UK Health Security Agency

# Staring into the Abyss: Five lessons from the UK's pandemic experience

# Plan

Outline of talk:

- Plausible Covid-19 scenarios later this year

- **Lesson 1:** Understanding the objective is harder than model and policy design

- **Lesson 2:** Data is valuable because it increases the policy choice set

- **Lesson 3:** Presented in the right way, pure data can inform policy

- **Lesson 4:** Combining different models can be a powerful policy influence

- **Lesson 5:** International collaborations are a good investment!

# Plausible UK Covid-19 scenarios later this year

Relative to Omicron…

| | Transmissibility | Immune Escape | Intrinsic Severity | Realised Severity |
|---|---|---|---|---|
| Reasonable Best Case | Same | Better | Same | Better |
| Central Optimistic | Same | Same | Same | Better |
| Central Pessimistic | Worse | Worse | Same | Same |
| Reasonable Worst Case | Worse | Worse | Worse | Worse |

*Source: UK SAGE Viral Evolution Scenarios*

# Lesson 1: Understanding the objective

- “Flattening the curve”, with the promise of vaccines

- The UK’s focus on healthcare capacity

- Challenges:
  - Domestic vs international policy objectives
  - Spill-overs to the economy and society
  - How to think about costs of pandemic
  - Distributional implications

*We are now in a much better position to set out a strategy for the future. But need to be prepared to pivot as the world changes!*

# Lesson 2: Widening choice sets

**Domestic response**

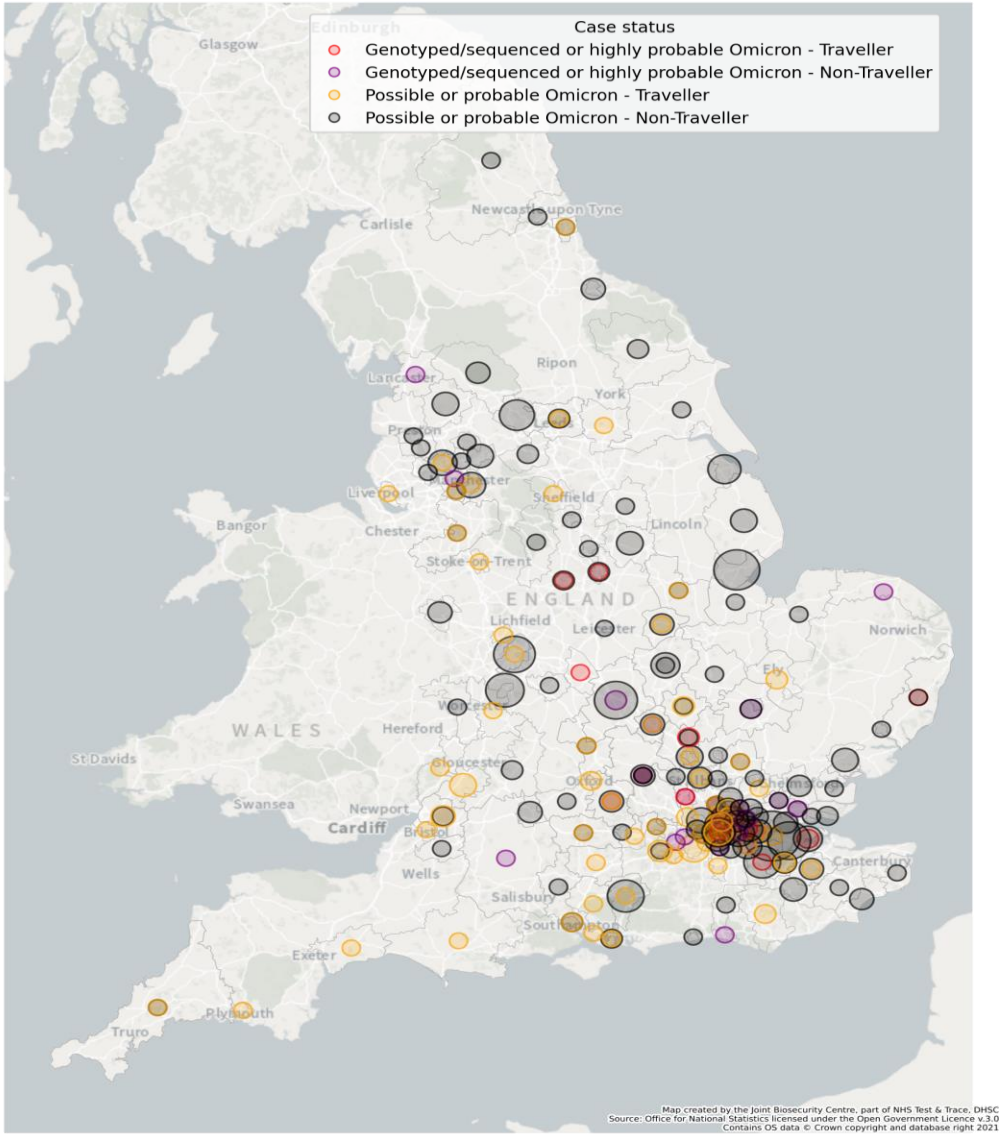
- Informing the decision to pivot from containment to wider control
- Informing the options for regional NPIs
- Informing the options for other interventions

