Lessons learned from designing COVID-19 vaccine trials in an evolving vaccine policy landscape

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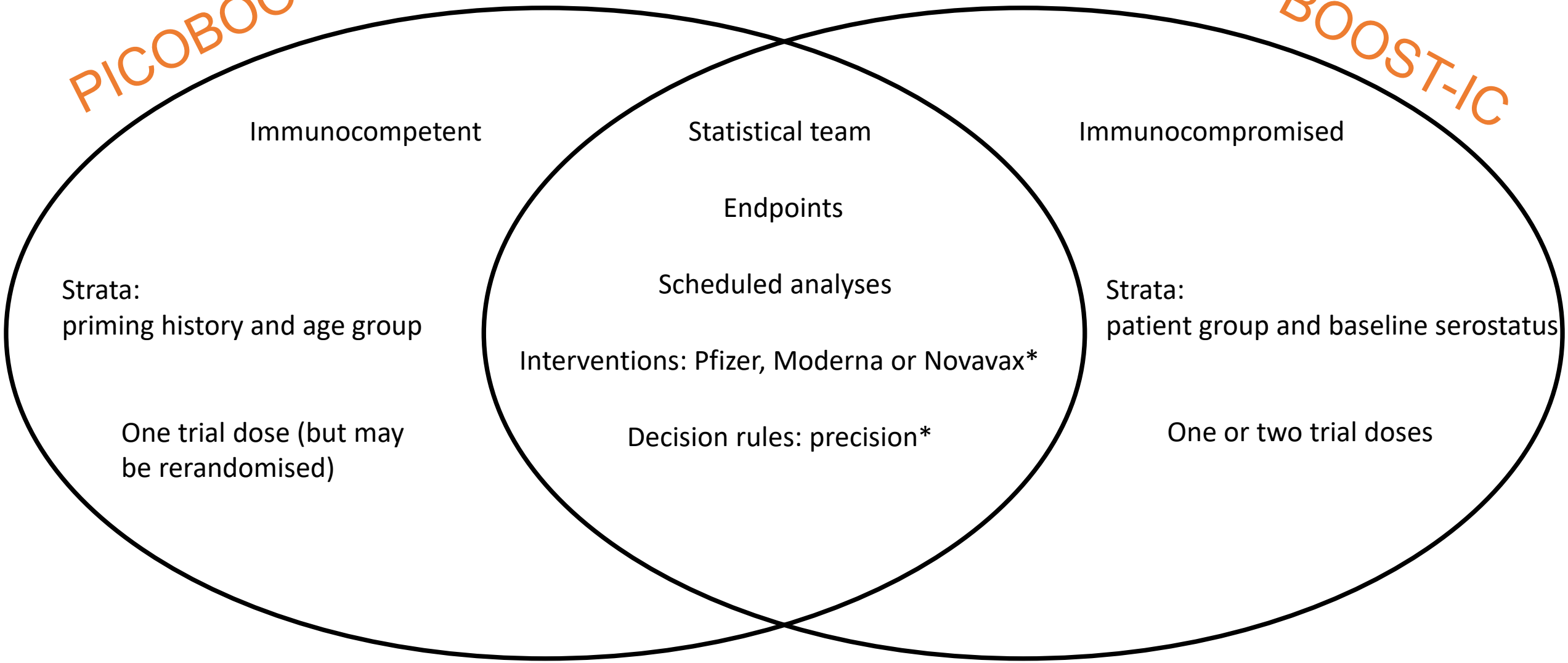
Background

