A scenario-based modelling framework for generating locally relevant forecasts of COVID-19 infections and deaths

Apex Resource Management Solutions Ltd.

in collaboration with

Dr. Sarah (Sally) Otto
University of British Columbia
&
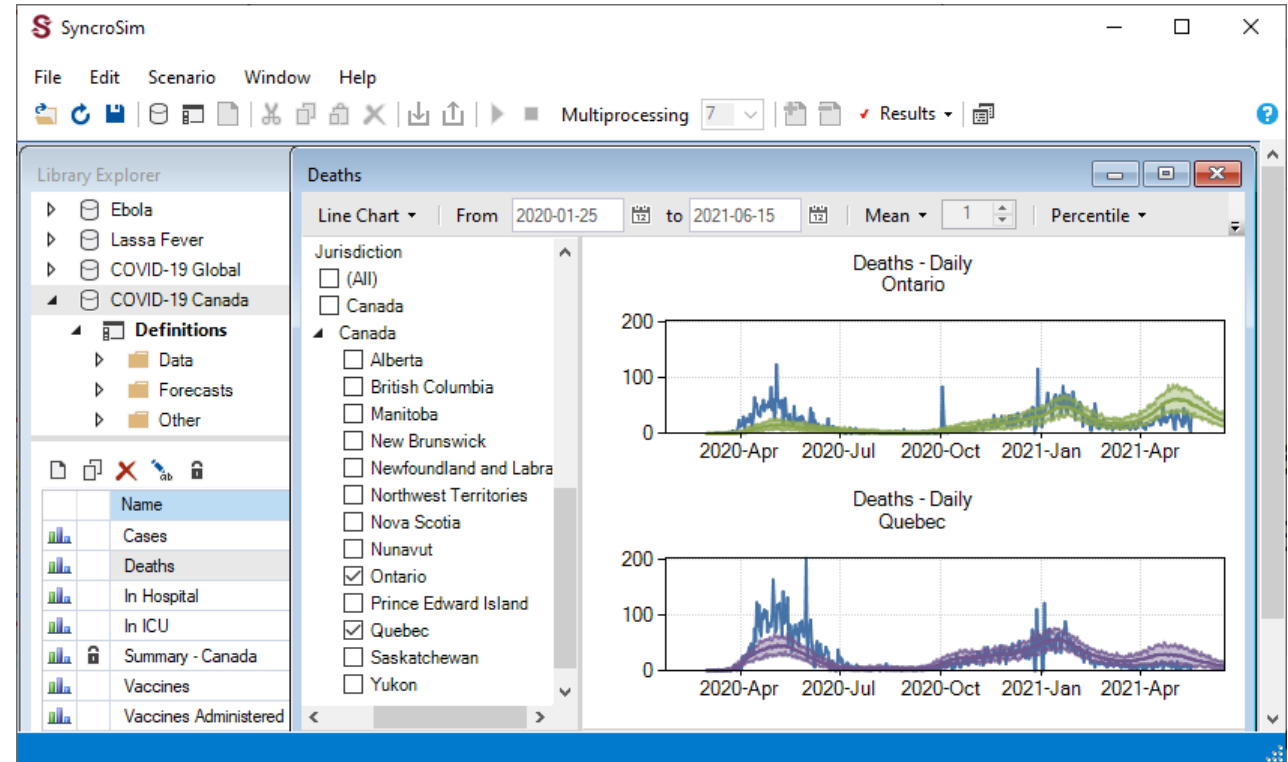Dr. Caroline Colijn
Simon Fraser University

Major Achievements

Solution:

Pandemic forecasting system that can be rapidly deployed anywhere in the world

- Mix-and-match latest data & models
- Near real-time (i.e. daily) updates
- Includes uncertainty in forecasts
- User-driven "what-if" scenarios

→ **World-leading innovation**

Benefits:

- Accelerated decision making
- Increased speed, efficiency & accuracy
- Brings together modellers, data providers & decision makers

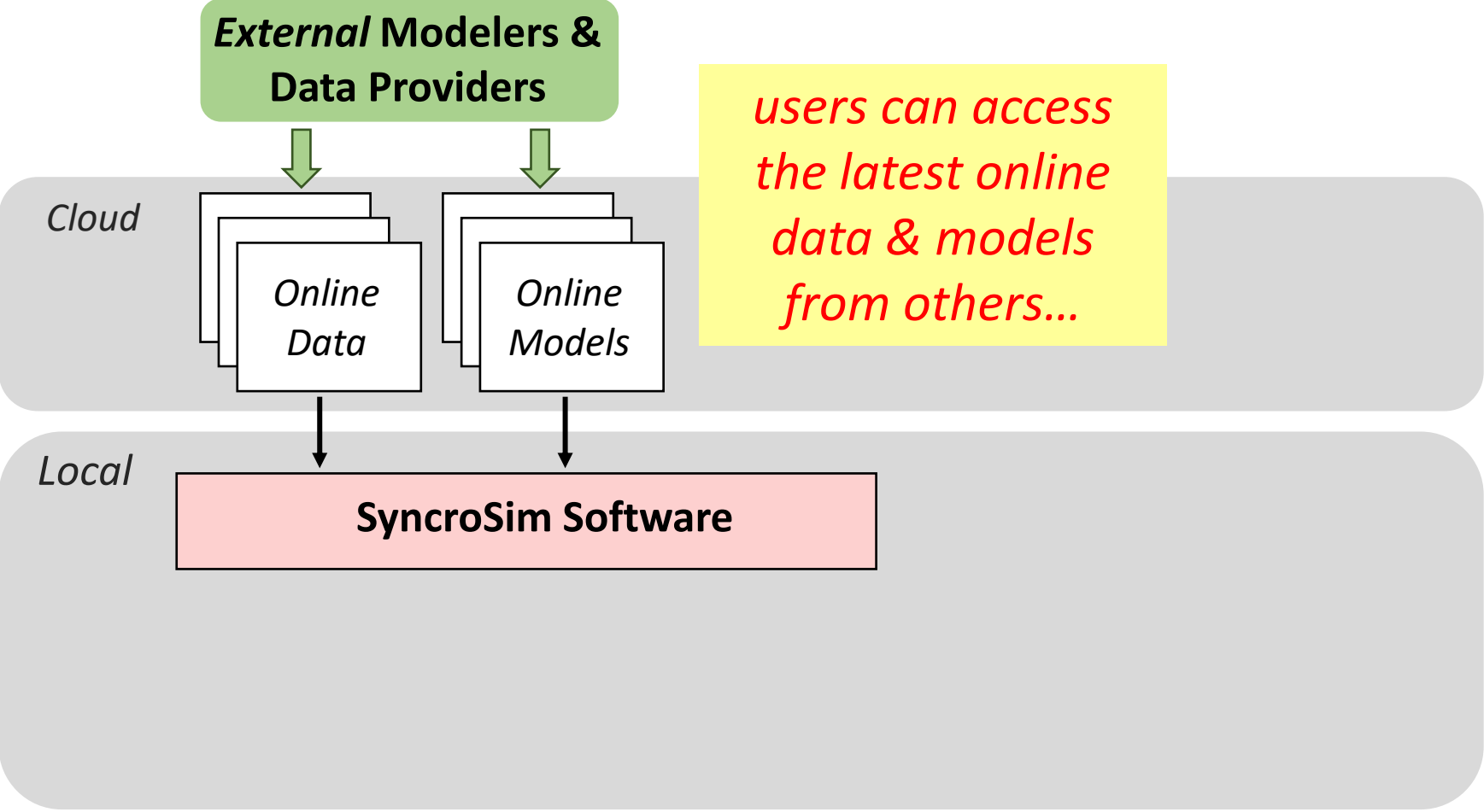→ **Locally responsive, meaningful, and ultimately actionable forecasts**

