Cambridge Judge Business School
Cambridge Centre for Health Leadership & Enterprise

COVID-19 TRACKER: INDIA

20 February 2022

Centre for
Health Leadership & Enterprise

UNIVERSITY OF
CAMBRIDGE
Judge Business School

HSTP
Health Systems
Transformation Platform

National Institute of Economic and Social Research

The national reproduction number stood at 0.7 as on 20th February, largely unchanged from the value one week ago. The filtered daily growth rate of cases was -12%. The trend value of reported daily cases can be expected to drop to around 3500 nationally by 5th March.

Reproduction numbers range from 0.5 (Assam) to 0.92 (Mizoram, unchanged from last week). Kerala is likely to see about 1,200 daily reported cases in terms of underlying trend in two weeks time, by 5th March.

The Omicron wave which began towards the end of December 2021 in India is now in retreat, with a large proportion of the population presently rendered immune from infection. It is however important to note that the virus continues to infect people. As immunity from Omicron fades over the coming months, an increasing proportion of the population will revert to becoming susceptible to infection. With this the daily growth rates of infection are likely to stop declining and turn around, eventually turning positive again. There are some early indications of this process, for example, in Delhi.

A forceful national vaccination mission is all the more important at this time of respite in order to forestall the next wave which may see the emergence of new variants with re-infection potential.
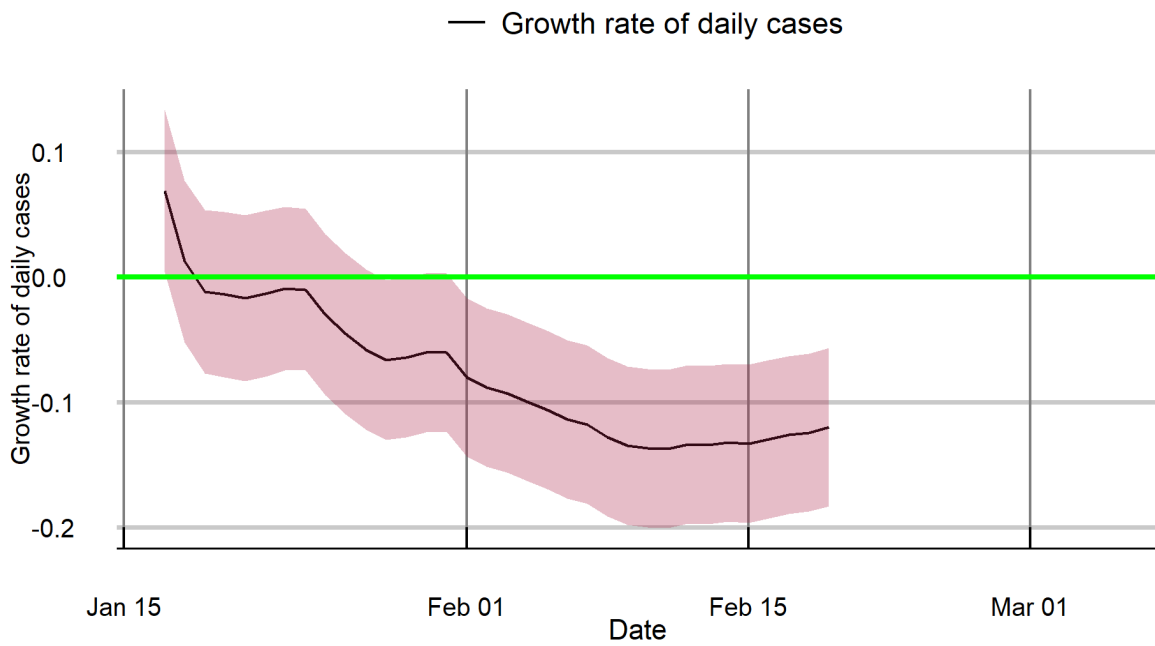
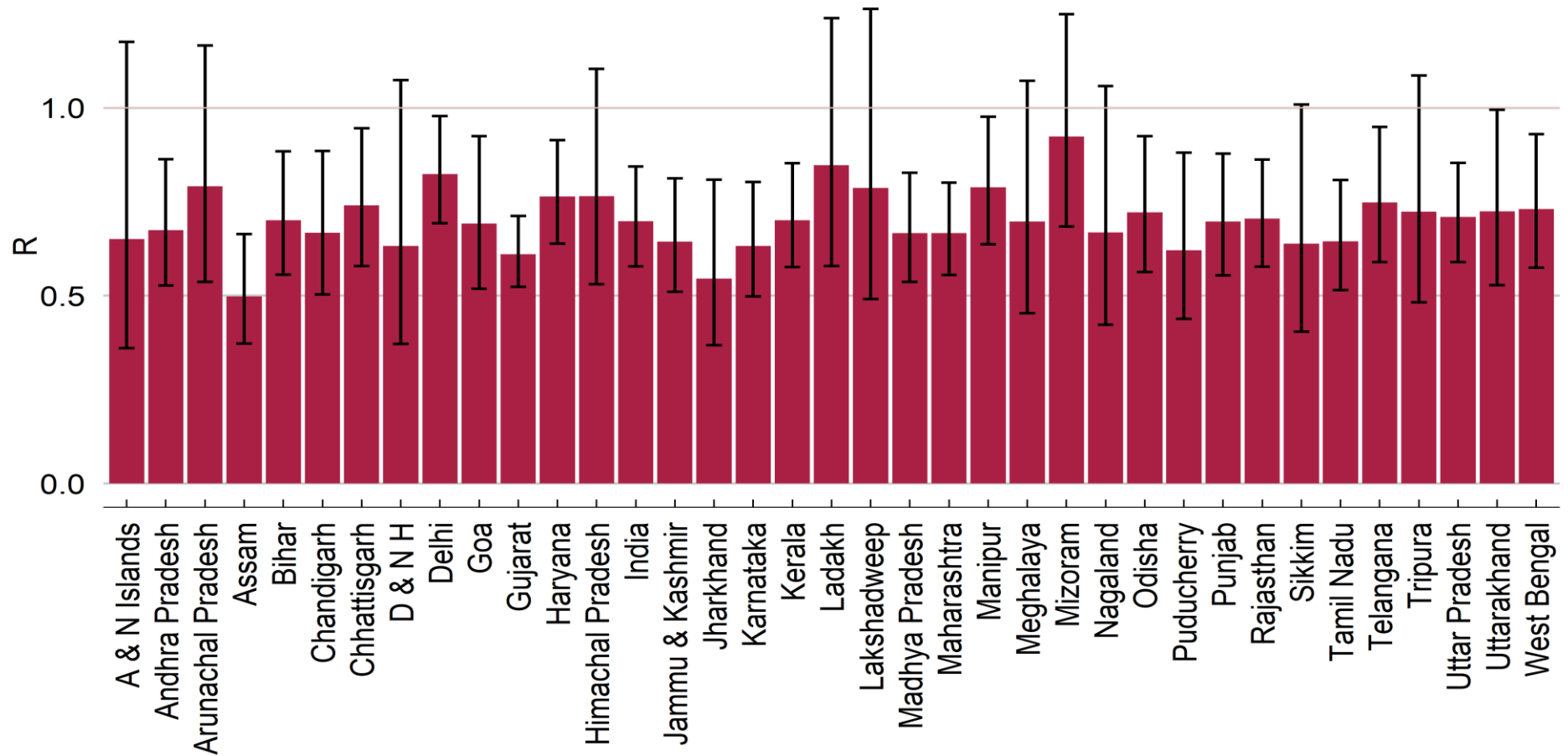# Forecasts of daily cases: 20th February to 5th March 2022

India
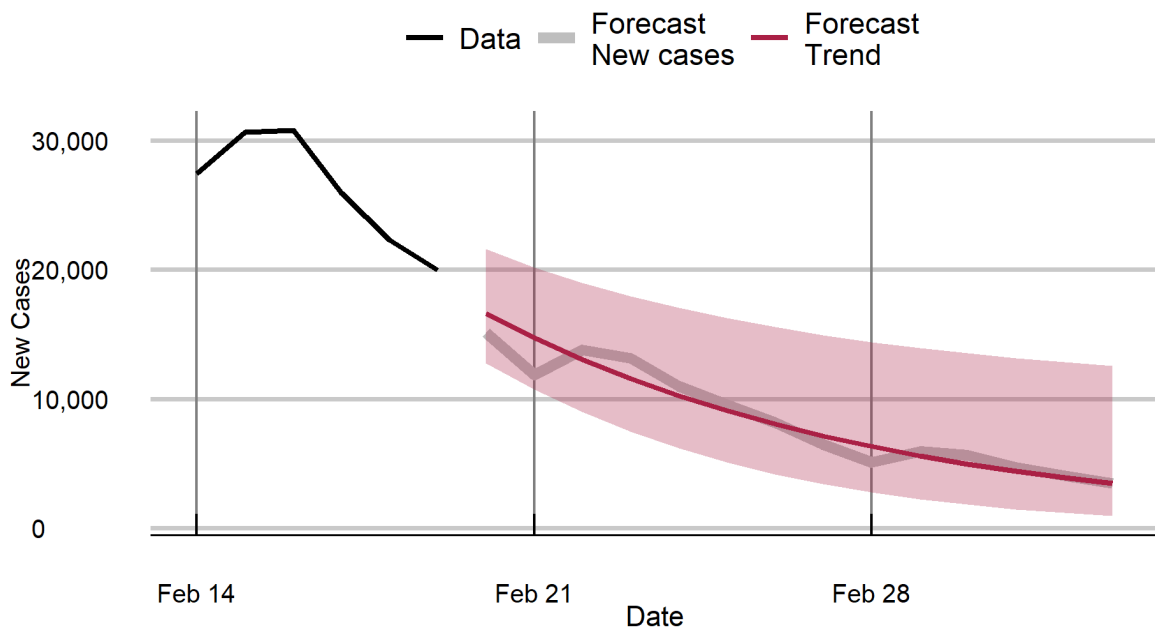
Filtered daily growth rates of new cases: days leading up to 20 February 2022

India

Reproduction numbers on 20th February 2022

Bar chart shows point estimates of R and confidence intervals with 95% coverage

Note: Small numbers in Andaman and Nicobar Islands, Dadra and Nagar Haveli and Daman and Diu, Lakshadweep, Nagaland, Sikkim, Tripura make their estimates less reliable.

Reproduction numbers and Filtered daily growth rates: 20th February 2022

	Reproduction number	Filtered growth rate
India	**0.70**	**-12.0%**
Andhra Pradesh	0.67	-13.2%
Arunachal Pradesh	0.79	-7.8%
Assam	0.50	-23.3%
Bihar	0.70	-11.9%
Chandigarh	0.67	-13.5%
Chhattisgarh	0.74	-10.0%
Delhi	0.82	-6.5%
Goa	0.69	-12.3%
Gujarat	0.61	-16.5%
Haryana	0.76	-9.0%
Himachal Pradesh	0.76	-8.9%
Jammu & Kashmir	0.64	-14.7%
Jharkhand	0.55	-20.2%
Karnataka	0.63	-15.3%
Kerala	0.70	-11.9%
Ladakh	0.85	-5.5%
Madhya Pradesh	0.67	-13.5%
Maharashtra	0.67	-13.5%
Manipur	0.79	-7.9%
Meghalaya	0.70	-12.0%
Mizoram	0.92	-2.6%
Odisha	0.72	-10.9%
Puducherry	0.62	-15.9%
Punjab	0.70	-12.0%
Rajasthan	0.71	-11.6%
Tamil Nadu	0.64	-14.6%
Telangana	0.75	-9.7%
Uttar Pradesh	0.71	-11.5%
Uttarakhand	0.72	-10.8%
West Bengal	0.73	-10.5%

Forecasts of daily cases and filtered daily growth rates of cases for states and union territories : 20th February to 5th March 2022

Andhra Pradesh
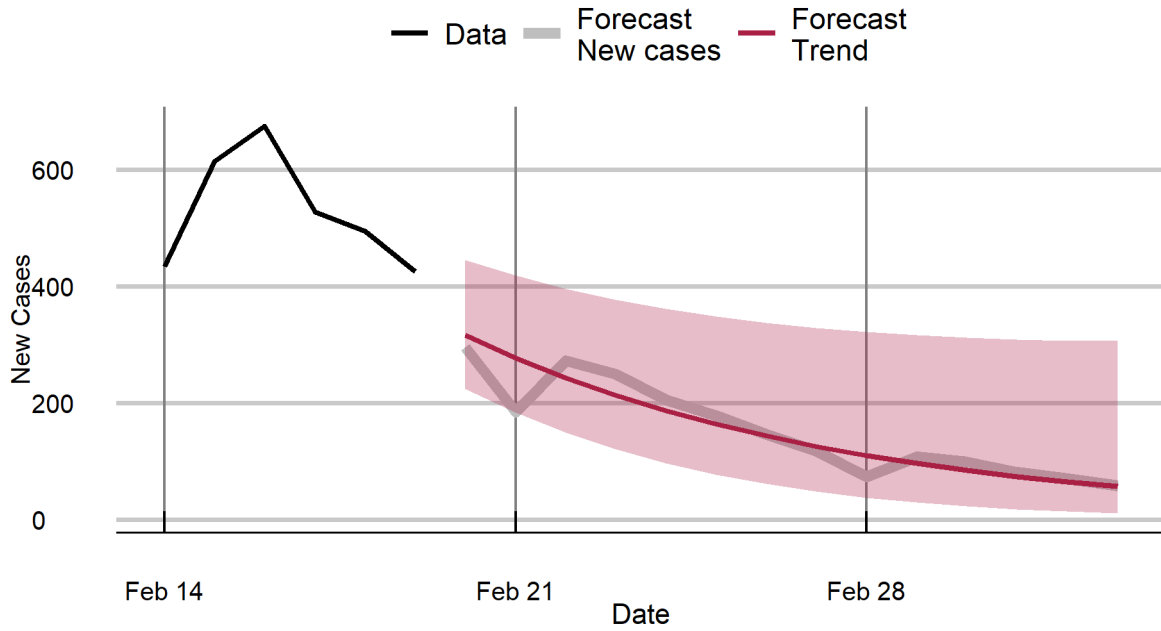
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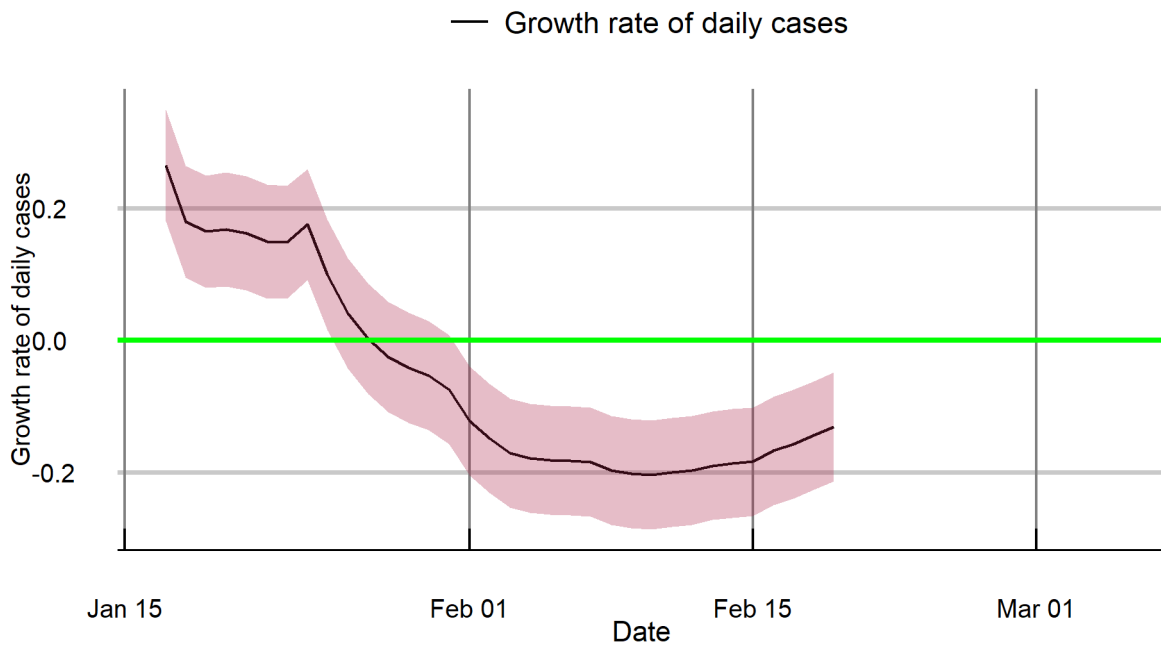
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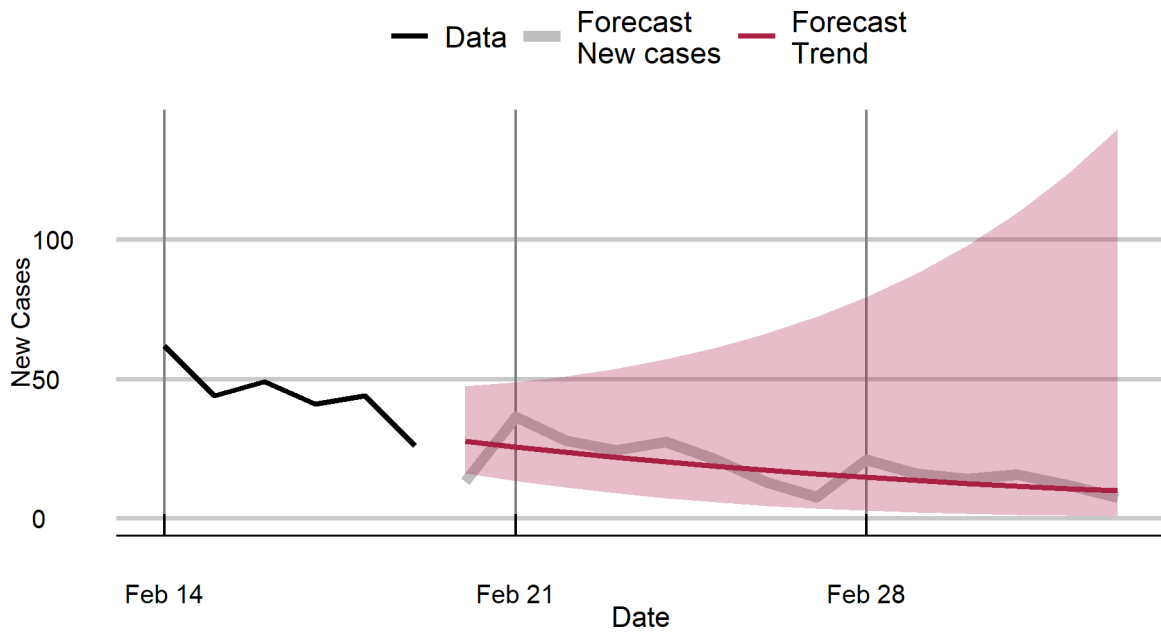
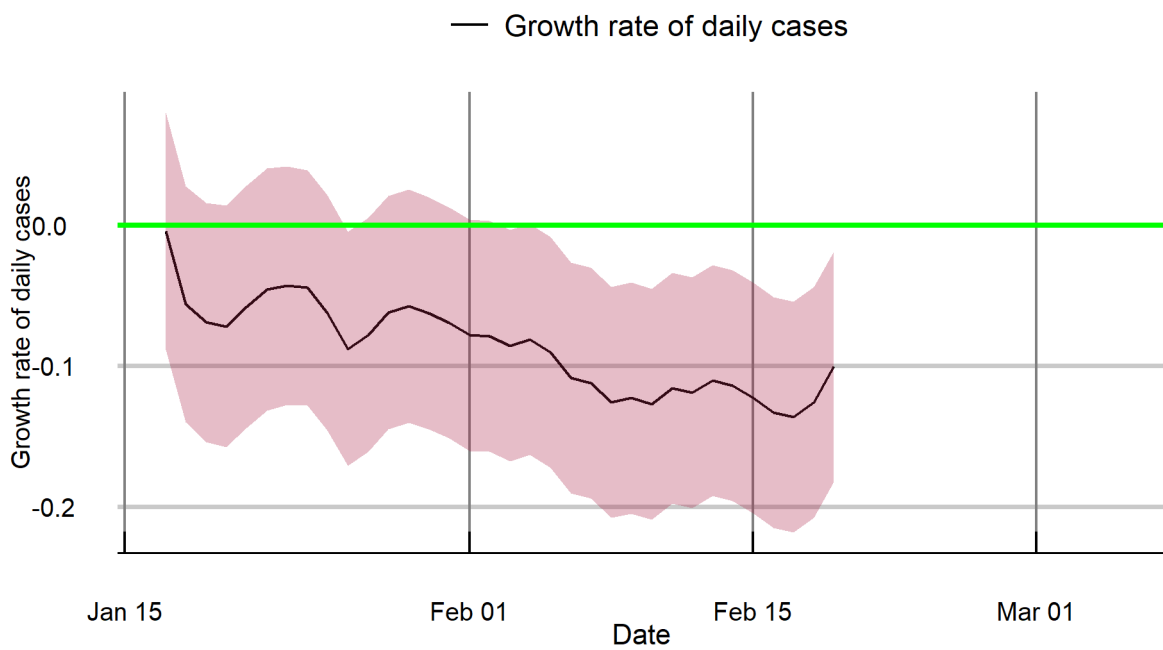

