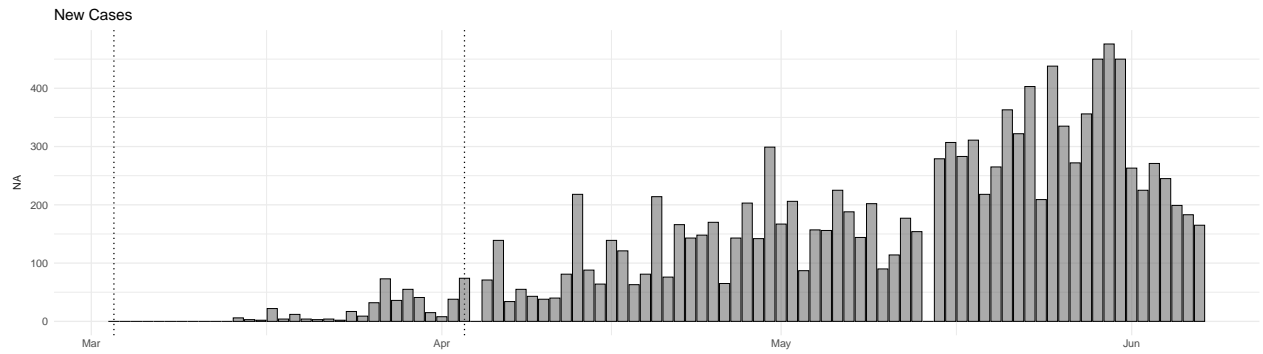
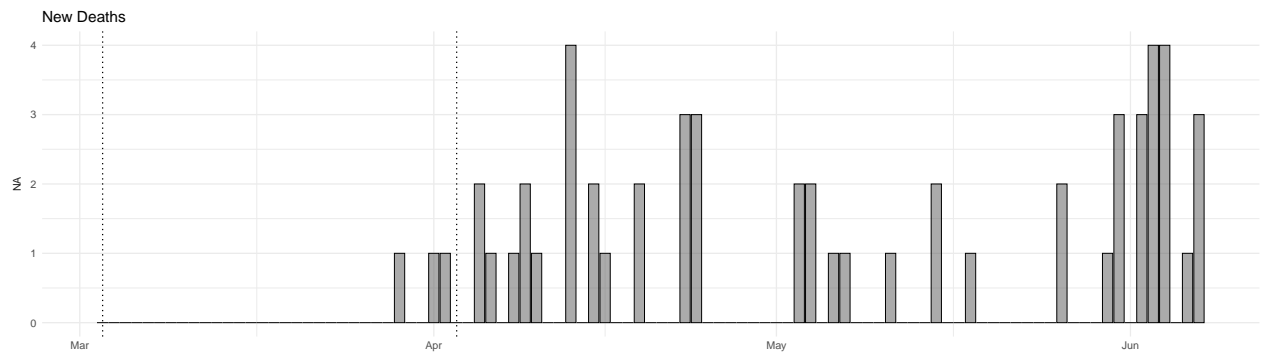


