

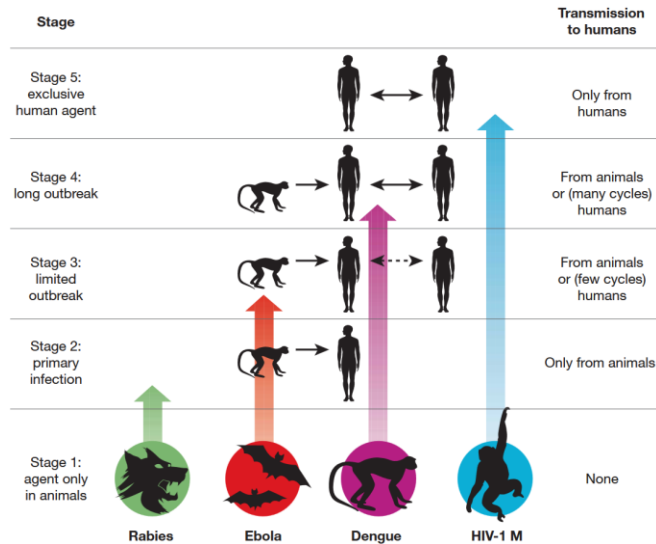
Post-pandemic changes in population immunity have reduced the likelihood of emergence of zoonotic coronaviruses

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Pandemic risk prediction:

- Human permissiveness: 'zoonotic potential'
- Onward human transmission: 'epidemic potential'
- Stable transmission: 'emergence potential'

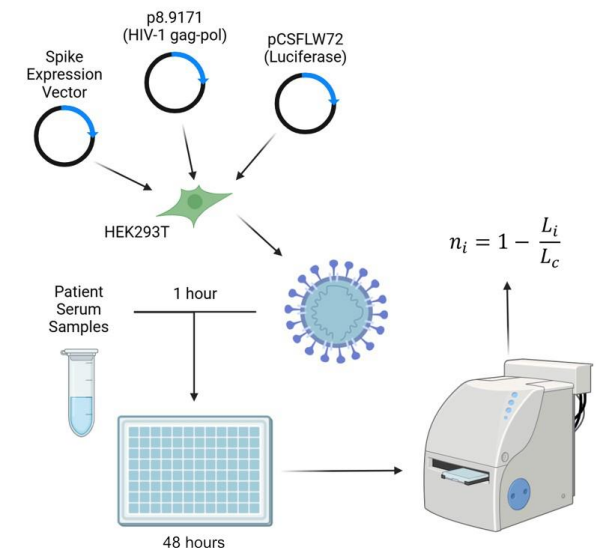


Key study questions:

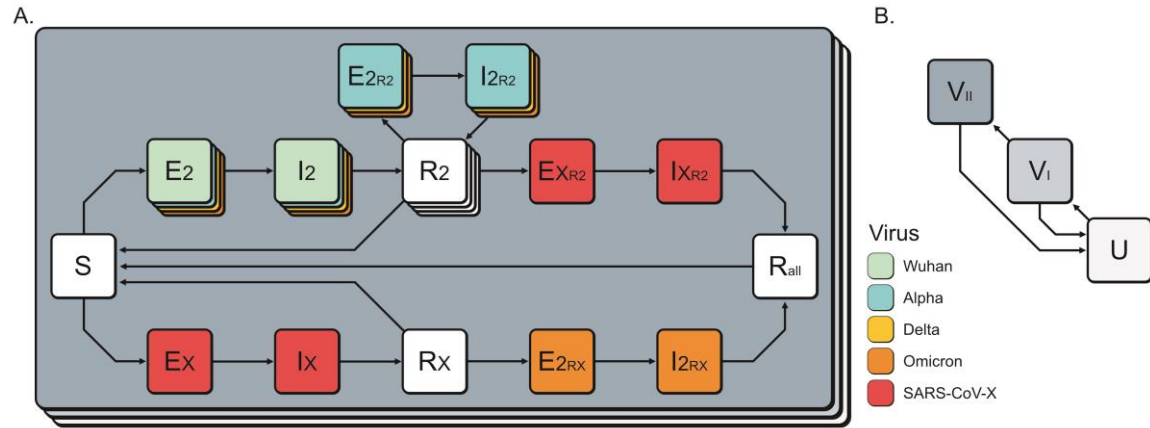
- Given the immunological context created by SARS-CoV-2 circulation and vaccination, how likely is the emergence of a new zoonotic SARS-coronavirus in humans in the post-pandemic era?
- Would currently available COVID-19 vaccines be an effective intervention to resist the emergence of a novel zoonotic coronavirus?

