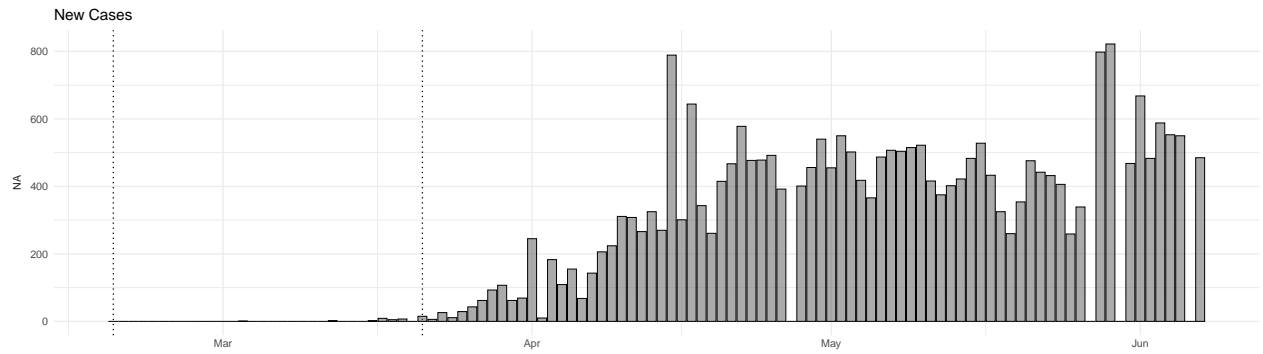
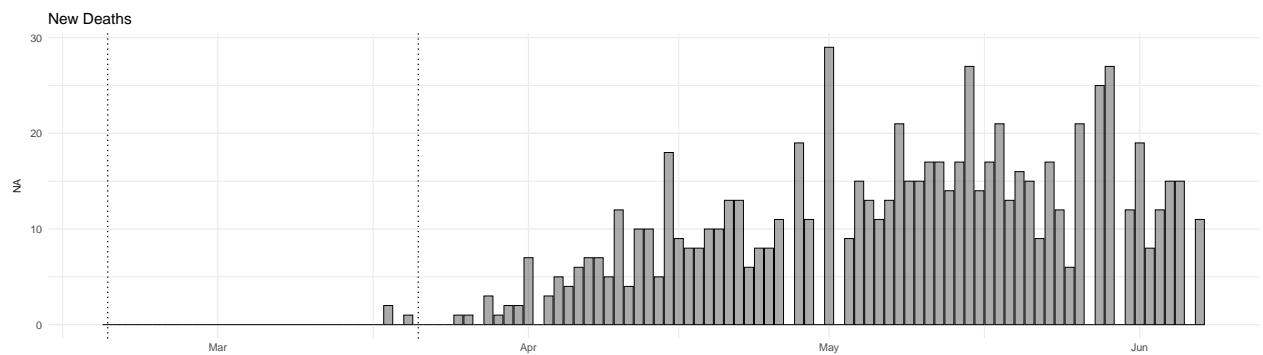