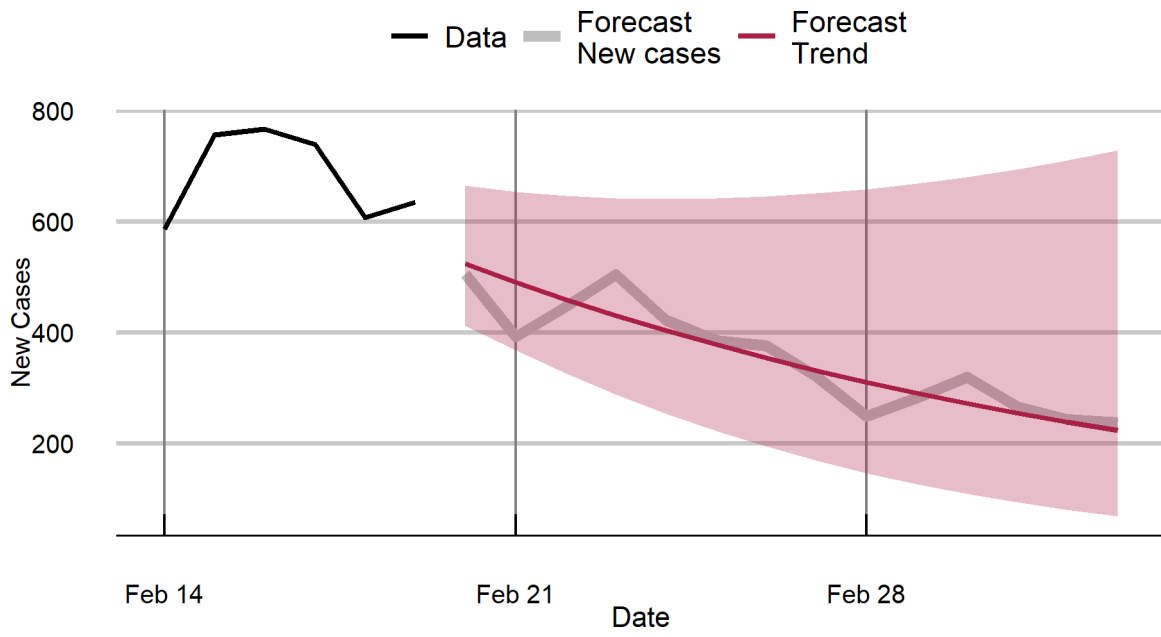## Arunachal Pradesh
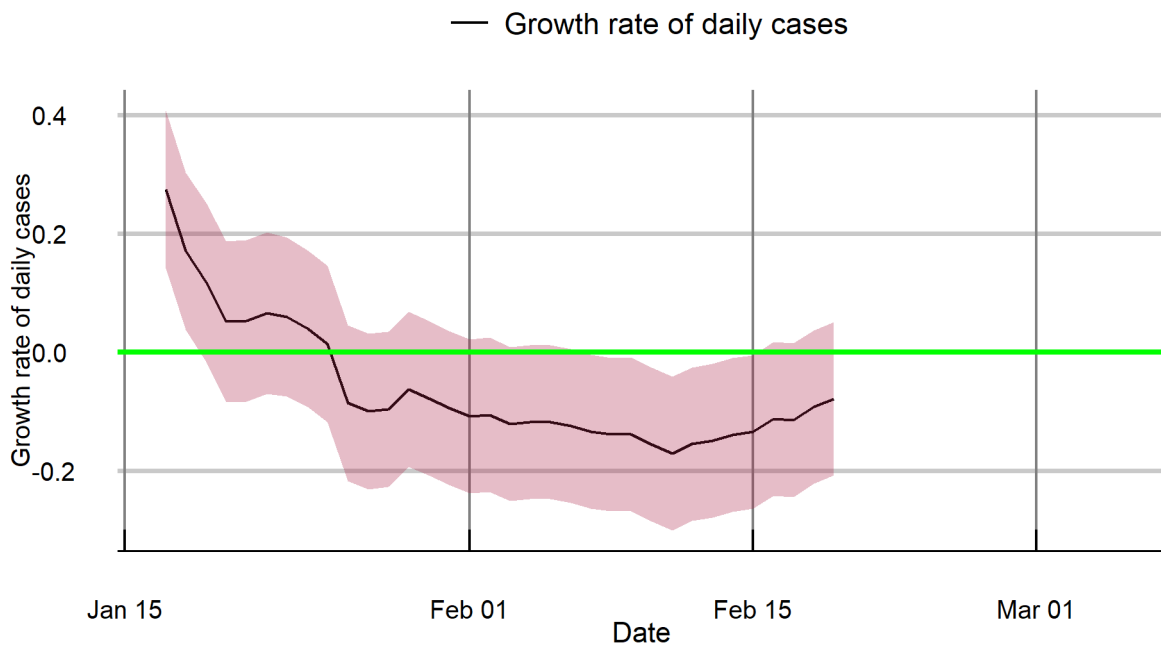
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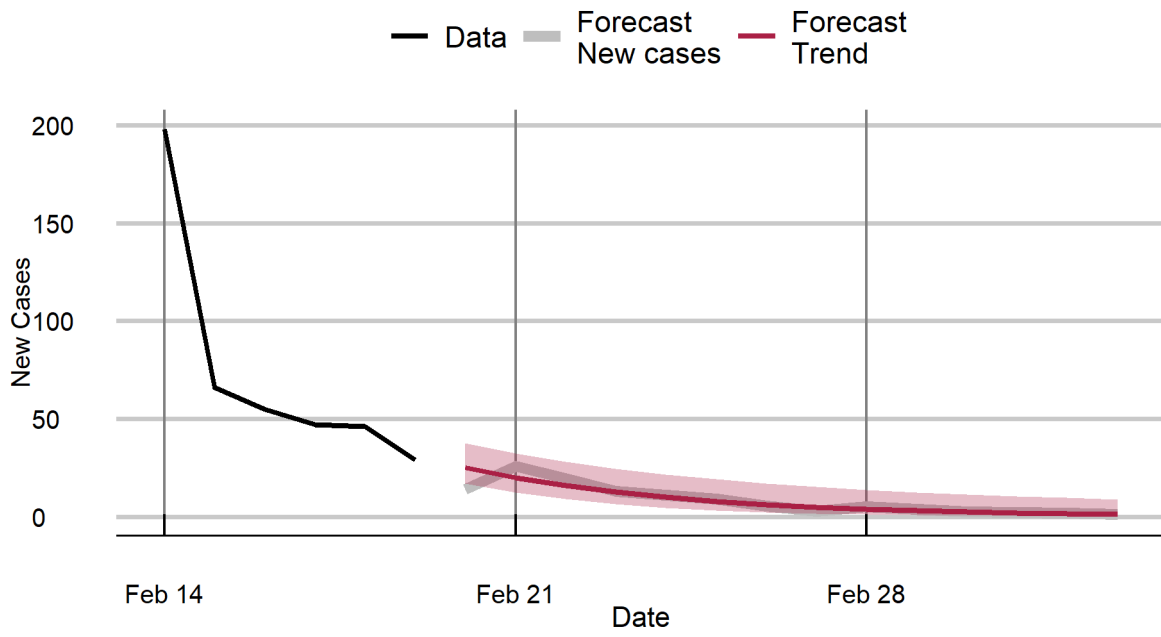
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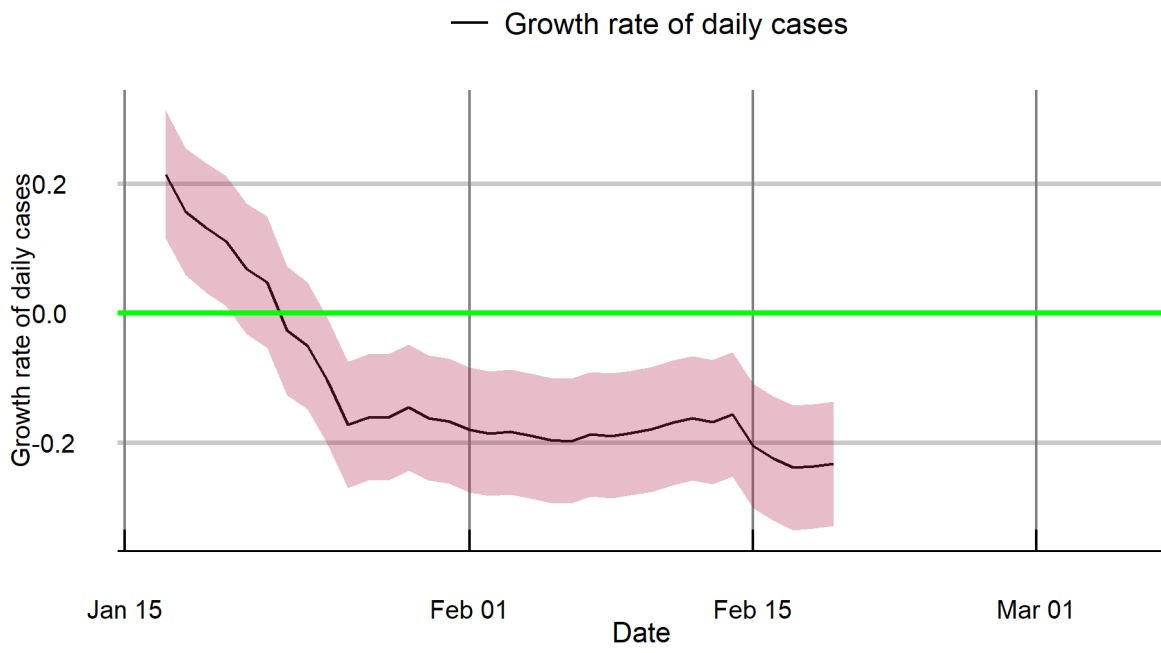
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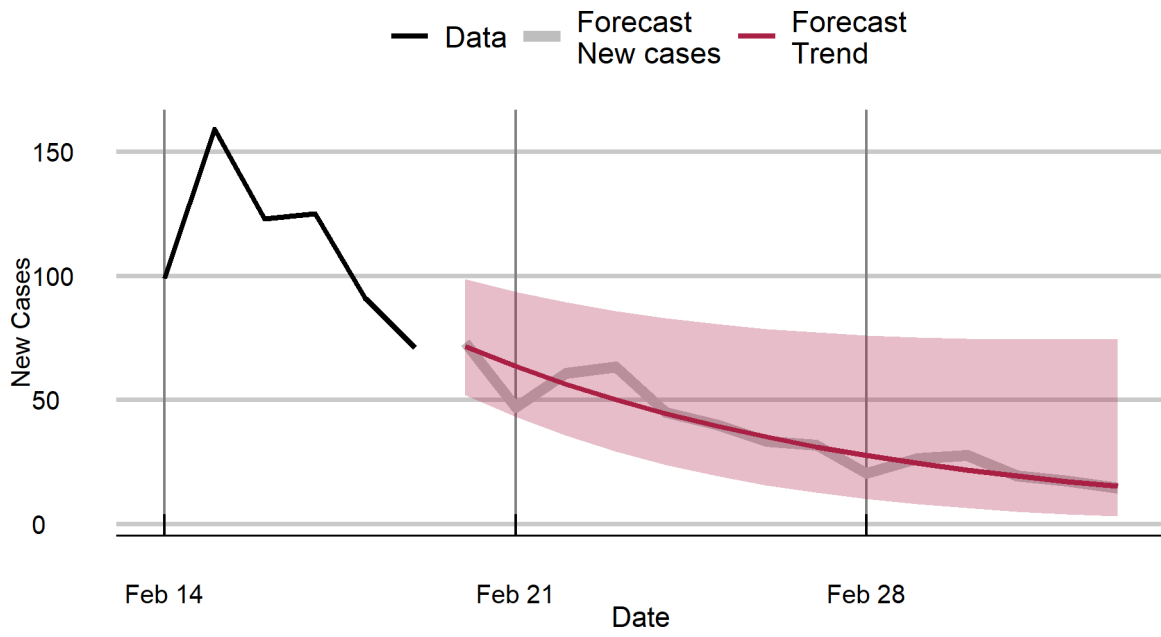
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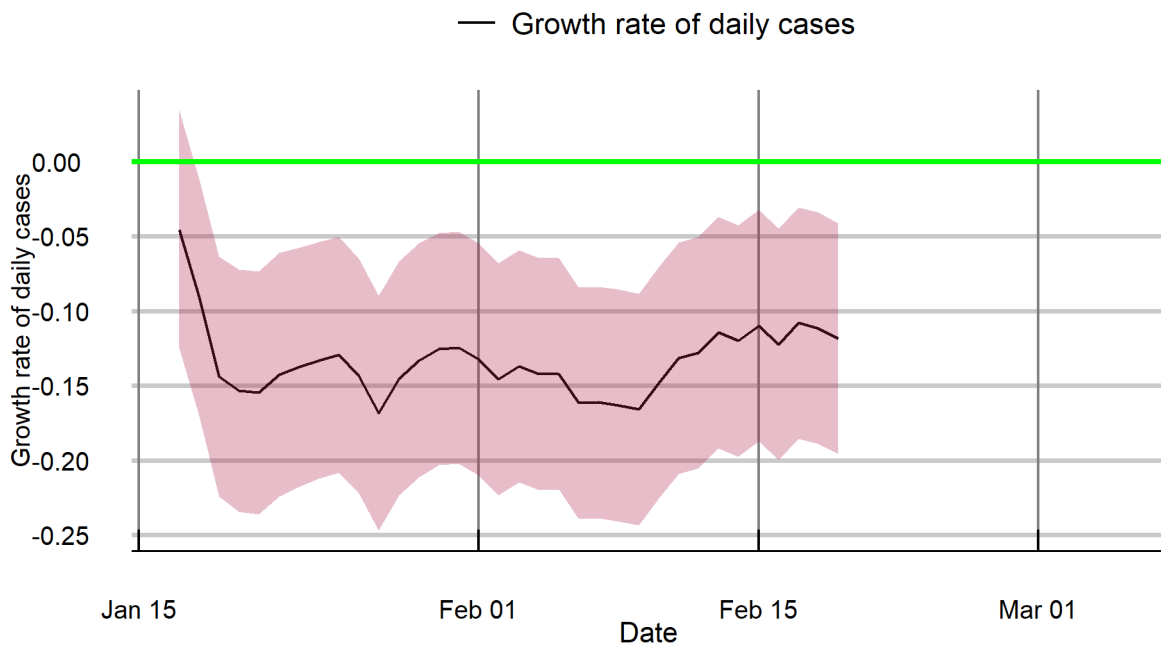
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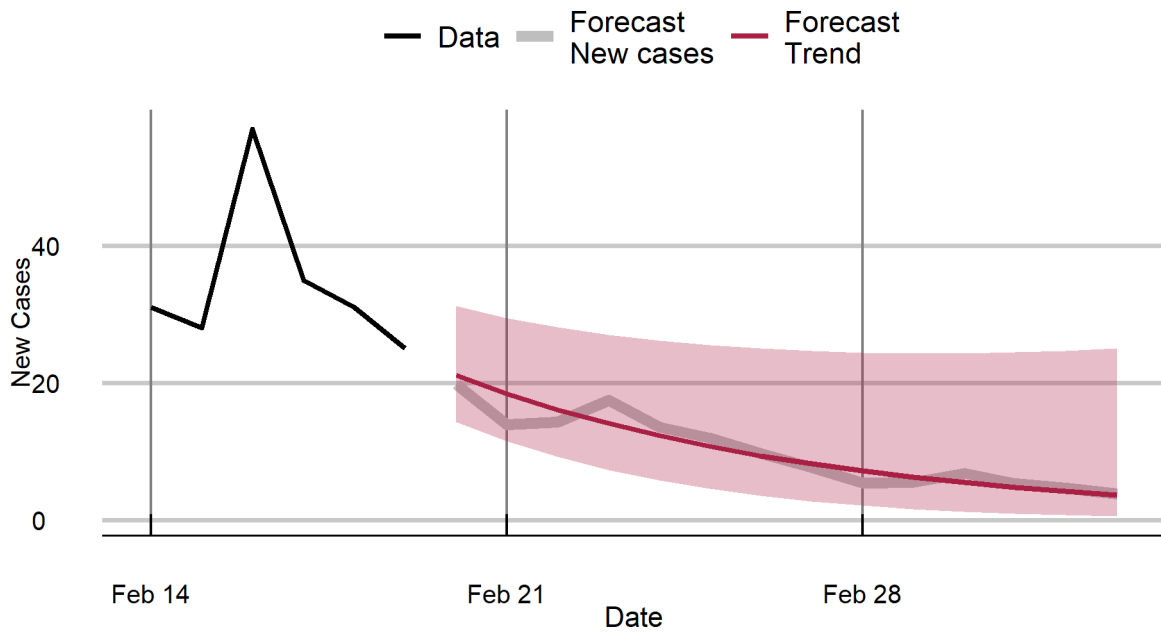
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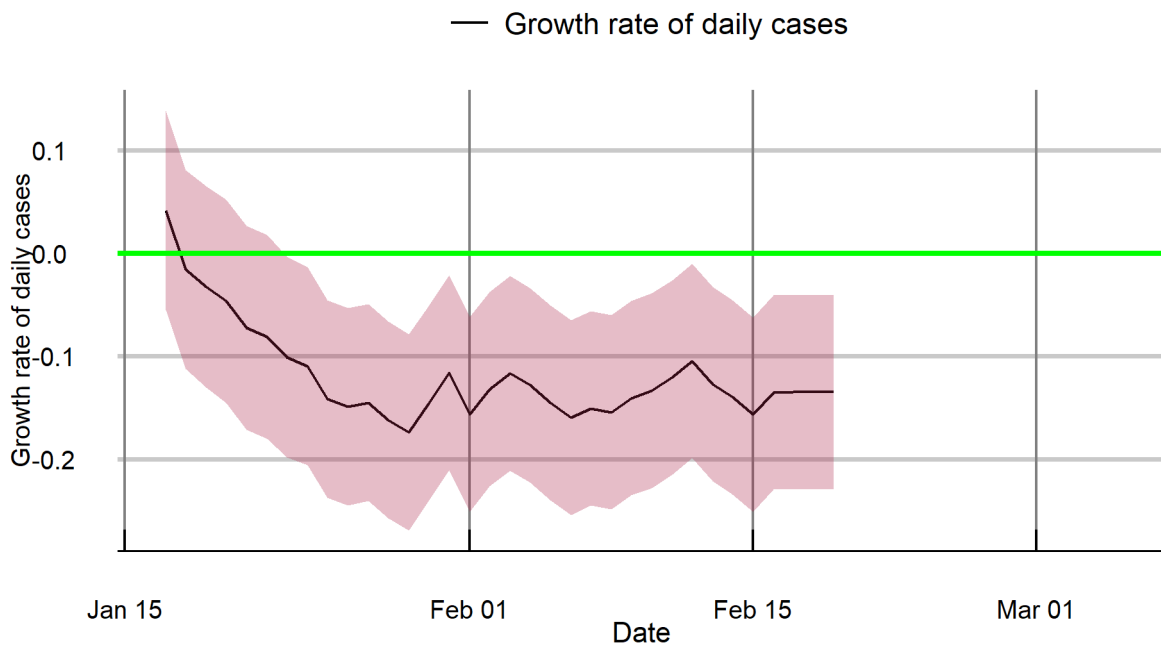