**International response**

- A way of buying time or choosing policy options?

*More work needed to quantify value of information*

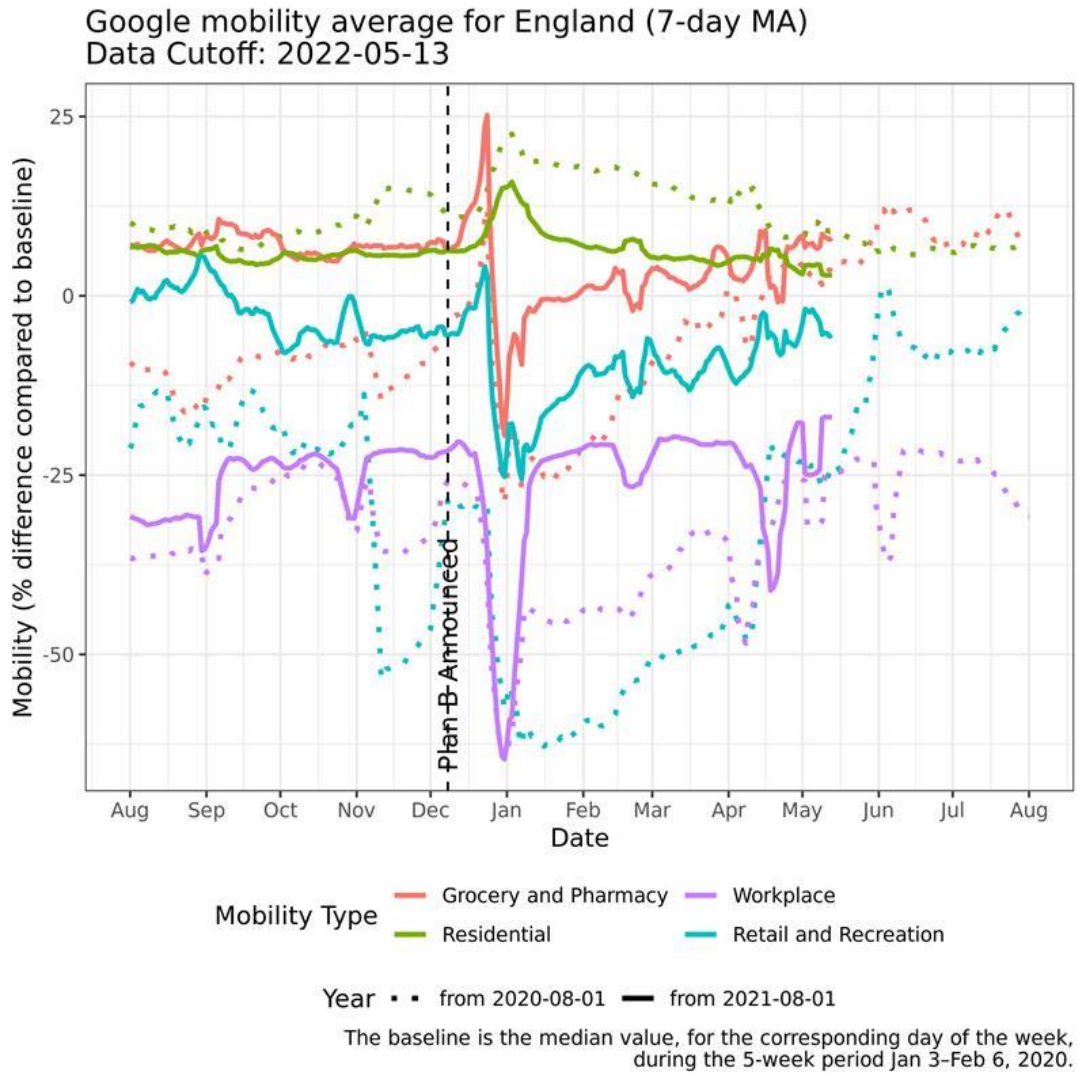
**Possible Omicron cases as of 1st December 2021**




