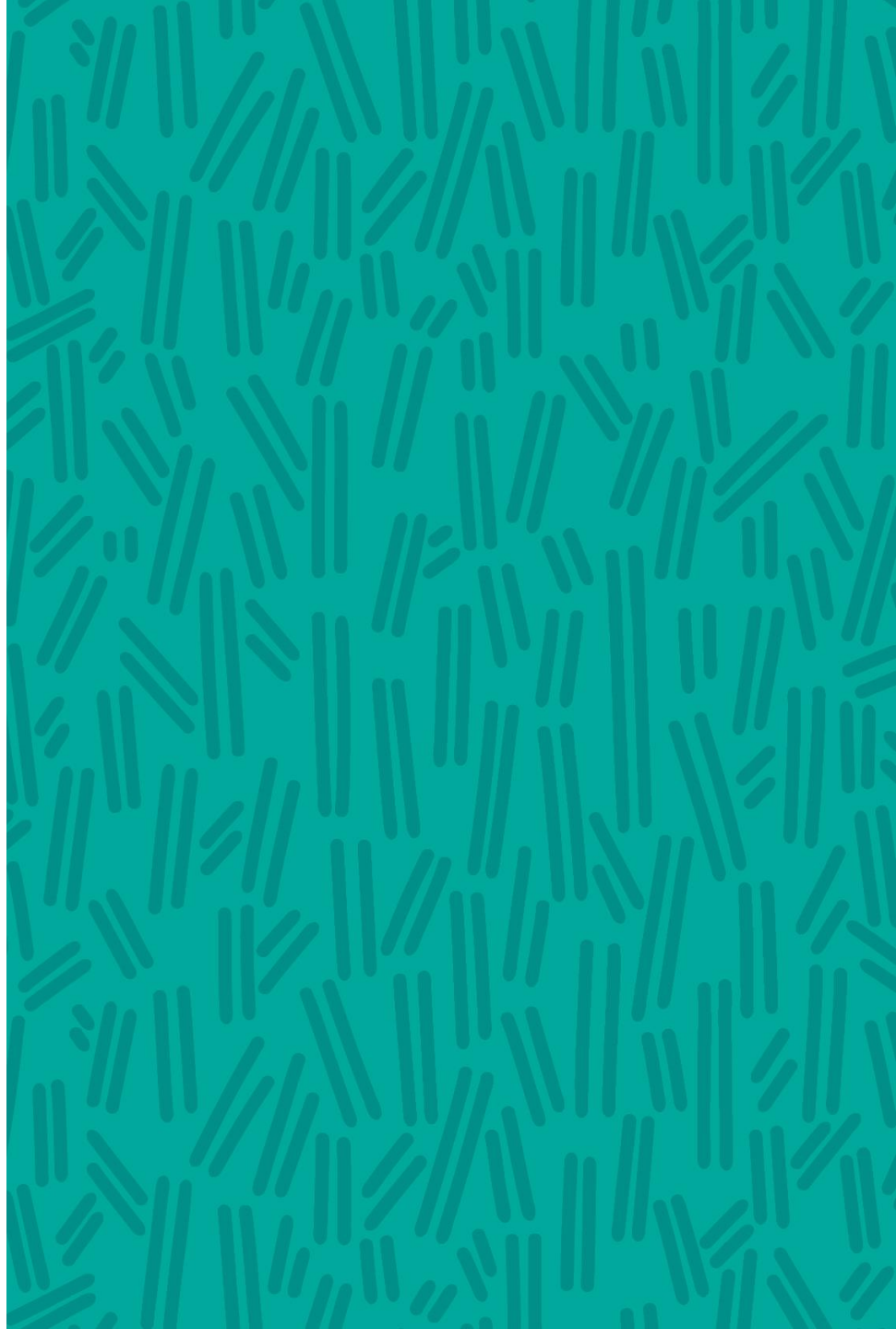
To study how the immunogenicity and effectiveness of influenza vaccination is influenced by prior vaccination experience