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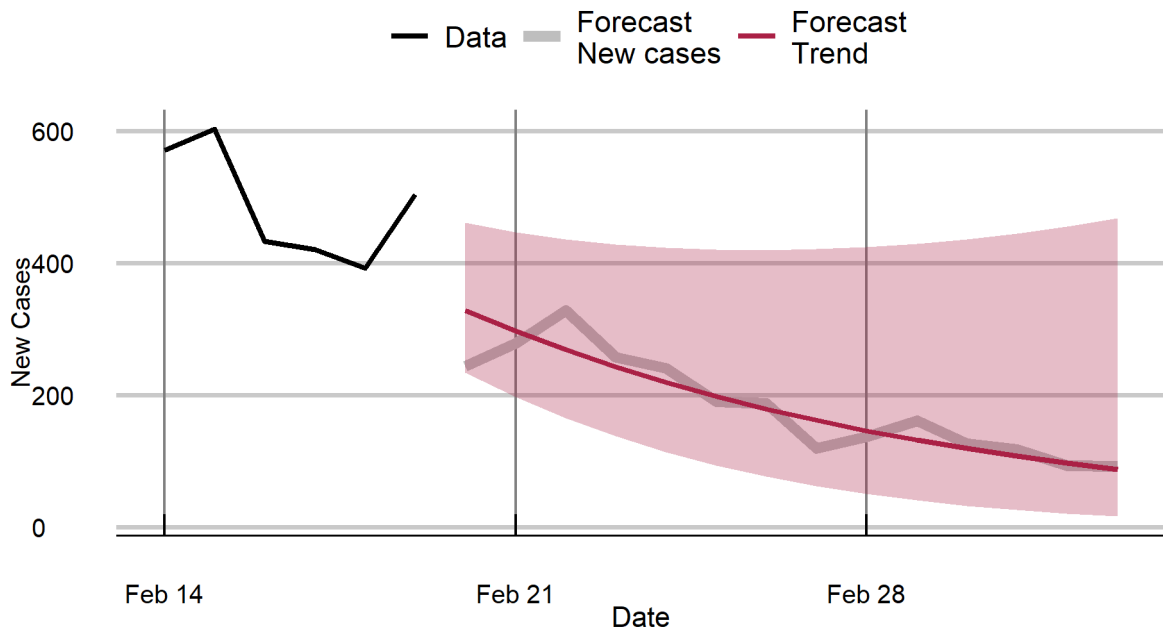
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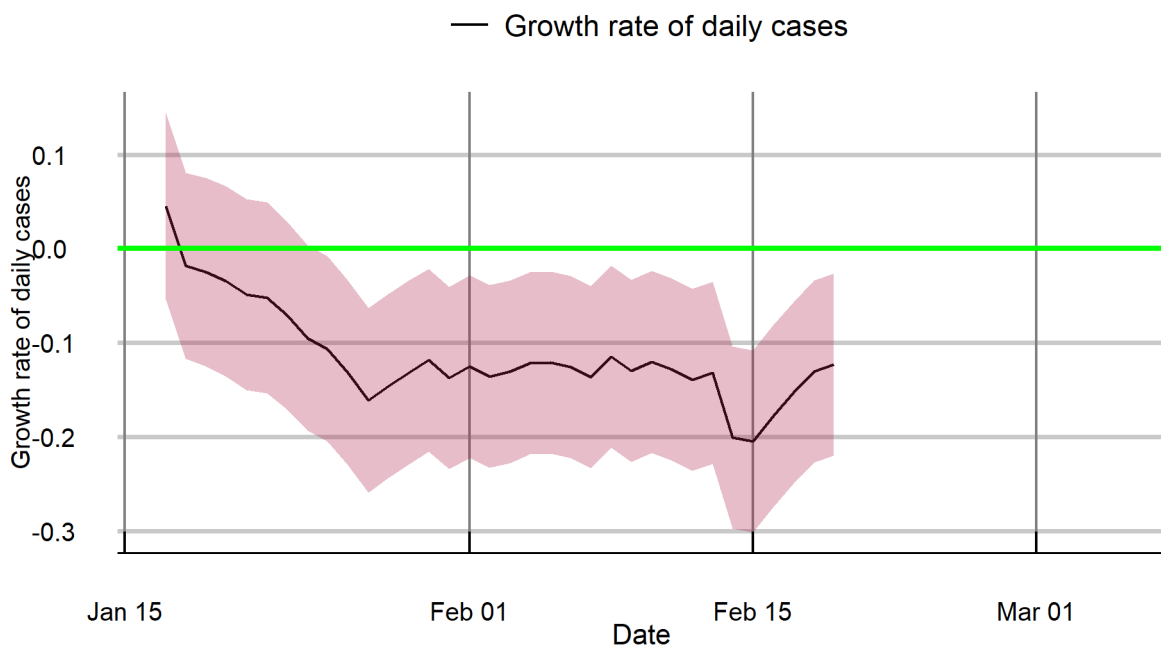
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Delhi
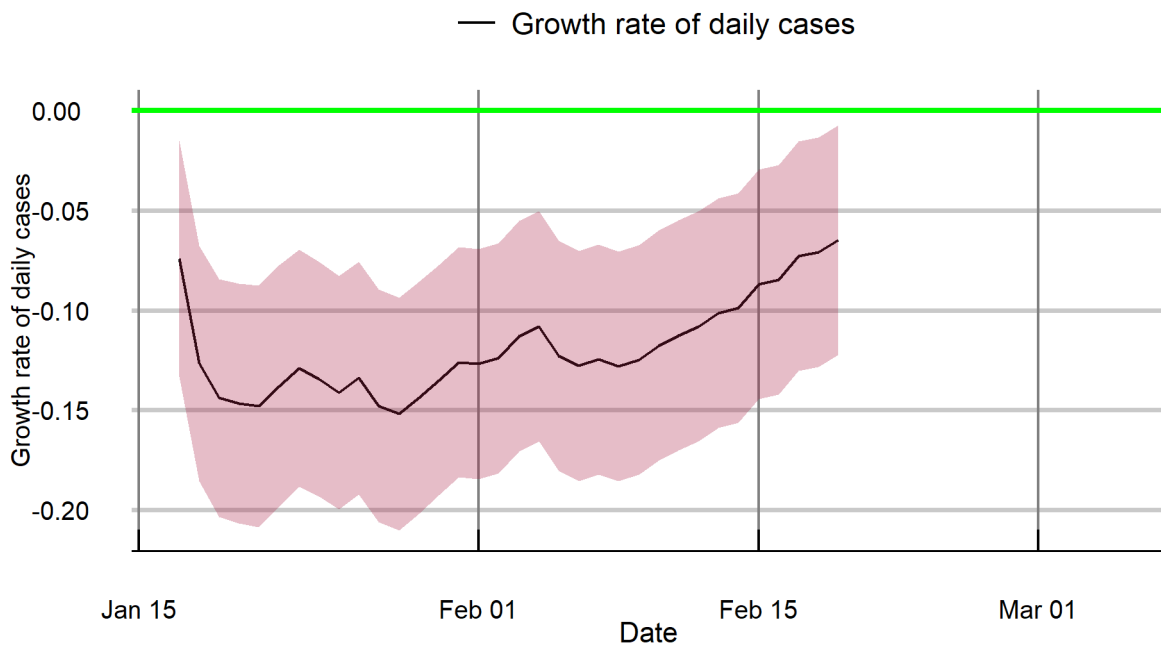
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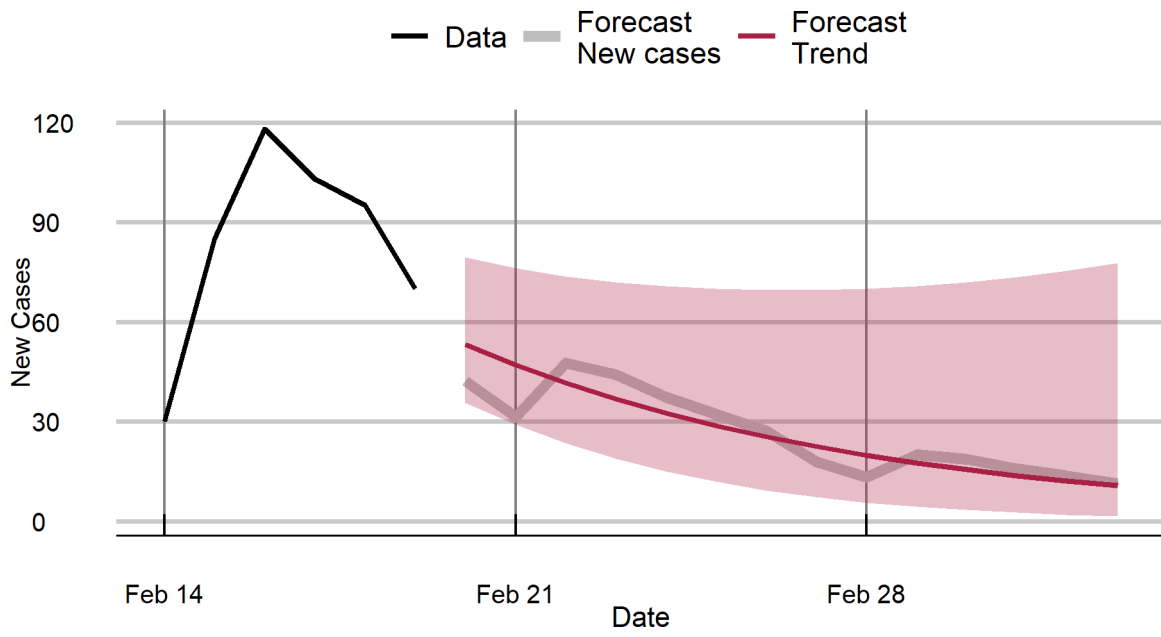
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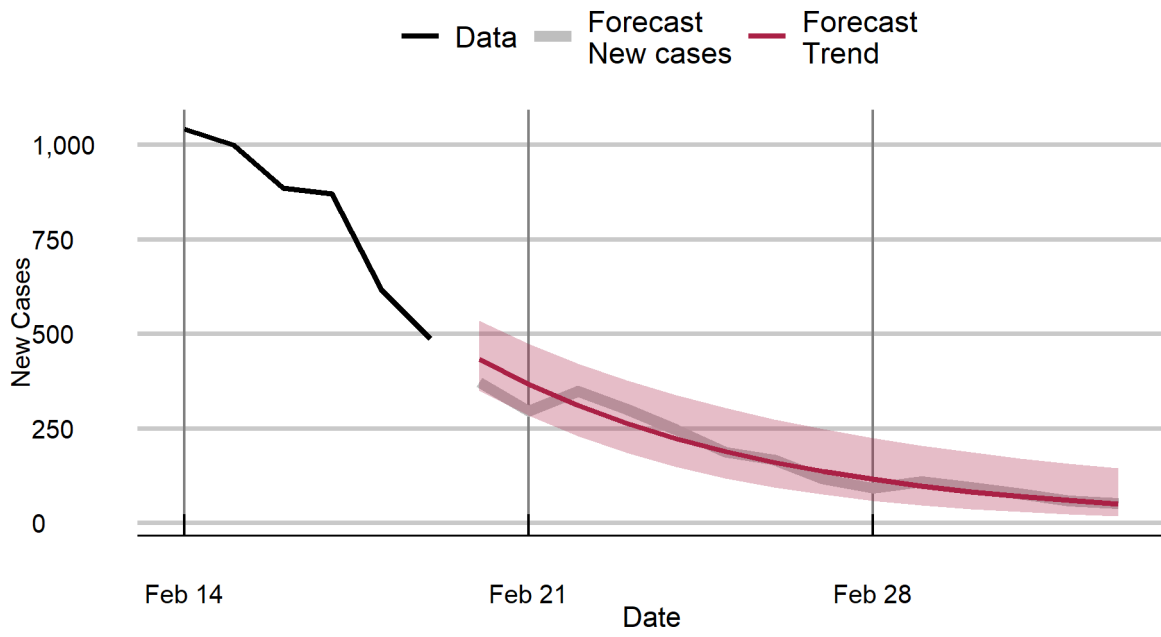
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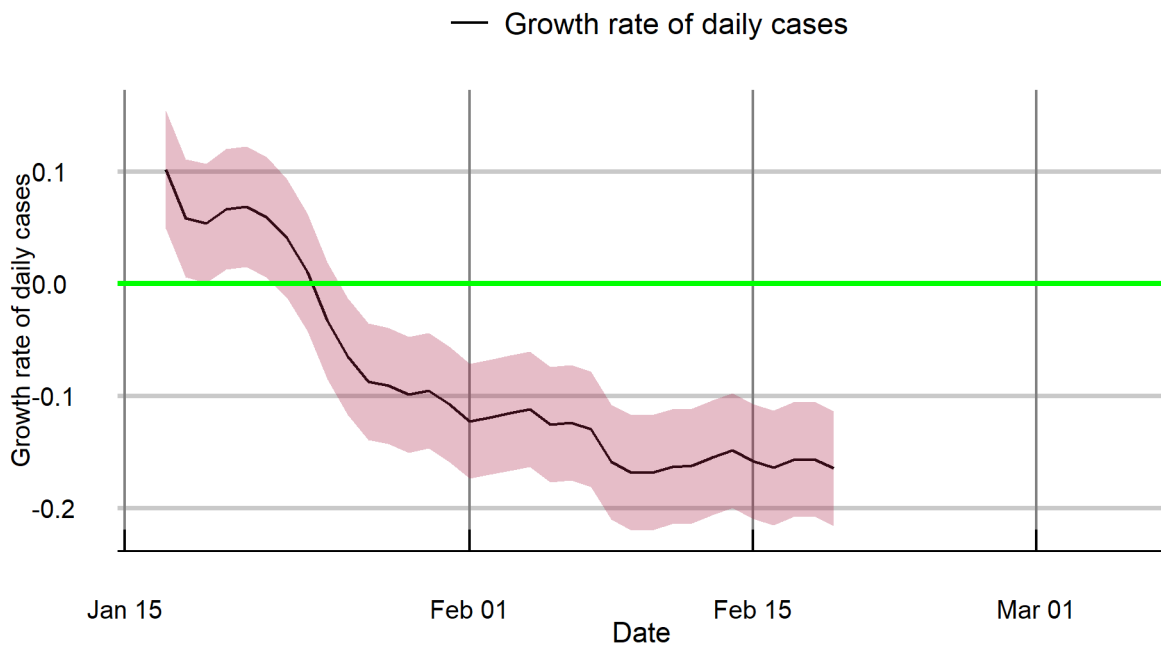
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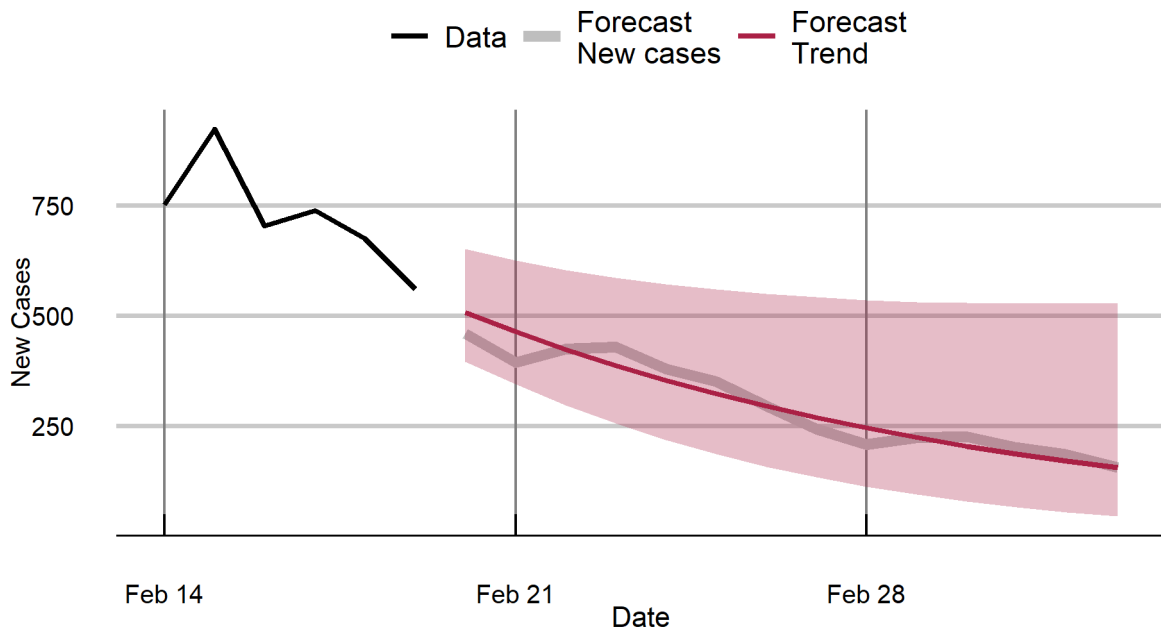
