Phase 2 Analysis

Action of Vaccine

The vaccines can be considered to have four possible actions:

1) **Infection blocking** – partially prevent infection and therefore reduce spread (data is weak, so we explore a range 0-85%).
2) **Disease blocking** – less symptoms in vaccinated individuals (this is the efficacy quoted for a vaccine).
3) **Transmission blocking** – may reduce onward transmission from those infected (no data, set to zero in the model).
4) **Severity reduction** – there could be a reduction in extremely severe disease (insufficient data, set to zero in the model).

These four measures increase after each dose of vaccine.

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Our Model

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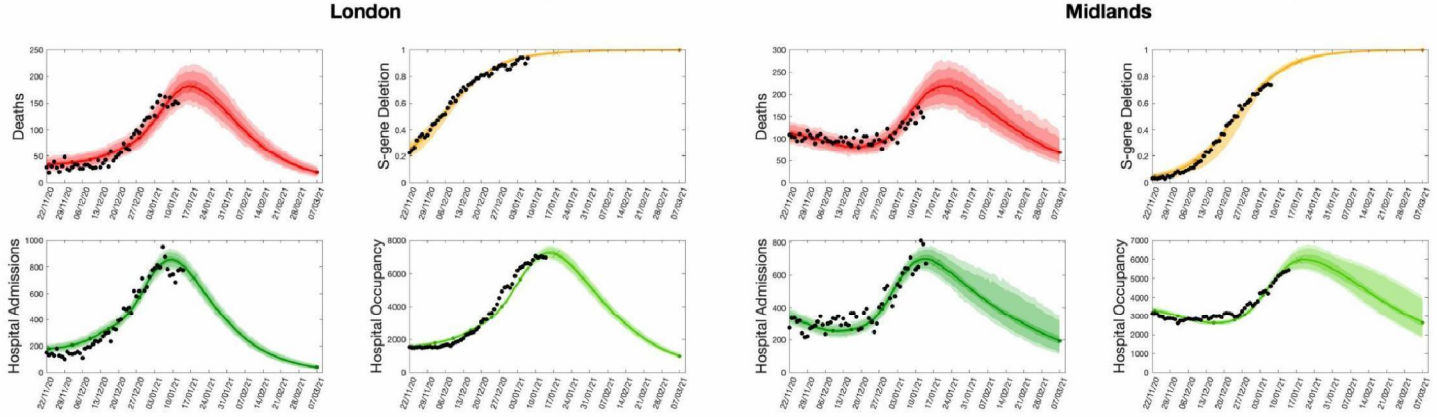
1) Includes age and risk groups, captures dynamics in the devolved nations and 7 NHS regions of England. Has been continually matched to regional data since April 2020, and feeds into the weekly *R* calculation.
2) Includes the spread of the new variant, and most recent lock-down data suggesting $R<1$ in all regions.
3) We assume 85% uptake, delivery of 2M doses a week and follow the JCVI priority groups.



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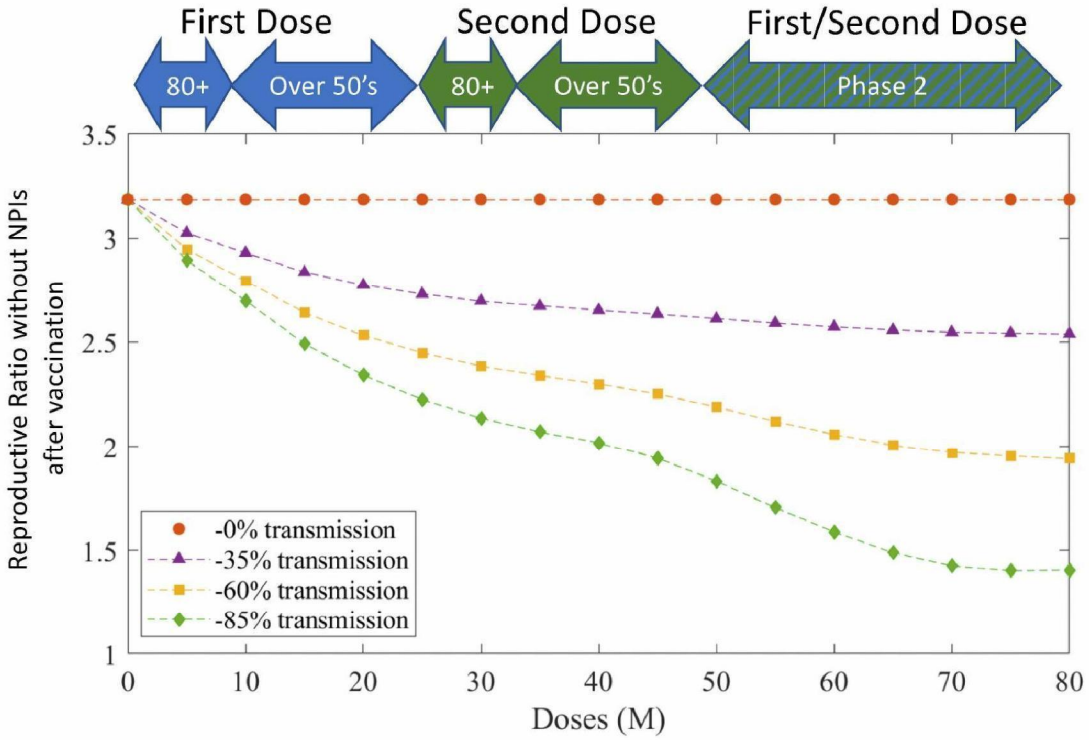
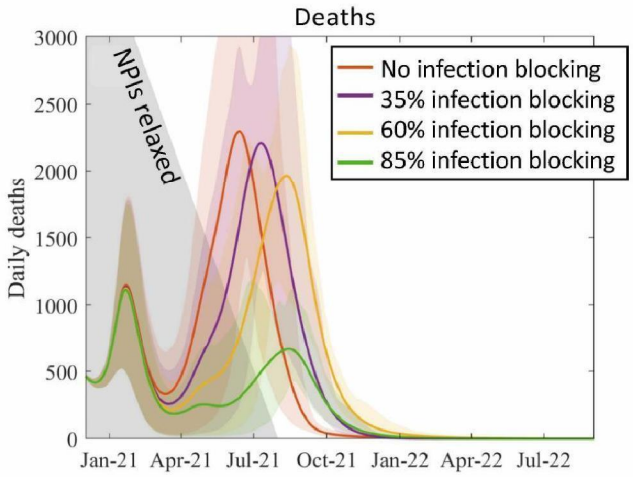
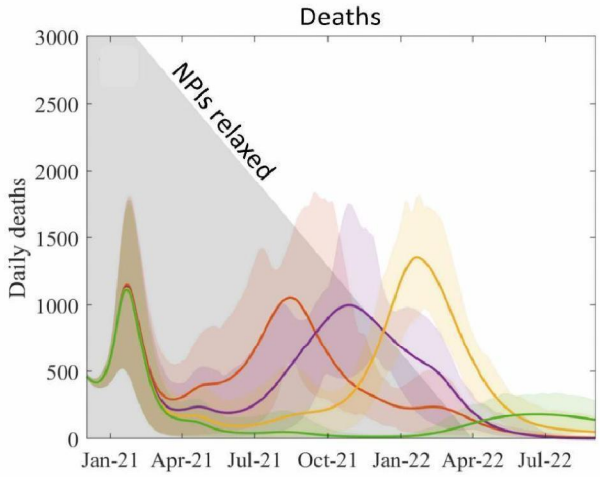
Herd Immunity (age-based)