Source: Advanced Analytics, A&DS, UKHSA Data Source: CTAS/HAD

# Lesson 3: Data presented in the right way

- When you have the universe of data, you don't need statistics or confidence intervals...
- **Example: Google Mobility**
  - Key to establish the causal mechanism and sufficiency of statistic
  - Key to make it intuitive and familiar
  - Key to disentangle structural breaks from behavioural changes



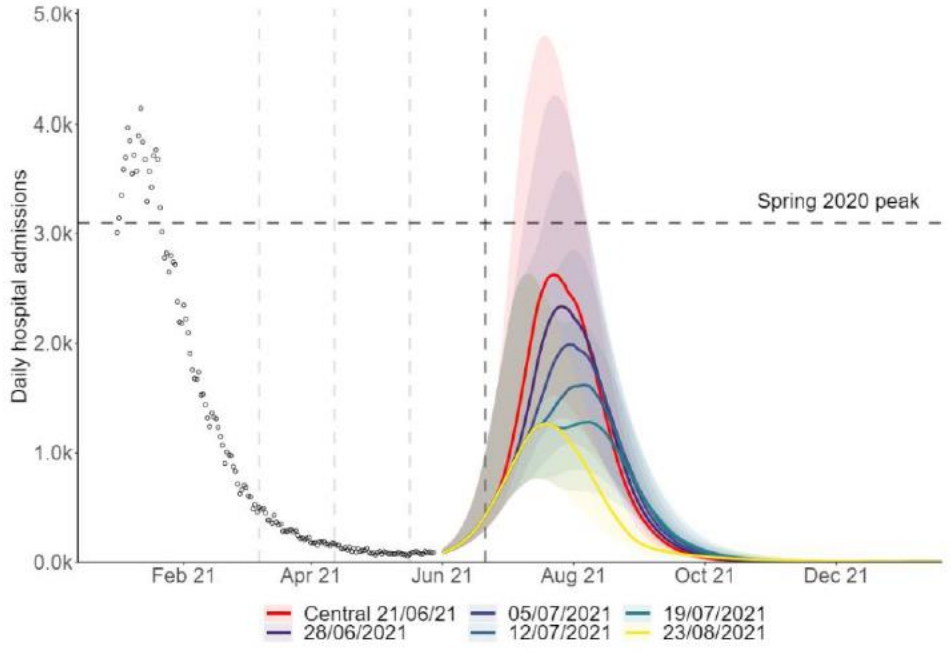

Source: Advanced Analytics, A&DS, UKHSA Data Source: CTAS/HAD

# Lesson 4: Combining models (complex)

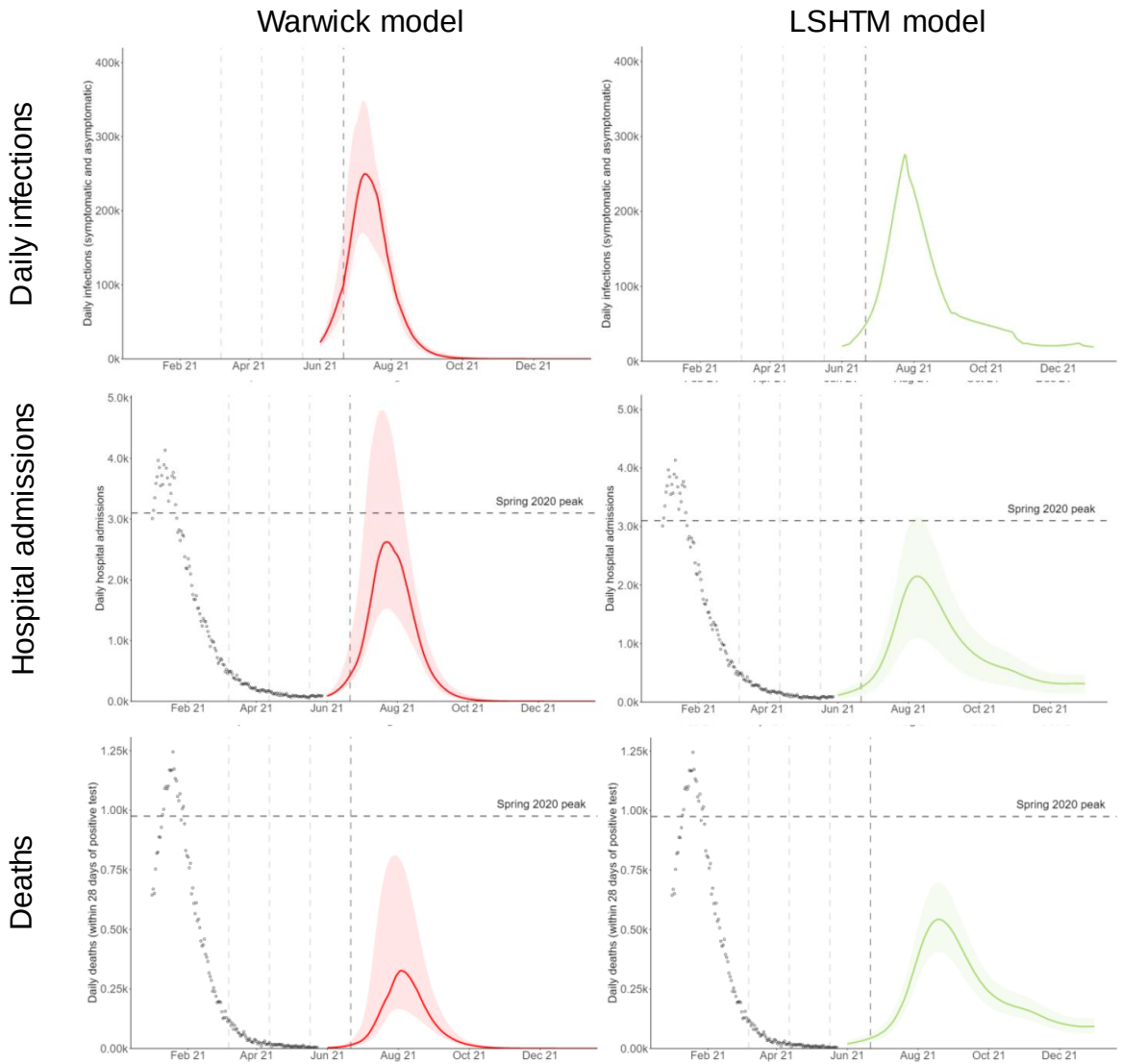
## The government's expert modelling group "SPI-M"

- The figures to the right show SPI-M's scenarios last year.
- The figure below shows a combination of those models, and the sensitivity of the path of admissions to varying the timing of the final NPI.