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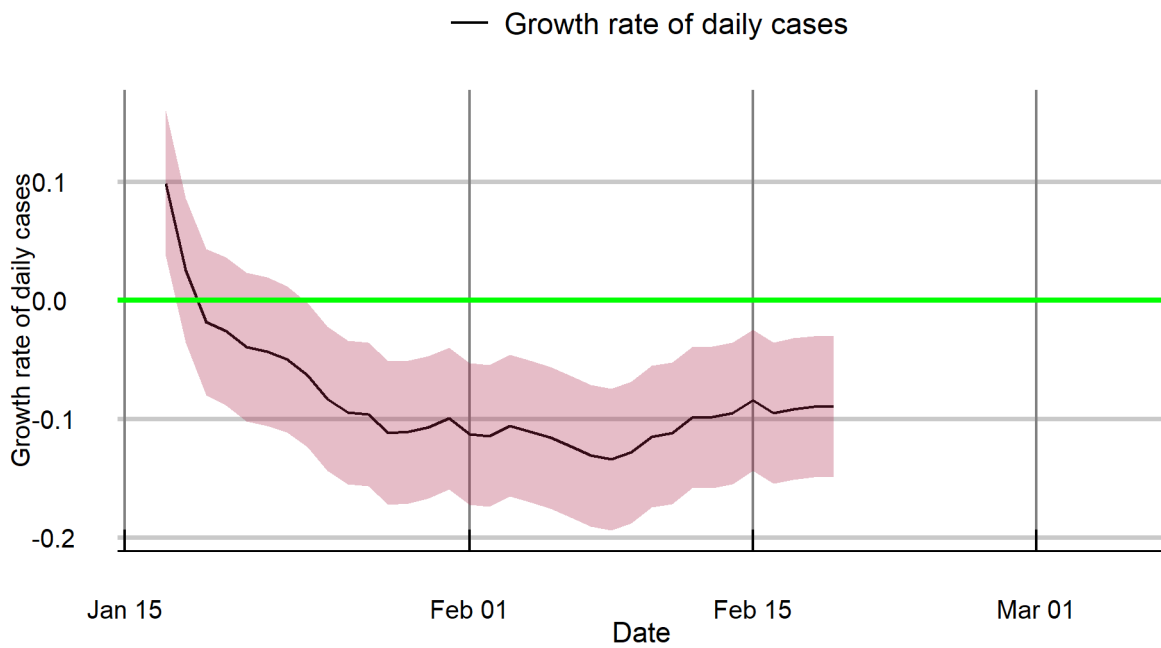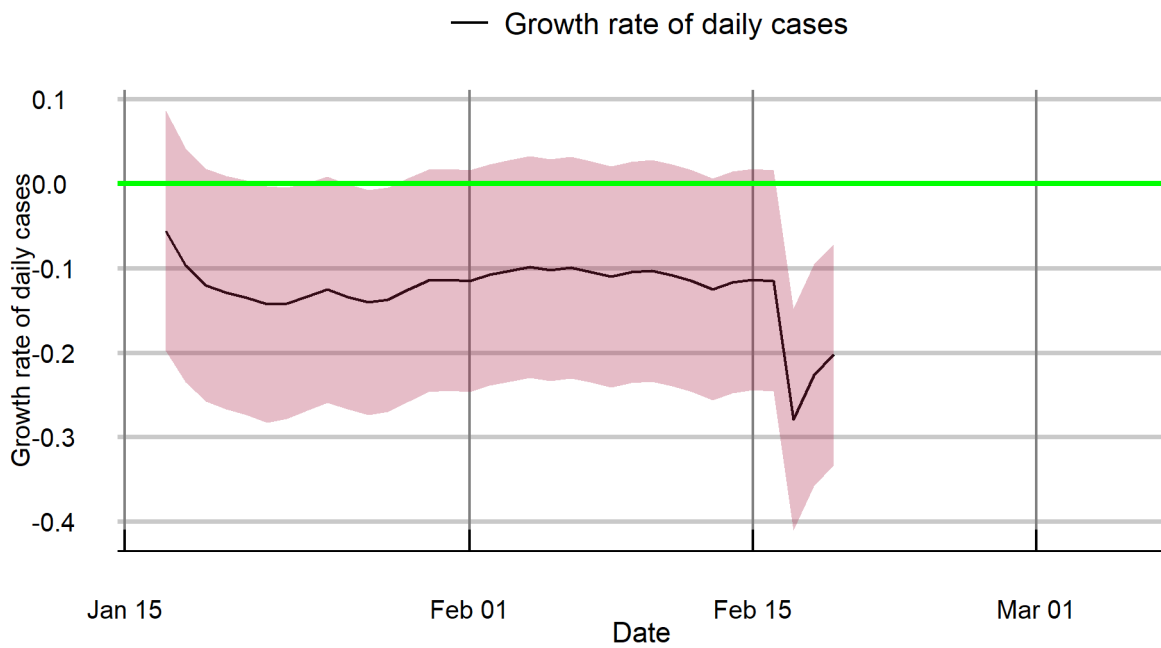
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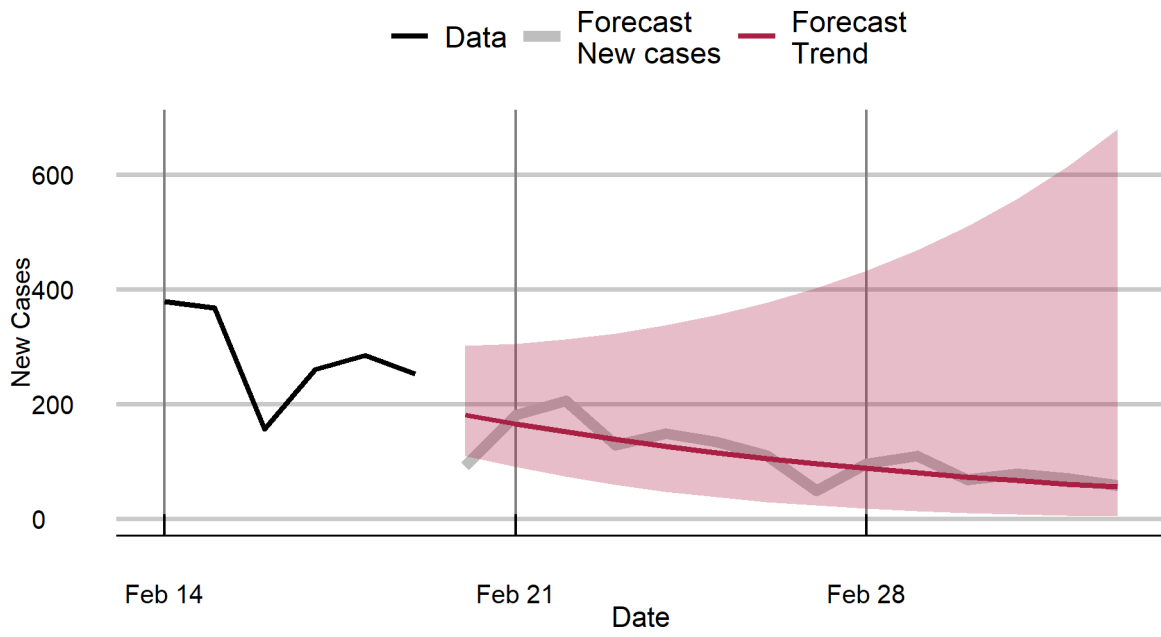
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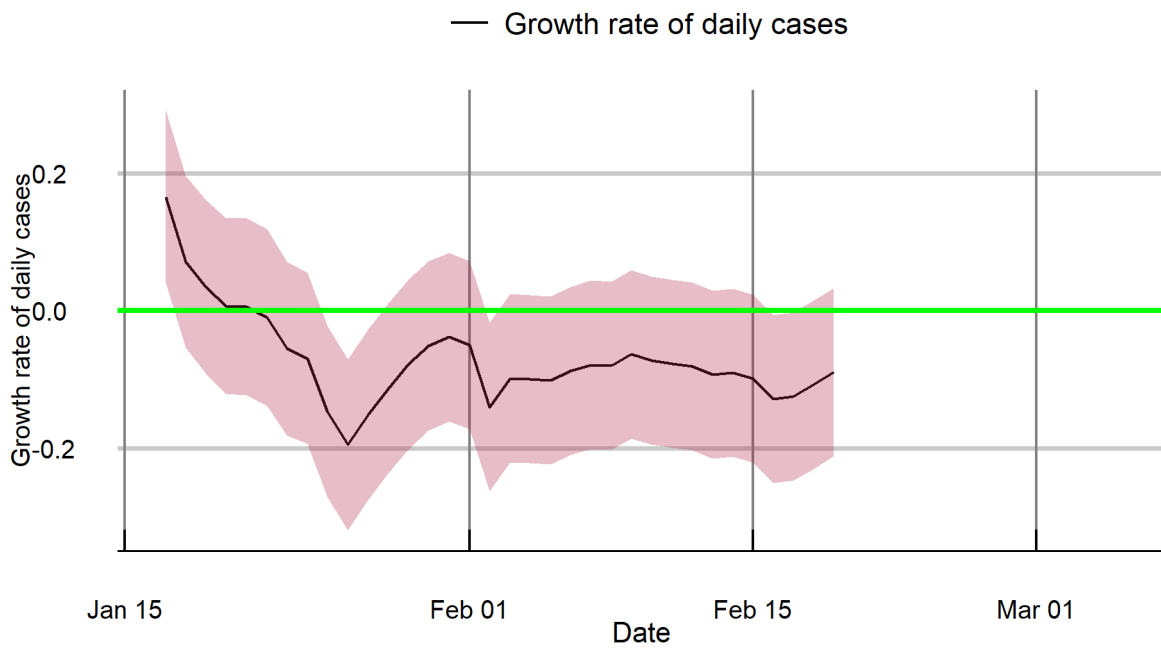
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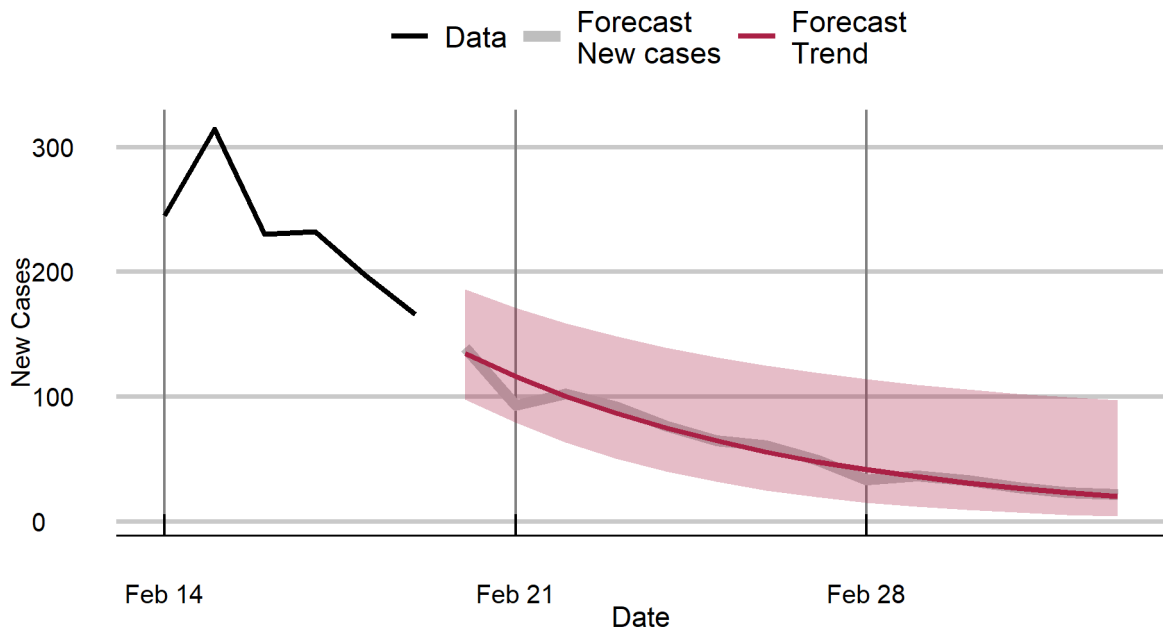
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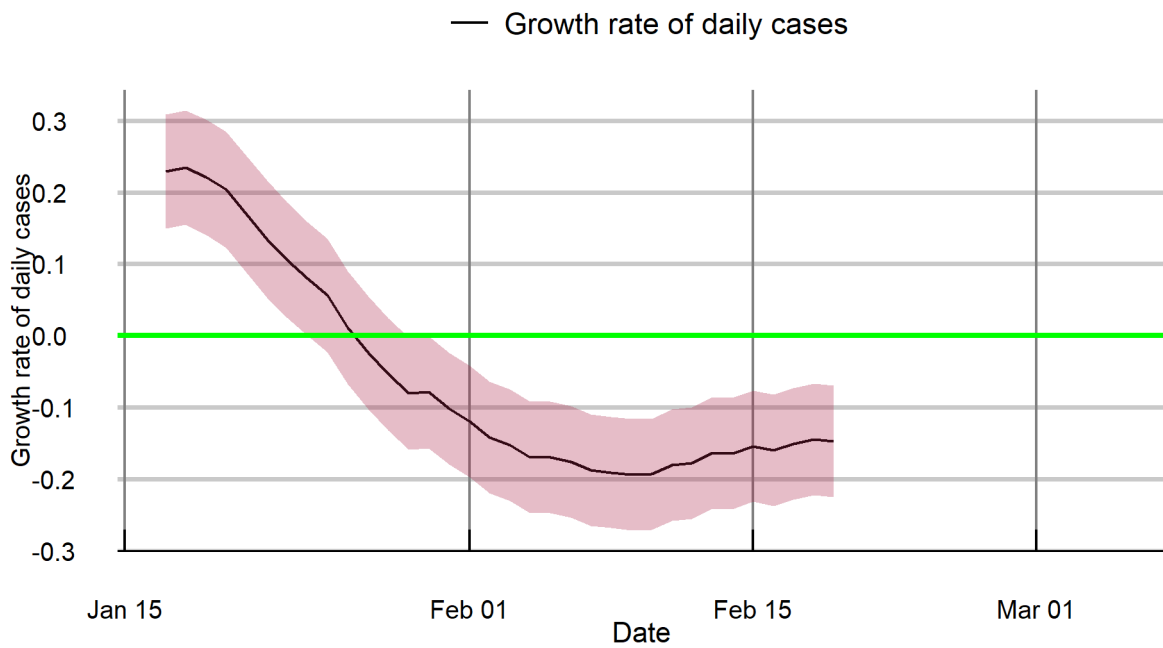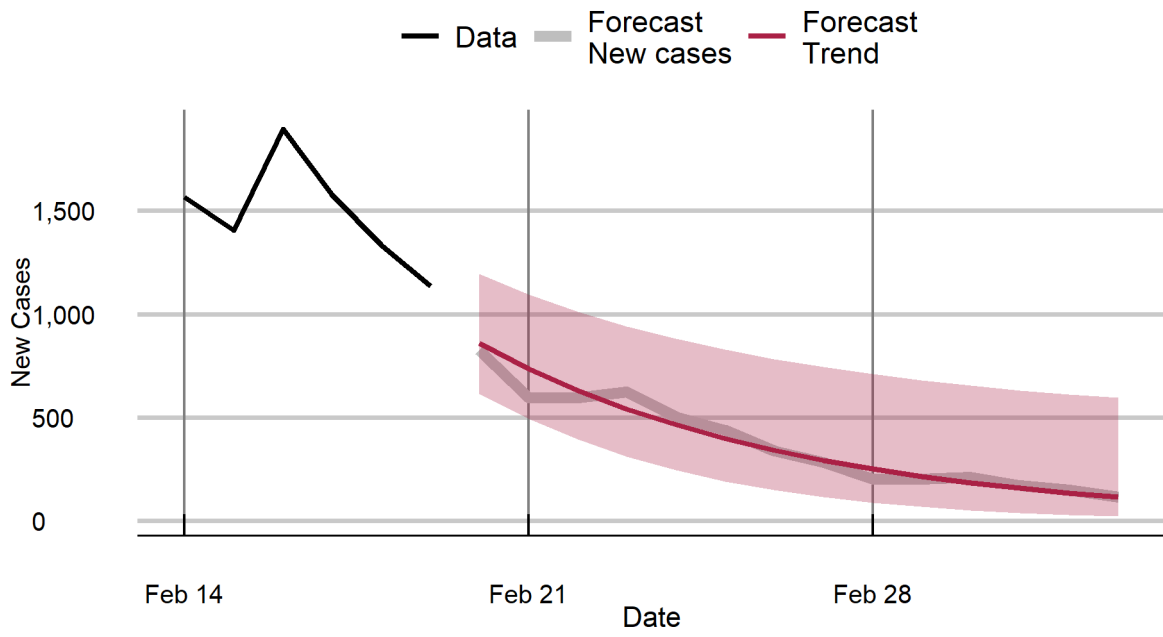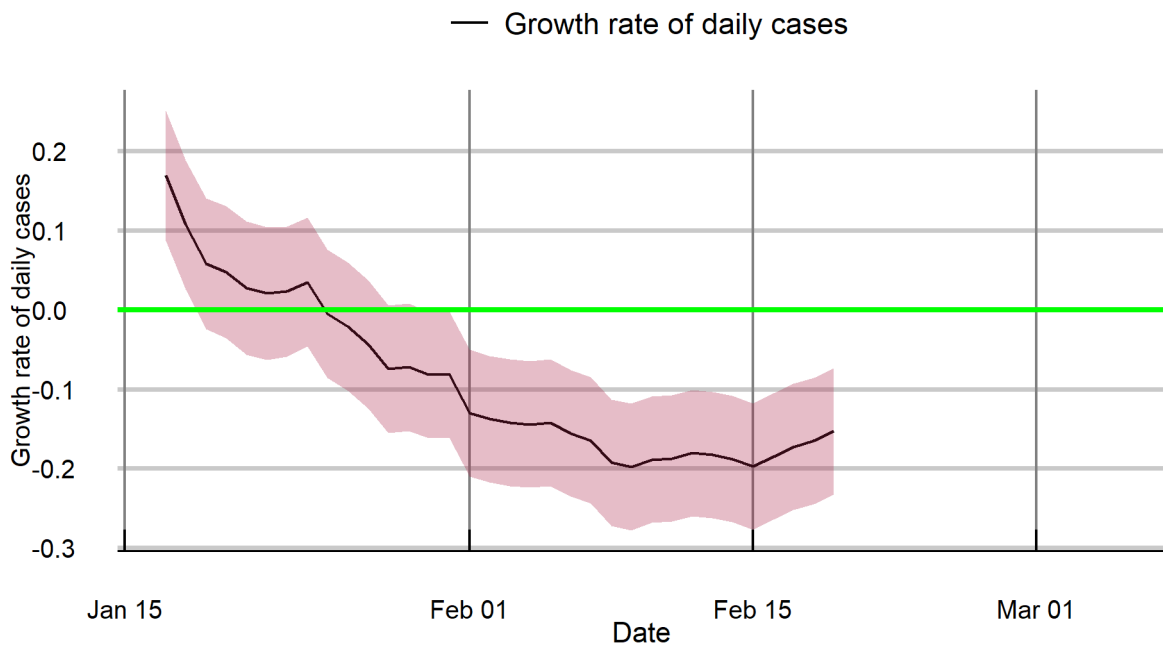
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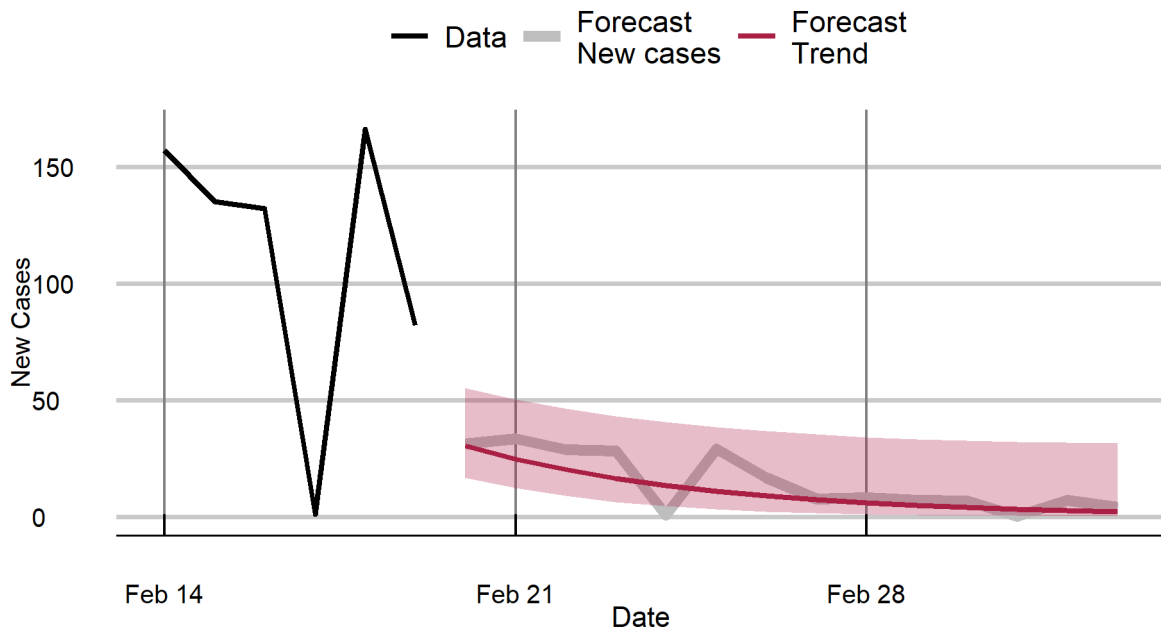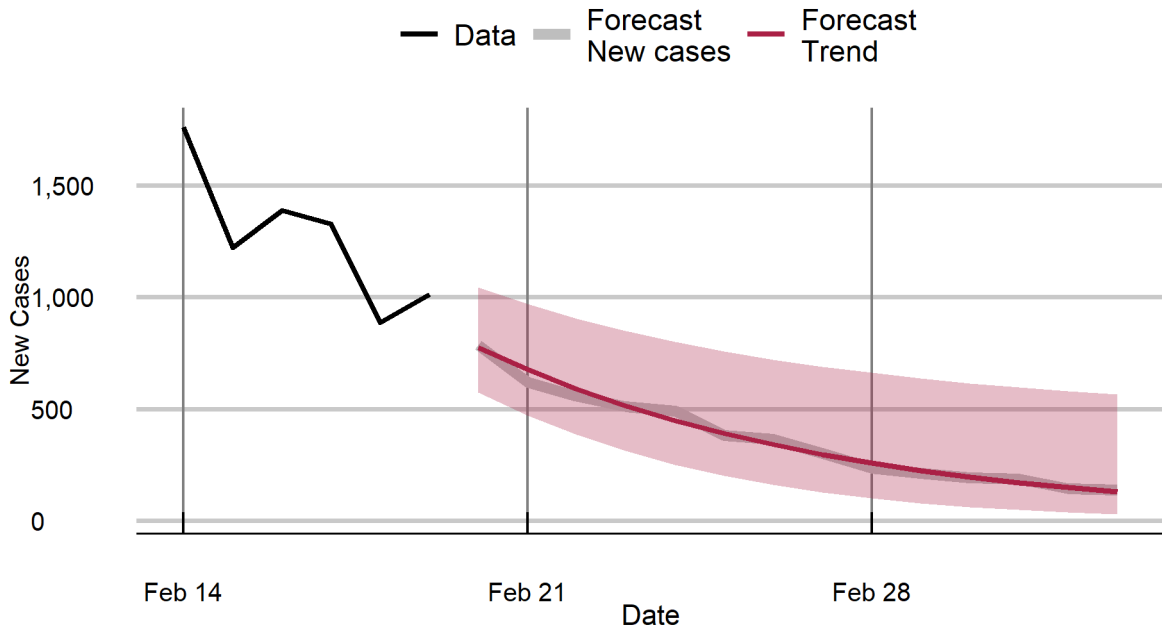

