

# Global predictions of short to medium-term COVID-19 transmission trends - a retrospective assessment

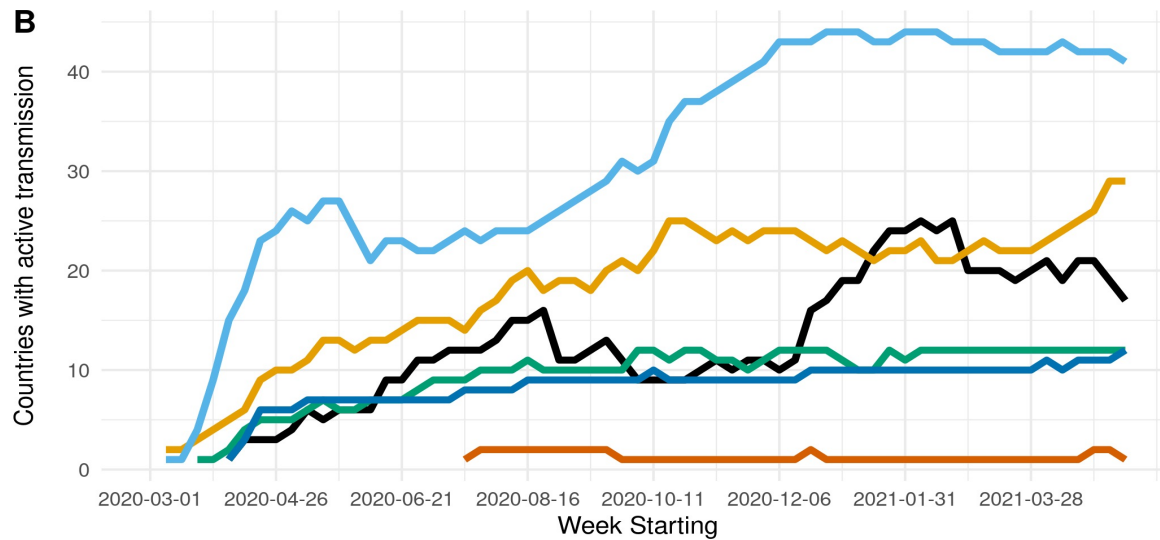
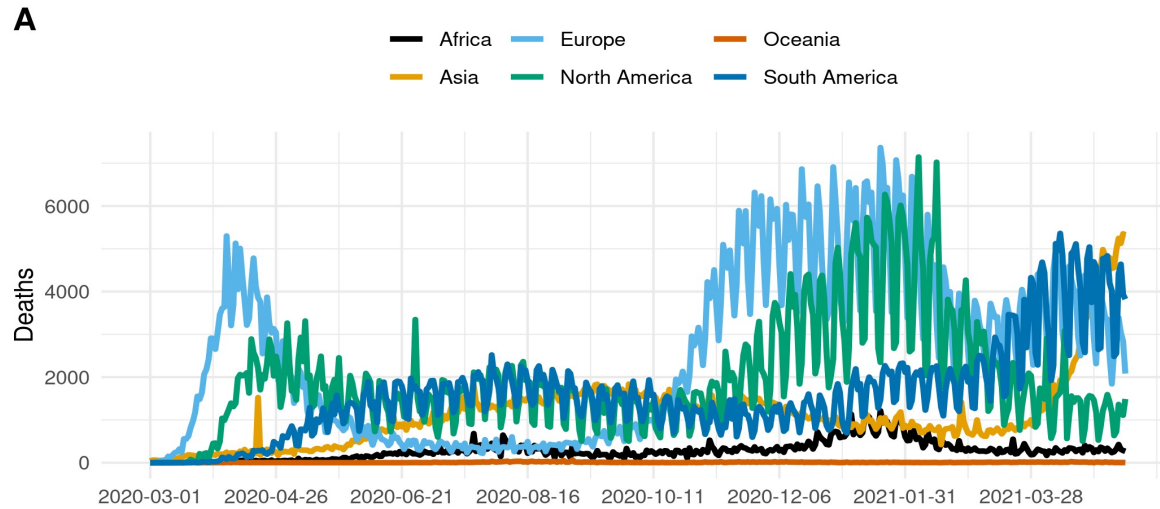
MRC

