Final Remarks

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Take Aways

In the last two days, we have covered a lot of ground. Here are some key takeaways:

- Infectious diseases are a major public health concern that can have devastating consequences.
- Mathematical models are essential tools for studying the dynamics of infectious diseases and informing public health decision-making.
- Models are simplifications of reality that help us understand complex systems.

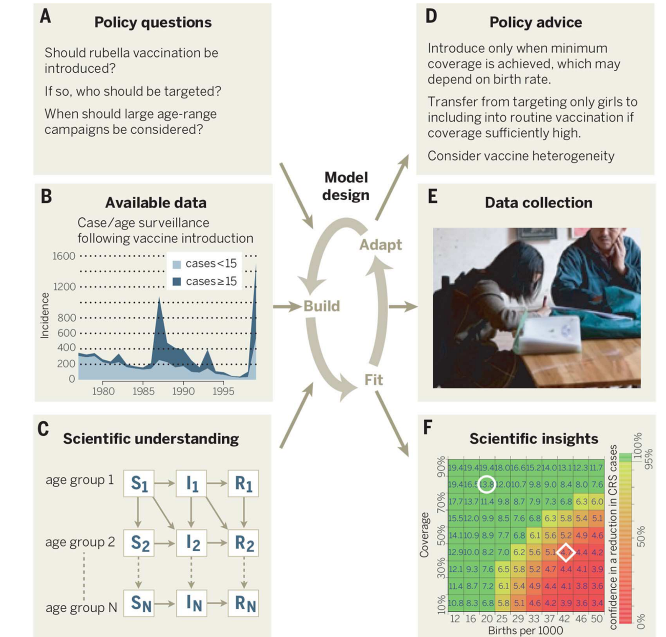
- We have discussed several compartmental models, including the SIR, SEIR, and SEIRV models.
- The SIR model is a simple compartmental model that divides the population into three compartments: susceptible, infected, and recovered.
- The SEIR model extends the SIR model by adding an exposed compartment.
- We can model various pharmaceutical and non-pharmaceutical interventions (NPIs) by modifying the transmission rate or adding new compartments.

- We have discussed the basic reproduction number, $R0$, which is a key parameter in infectious disease epidemiology.
- $R0$ is the average number of secondary infections produced by a single infected individual in a completely susceptible population.
- If $R0 > 1$, the disease will spread in the population; if $R0 < 1$, the disease will die out.

- Deriving the basic reproduction number, $R0$, is an essential step in understanding the dynamics of infectious diseases.
- Deriving $R0$ for the simple SIR model is simple as we just need to study the threshold phenomena.
- For more complex models, we can use the next-generation matrix approach to derive $R0$.

- Often, homogeneous models are not sufficient to capture the complexity of infectious diseases.
- Incorporating heterogeneity into the models is essential for capturing the complexity of infectious diseases.
- Age structure is a common form of heterogeneity that can be incorporated into the models.
- Other forms of heterogeneity include spatial, temporal, and contact heterogeneity.

How do we build models



What skills are needed to build and use infectious disease models?

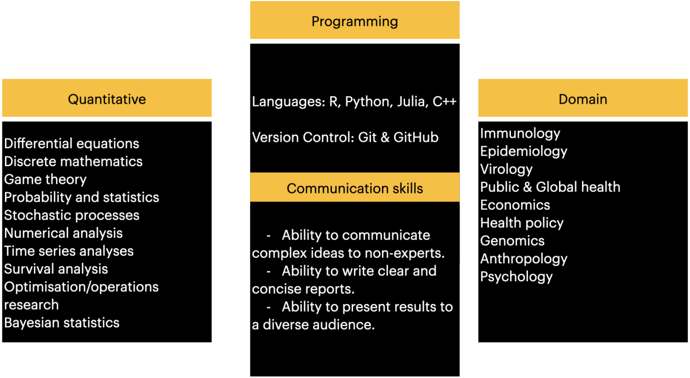


Figure 1: A non-exhaustive list of skills needed for modelling.