# Ukraine

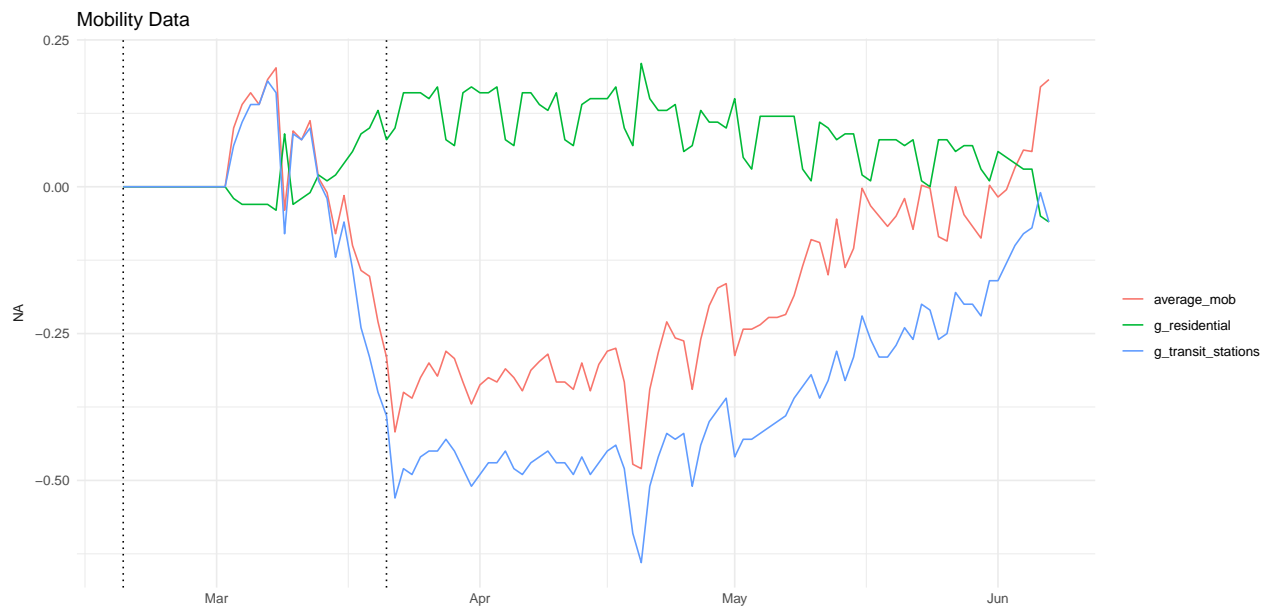
## Data



Vertical dotted lines represent the first seeding day and the epidemic start date.



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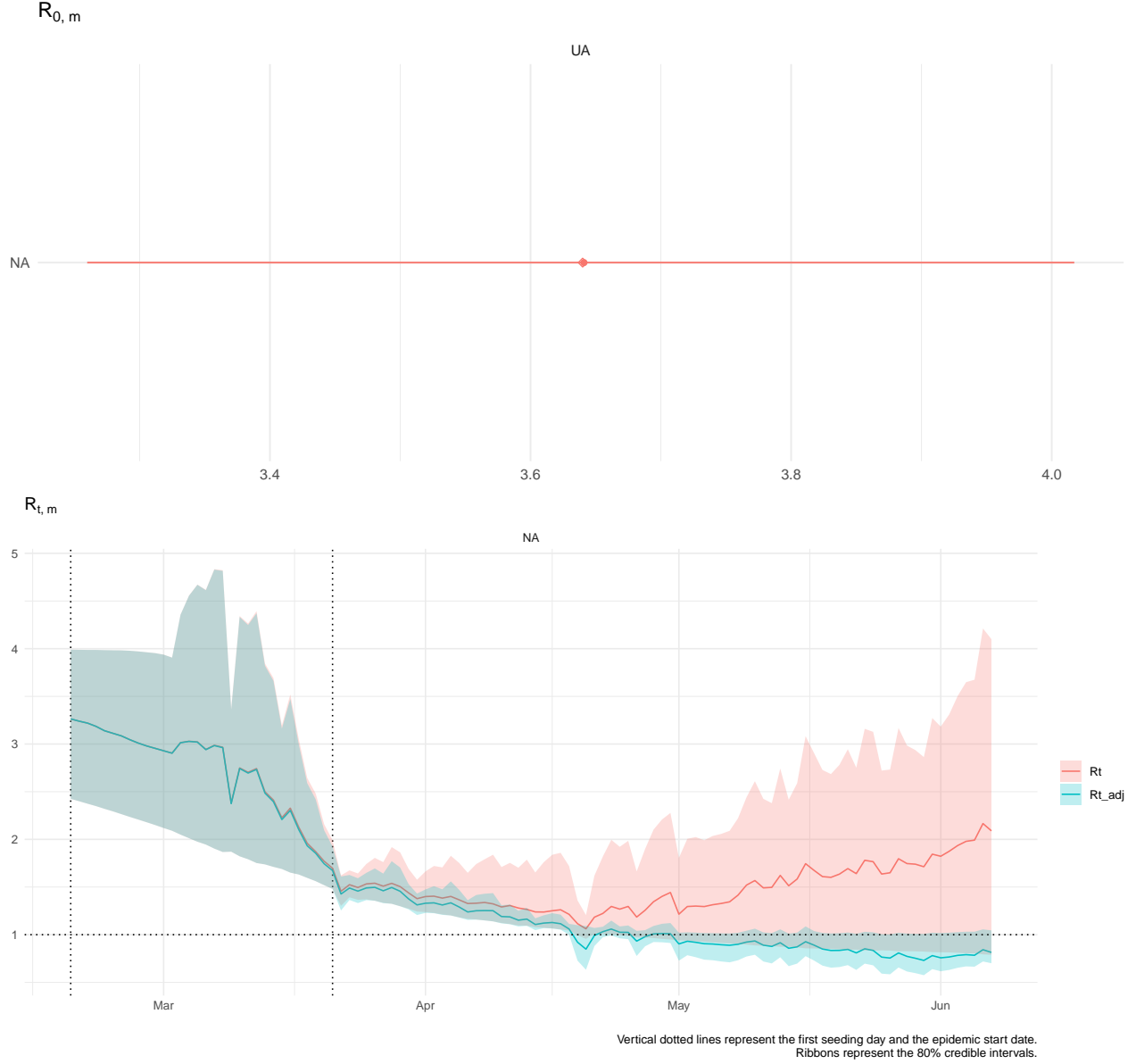
## Analysis

