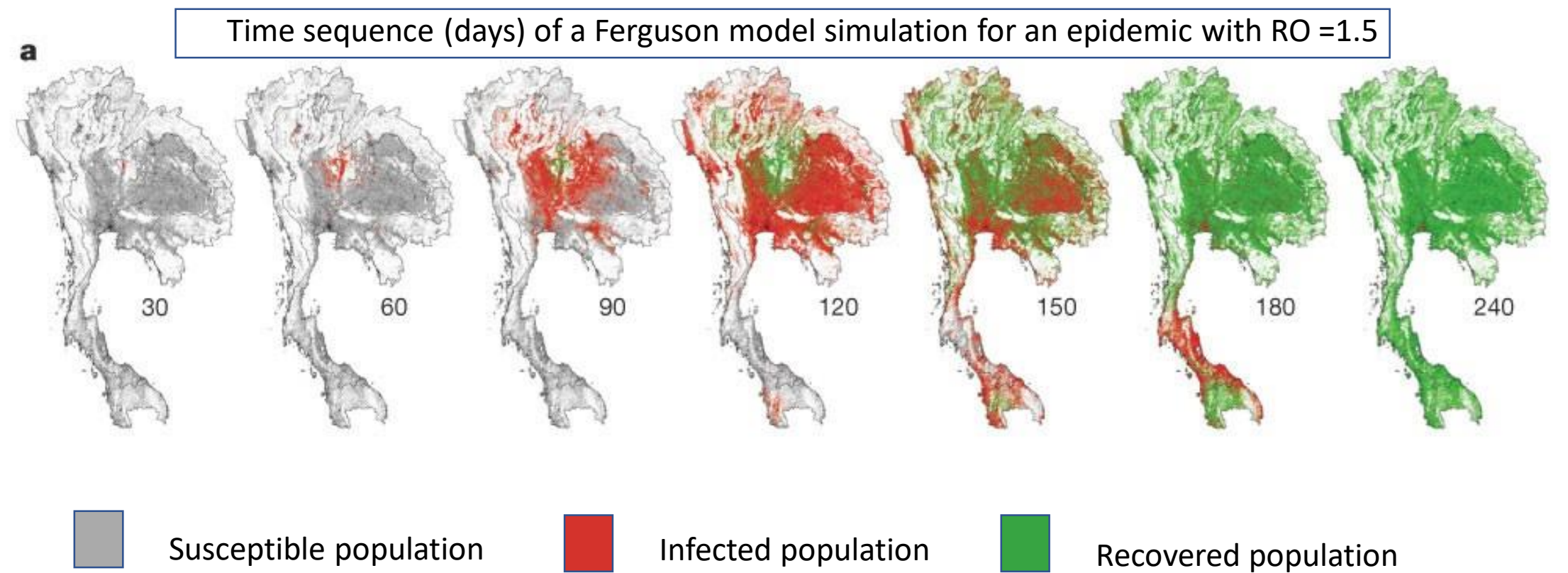
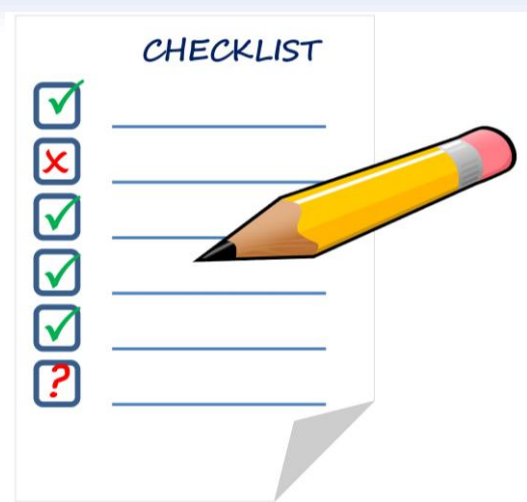


## What is the Ferguson model?

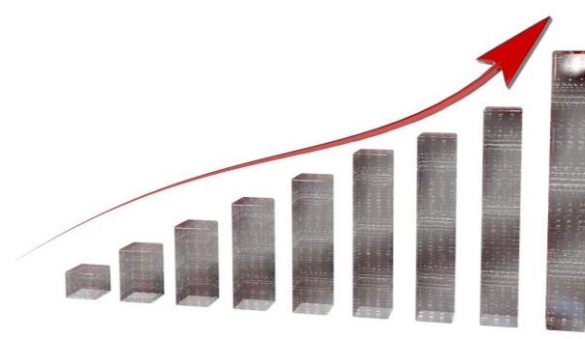
- An agent-based model
- Created by Neil Ferguson in 2005
- Originally designed to model influenza
  - Adapted in 2020 to model Covid-19
- Produced results that encouraged enforced UK lockdown
- "Thousands of lines of undocumented C (code)"



## Why are we replicating it?



Verification of results



Expansion of features

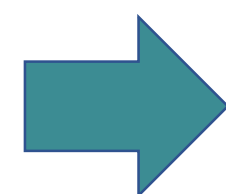


Exploration of replicability

## The main challenges of this replication

### Documentation

- Insufficient reporting in model publications
- Difficult to obtain input data
- No model specifications



### Solutions

- Group exploration of available literature
- Collection of comparable input data
- Calculated estimations for algorithms and features

### Performance

- Simulating the entire UK is expensive (~66.65 million agents)
- Agent model optimisation is often challenging
- Faster realizations = Faster results

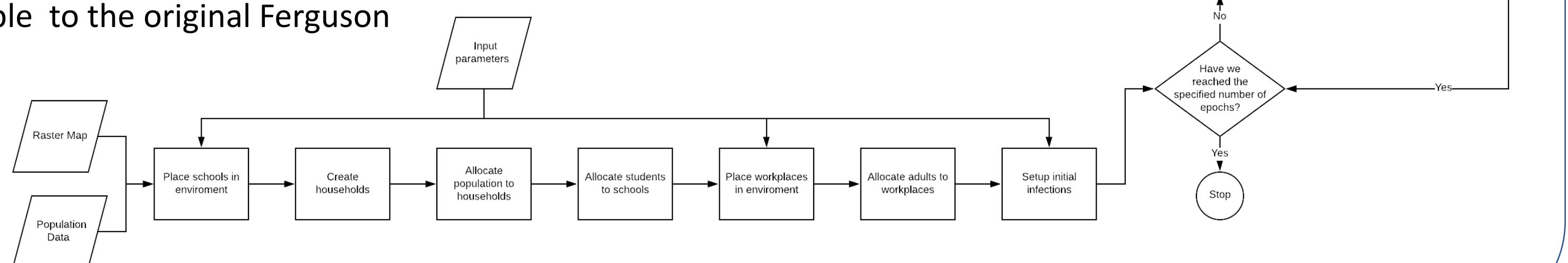


### Solutions

- Aggressive optimisation using Cython and profiling
- Problem points identified and focused

## An overview of our current Replication state

- An agent-based model implemented in Python
- Models COVID-19 transmission throughout the UK (or sub-sections)
- Current goal is version 3.0 (Release)
  - Aims to be functionally comparable to the original Ferguson model
  - Currently ~37% to goal



High level example of a replication realization