**SPI-M Step 4: Sensitivity to timing of taking "Step 4"**




**SPI-M "Step 4": Central Assumptions**




Source: Advanced Analytics, A&DS, UKHSA Data Source: CTAS/HAD

# Lesson 4: Combining models (simpler)

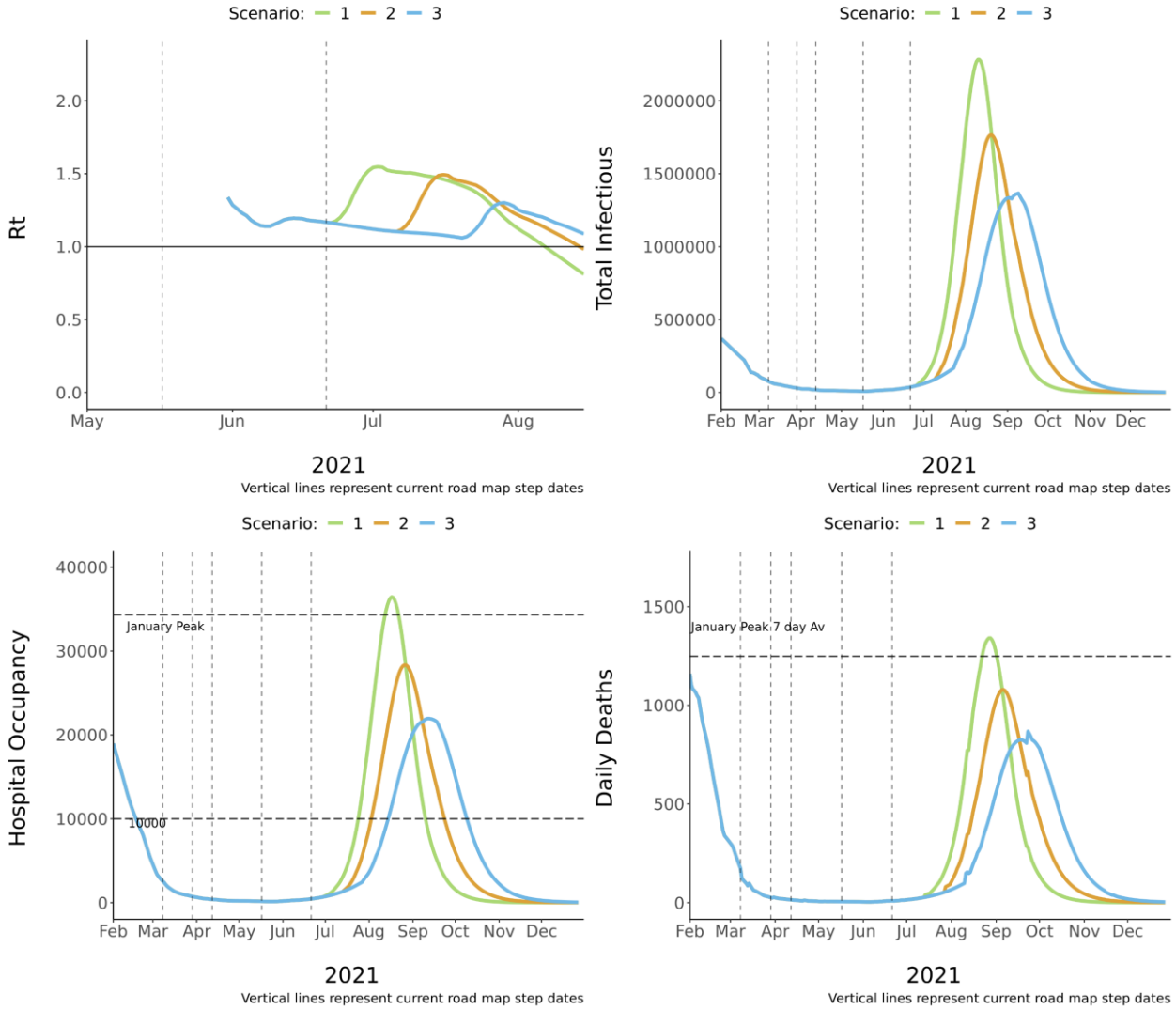
## Policy-relevant frameworks

A relatively simple model to replicate these scenarios in an illustrative analysis of Alpha and Delta, assuming:

- **Increased transmissibility**
- **Immune escape** against infection
- More **severe disease**

This analysis helped colleagues understand how all the uncertainties might fit together.

And what policy could or could not achieve under plausible assumptions.