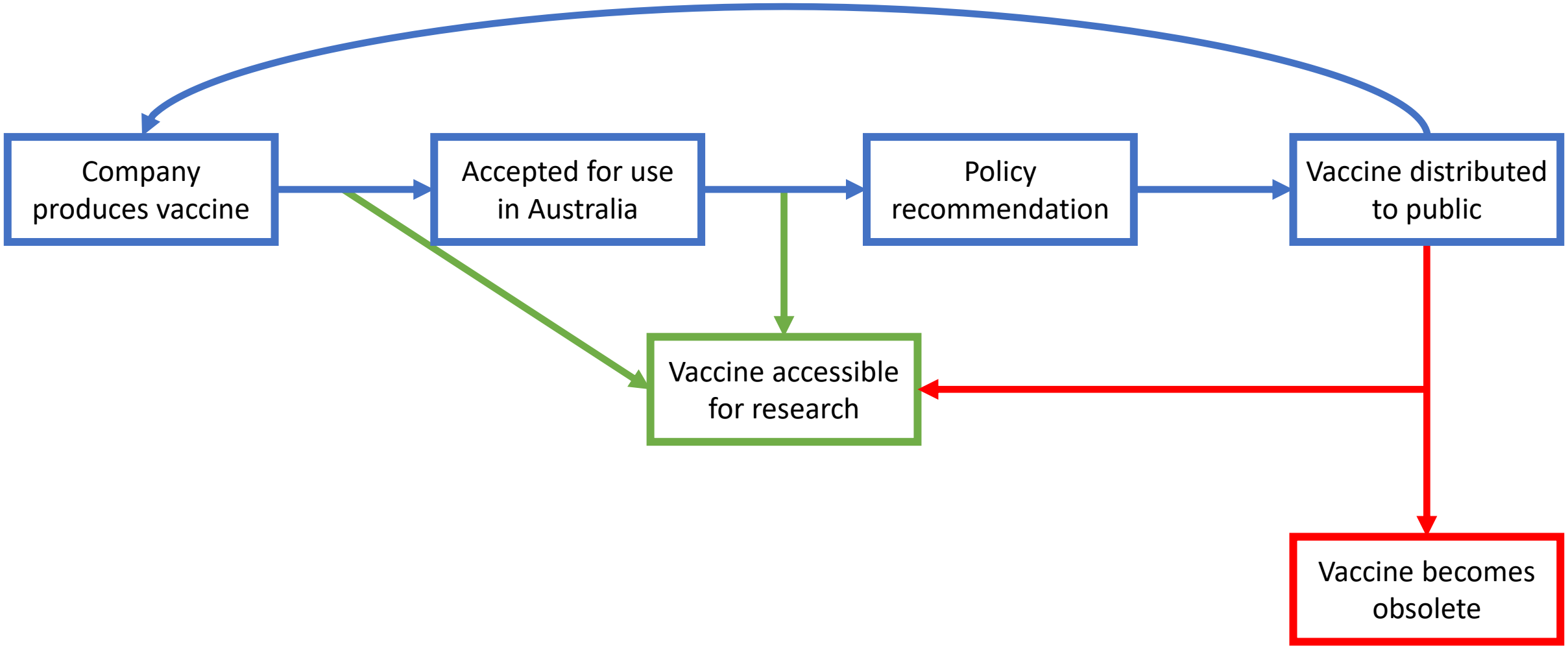
- Biostatistician from Perth, Australia
- Recently involved in the design of two Australian multiple arm adaptive COVID-19 vaccine trials
  - **PICOBOO**: Platform trial in COVID-19 priming and boosting
  - **BOOST-IC**: Bringing optimised COVID-19 vaccine schedules to immunocompromised populations