To characterize immunological profiles following infection and vaccination

To correlate immunological profiles and vaccine effectiveness

Hypothesis

Post-vaccination serum antibody titres will be lower among the most highly vaccinated, compared with those less frequently vaccinated



Study design

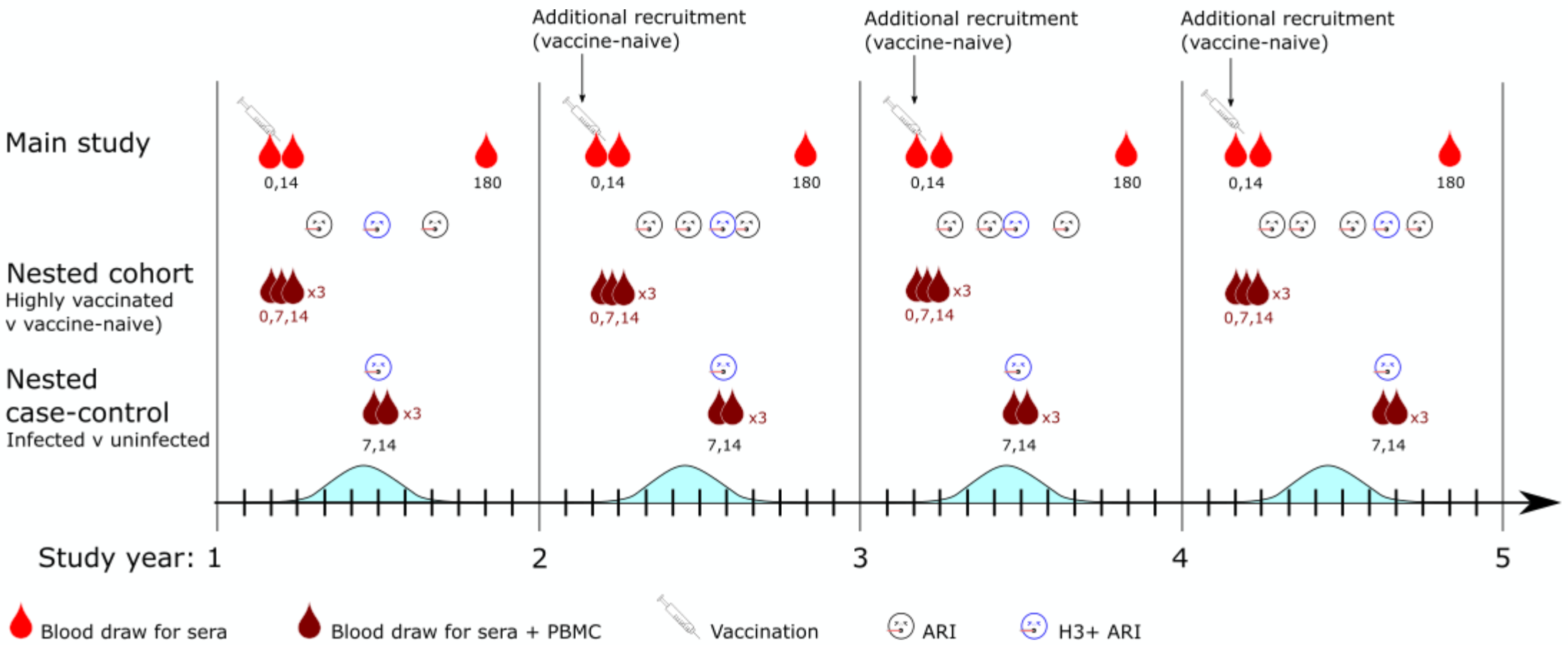
Longitudinal cohort study. The study was held at multiple sites in Australia

Recruitment was from 2020 to 2023.