Number of divergent transitions = 7

Maximum  $\hat{R} = 1.735383$

Minimum Bulk ESS = 6.095183

Minimum Tail ESS = 7.292076



Contact rate function:

$$cr(t; t^*, \lambda_j, \kappa) = \lambda_j + \frac{1 - \lambda_j}{1 + \exp(\kappa(t - t^*))}$$

where

$$\lambda_j \sim \text{Beta}(3, 1)$$

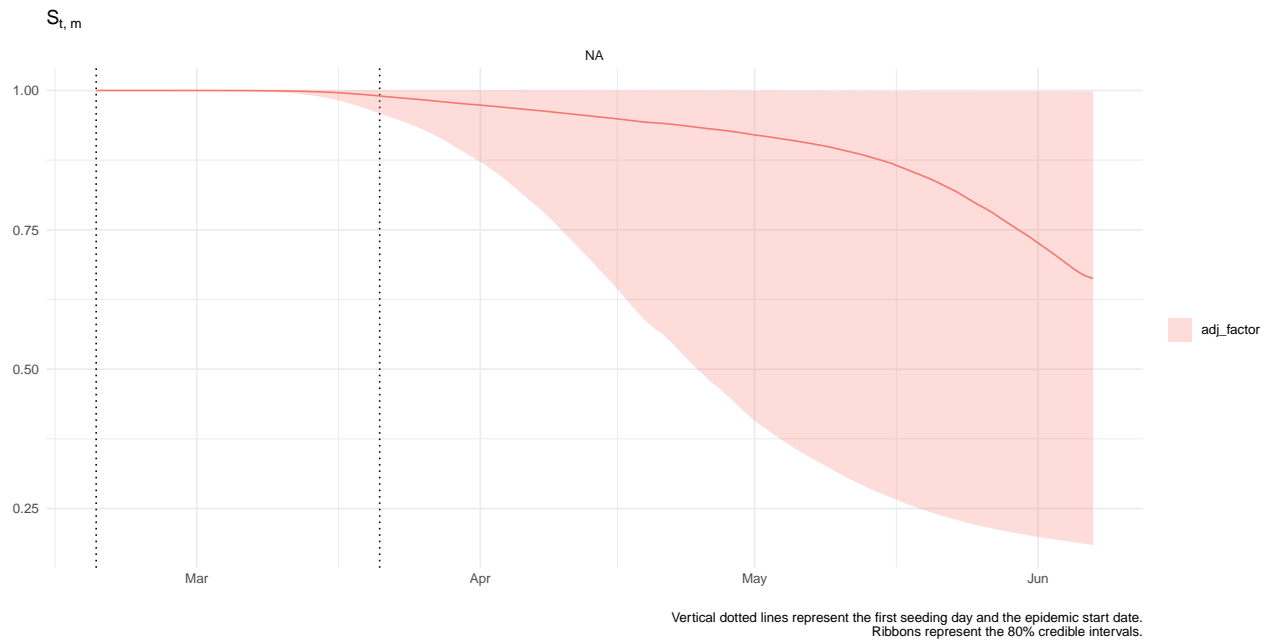
$$\kappa \sim \text{NegHalfNormal}(0, 1).$$