A tale of two trials

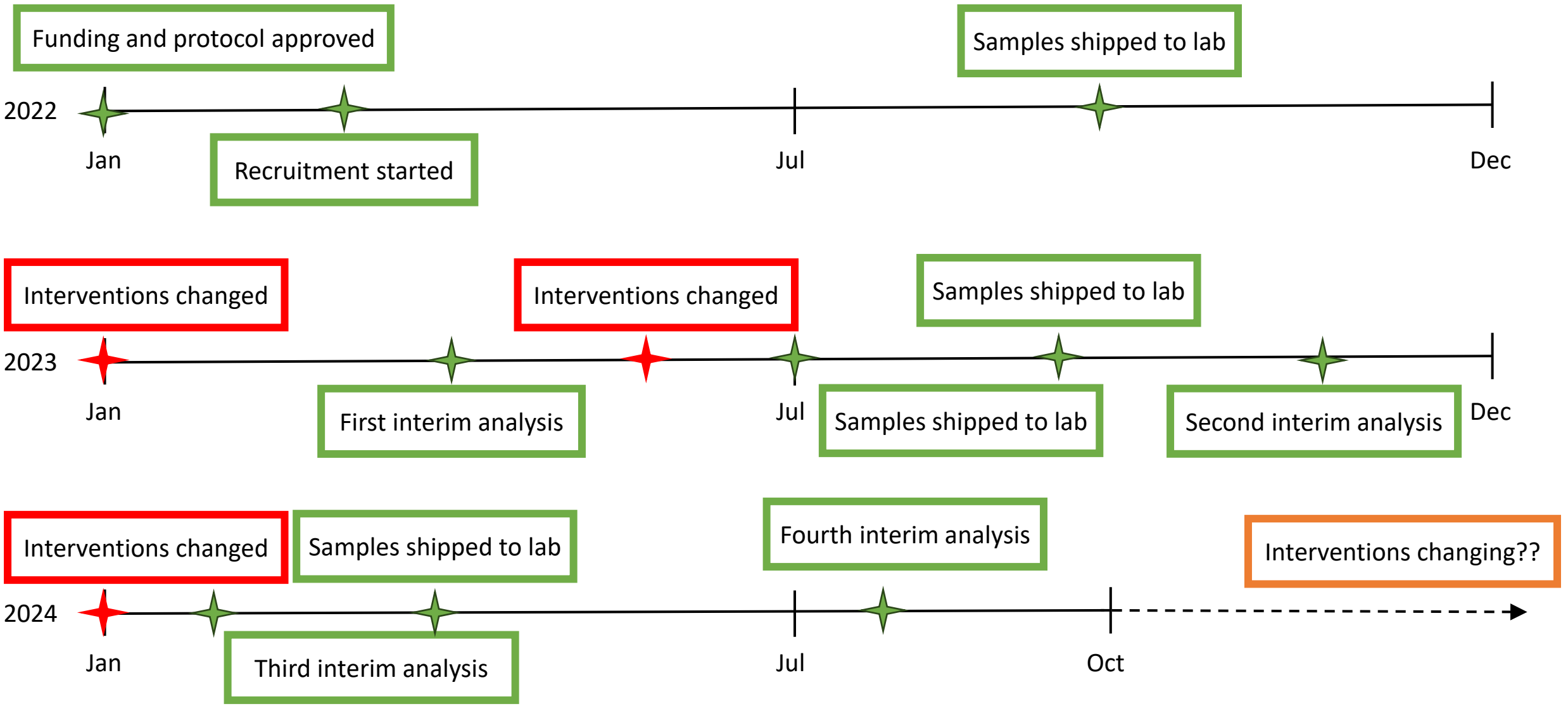
Timely impact on national vaccine policy