Centre for  
Global Infectious  
Disease Analysis

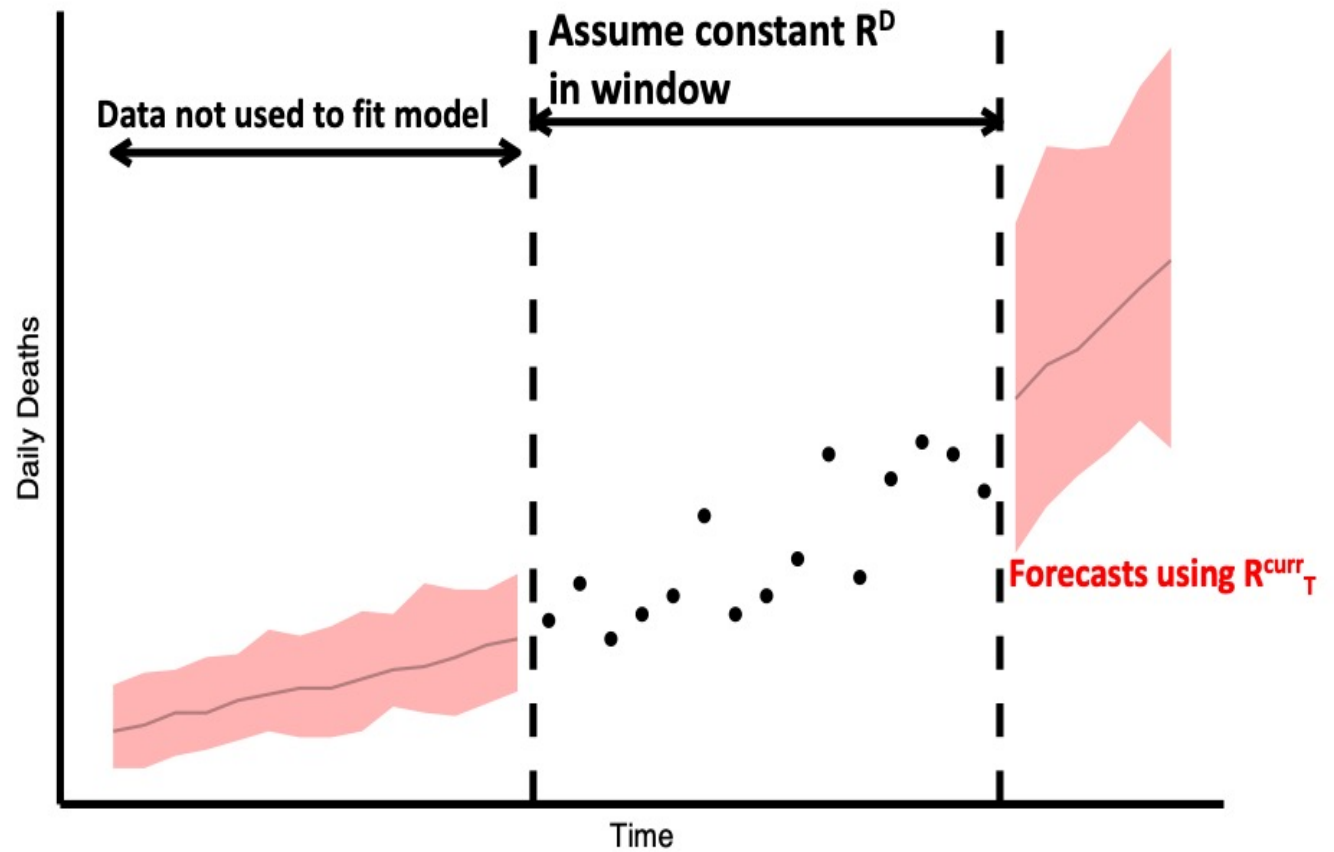
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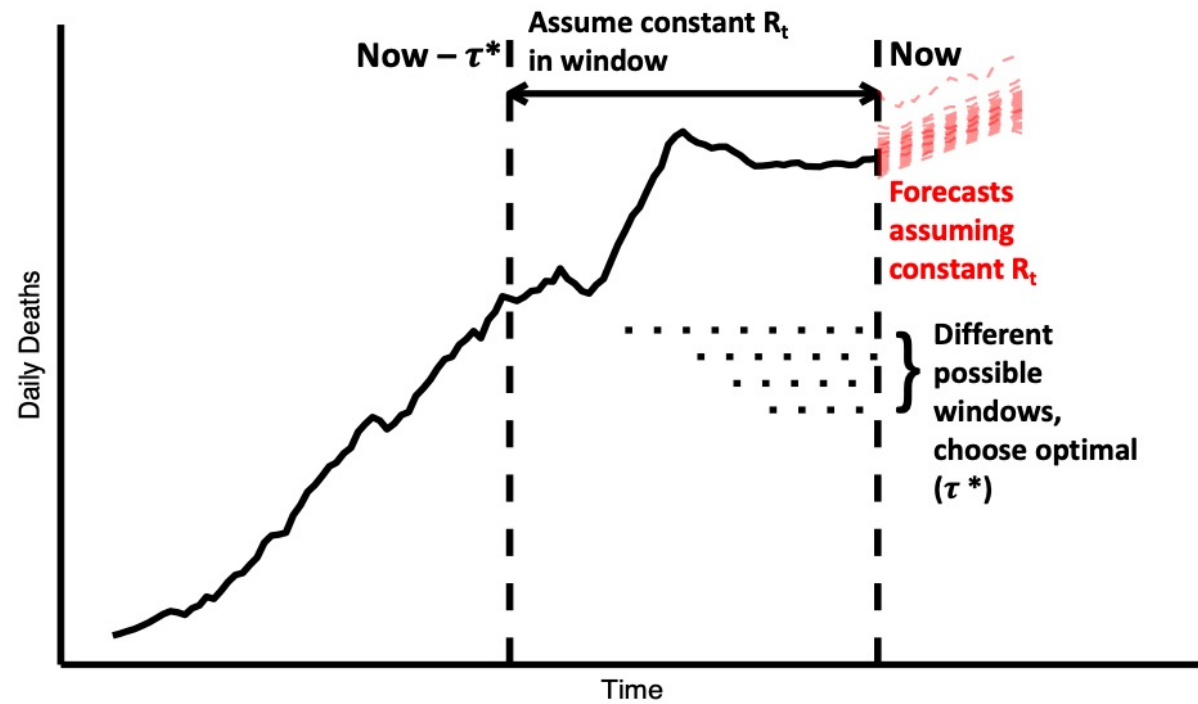
# Background