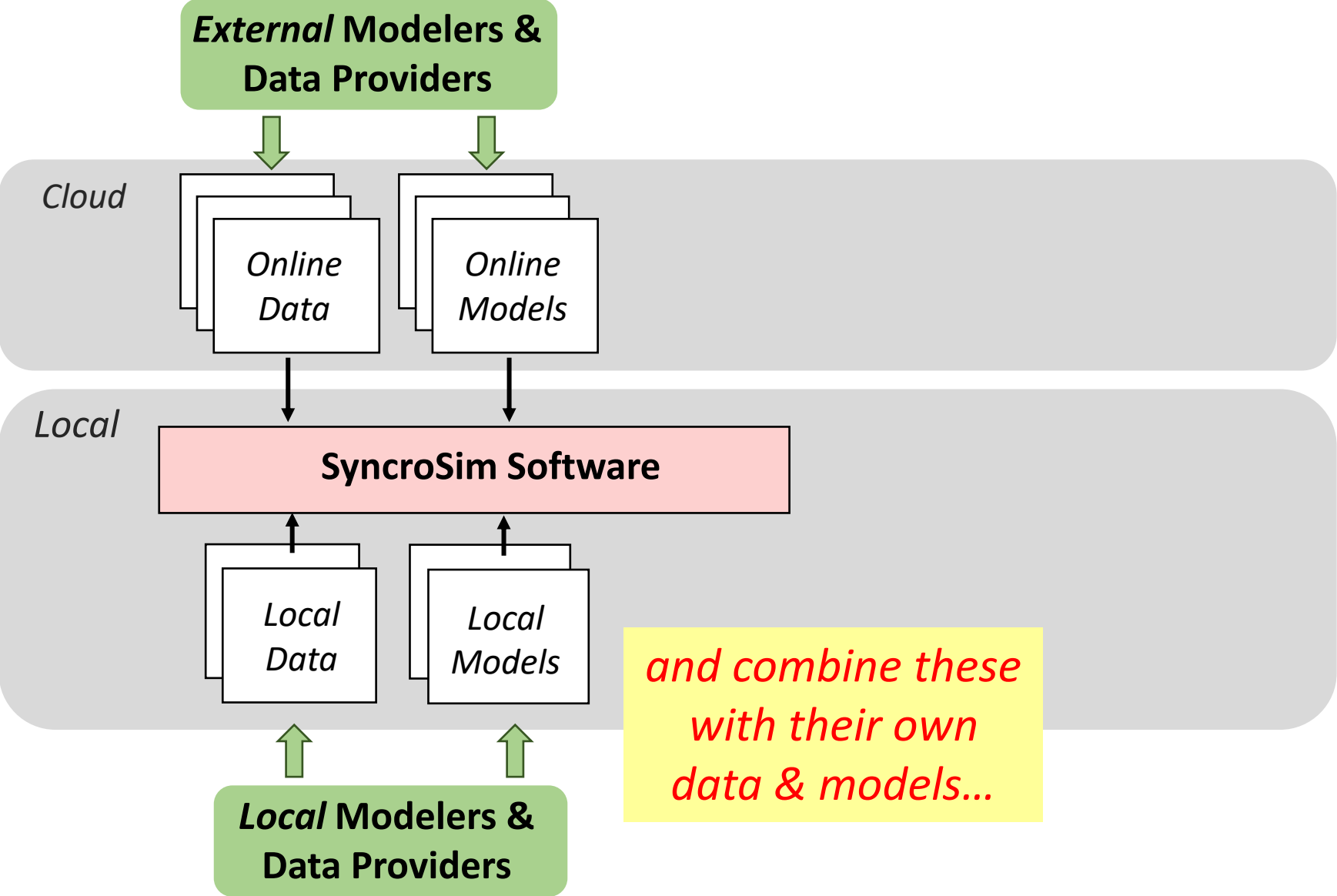# COVID-19 Forecasting System Framework

Local

SyncroSim Software