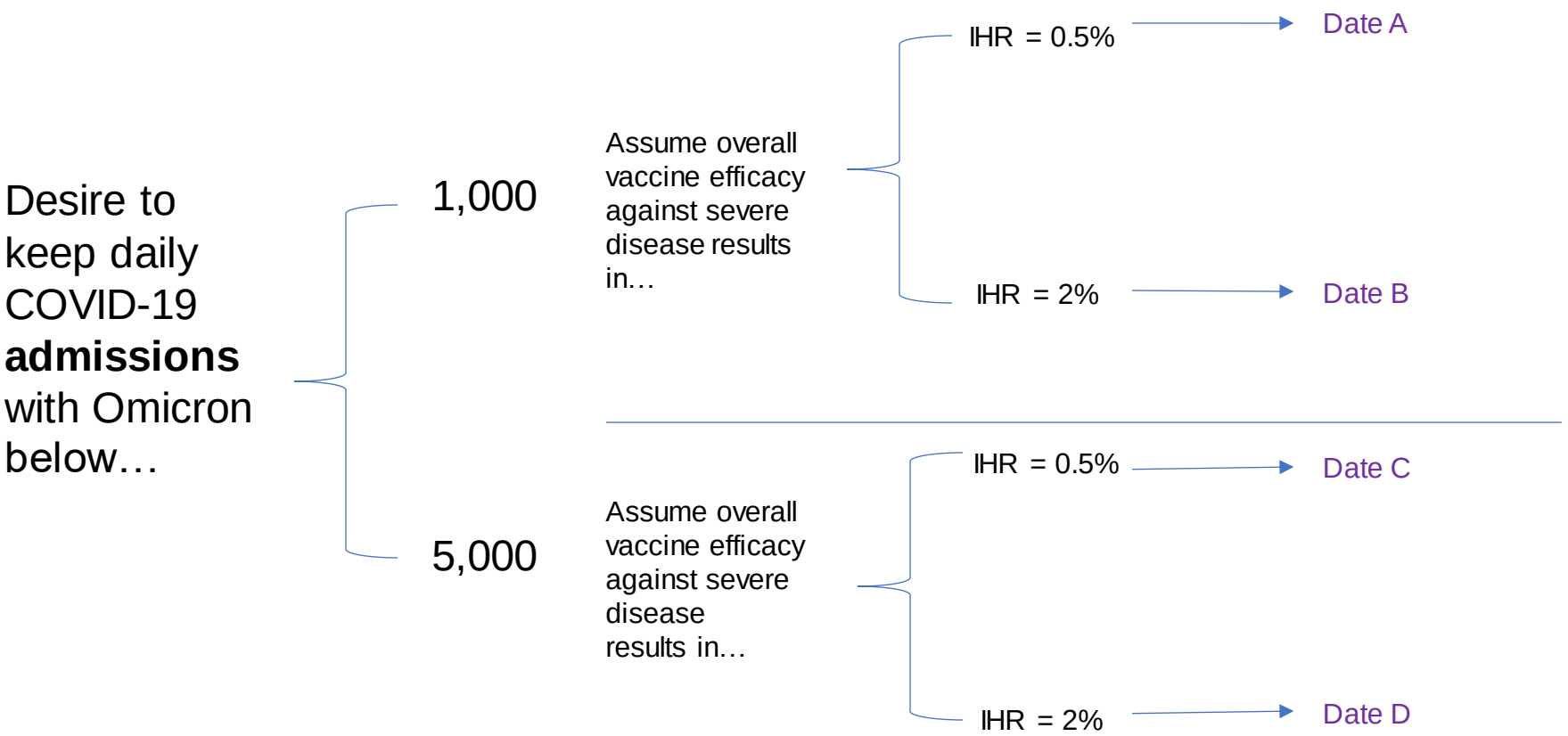



Source: Advanced Analytics, A&DS, UKHSA Data Source: CTAS/HAD

# Lesson 4: Combining models (simplest)

**Calculation to illustrate required timing of restrictions**

***Last date at which stringent national measures can be introduced while keeping admissions below threshold.***




*Lesson: exponential growth is unintuitive and sometime simple calculations can be very powerful when designing and framing policy!*

*Assumptions: 2.5 day doubling time, IHR varying by values, stringent means R<1, no susceptible depletion*

# Lesson 5: The benefits of collaboration

- Expanding the evidence base
  - From GISAID to samples to qualitative information
  - For funding health security

- Exploiting policy variation
  - Some success with the four UK nations
  - Plenty more to do!

- Science, policy **and** organisational lessons

- Laying the foundations for the next crisis

- More conferences like this one!