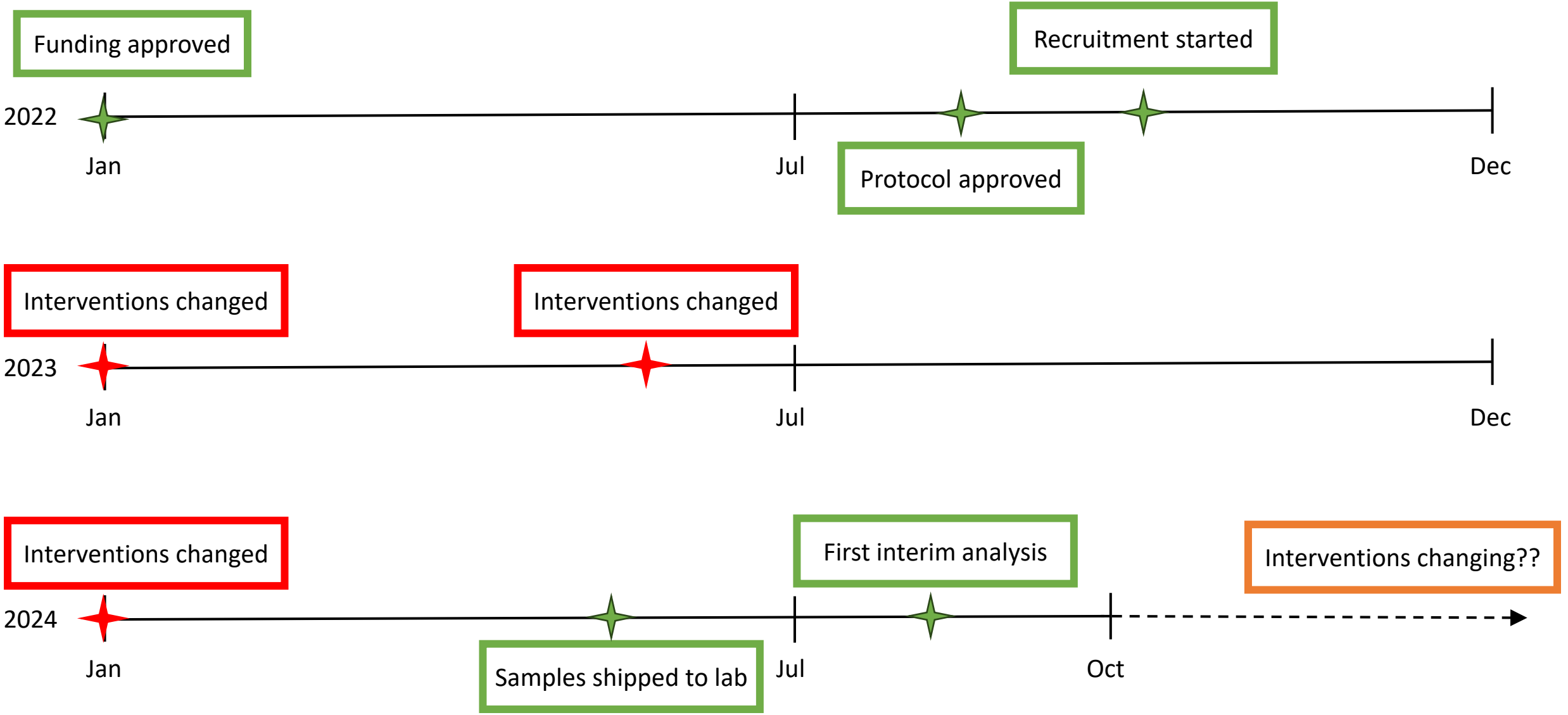
A recipe for disaster?