Blood and respiratory specimens were collected

The study included a nested study with more in-depth immunology for vaccine naive and highly vaccinated 5/5 participants

Study Design



Recruitment

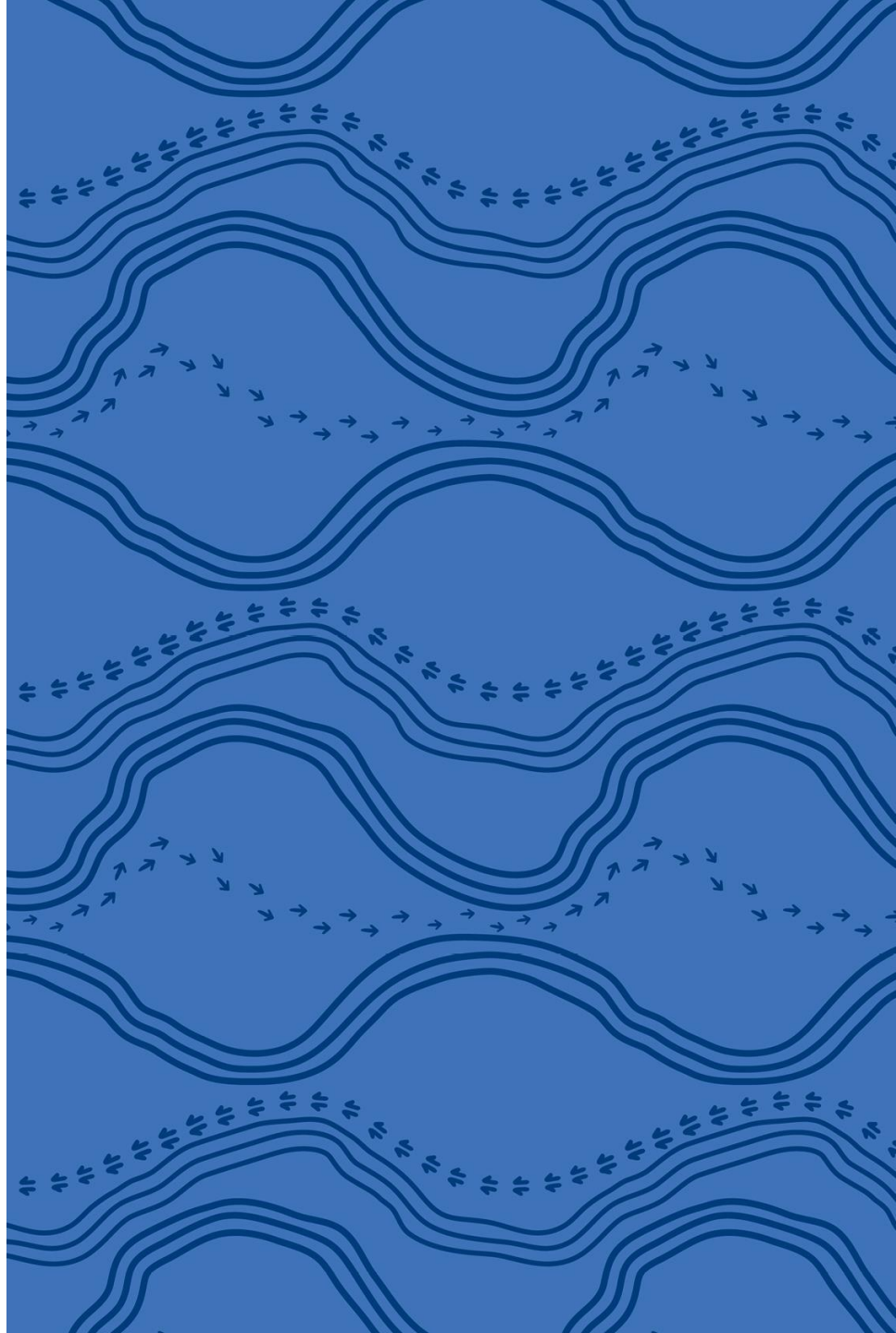
In Perth we recruited 250 participants per year with different Influenza vaccination history (those with 0, 1, 2, 3, 4, 5 years)

During recruitment we worked alongside CAHS staff Health Flu clinic

Two nurses were responsible for gaining informed consent, taking blood and vaccinating participants.