# Kazakhstan

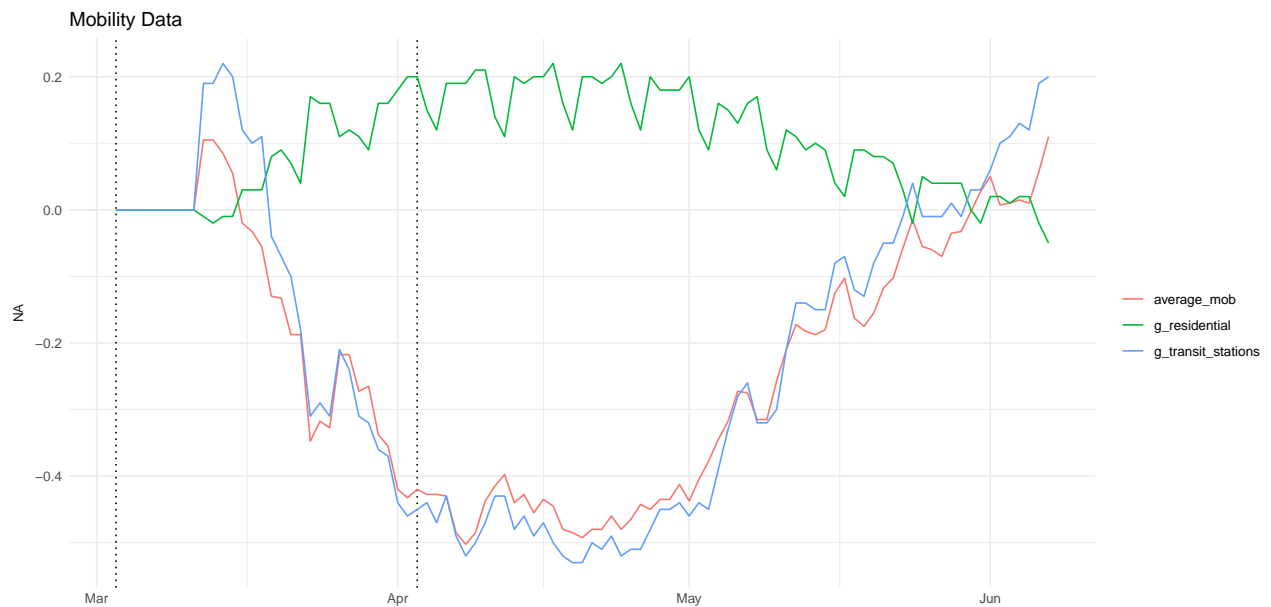
## Data



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



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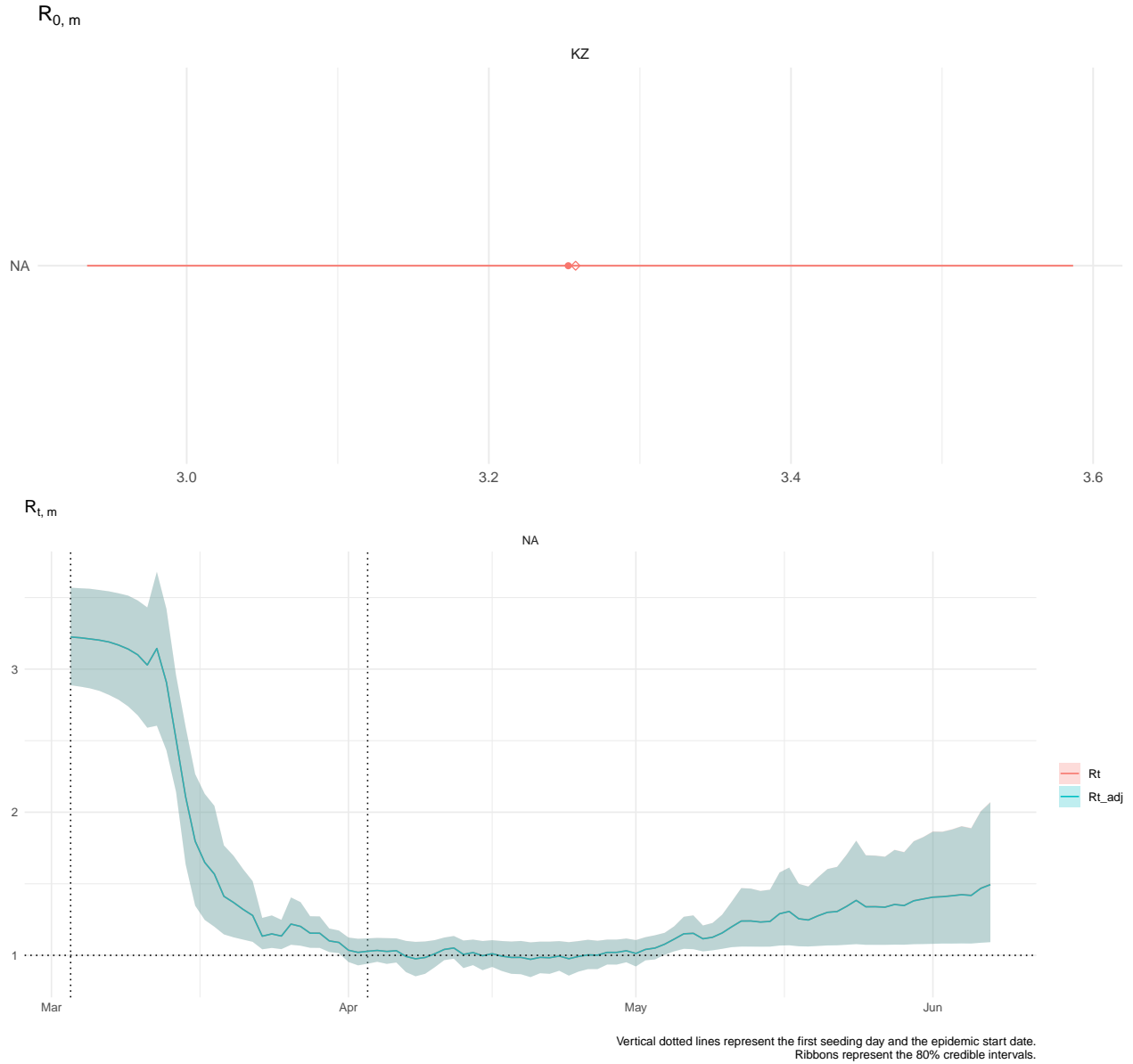
## Analysis