Jharkhand

Karnataka

Karnataka

Kerala
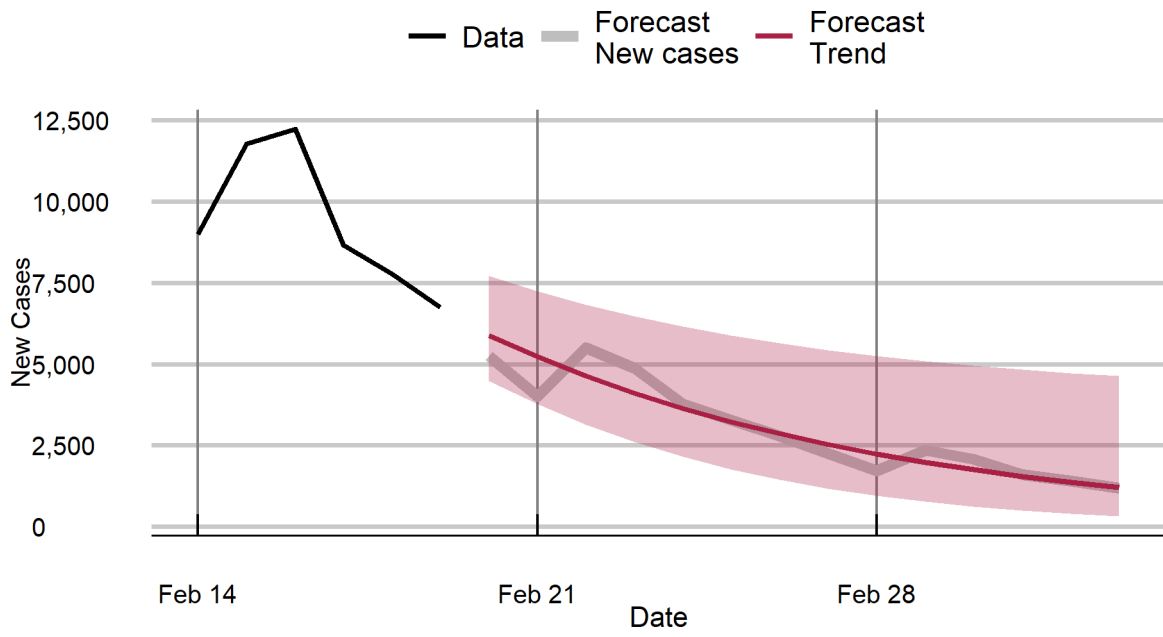
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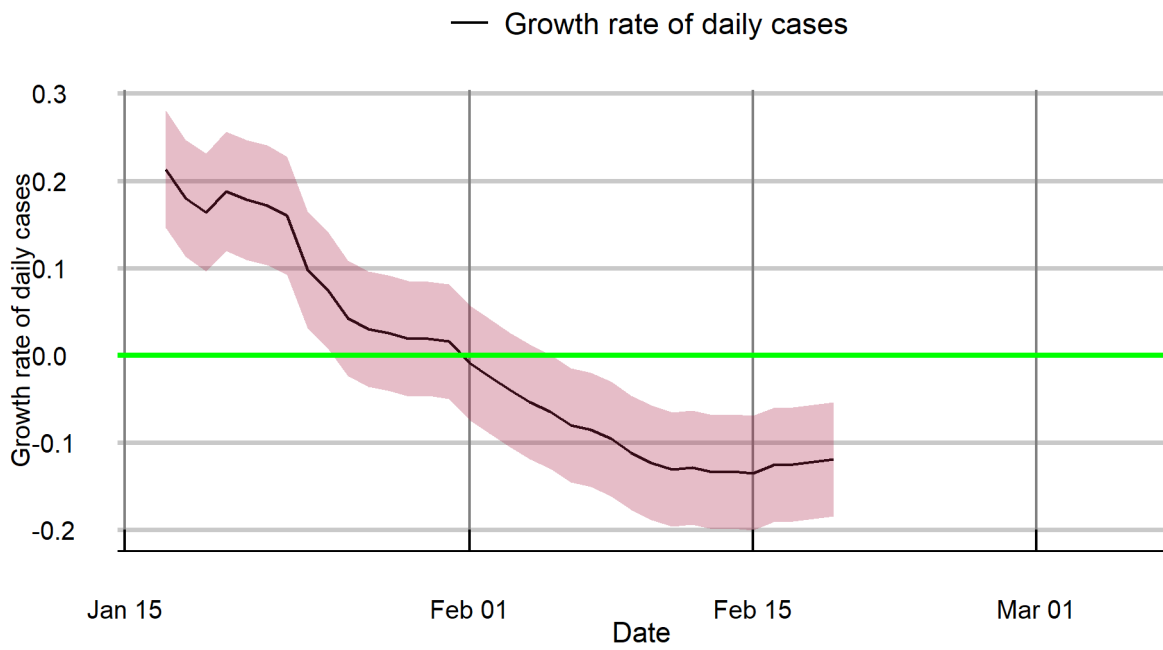
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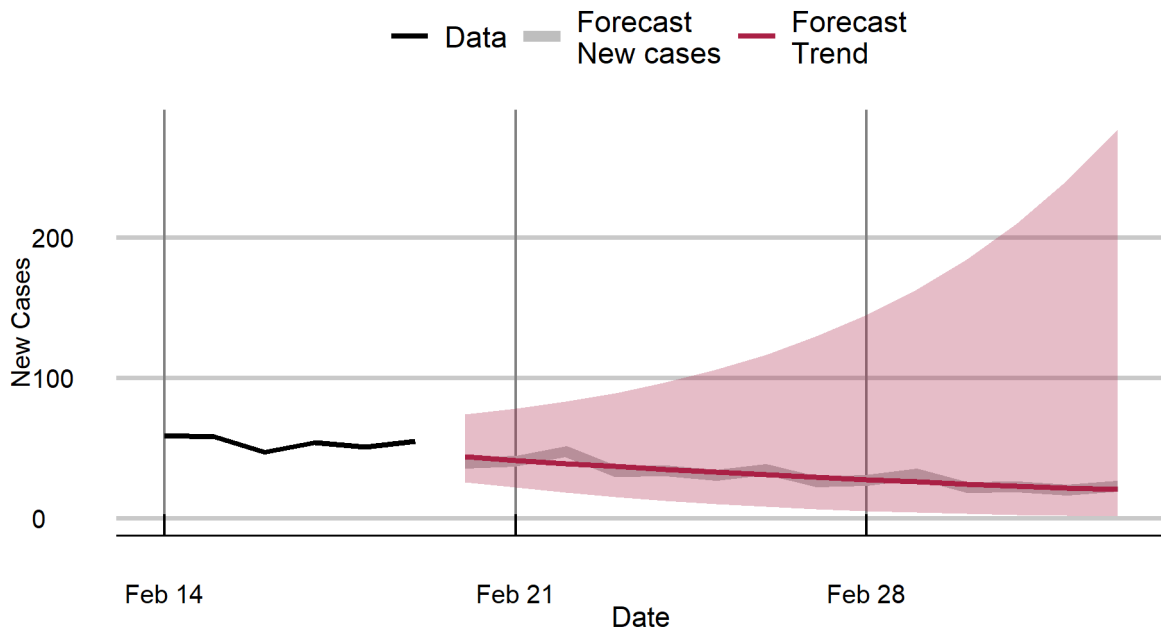
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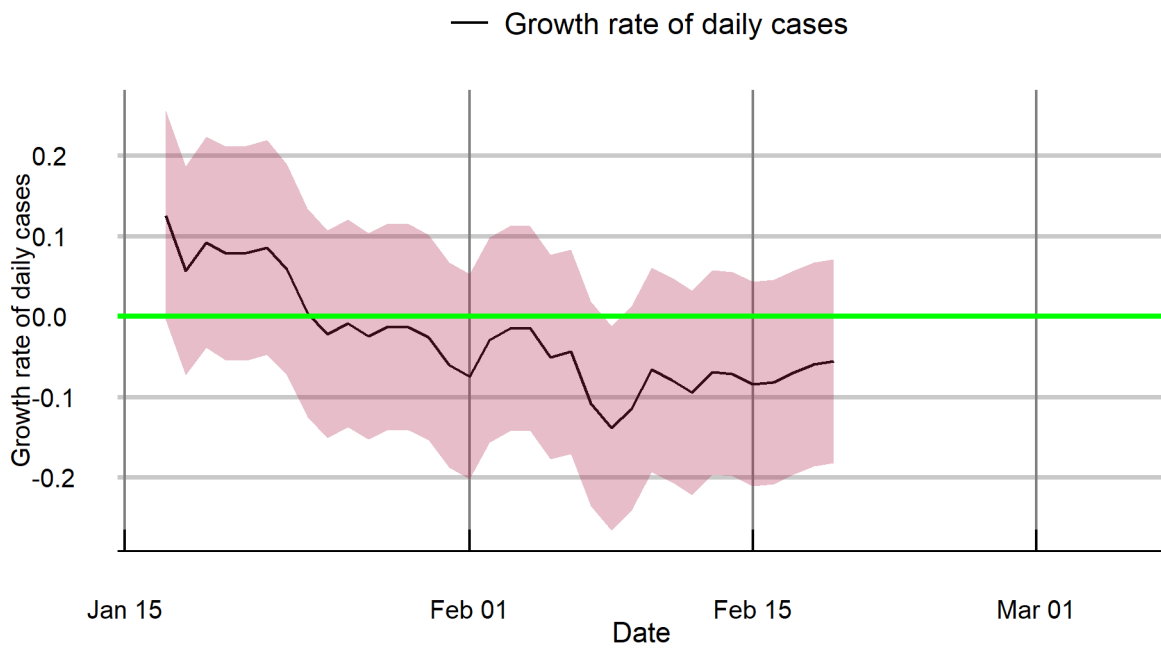
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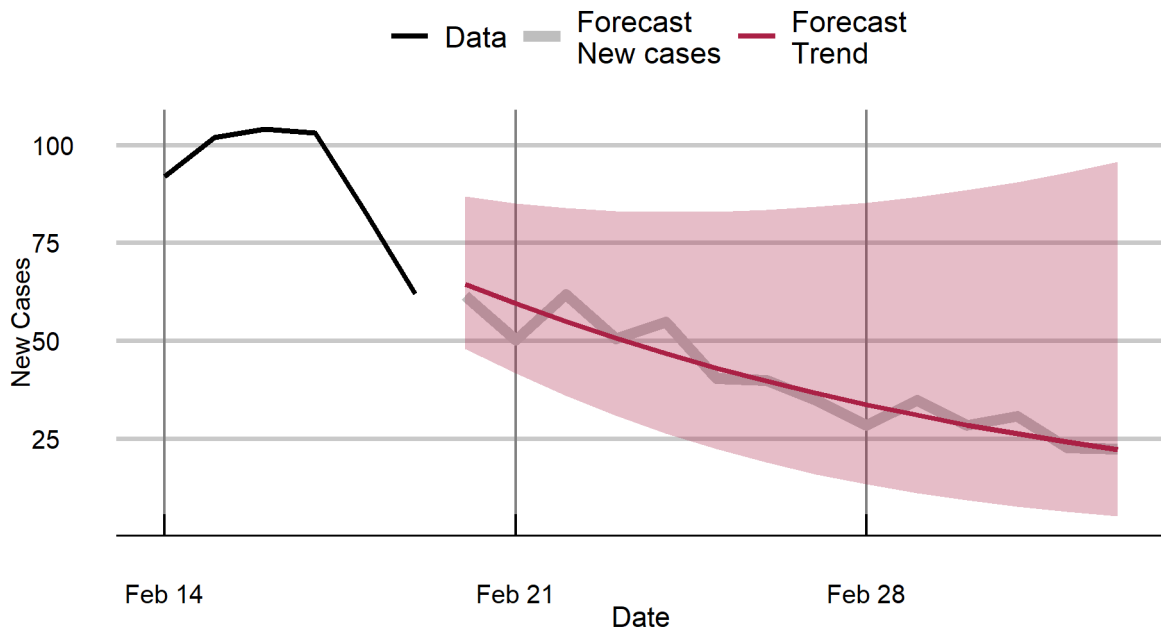## Madhya Pradesh
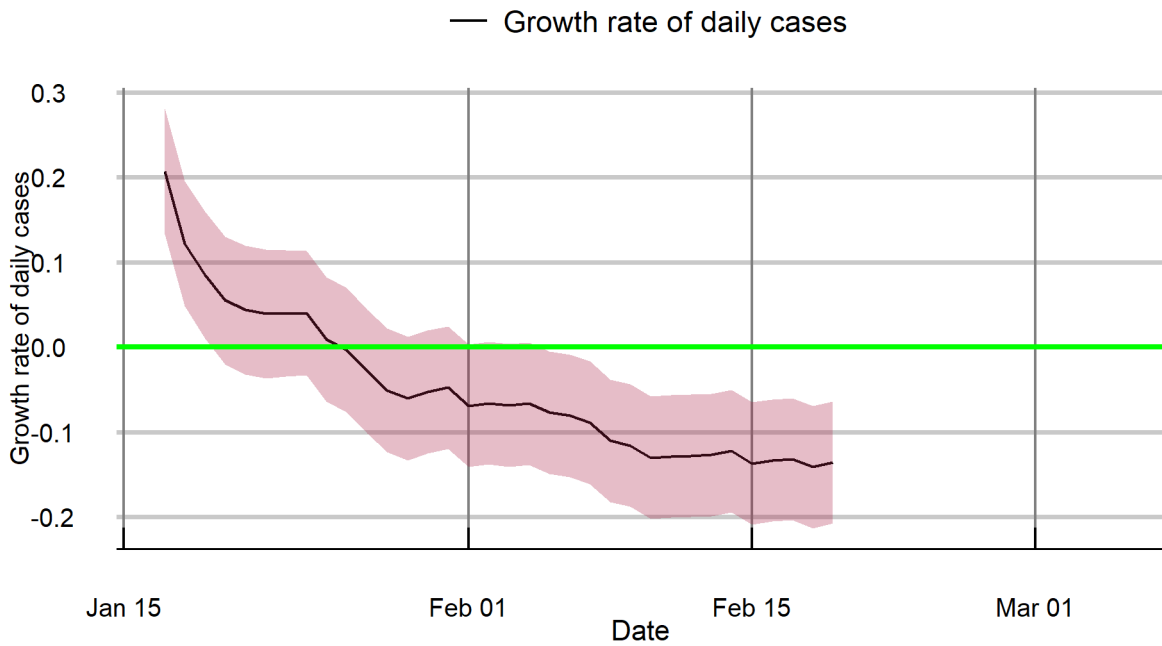
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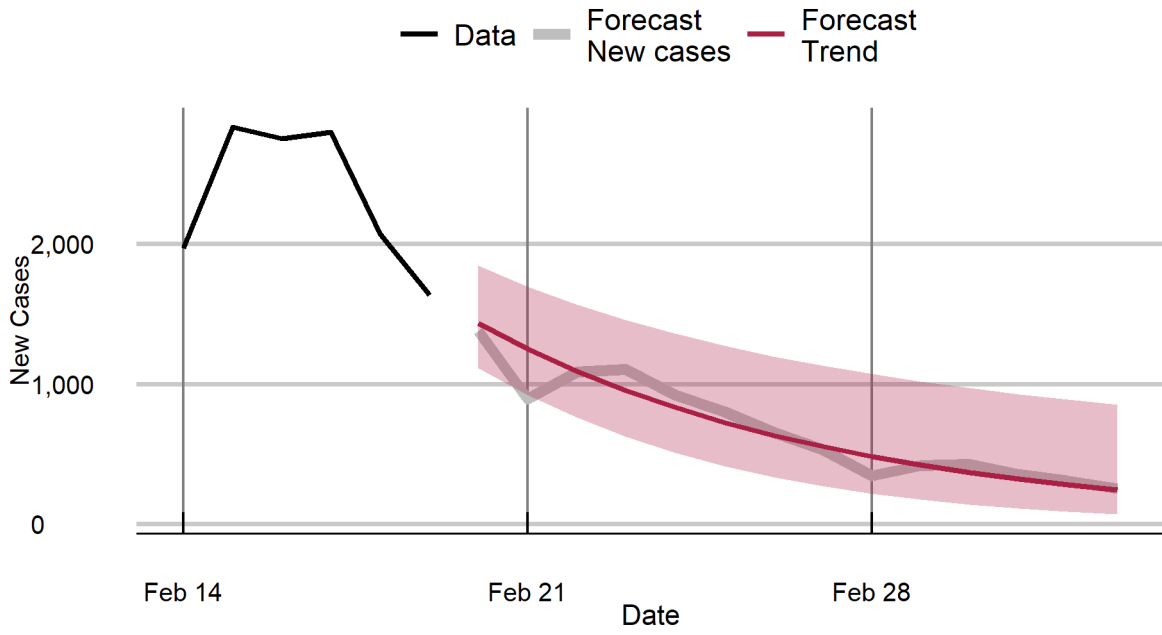