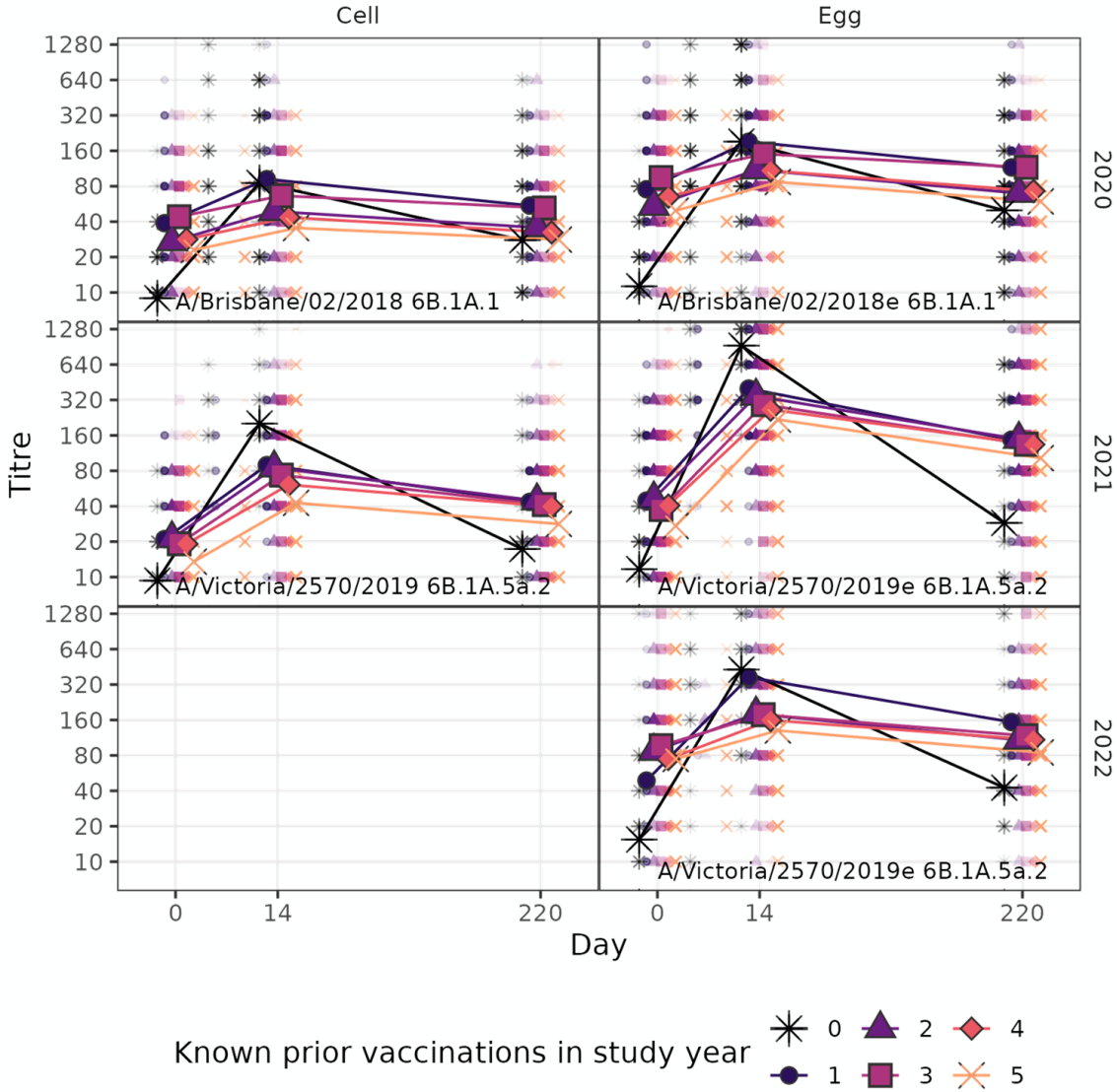
50 participants remained in the study for all 4 years