Gradual release from February

The most likely scenario is a gradual relaxation of controls from Spring onwards.

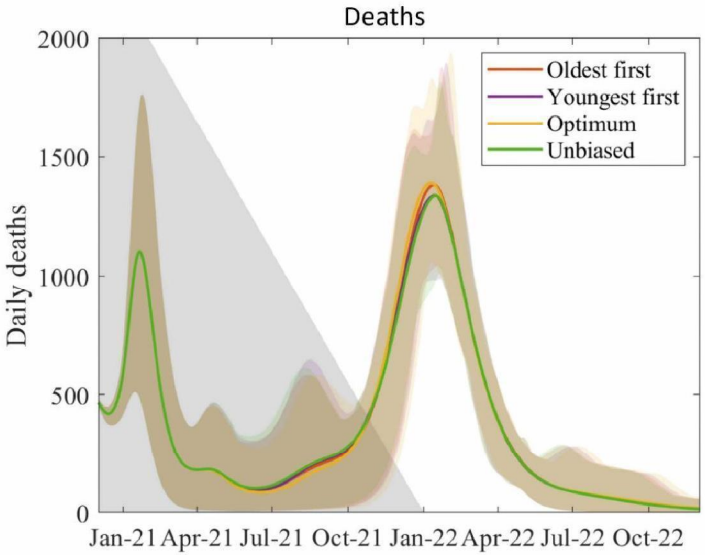


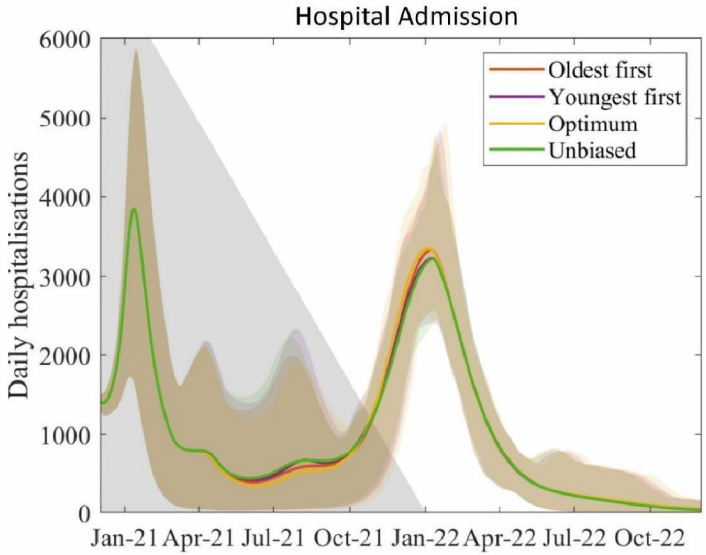


A slow gradual release is by far the most effective solution for keeping the number of deaths and hospitalisations low. **Slower relaxation & high infection blocking are needed**.

Optimising Phase 2

Using gradual reduction of NPIs we have had a preliminary look at age-based prioritization of Phase 2 vaccination.





JCVI Input on Assumptions

1) **Infection blocking** – partially prevent infection and therefore reduce spread (data is weak, so we explore a range **0-85% - default 48% (1 dose) / 60% (2 doses)**).
2) **Transmission blocking** – may reduce onward transmission from those infected (no data, **set to zero in the model**).
3) **Severity reduction** – there could be a reduction in extremely severe disease (insufficient data, **set to zero in the model**).

4) **Gradual reduction in NPIs** – are we happy with this? It should maximise the signal of vaccination in the <50s.
5) **Deployment rate**. 2M doses a week; and 12 week separation.

6) **Future work** to look at 'groups' with higher risk (eg. Shop-workers, Taxi drivers)