## Contact Rate

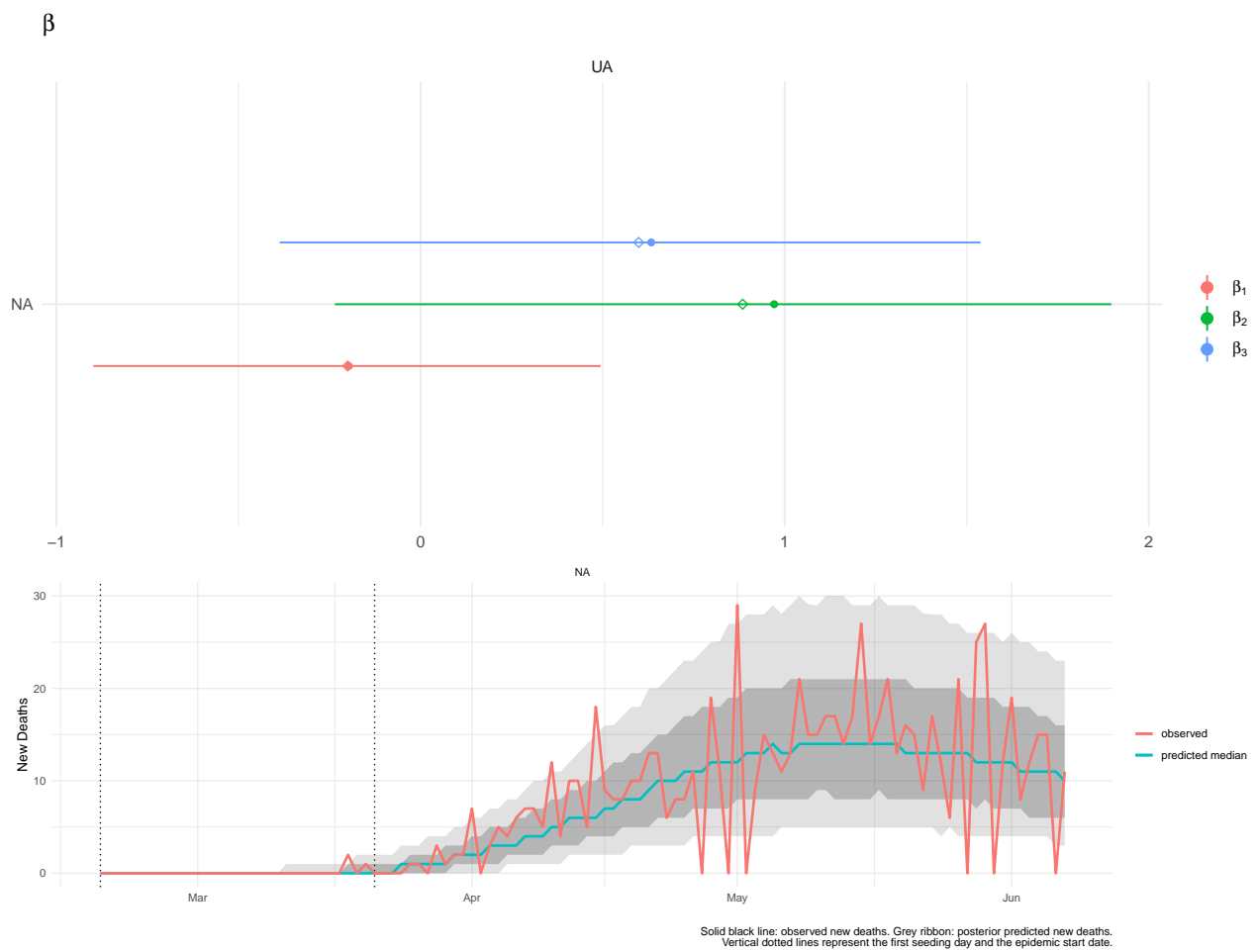
Vertical dotted lines represent the first seeding day and the epidemic start date.  
Ribbons represent the 80% credible intervals.