# Methods – Model 1

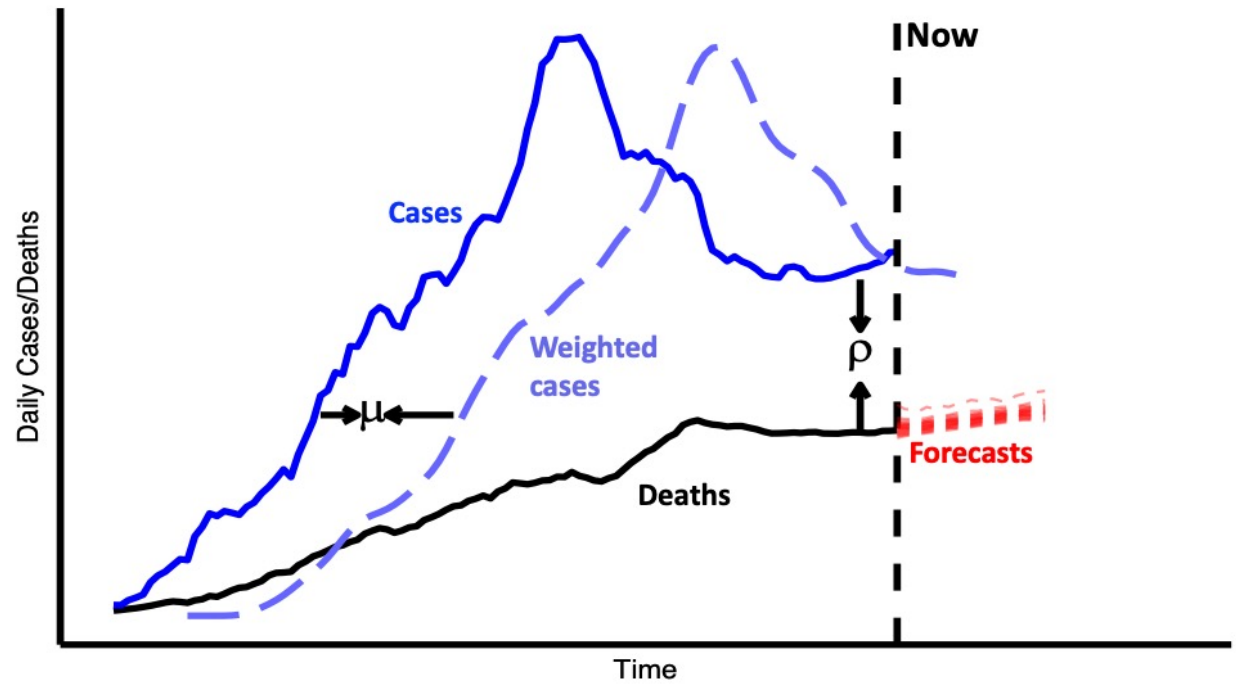


# Methods – Model 2





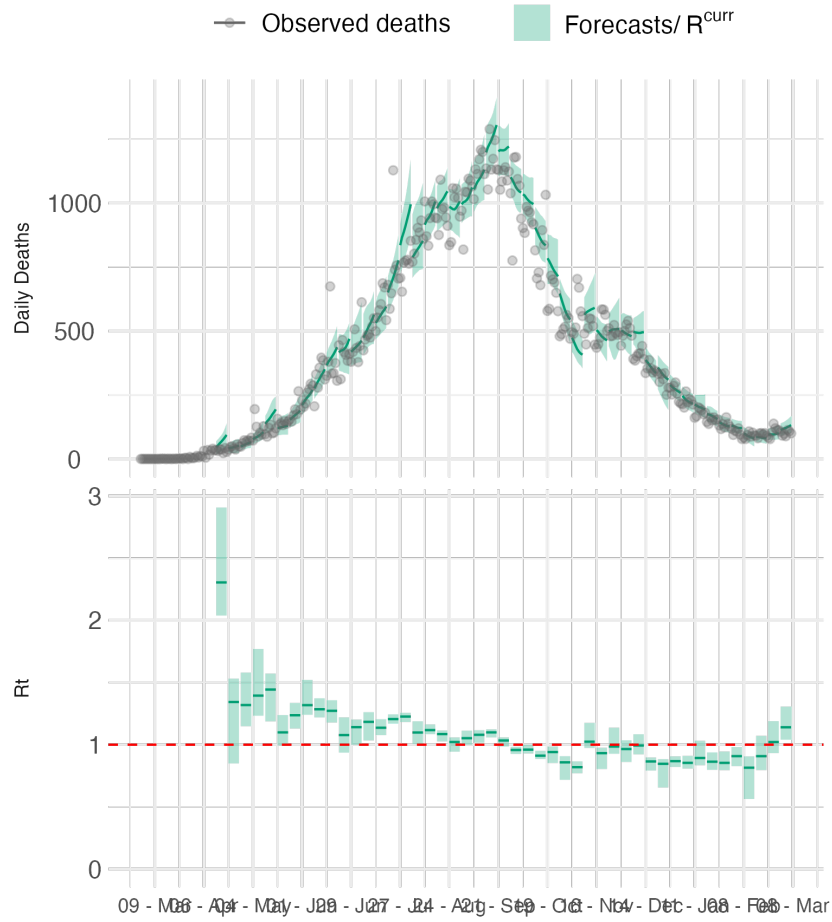
# Methods: Model 3



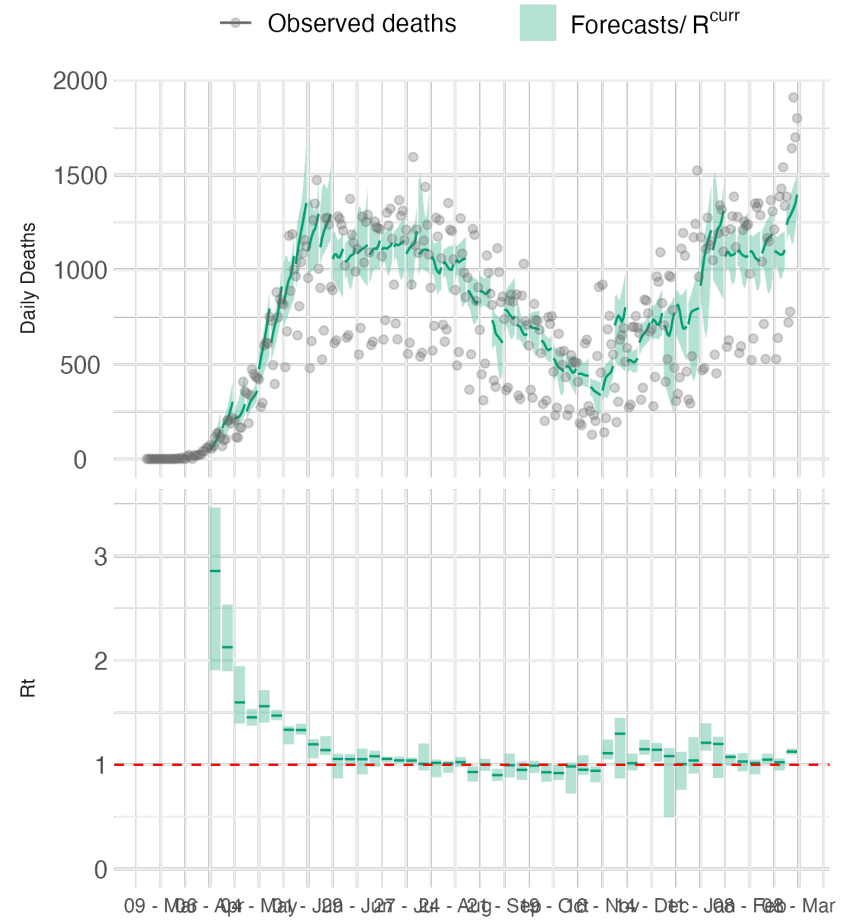
The image features a dark blue background. A lighter blue circle is positioned on the right side, partially overlapping a vertical line that runs through the center of the image. The word "Results" is written in white text, centered horizontally and partially overlapping the circle and the vertical line.