Number of divergent transitions = 0

Maximum  $\hat{R} = 1.003469$

Minimum Bulk ESS = 1556.436

Minimum Tail ESS = 1213.422



Contact rate function:

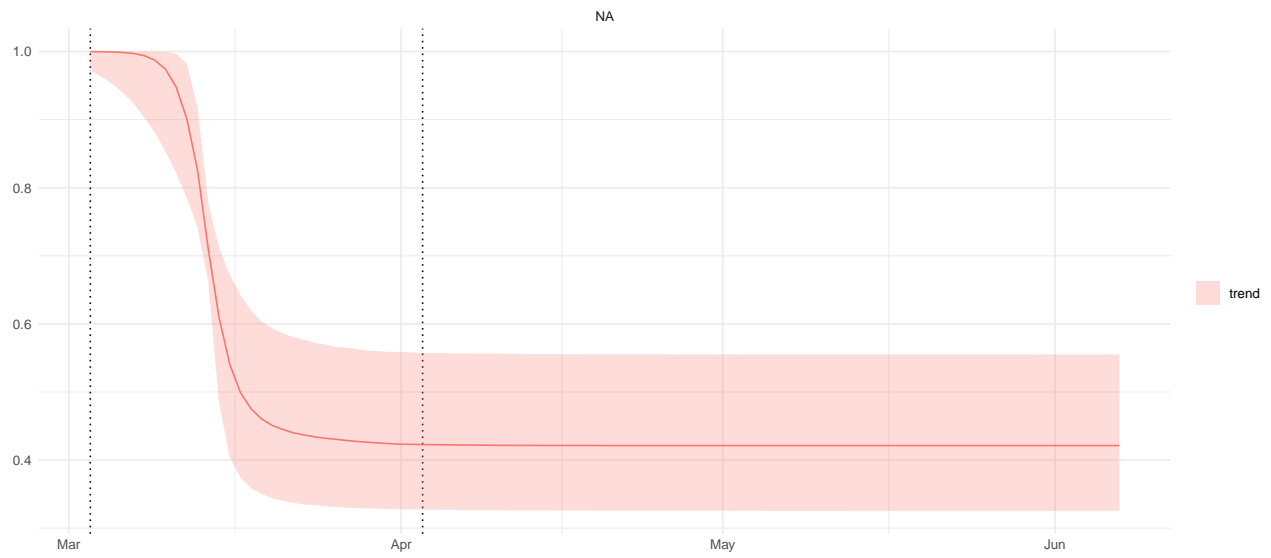
$$cr(t; t^*, \lambda_j, \kappa) = \lambda_j + \frac{1 - \lambda_j}{1 + \exp(\kappa(t - t^*))}$$