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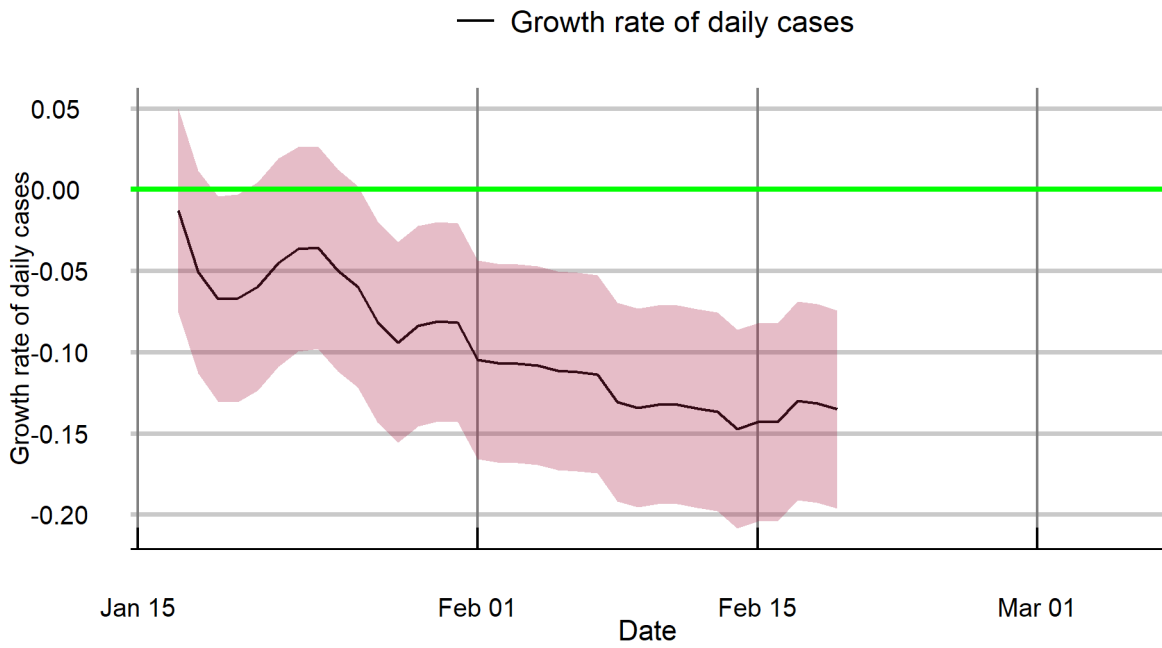
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Manipur
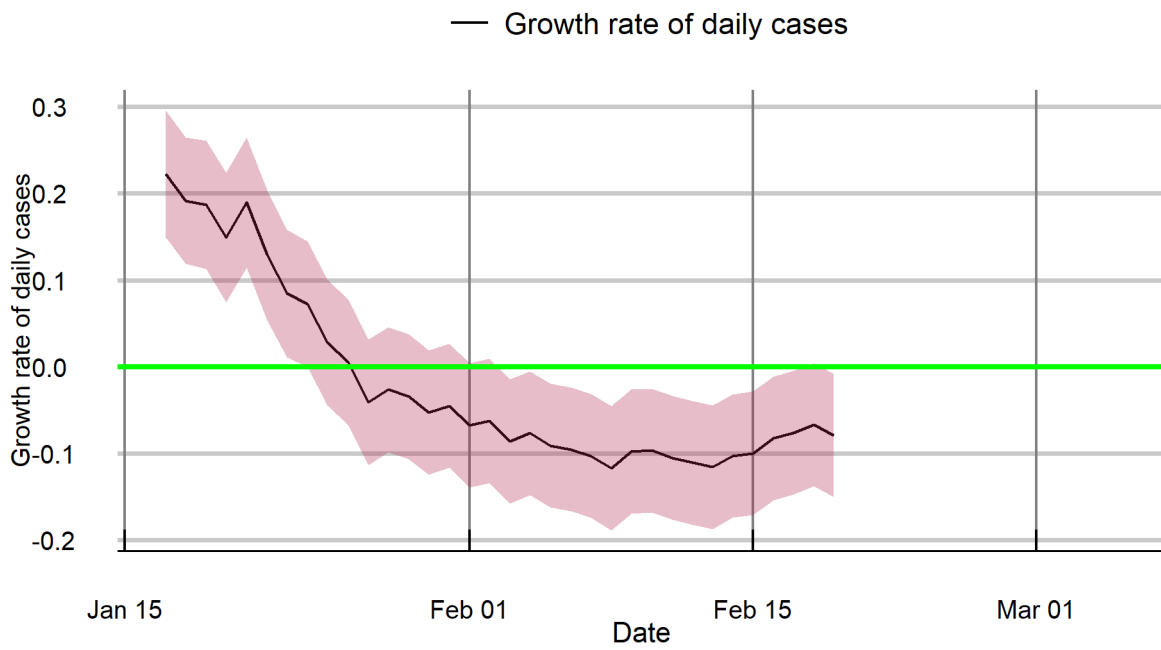
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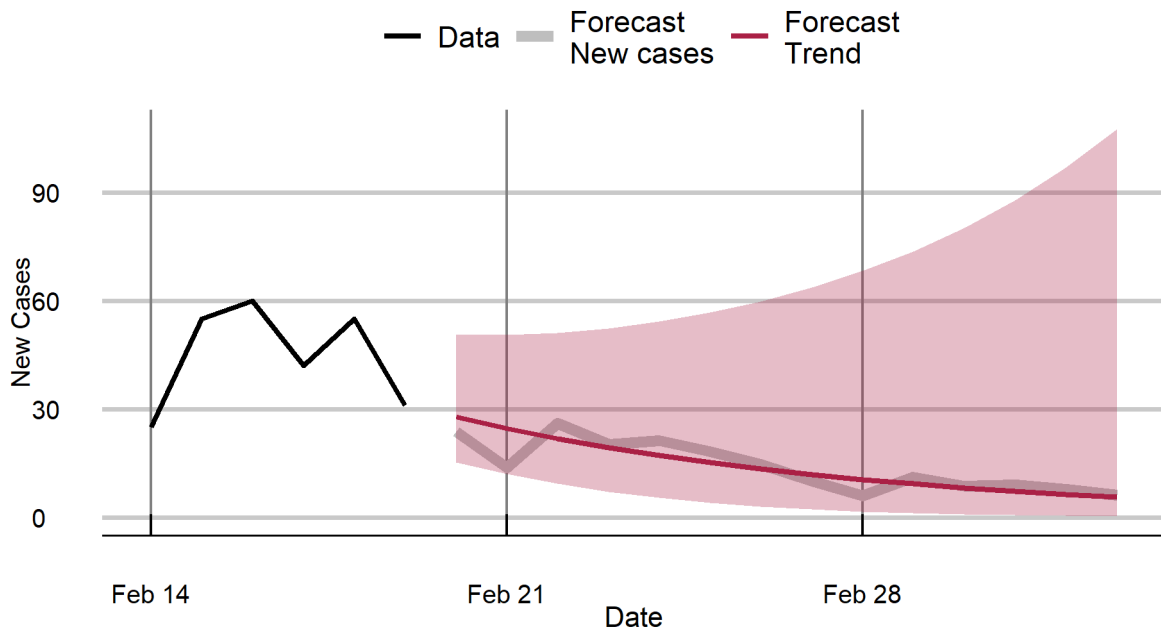
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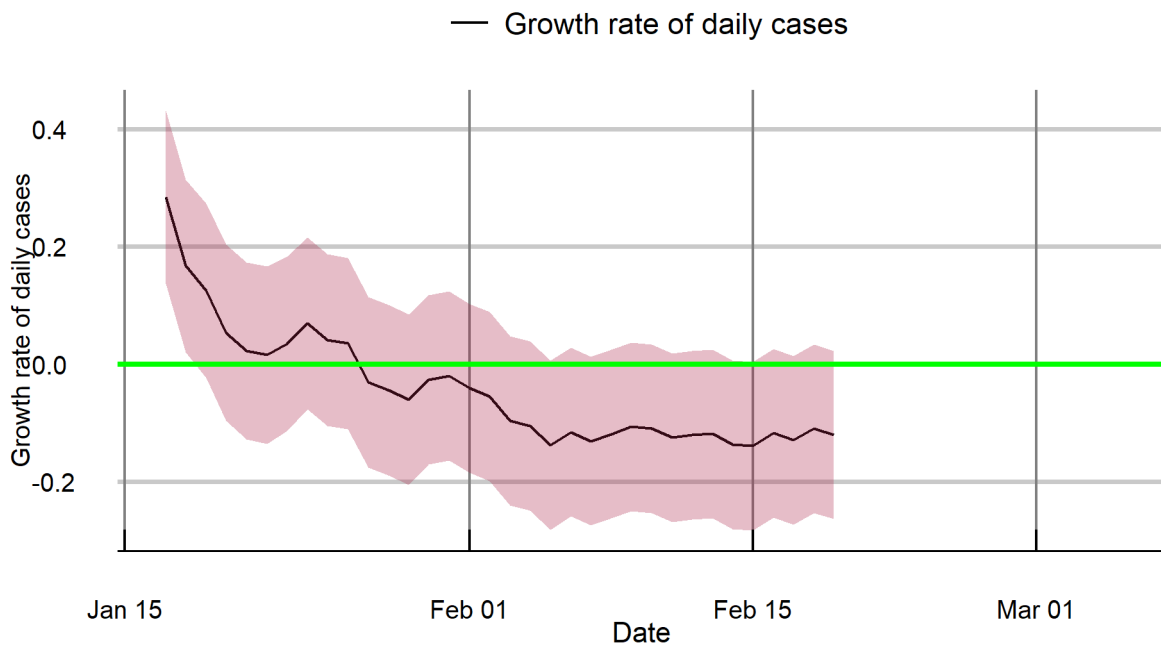
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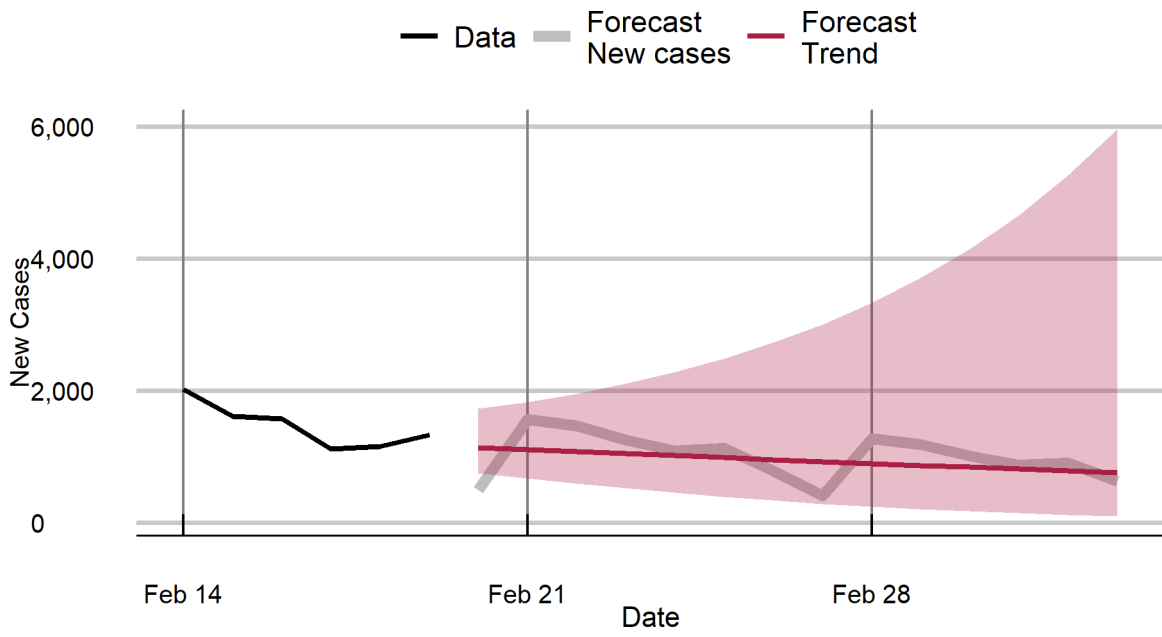
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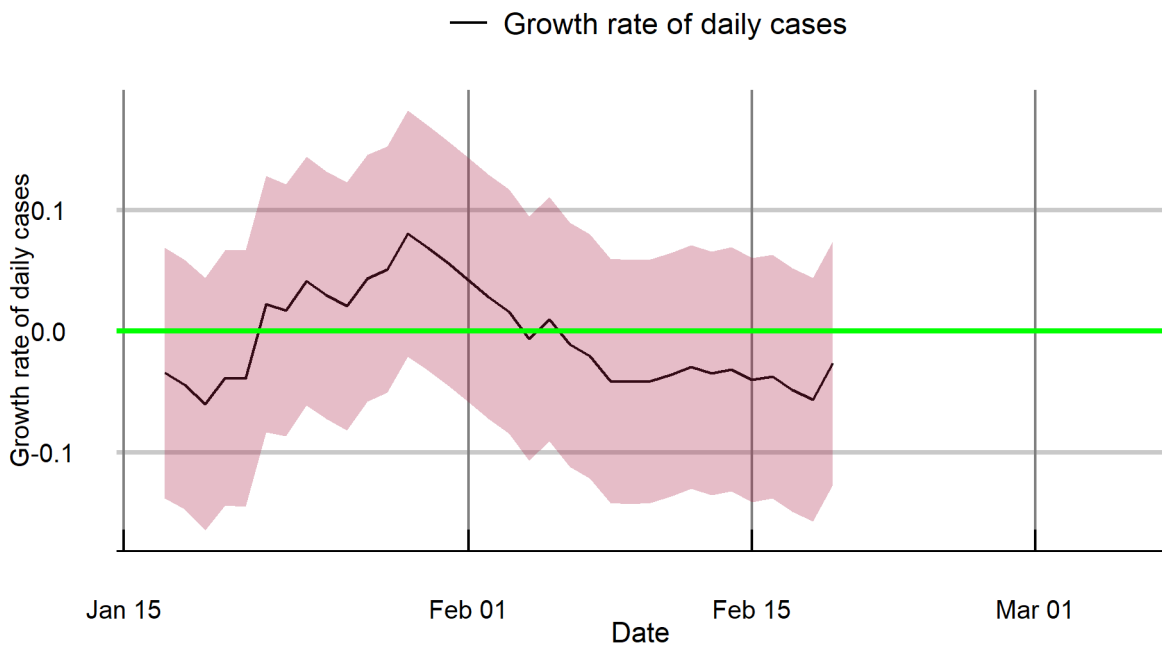