# Results

### India

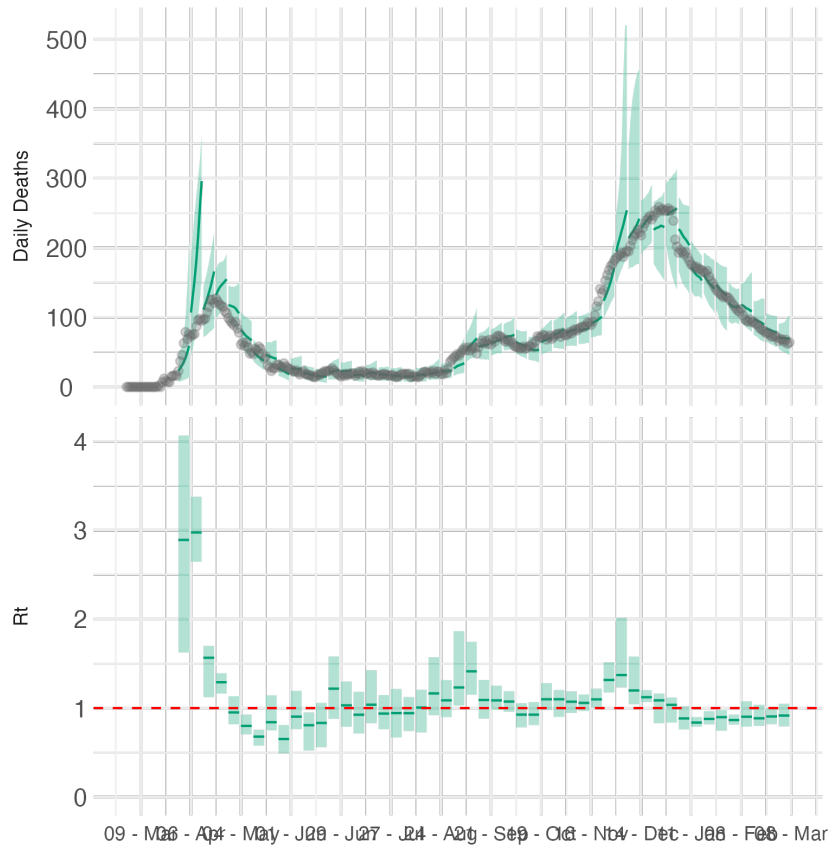


### Brazil



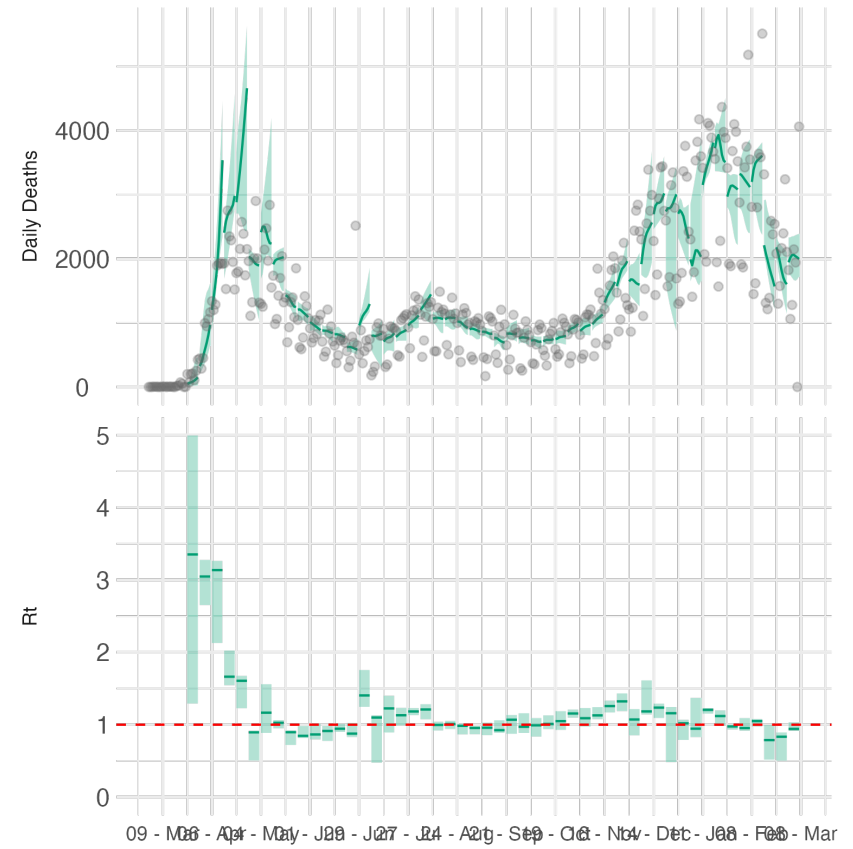
### Turkey

—●— Observed deaths    ■ Forecasts/  $R^{curr}$



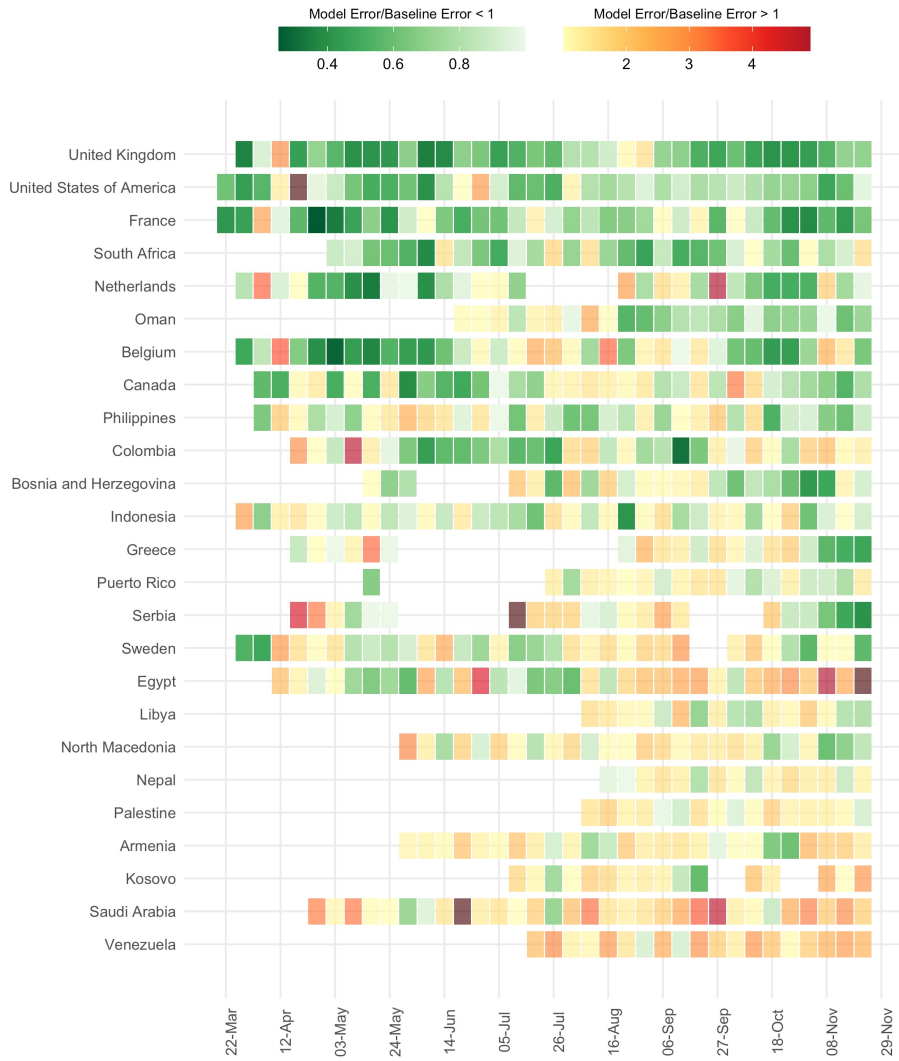
### USA

—●— Observed deaths    ■ Forecasts/  $R^{curr}$

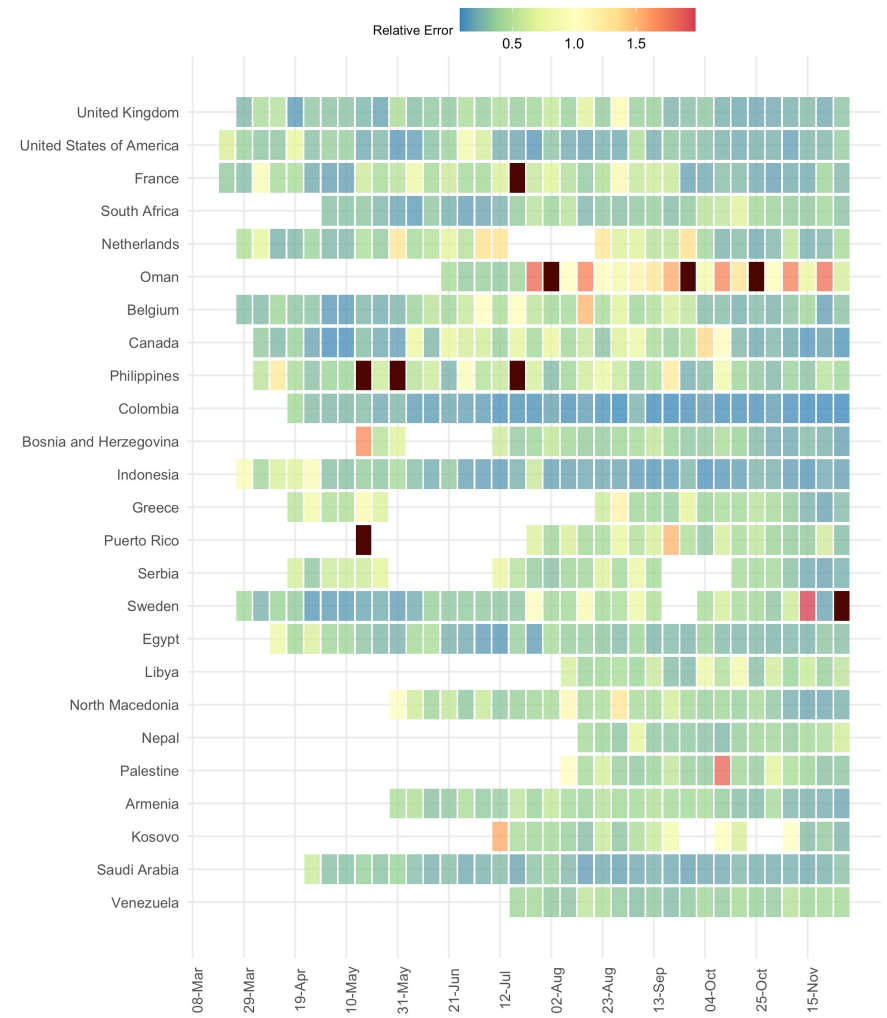