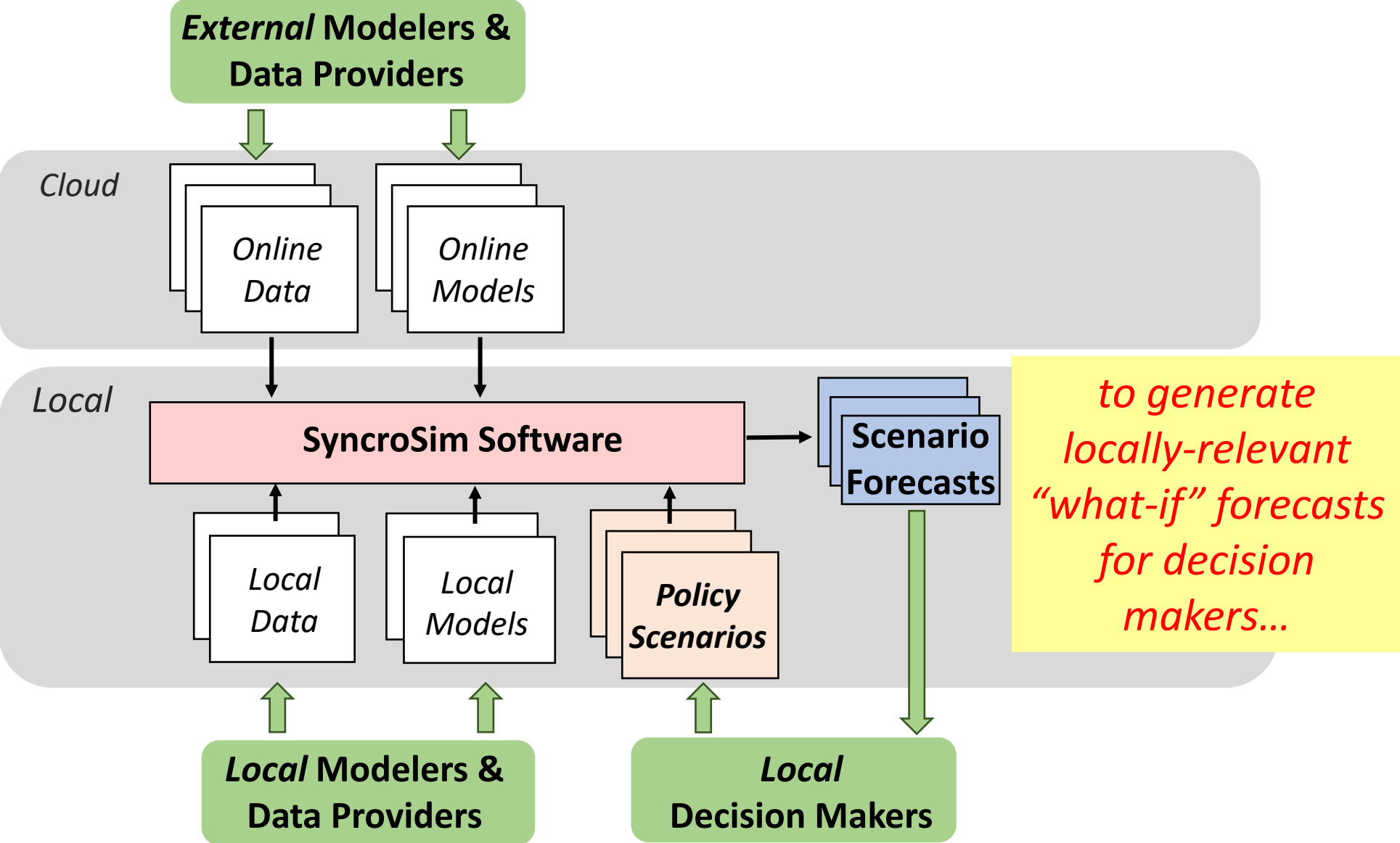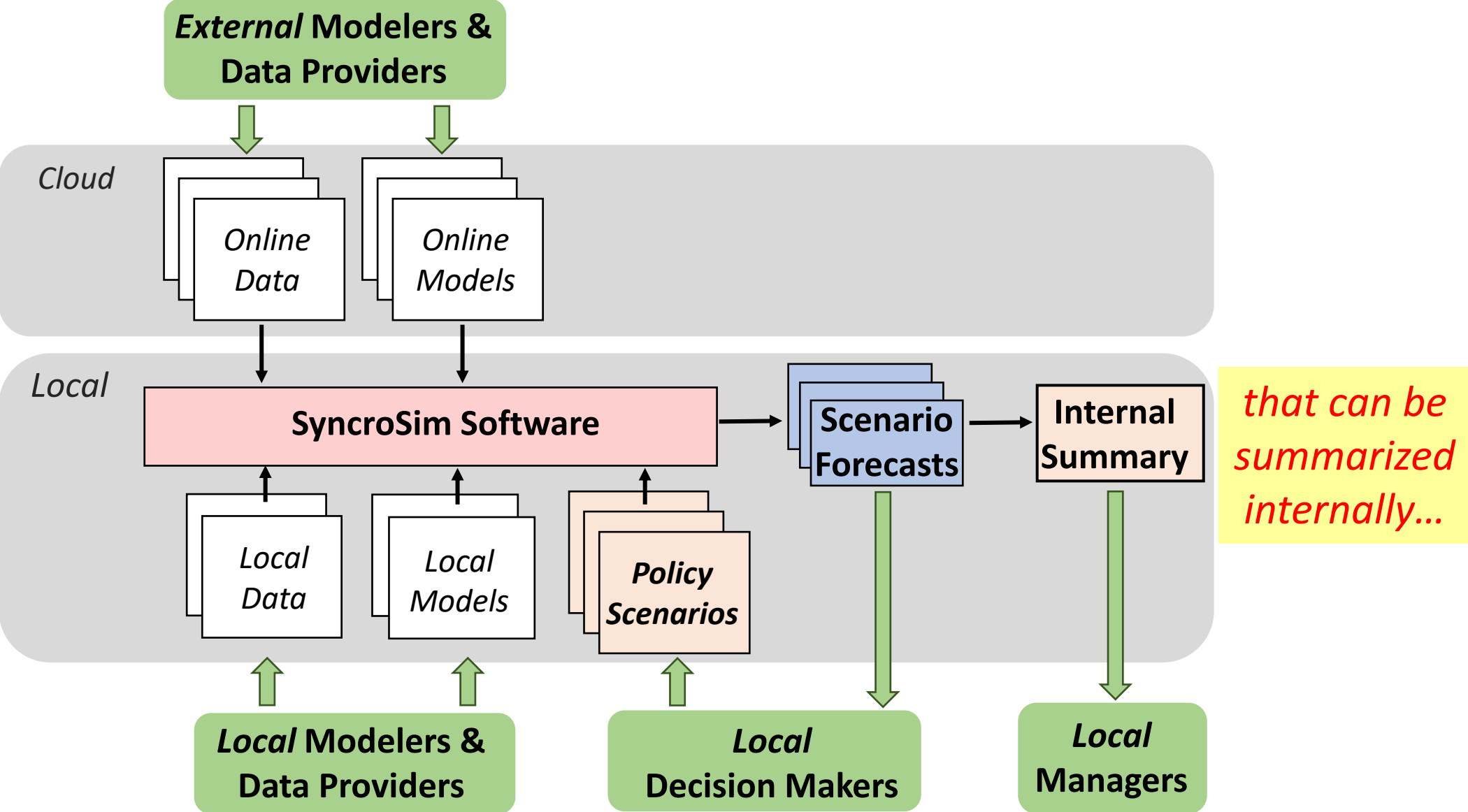*Using our existing commercial SyncroSim desktop software...*