How it went for PICOBOO…



How it went for BOOST-IC…



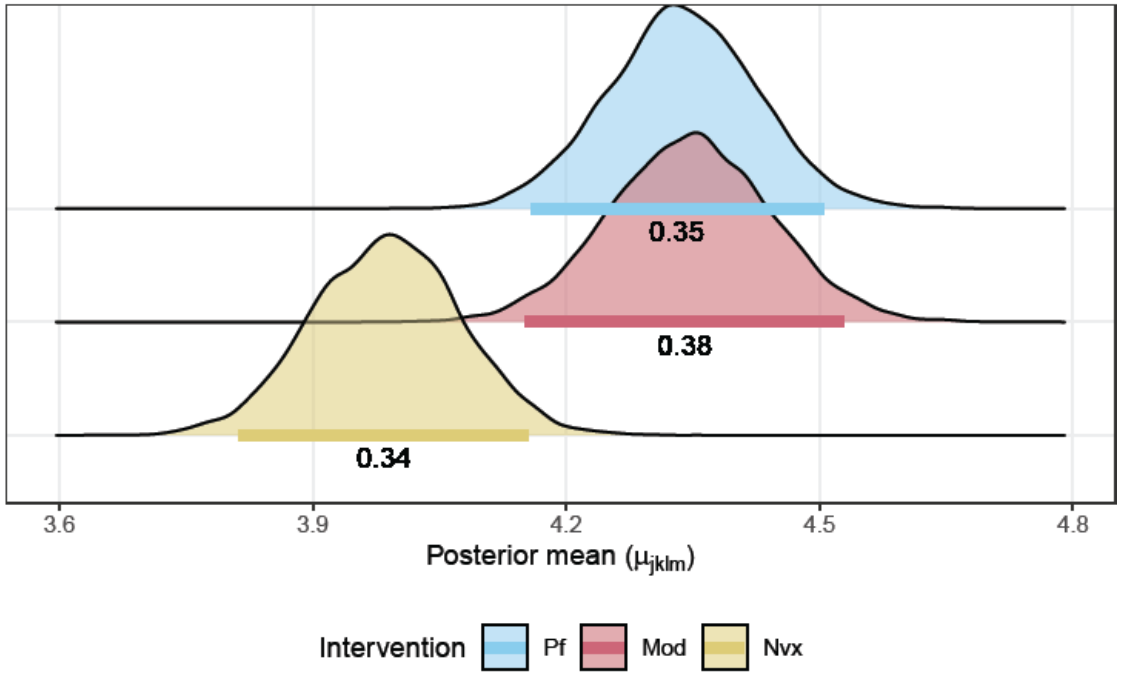
Statistical design

Based on stratum, intervention and dose number (PICOBOO)

- Quantity of interest: mean antibody concentration μ_{jklm}
- Concerns: interpretability, thresholds, concurrent randomisation,…
- No formal comparisons!
- Conceptualise the trial as an information gathering expedition
- Want to **precisely** estimate the quantity of interest
- Decision rule is based on this **precision**

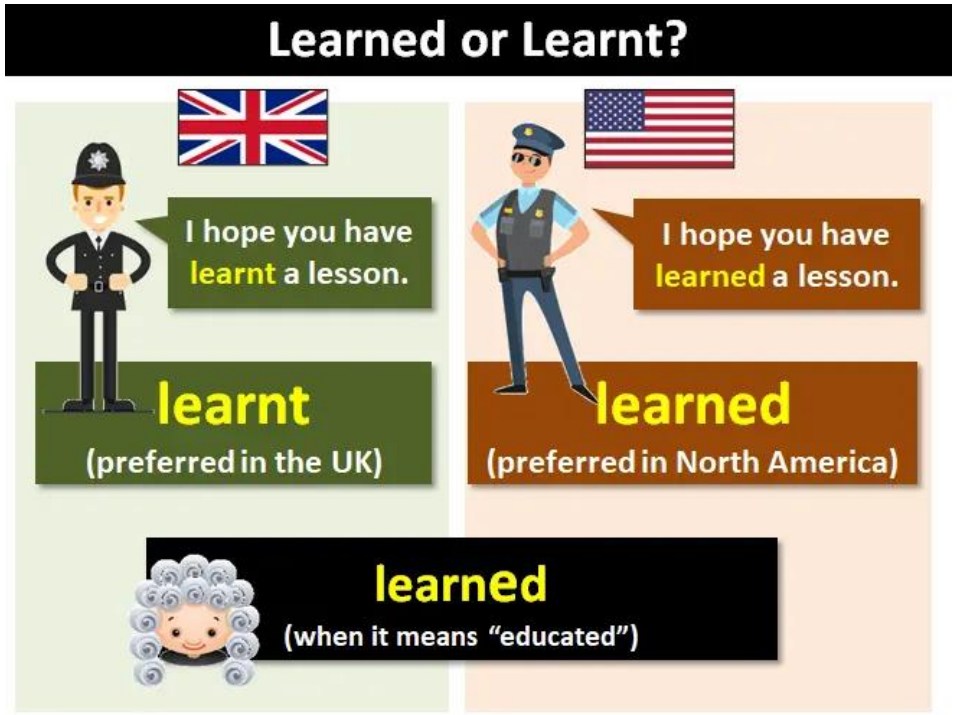
Precision decision

$$\widehat{\mu_{jklm,U}} - \widehat{\mu_{jklm,L}} < \rho$$



- Precision defined as width of 95% highest density credible interval
- Narrow interval → sufficient precision → cease recruitment
- Threshold based on clinical judgement and simulation study

Lessons learnt



1. Predict the future (or at least try)
2. Make the trial objective clear
3. Communicate openly with the DSMB
4. Think about the documentation structure (e.g., core/master protocol)
5. Keep the model notation general
6. Decide on blinding roles and ensure you have the personnel
7. Be flexible (in mind, body and spirit)
8. Be brave (the journey is worthwhile)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