# Retrospective Assessment

# Compare ensemble and null model error



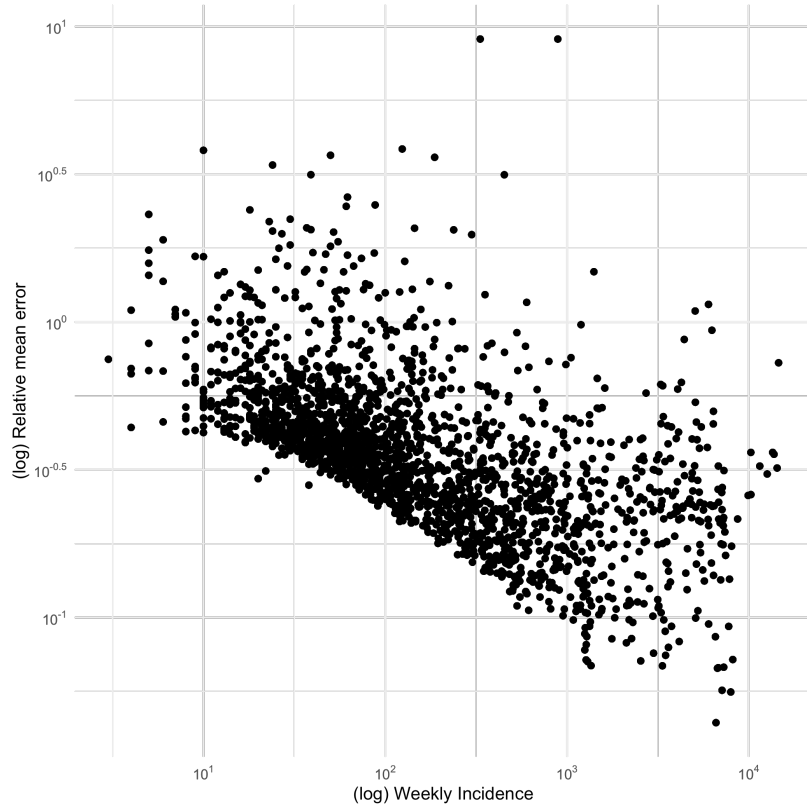
# Model relative error



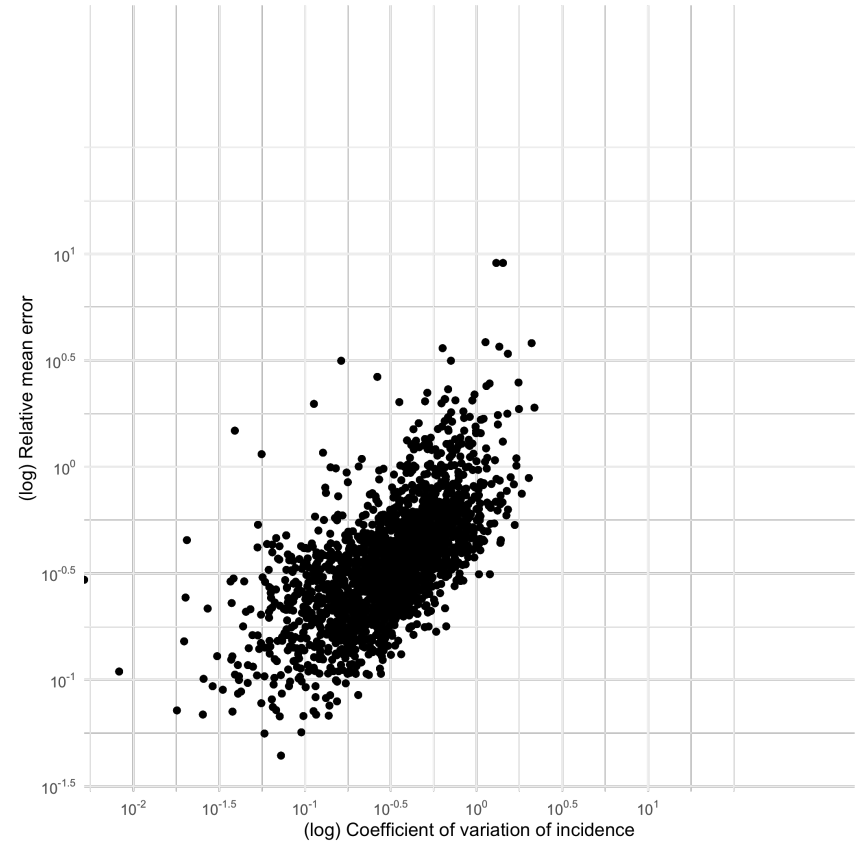


Phase	Ensemble model error >Null model error	Ensemble model error <Null model error
Declining	16.5% (32)	83.5% (162)
Growing	30.5% (107)	69.5% (244)
Stable/growing slowly	55.4% (640)	44.6% (516)