>1500 participants recruited Australia wide



Results - H1N1 titres

- H1 responses show some deterioration of antibody response with increased frequency of vaccination
- Greater boost for vaccine-naïve in 2021 against A/Victoria/2570/2019
- But drops back to lower levels
- 2022 boosting improves end of season response
- Vaccine-naïve did not maintain titres to Vic/2570

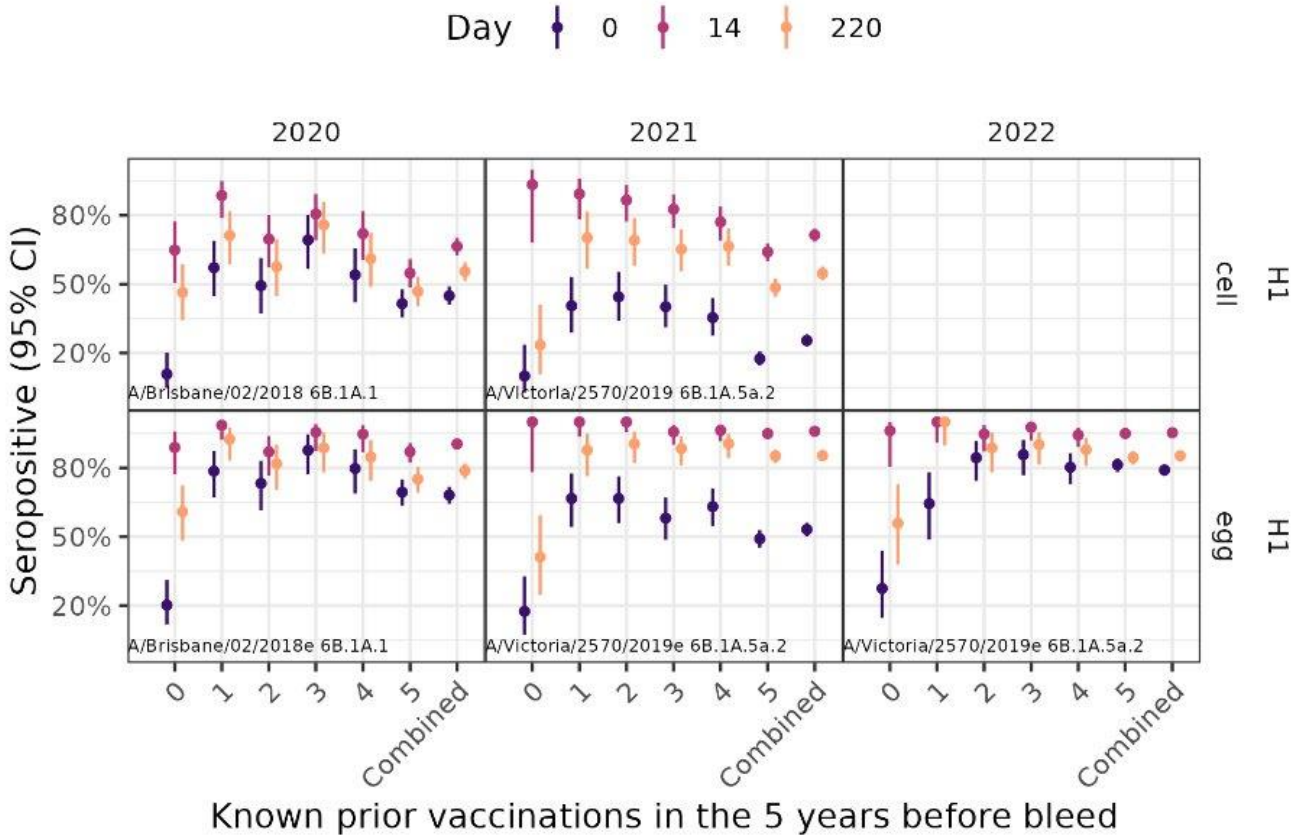


Results – H1N1 seropositivity

High sero-positivity in 2021 and 2022

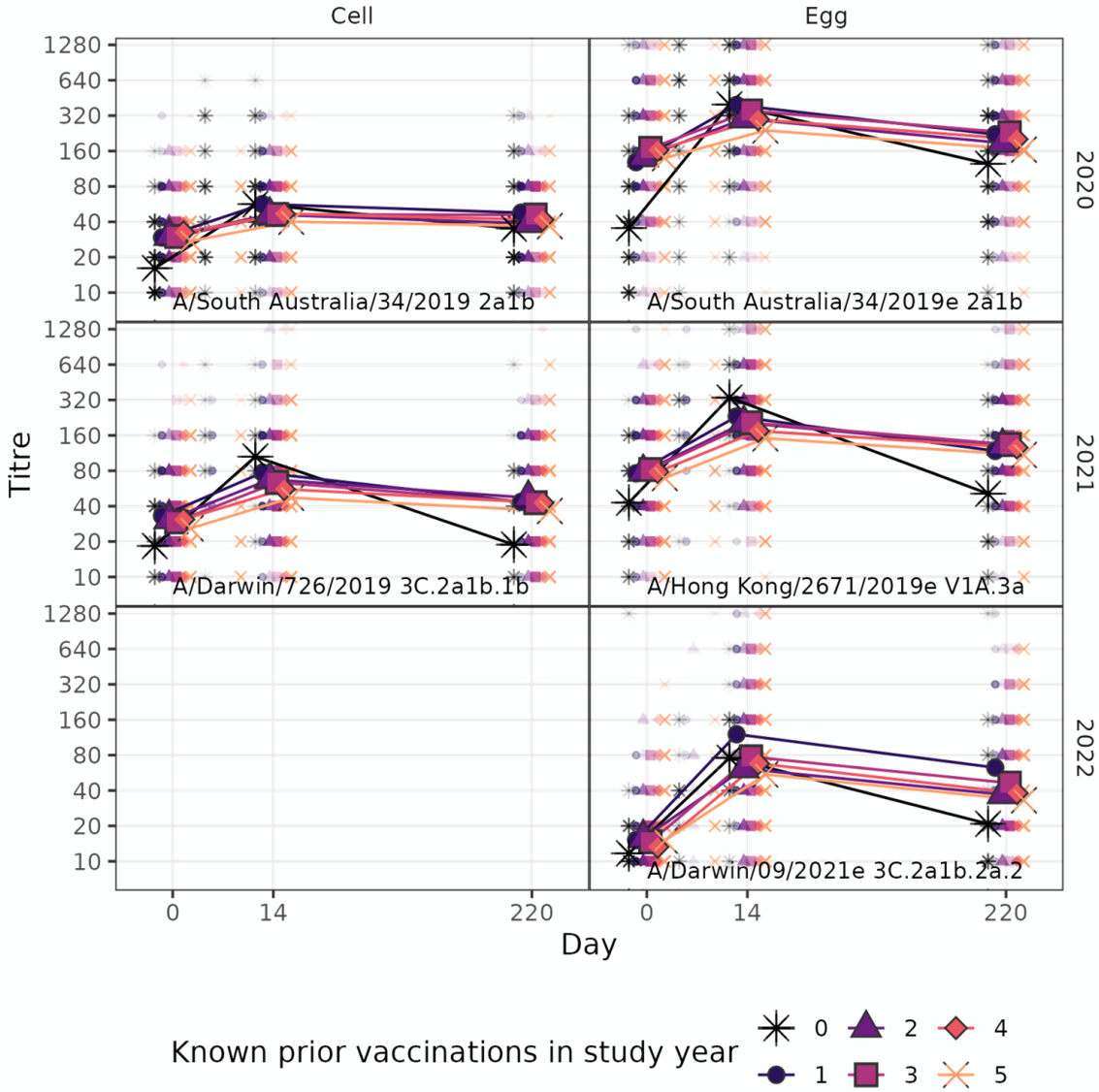
High post-vaccination titres in vaccine naïve may not be maintained until the end of the season