COVID-19 Forecasting System Framework
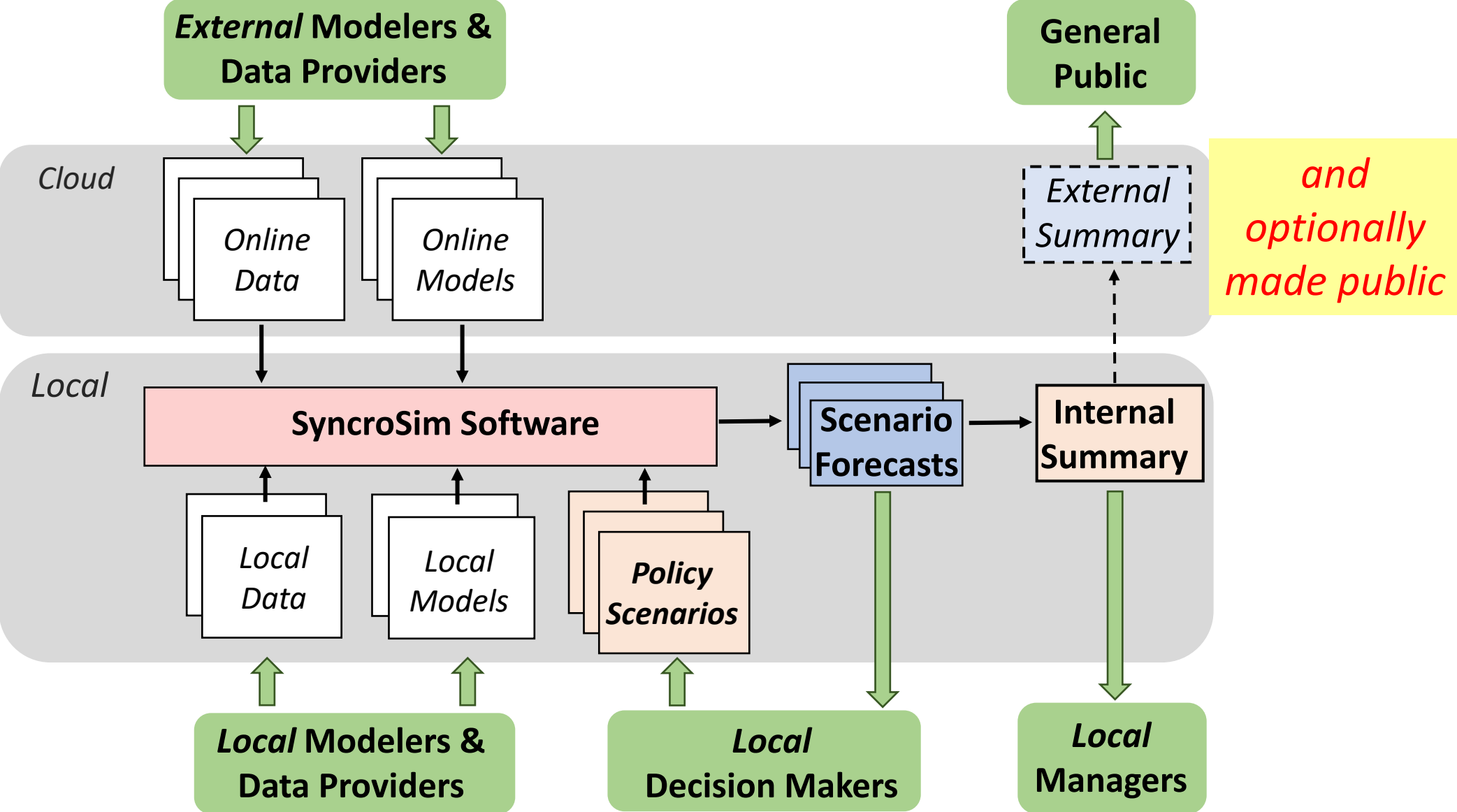
COVID-19 Forecasting System Framework