Unclear	68.4% (322)	31.6% (149)

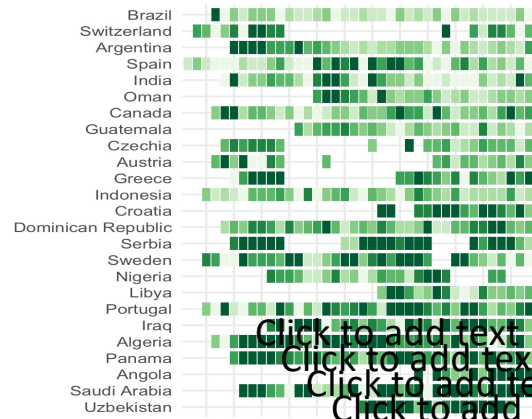
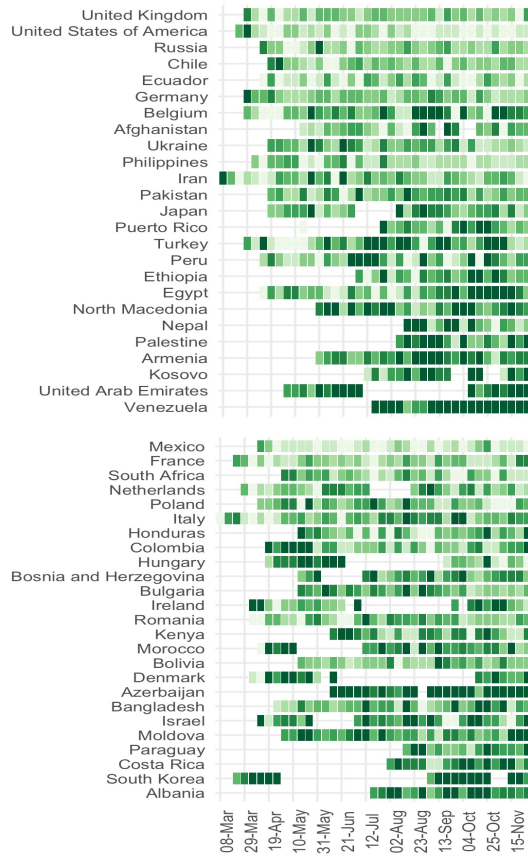
## Model error varies inversely with the weekly incidence



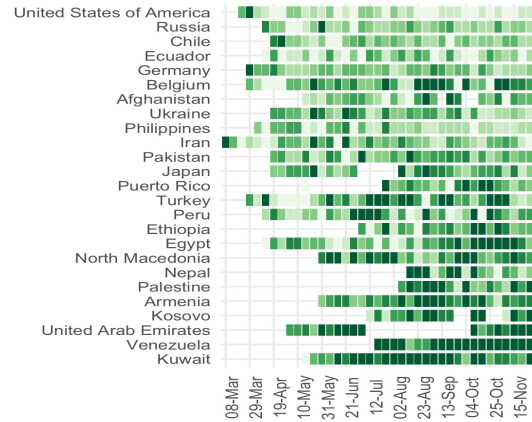
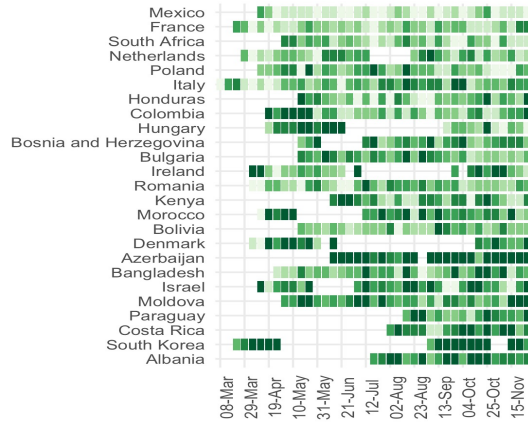
## Model error varies directly with the variability in weekly incidence