Reduction in titre and seropositivity with more doses of vaccine



Results - H3N2 titres

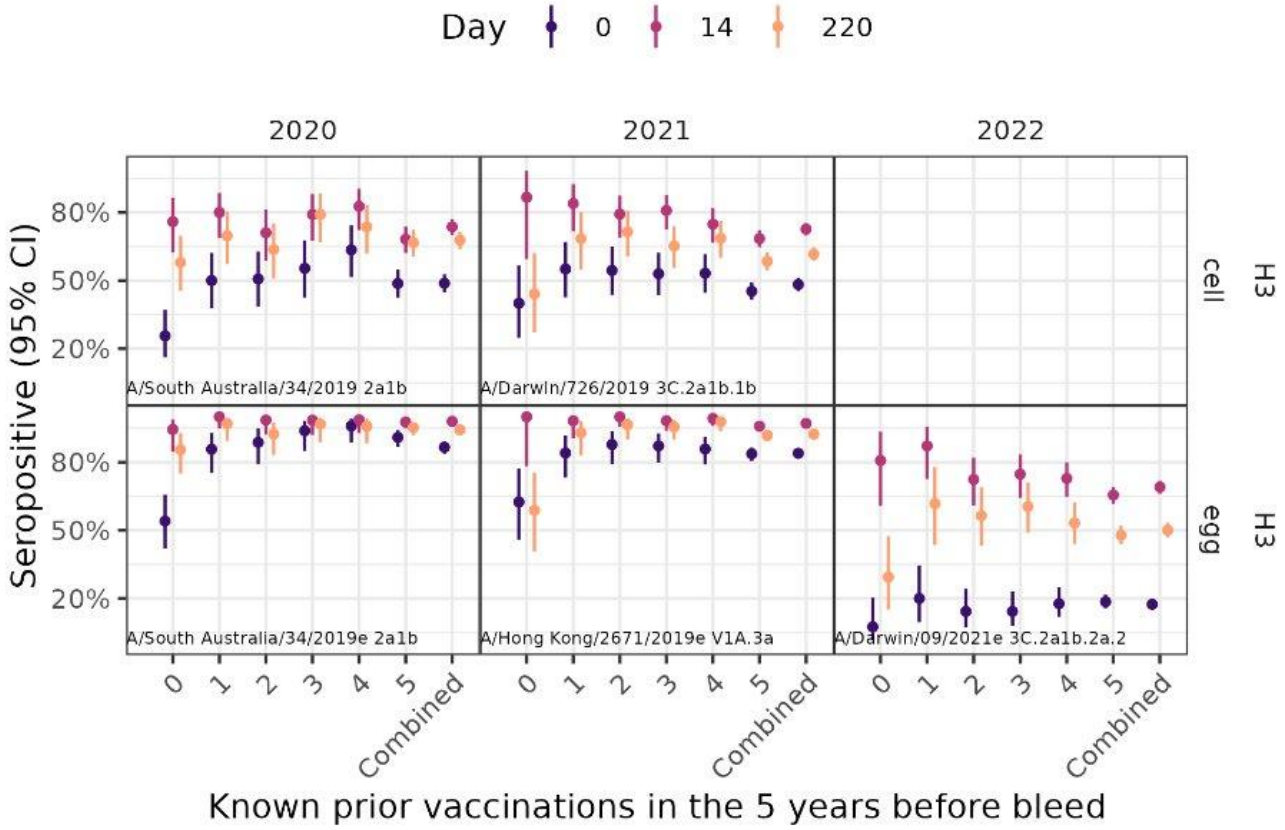
- Titres to egg-grown viruses tend to be greater than against cell-grown
- Gradient effect apparent with higher post-vaccination titres with fewer prior vaccinations
- Starting titres much lower in 2022 – greater antigenic distance
- Vaccine did not maintain titres until the end of the year



Results – H3N2 seropositivity

Seropositivity (post-vaccination titre >40) was better for egg-grown antigens

There is a subtle gradient of higher seropositivity in vaccine naïve, which is more apparent in 2021 and 2022