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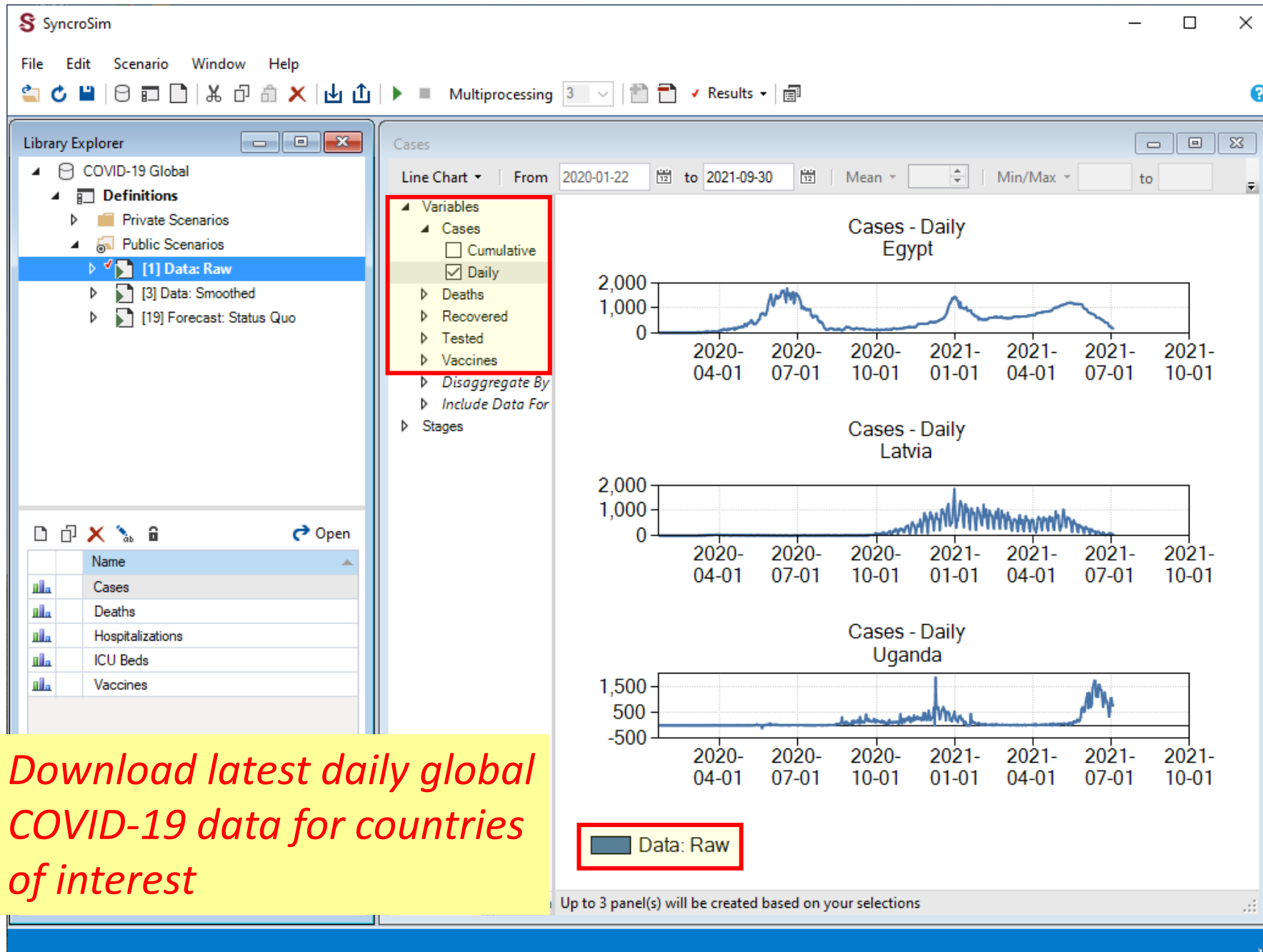
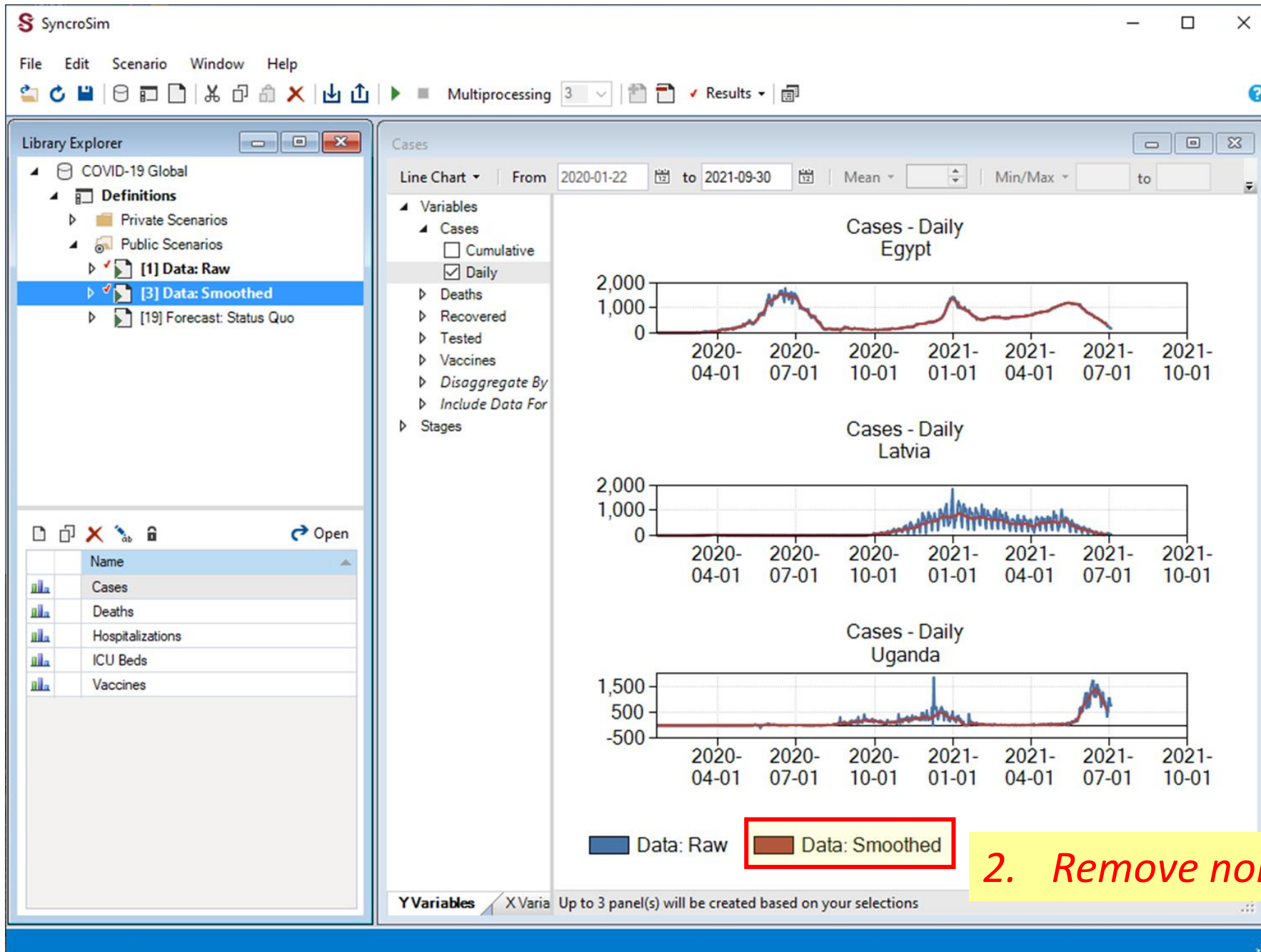# COVID-19 Forecasting System Framework