where

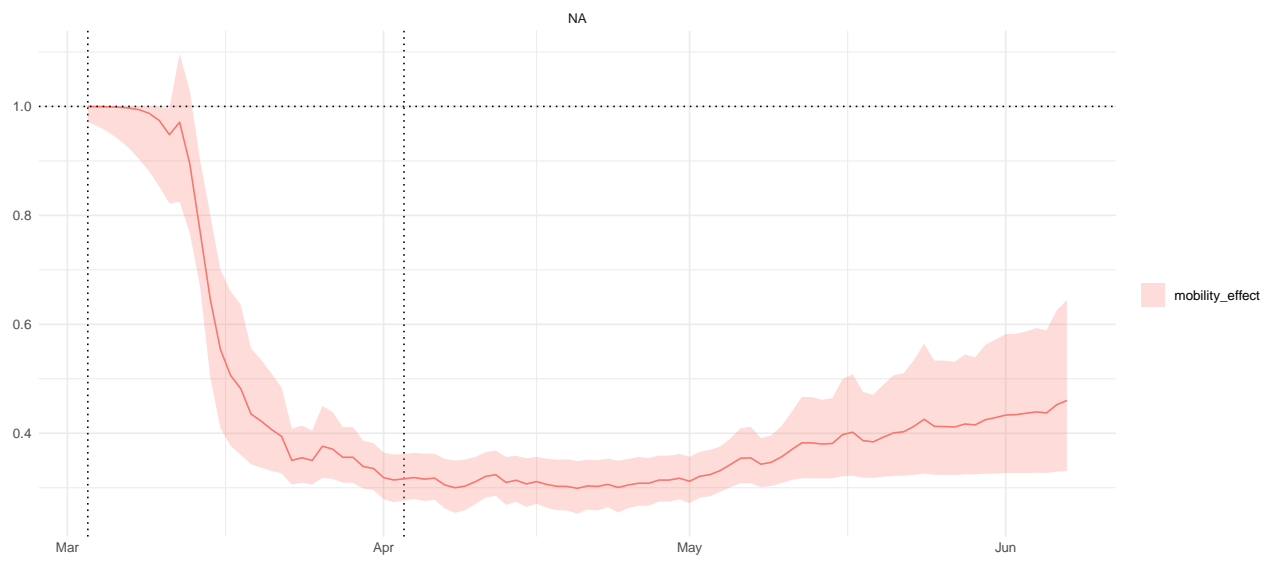
$$\lambda_j \sim \text{Beta}(3, 1)$$

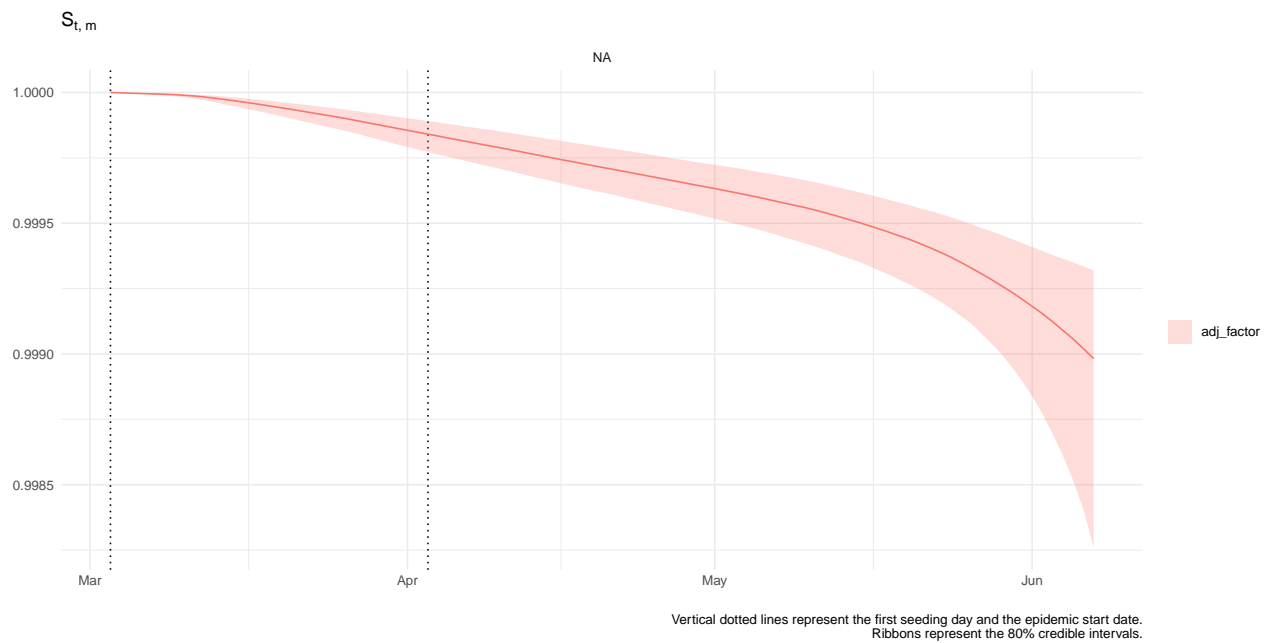
$$\kappa \sim \text{NegHalfNormal}(0, 1).$$