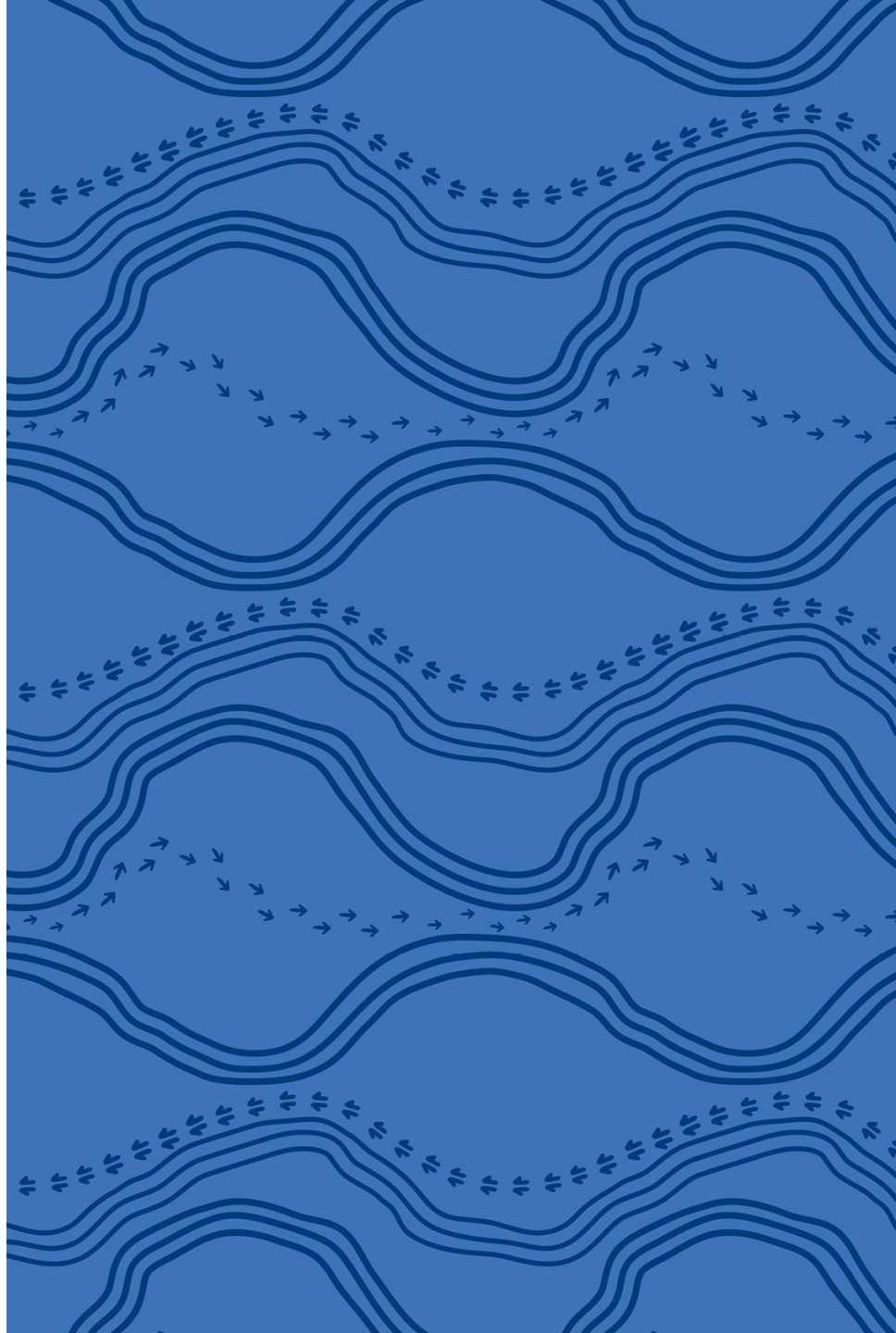
Conclusions

We observed decreasing post-vaccination antibody responses with increasing number of prior vaccinations

Duration of protection appear to be similar across groups with prior vaccination experience

- ie similar post-season GMTs
- Vaccine-naïve were least able to maintained titres

Provides an opportunity to explore flu immunity but insufficient data to results in any policy change



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