COVID-19 Forecasting System Framework
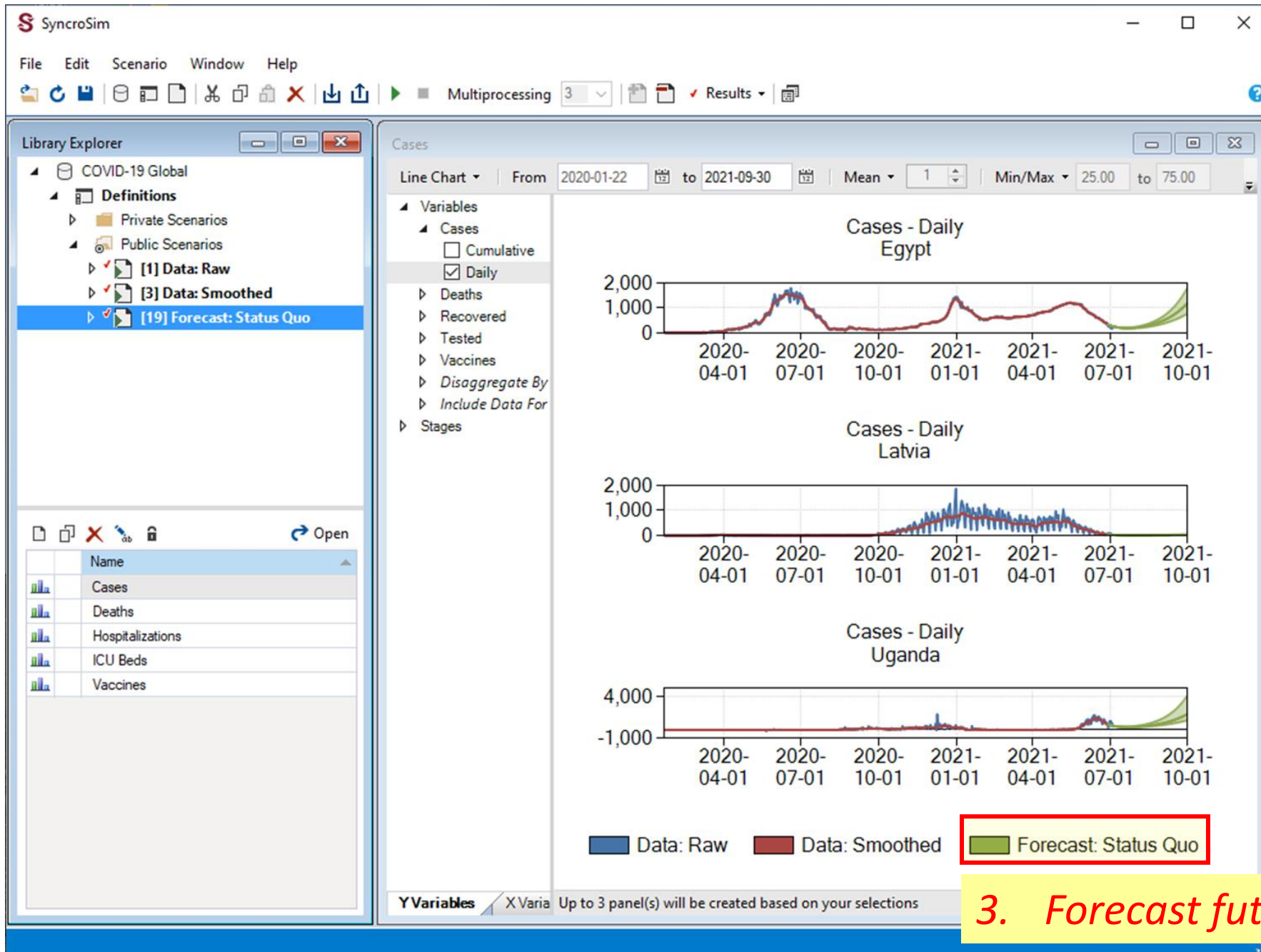
Demonstration:
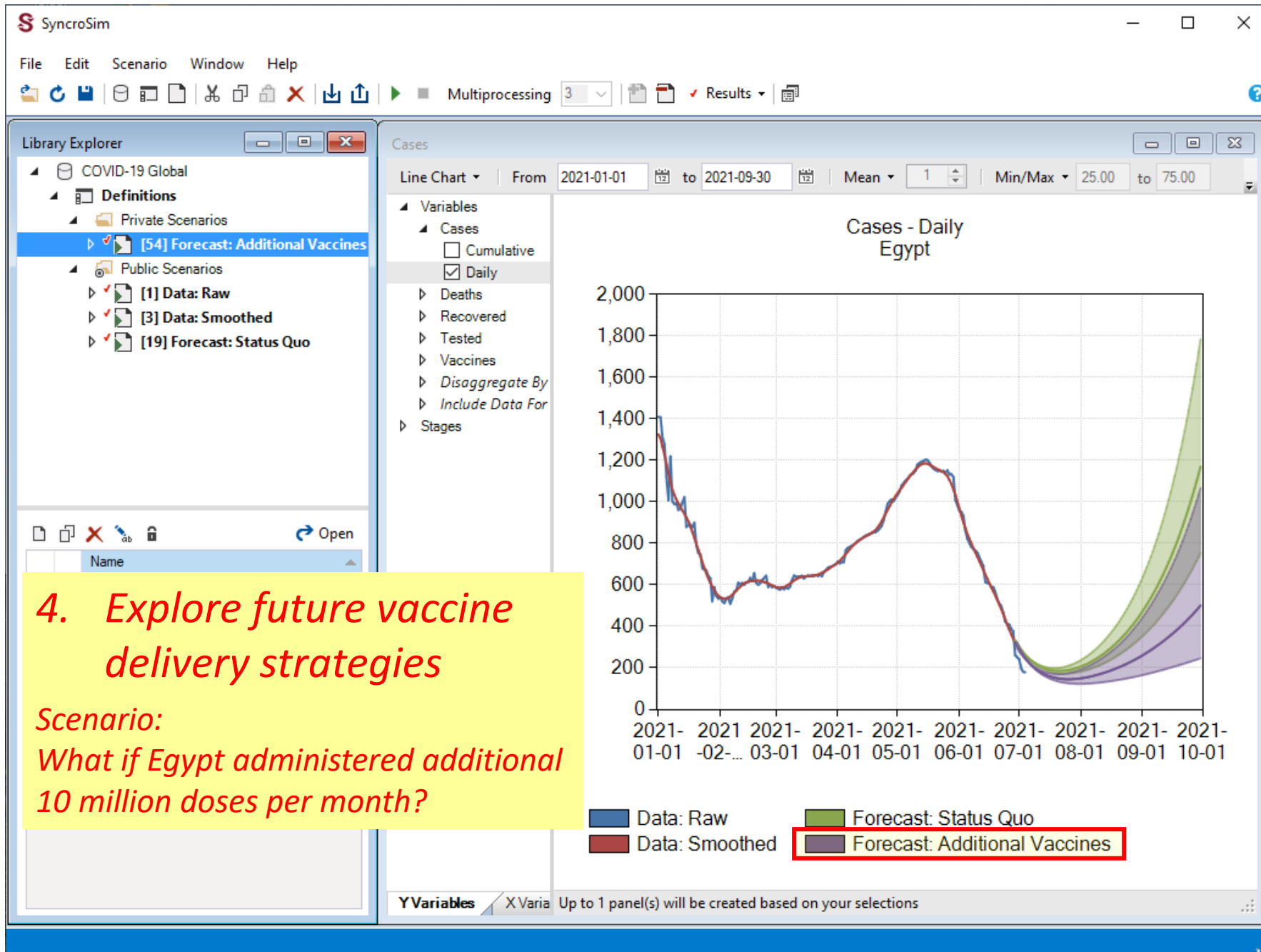
COVID-19 Forecasting System