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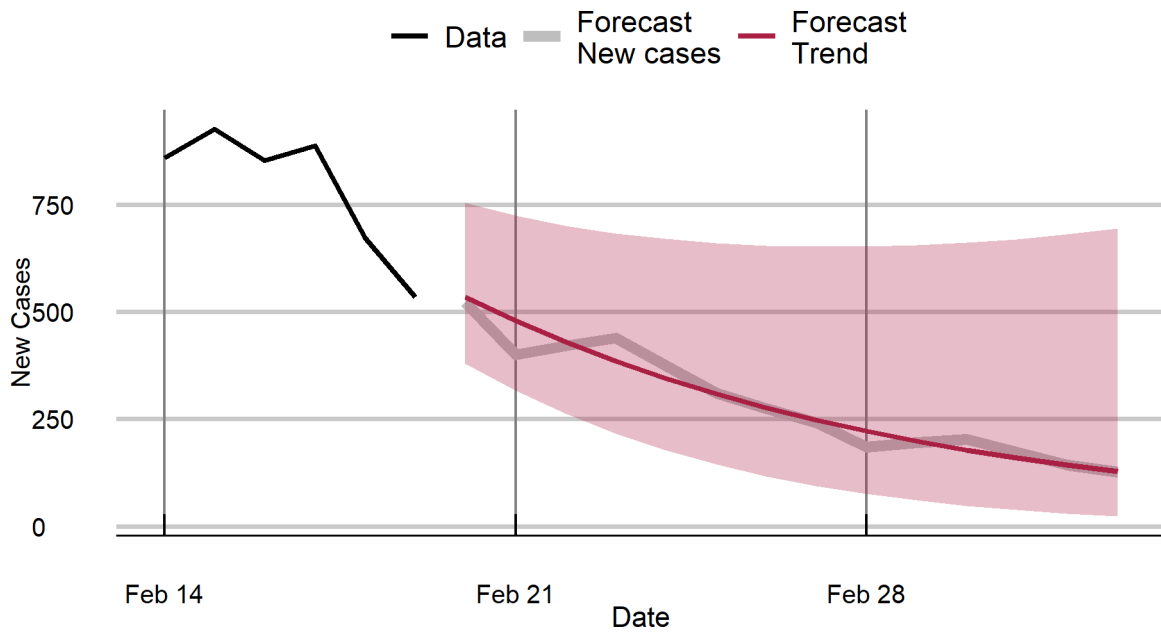
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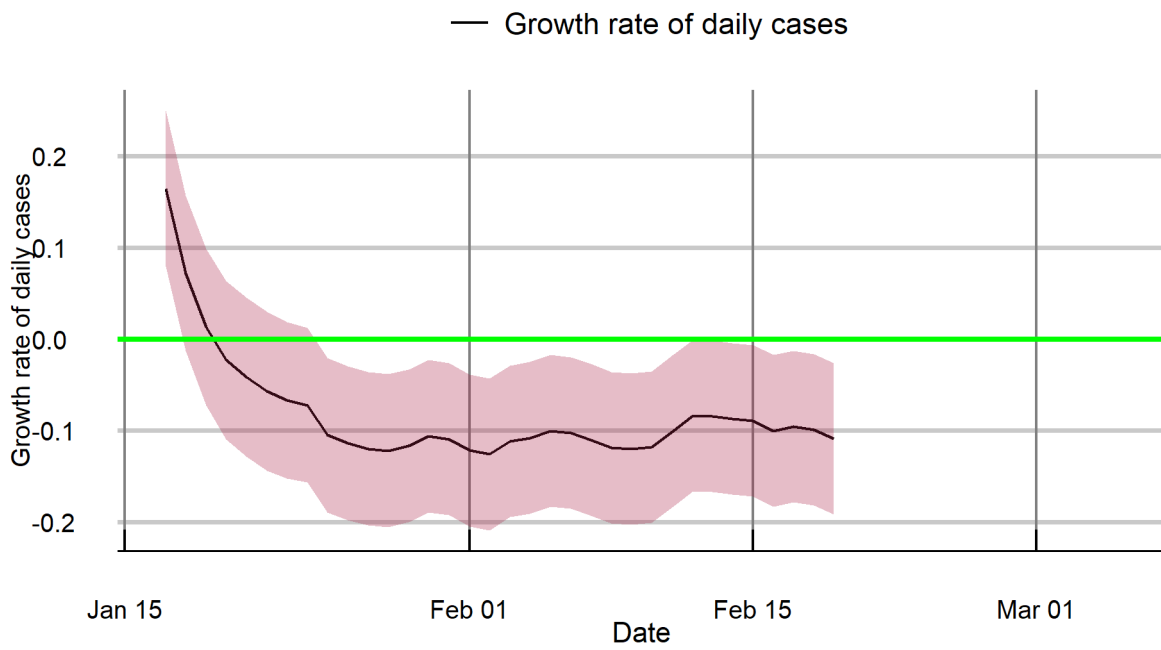
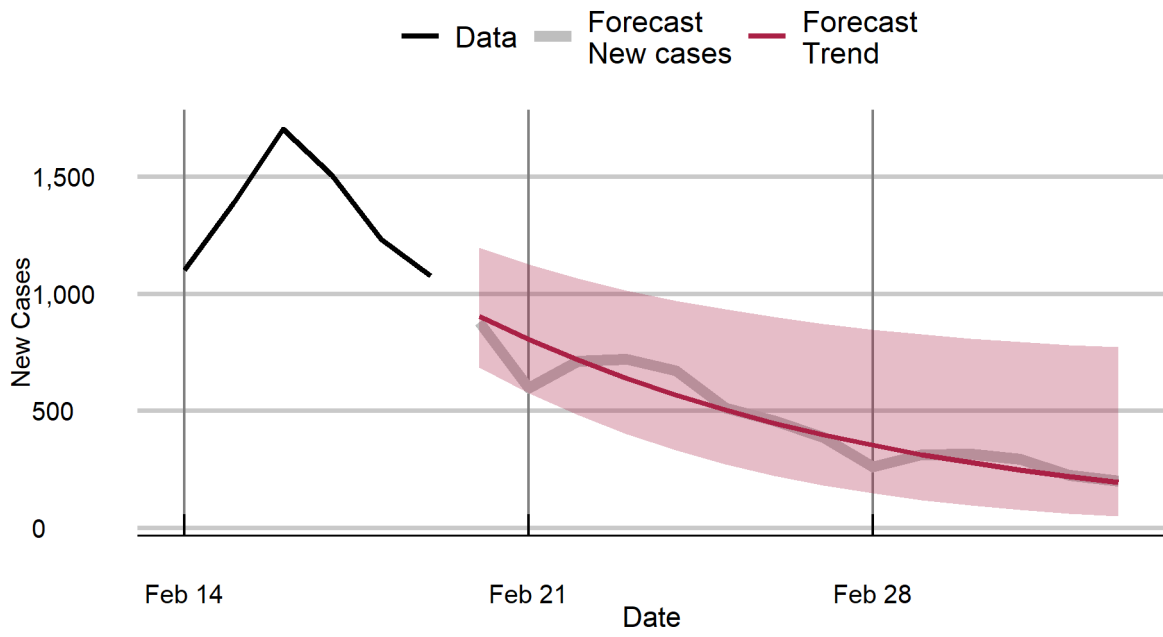## Puducherry
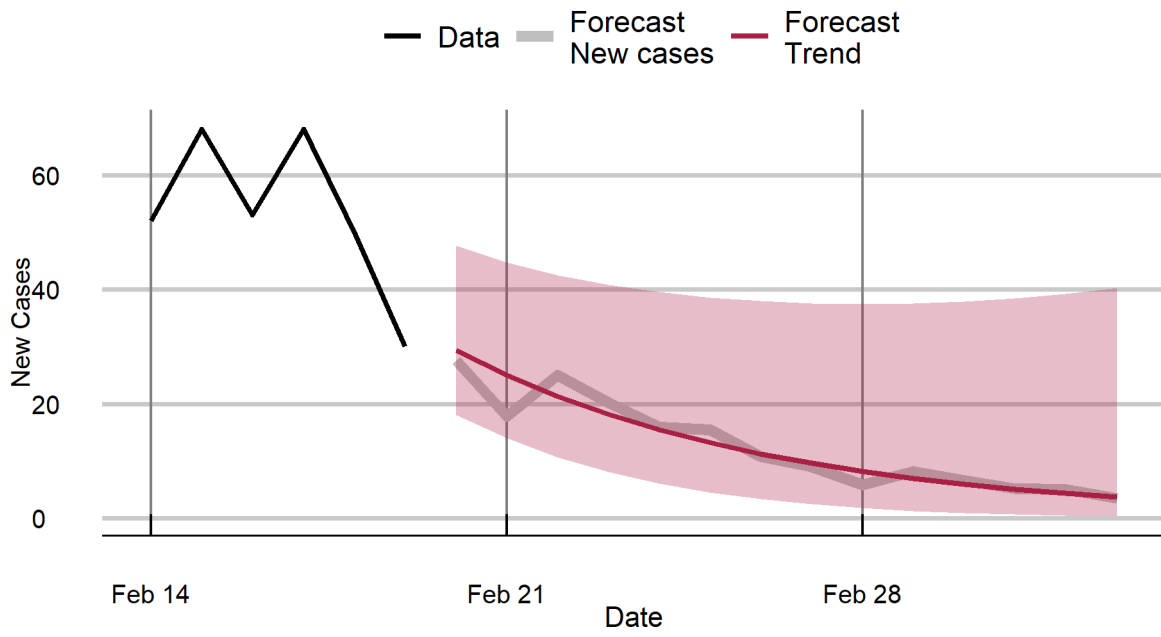
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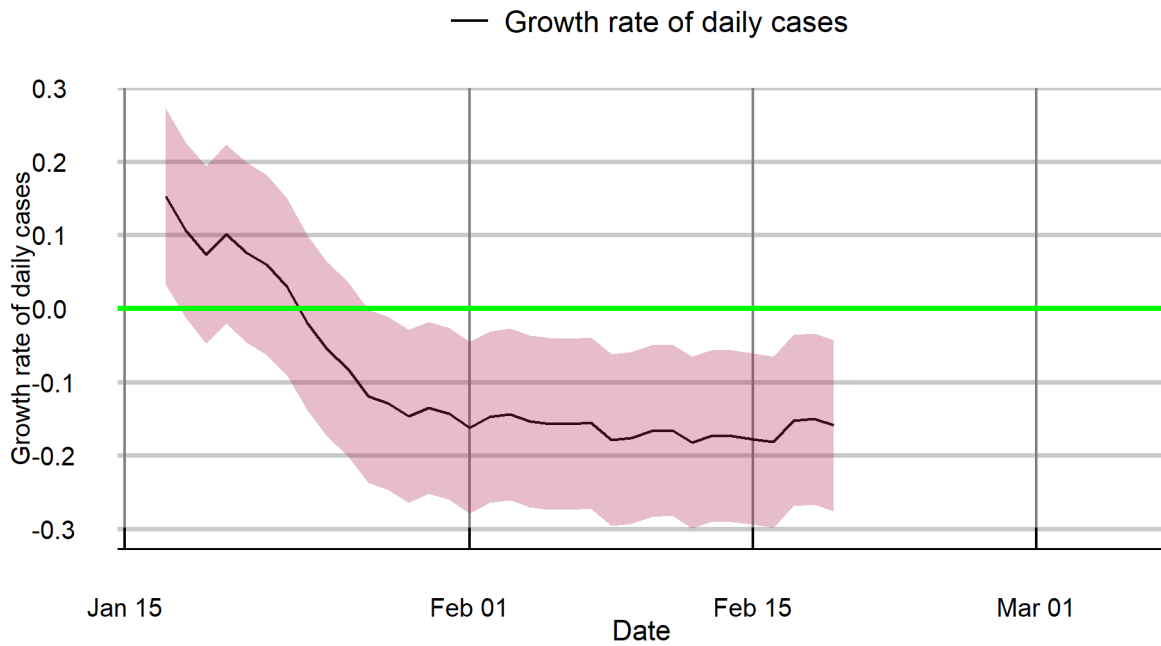
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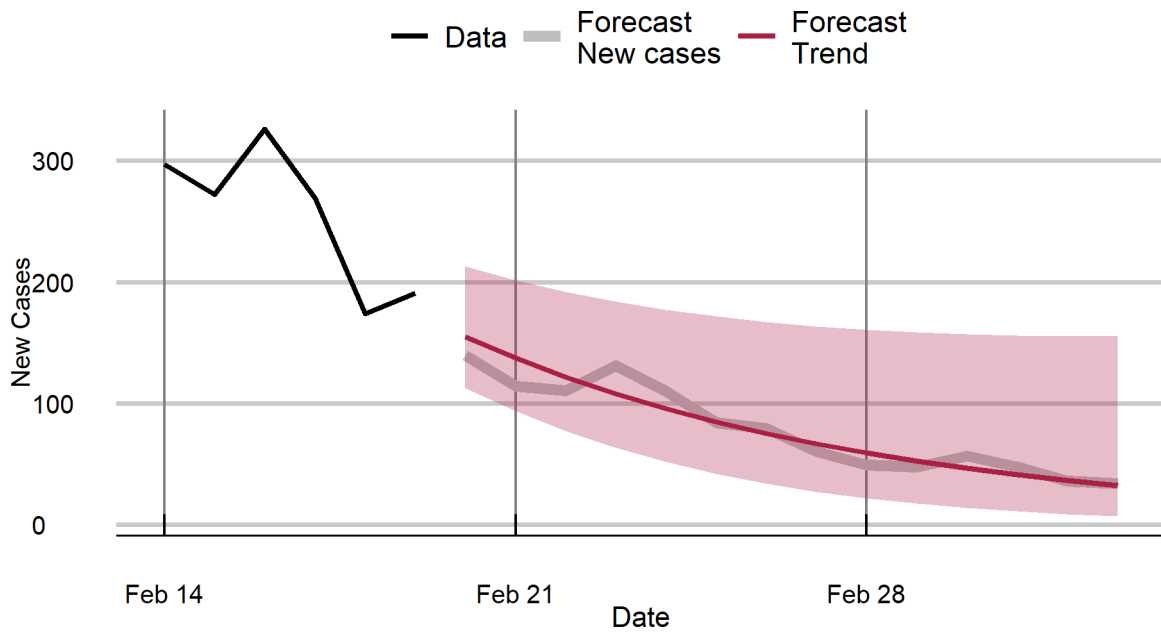
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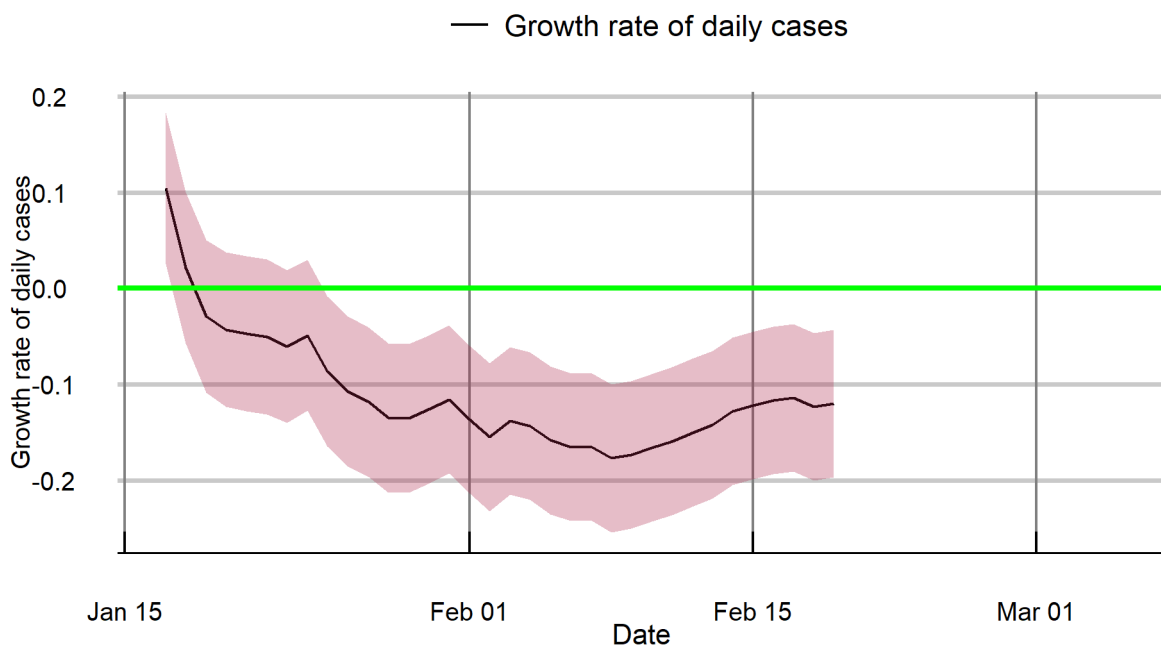
Rajasthan