### Contact Rate



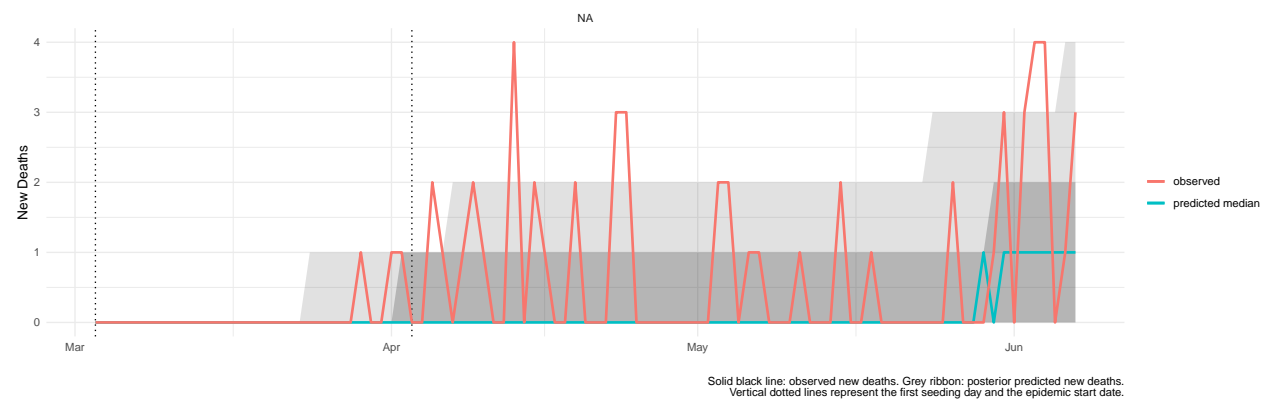
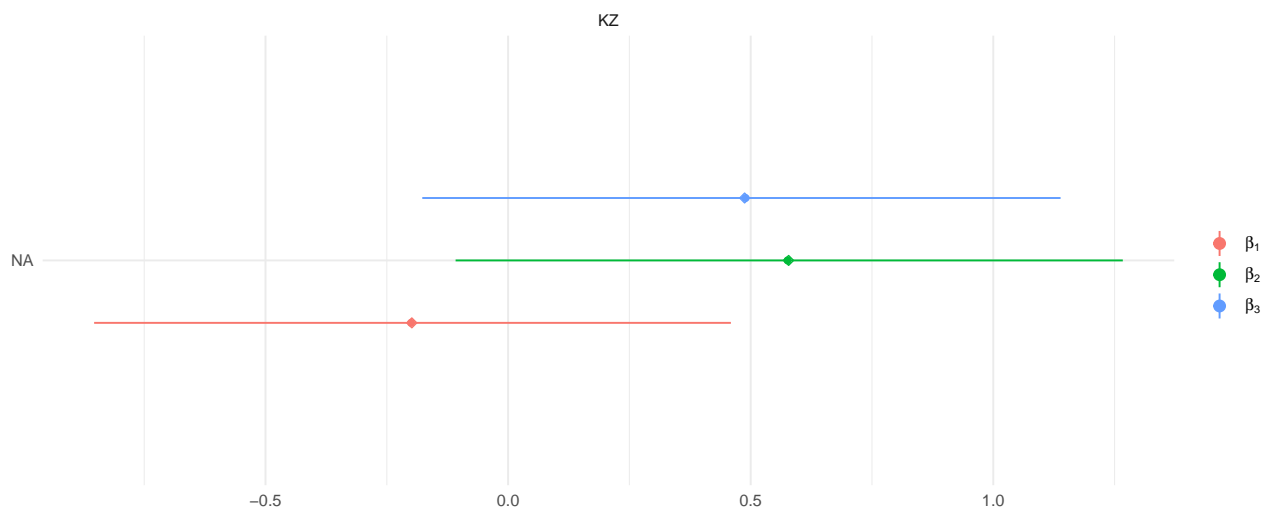
### Mobility effect