1. *Download latest daily global COVID-19 data for countries of interest*

2. Remove noise

3. *Forecast future cases*

4. *Explore future vaccine delivery strategies*

Scenario:
What if Egypt administered additional 10 million doses per month?

5. Publish results daily internally and/or online...
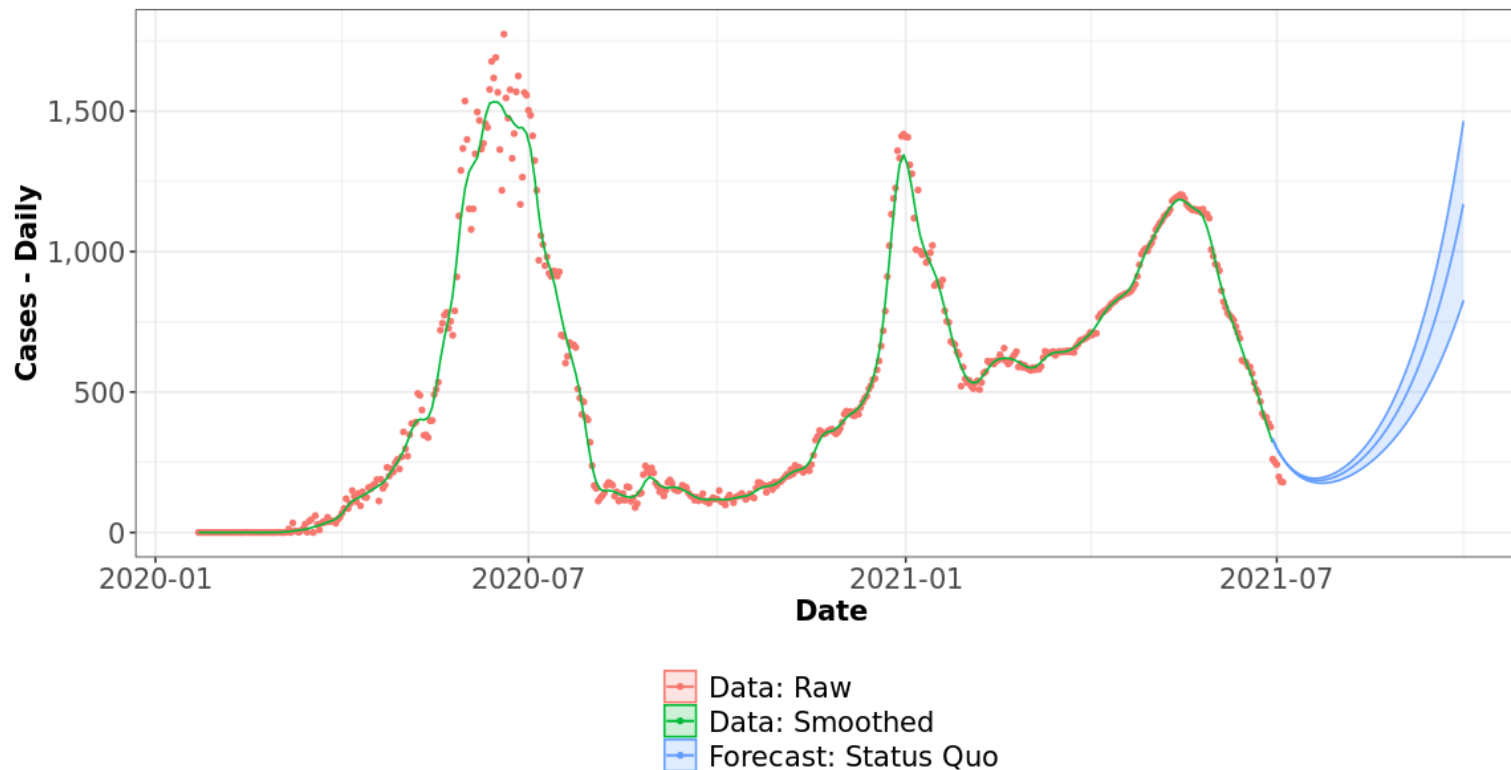
... including maps of future forecasts
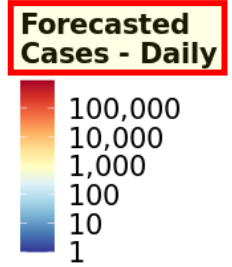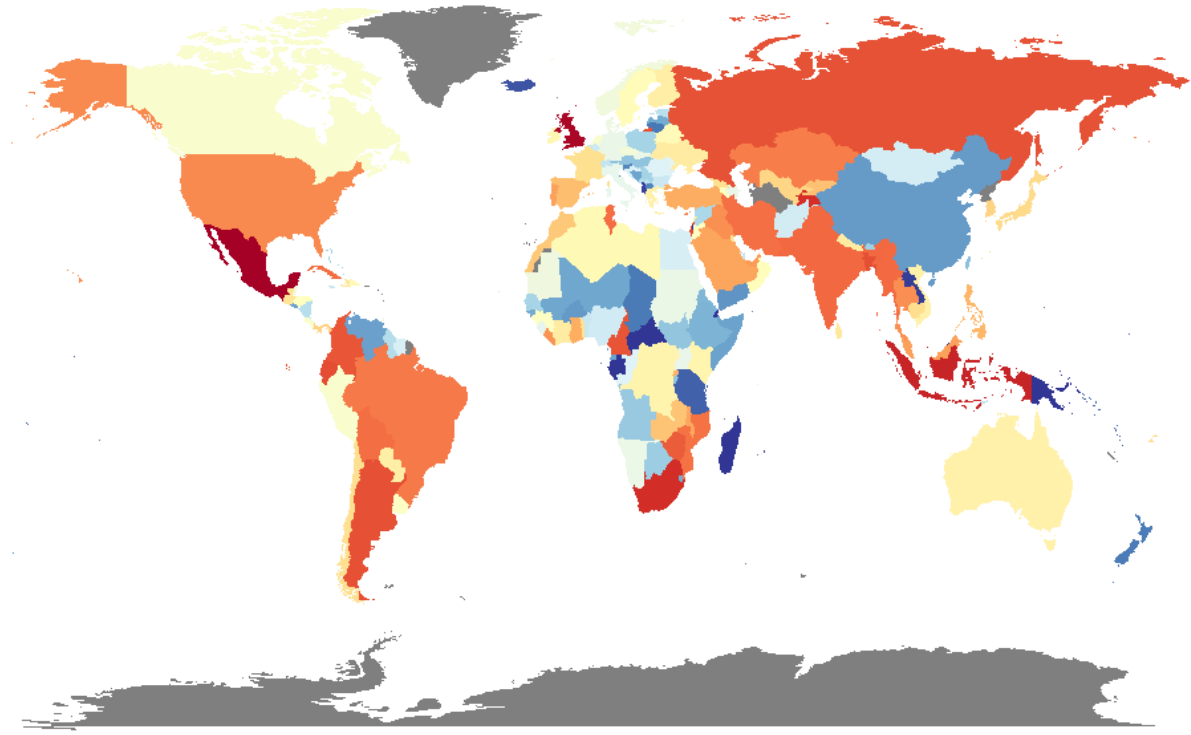
Global forecast for July 26
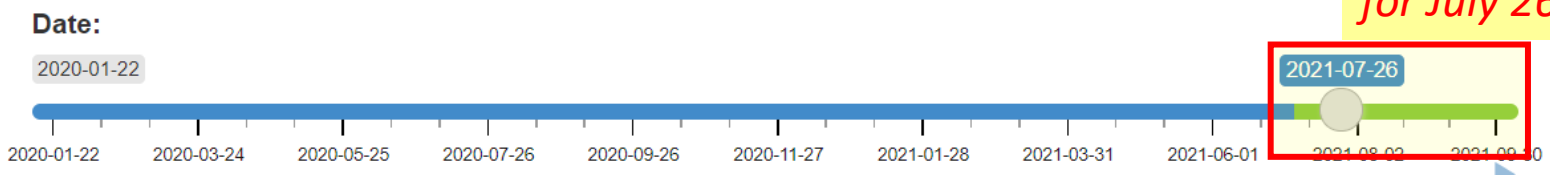
Scientific Innovations

General platform for **risk-based predictive analytics**
$\rightarrow$ *e.g. pandemics, hazards, disasters, environment, logistics*

1. **Connects decision makers** directly to underlying data & models – both globally and locally

2. Data & models are **continuously updated** in near real-time

3. **Allows forecasts** generated by alternative models **to be compared**

4. **Incorporates uncertainty** into all forecasts

5. Tracks legacy of all inputs and outputs associated with **"what-if" future scenarios**

Technical Innovations

1. Allows models to be chained together in **user-defined "pipelines"**

2. Supports models written in **any programming language**

3. Automatically **structures data** associated with all model inputs and outputs

4. Extensive support for **big (spatial) data**, including spatial **Monte Carlo simulations**

5. Well suited for **machine learning** workflows