Experimental serum dataset:

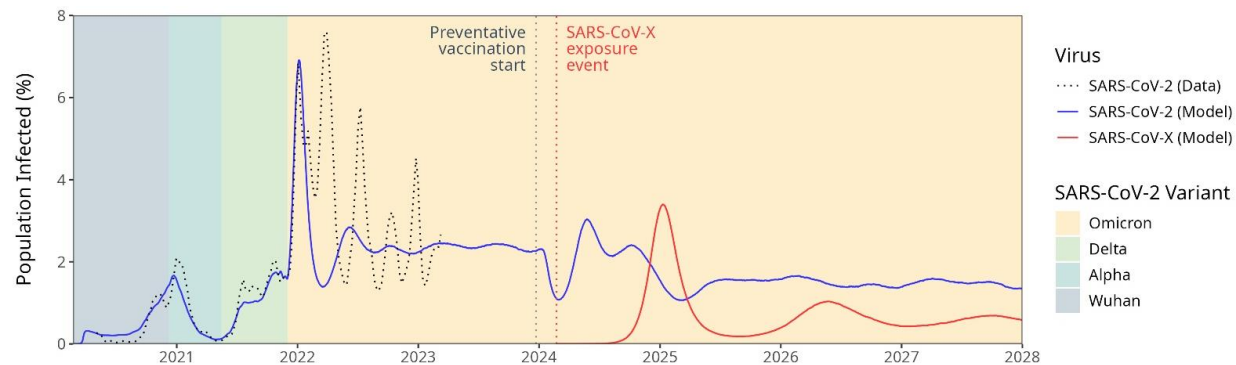
- Sera from primary and secondary care patients from March 2020 – September 2021.
- Cross-neutralisation activity measured in pseudotype neutralisation assay.



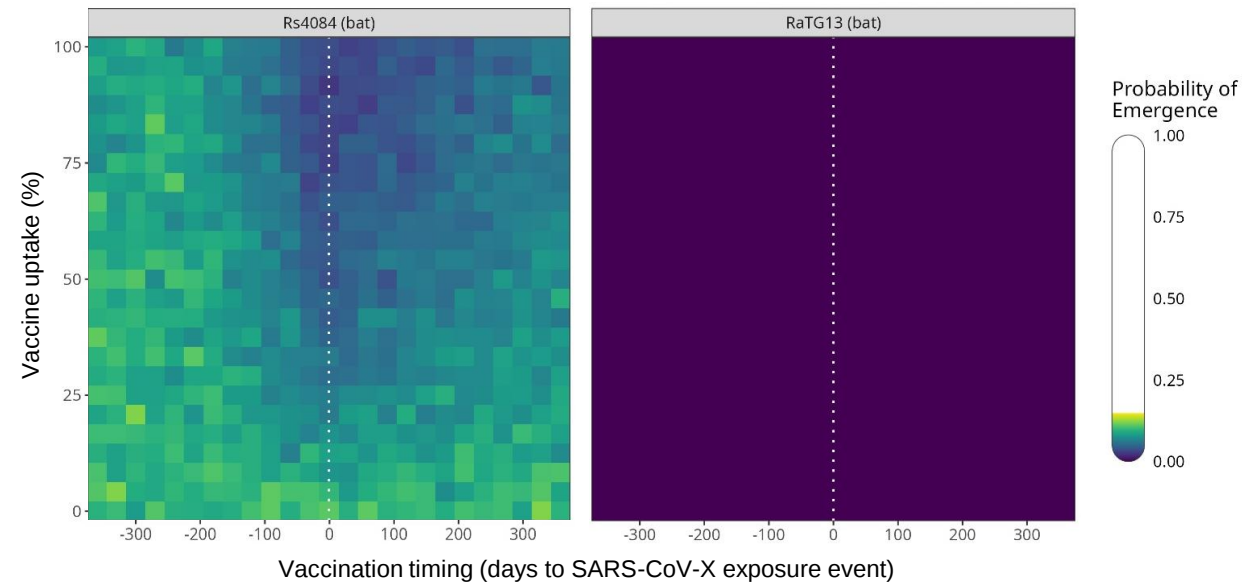
SEIRS co-circulation model (Odin):



- Recovered individuals can be re-infected with a subsequent variant or different virus species.



Key findings:



- Antibodies against SARS-CoV-2 cross-react with other SARS-coronaviruses and vary in efficacy by source.
- Zoonotic coronaviruses are unlikely to emerge from a single exposure event in populations with endemic SARS-CoV-2.
- Short-term widespread COVID-19 vaccination may be used to resist the emergence of zoonotic SARS coronaviruses.
- Vaccination with a theoretical high specificity SARS-CoV-2 vaccine increased the probability of emergence of zoonotic coronaviruses.