Mobility effect

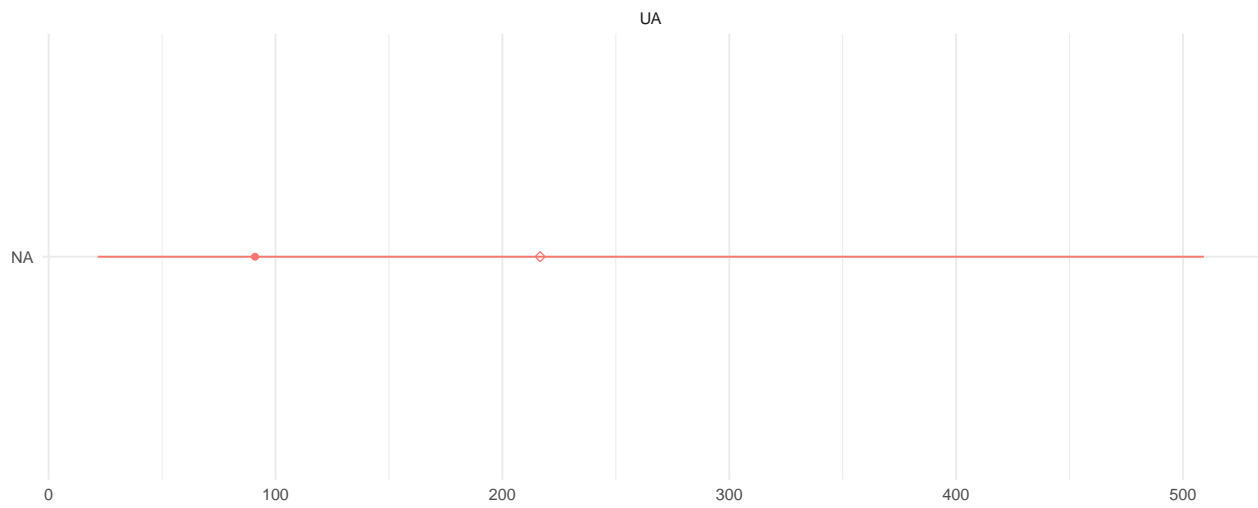
Vertical dotted lines represent the first seeding day and the epidemic start date.  
Ribbons represent the 80% credible intervals.



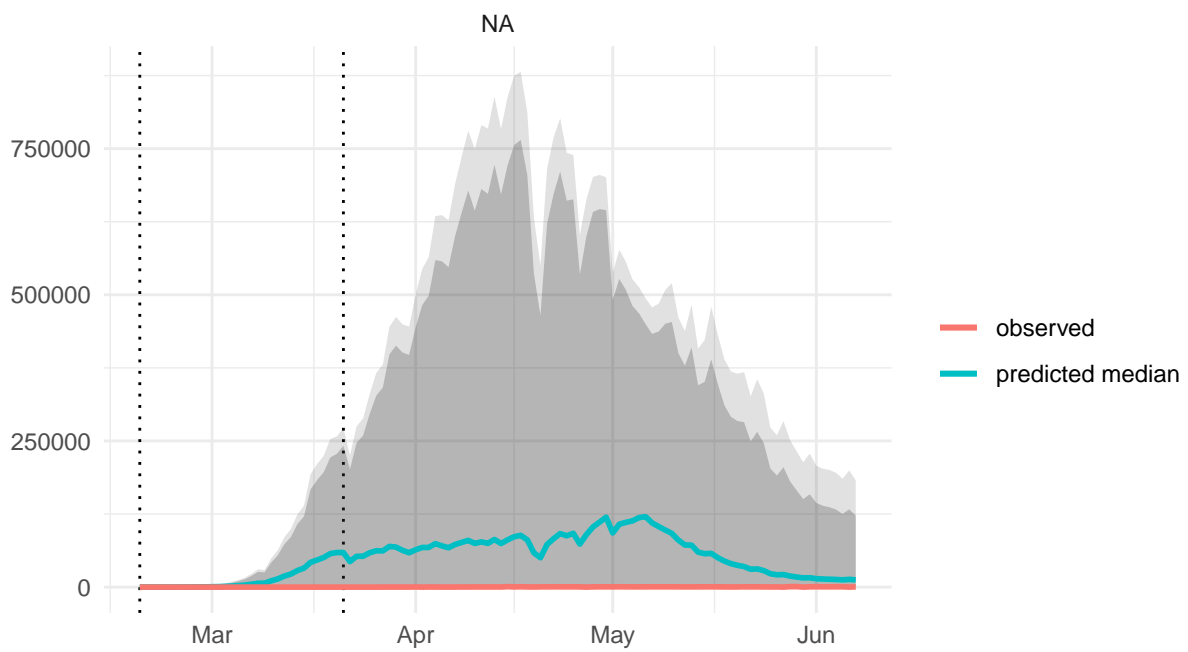
Mobility linear model:  $\beta_1 \cdot X_{\text{residential}} + \beta_2 \cdot X_{\text{transit}} + \beta_3 \cdot X_{\text{average}}$ .



## Imputed Cases



## New Cases predicted vs observed



Solid black line: observed new deaths. Grey ribbon: posterior predicted new deaths.  
Vertical dotted lines represent the first seeding day and the epidemic start date.