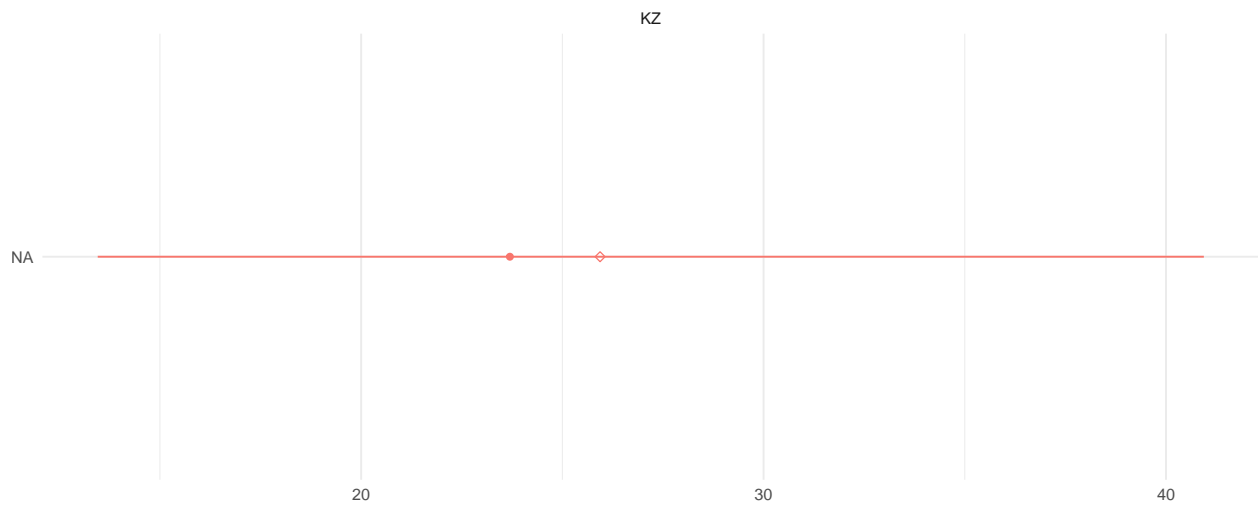


Mobility linear model:  $\beta_1 \cdot X_{\text{residential}} + \beta_2 \cdot X_{\text{transit}} + \beta_3 \cdot X_{\text{average}}$ .

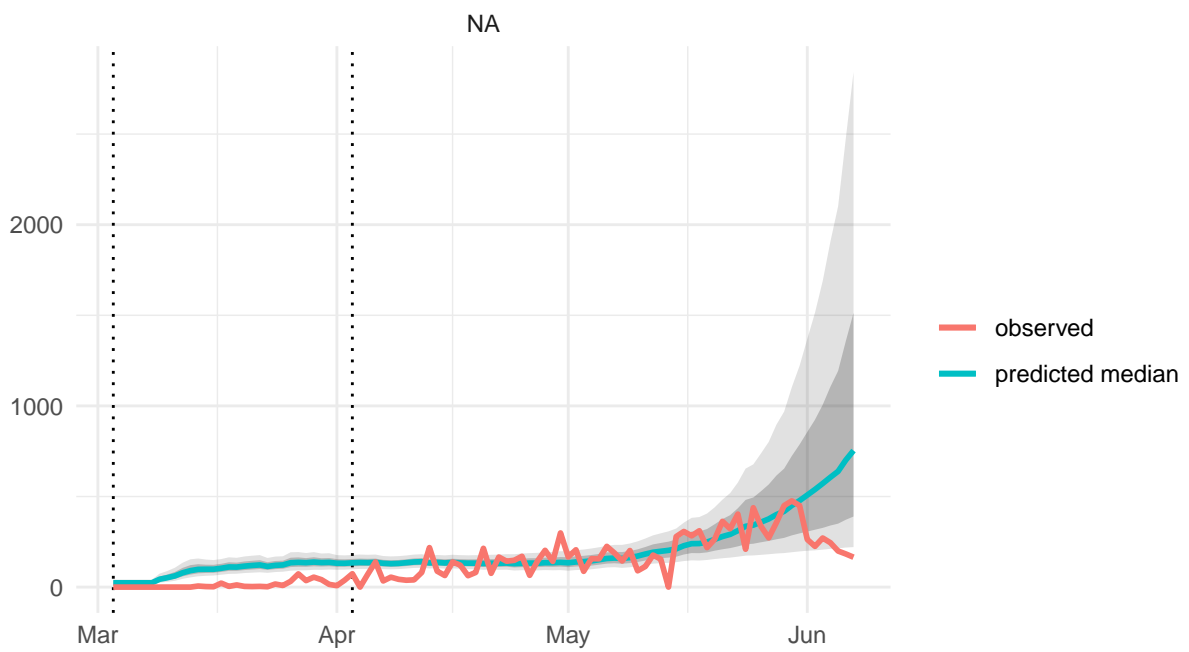
$\beta$



## 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.