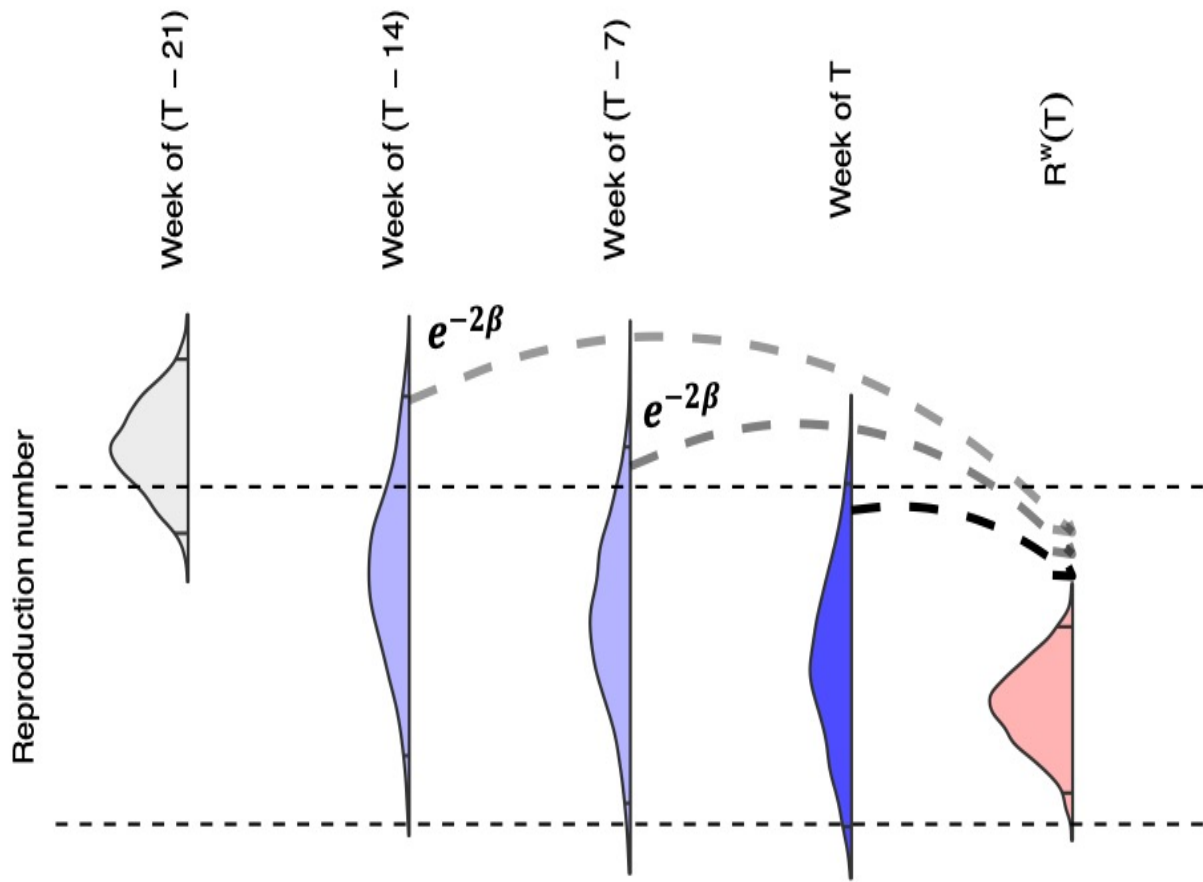
Proportion in 50% CrI



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# Medium-term forecasts

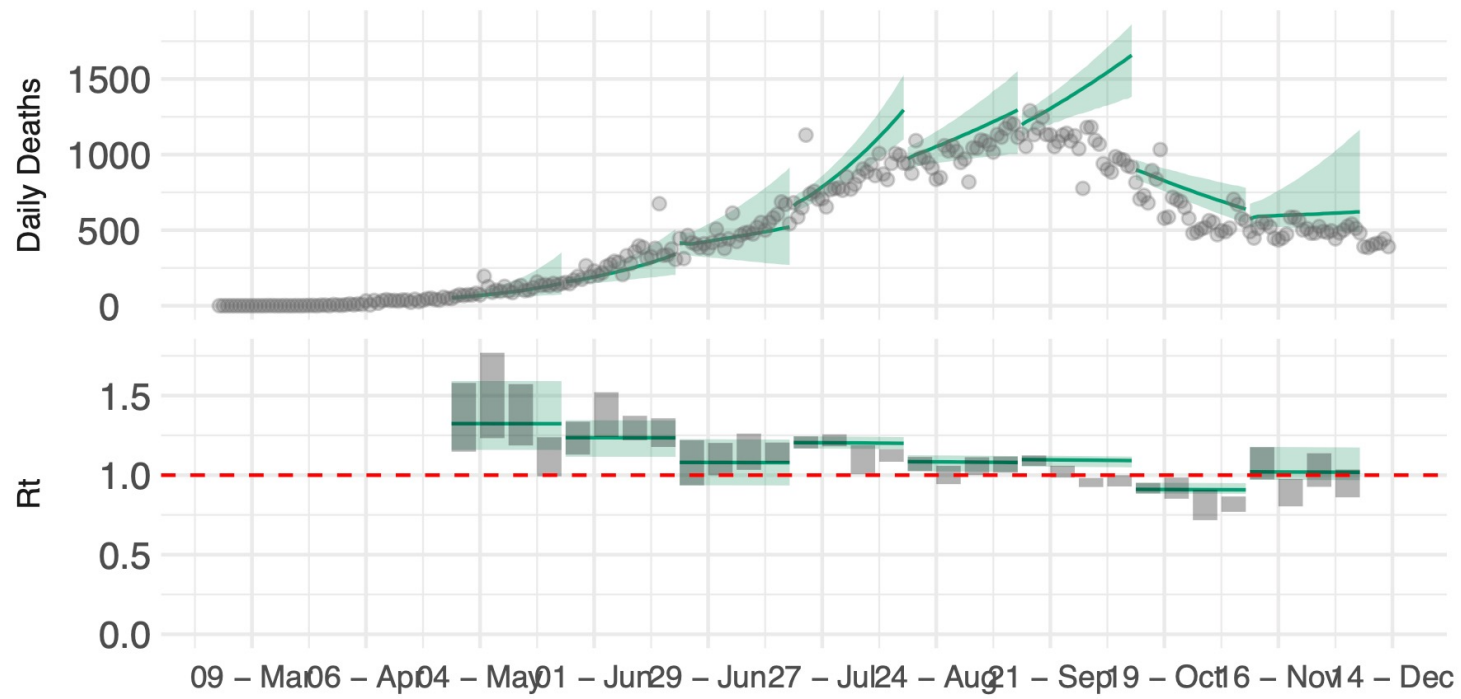


$$R_t^{eff} = \frac{R_t^w}{p_t^S}$$

$$R_{t+i}^S = R_t^{eff} p_{t+i}^S$$

# India

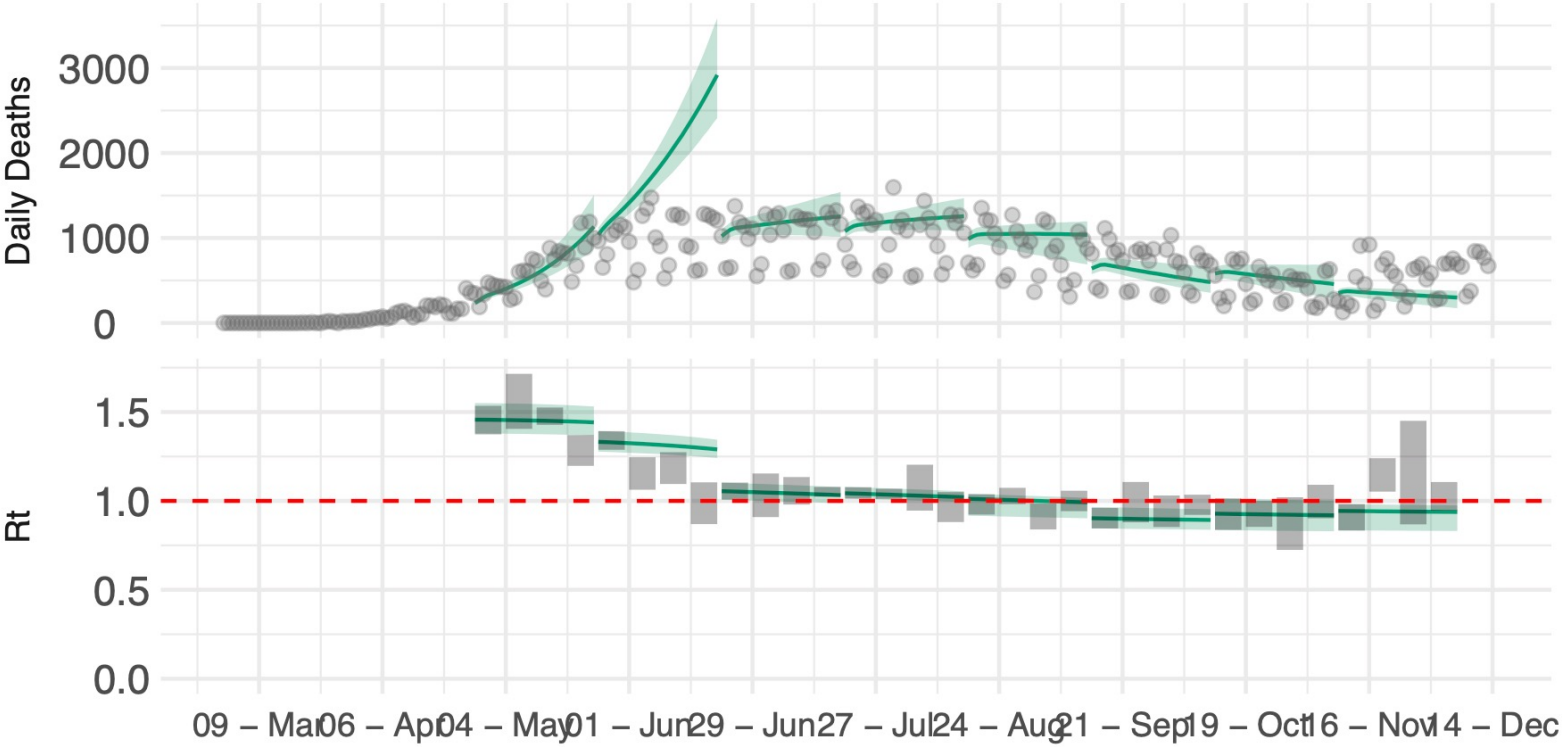
—●— Observed deaths    — Forecast (median and 95% CrI)



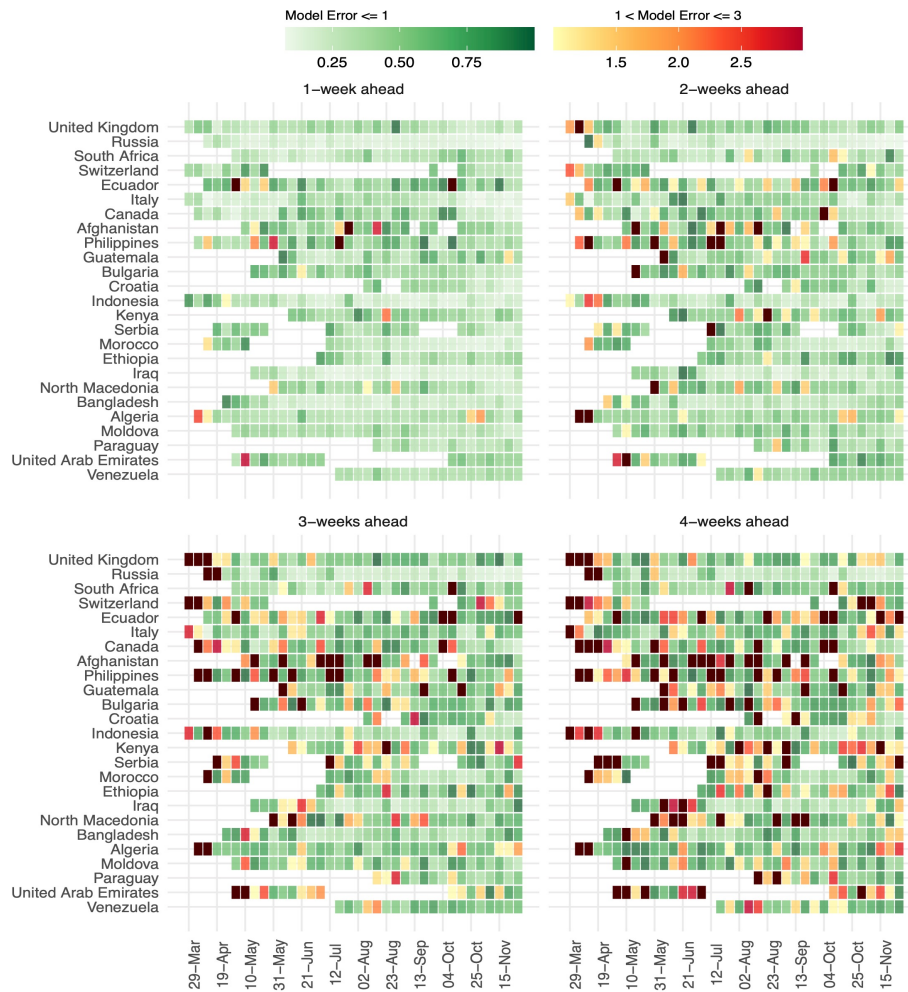


# Brazil

—●— Observed deaths    — Forecast (median and 95% CrI)



# Medium-term forecasts relative error



- Model error grows over the projection horizon, with relatively small error up to 4 weeks.

# Conclusions

- Simple models, relying on the reported number of cases and deaths
- Ensemble model does well at capturing the transmission trends
- Medium-term forecasts perform well up to 4 weeks ahead.