Rajasthan
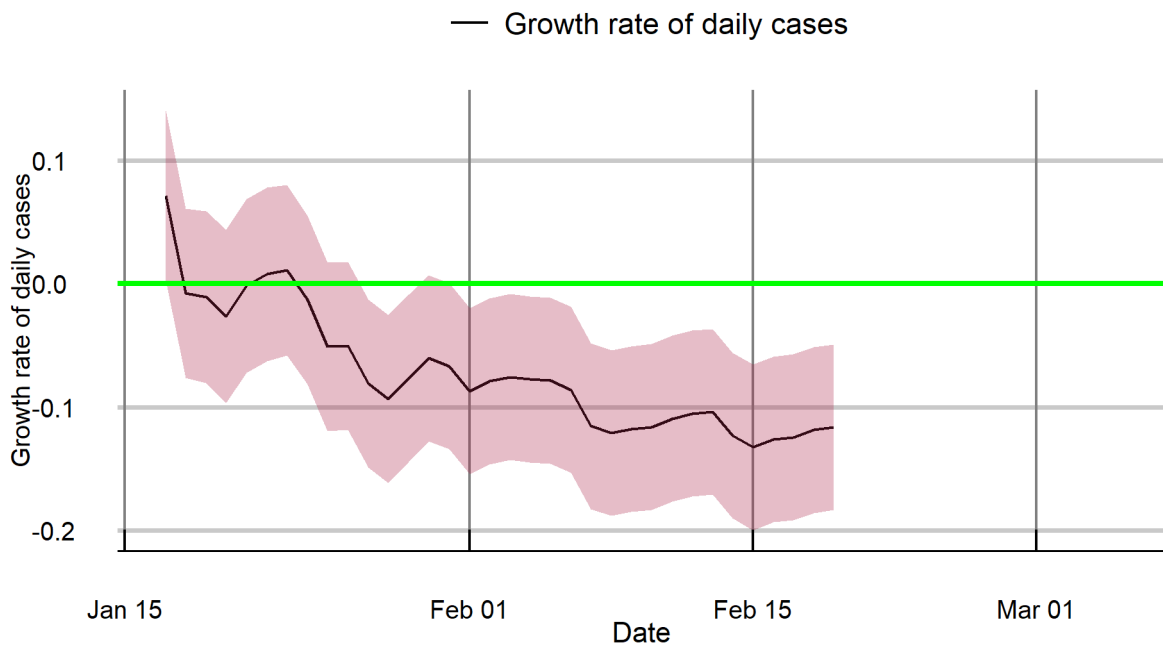
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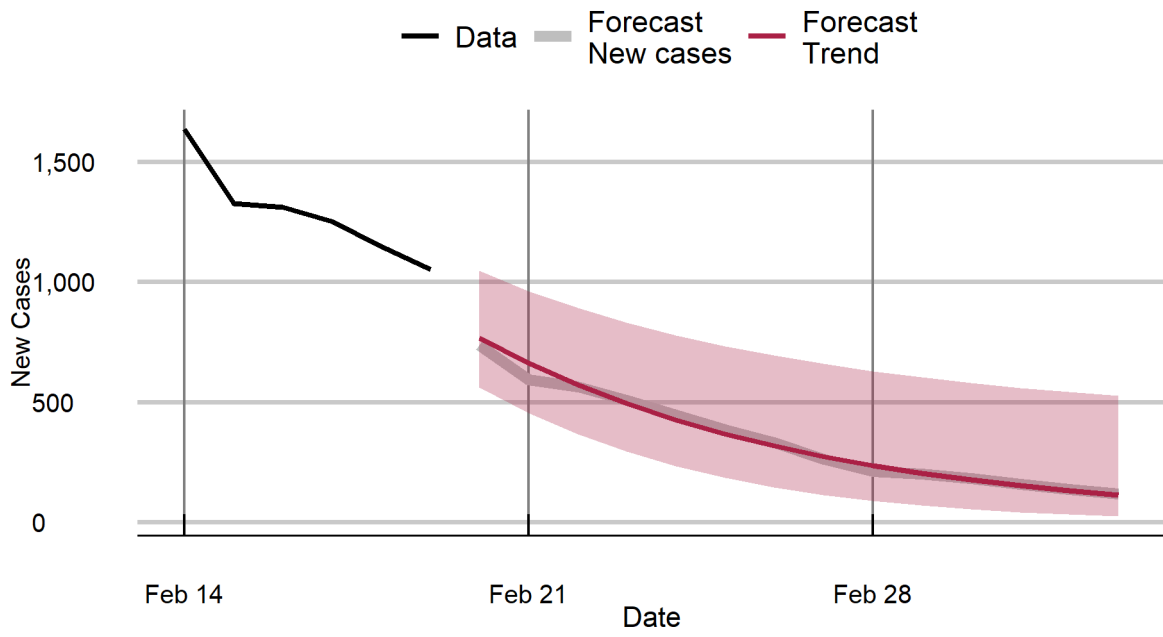
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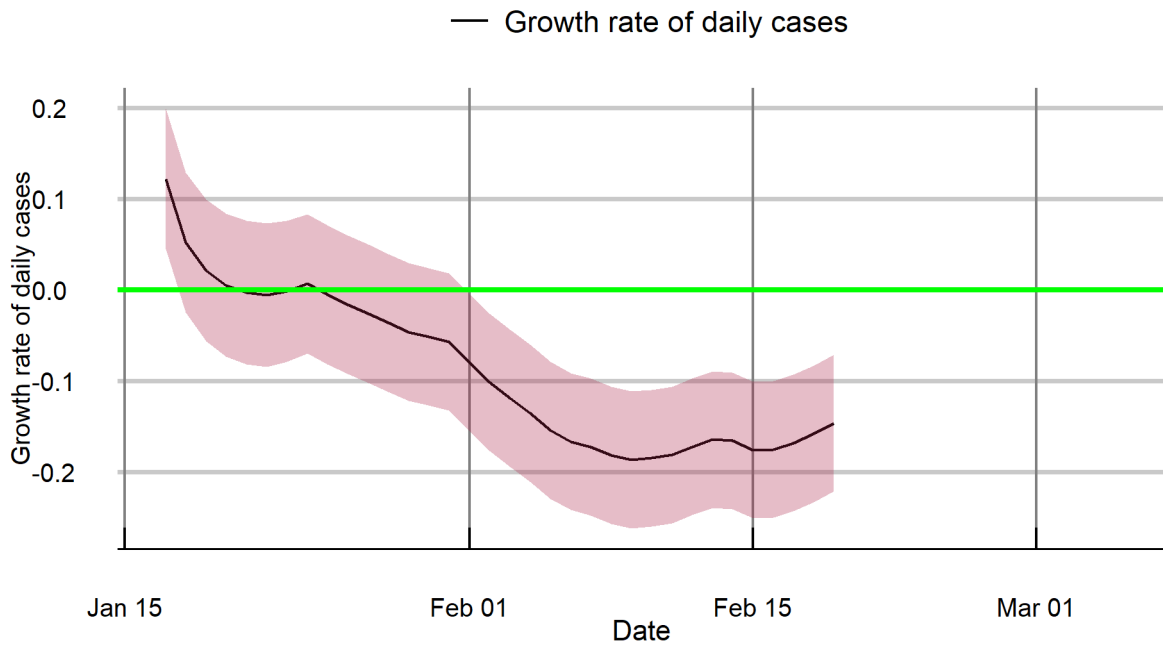
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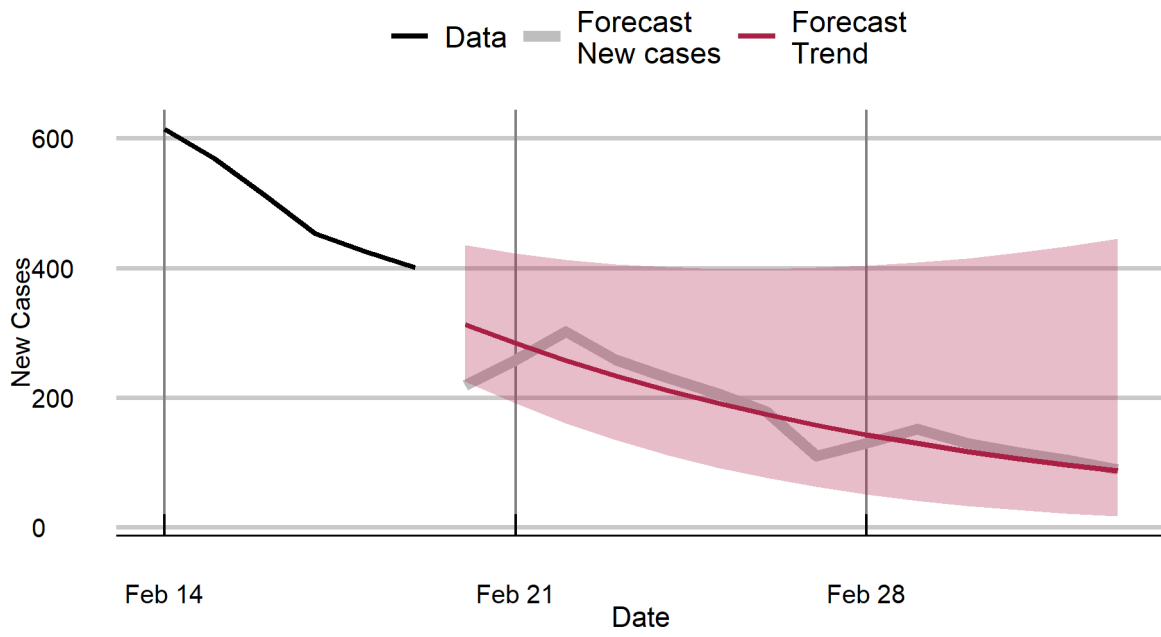
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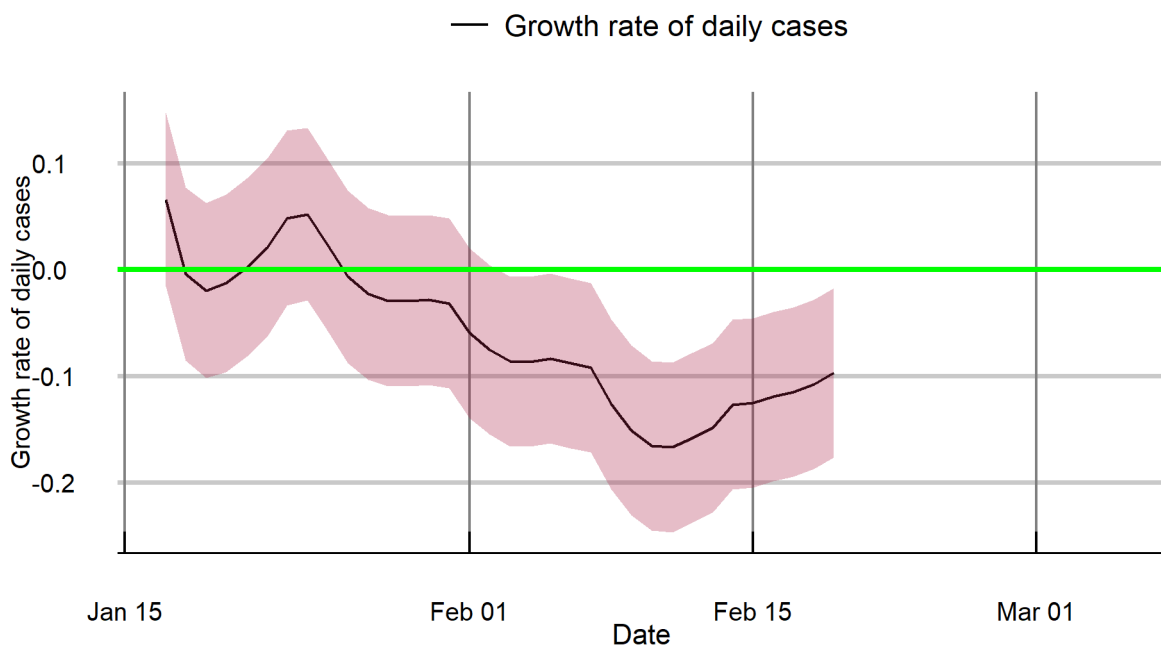
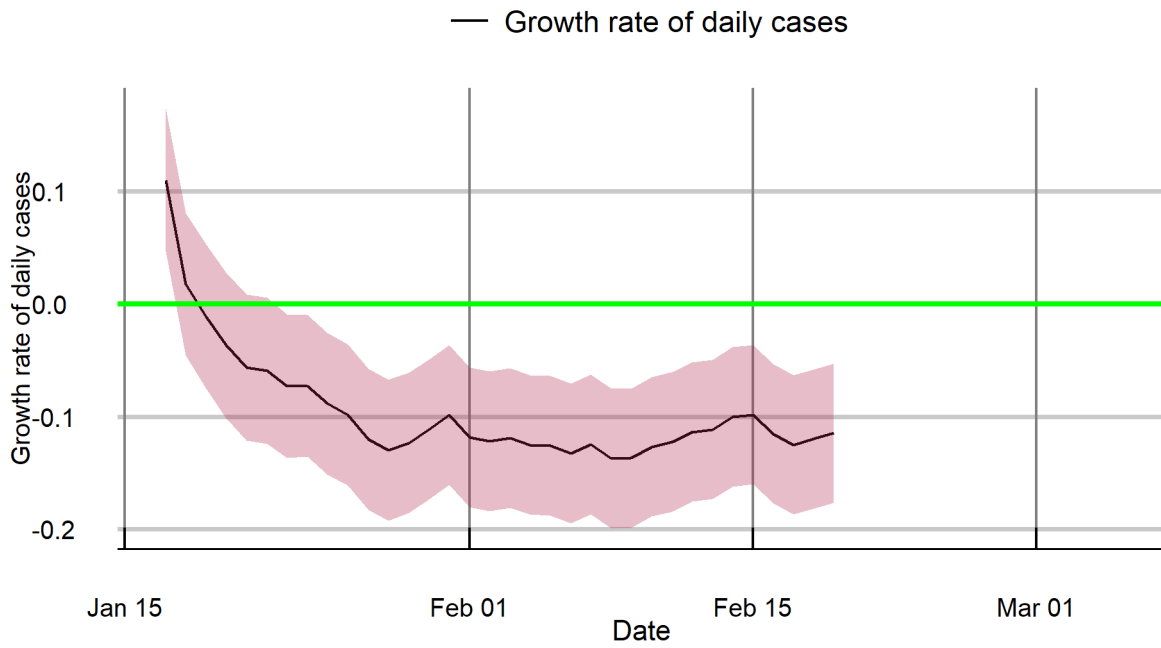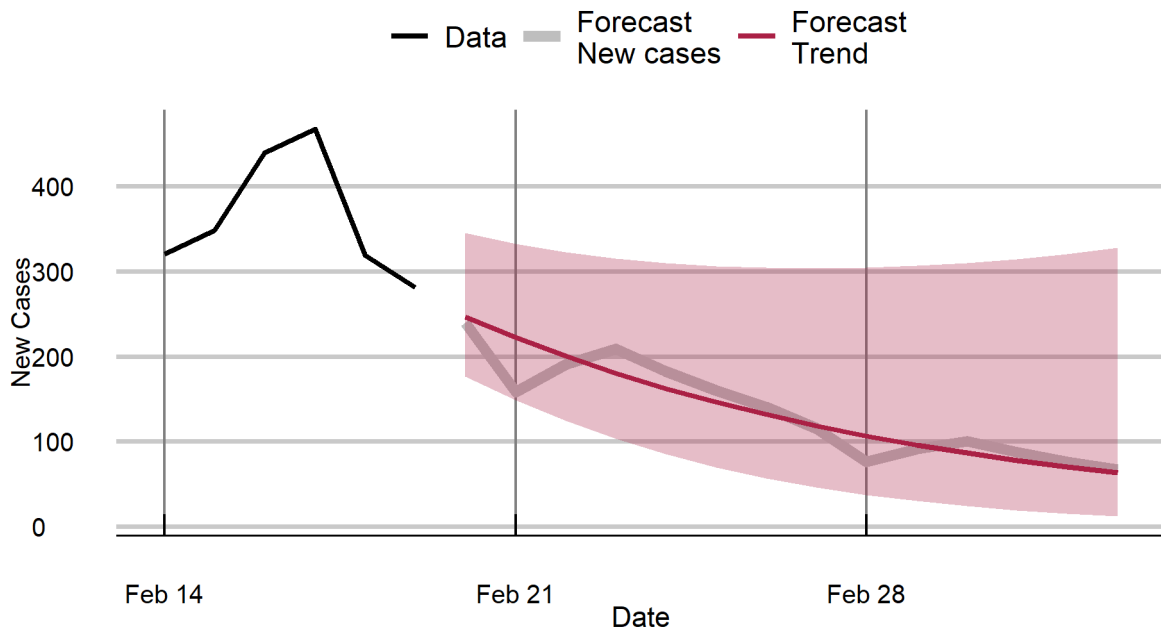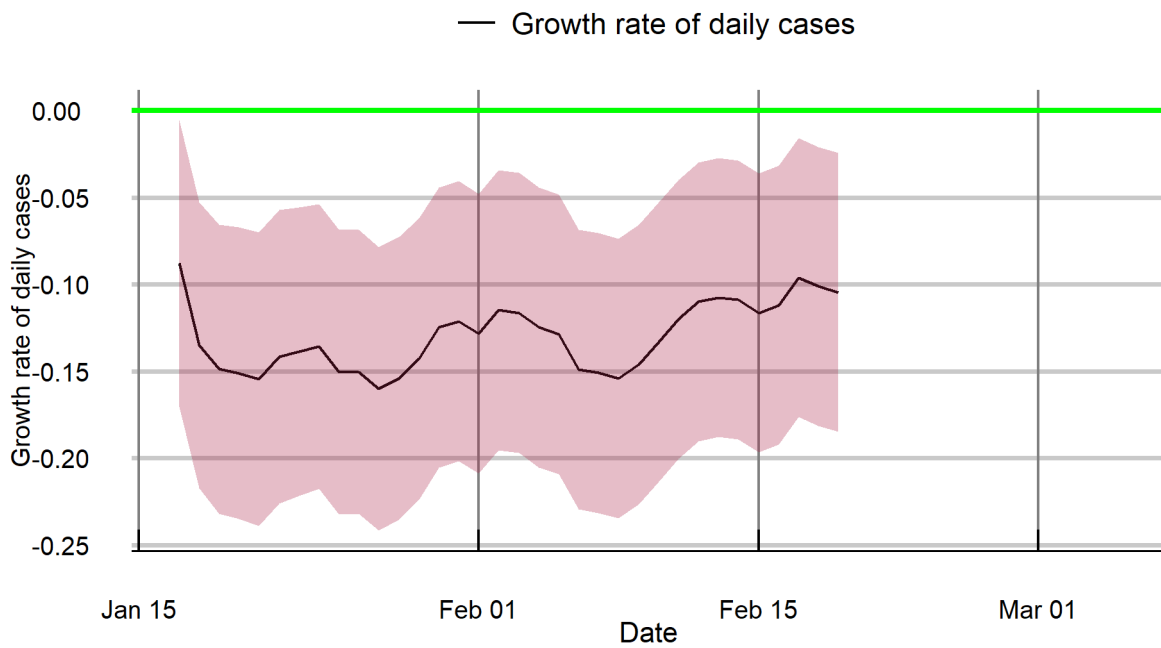## Uttarakhand
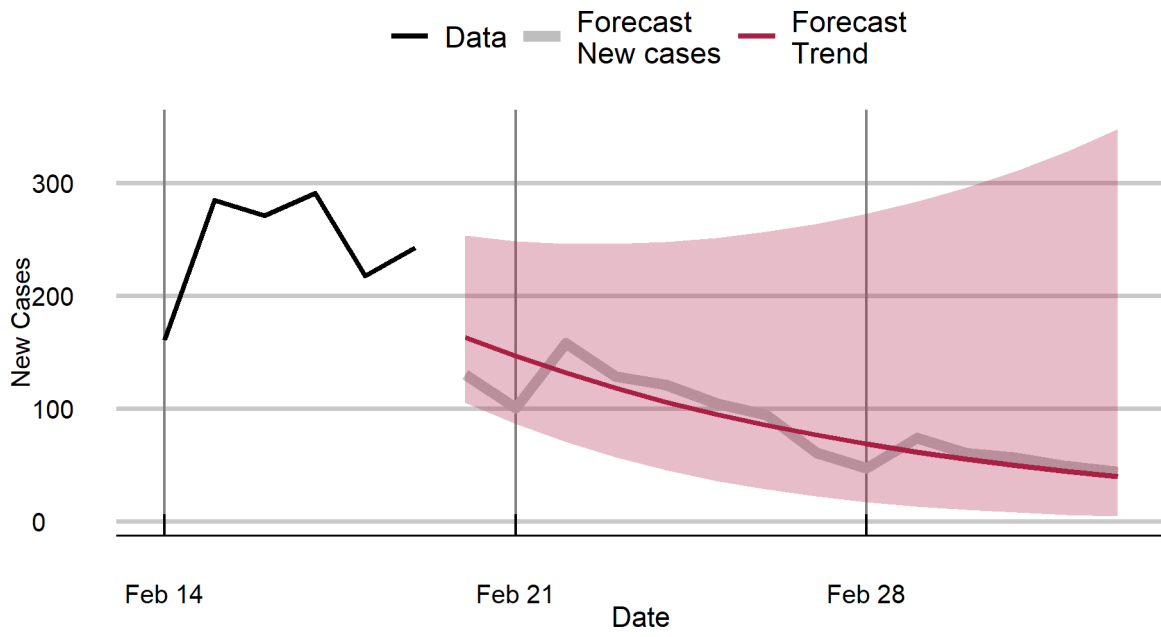
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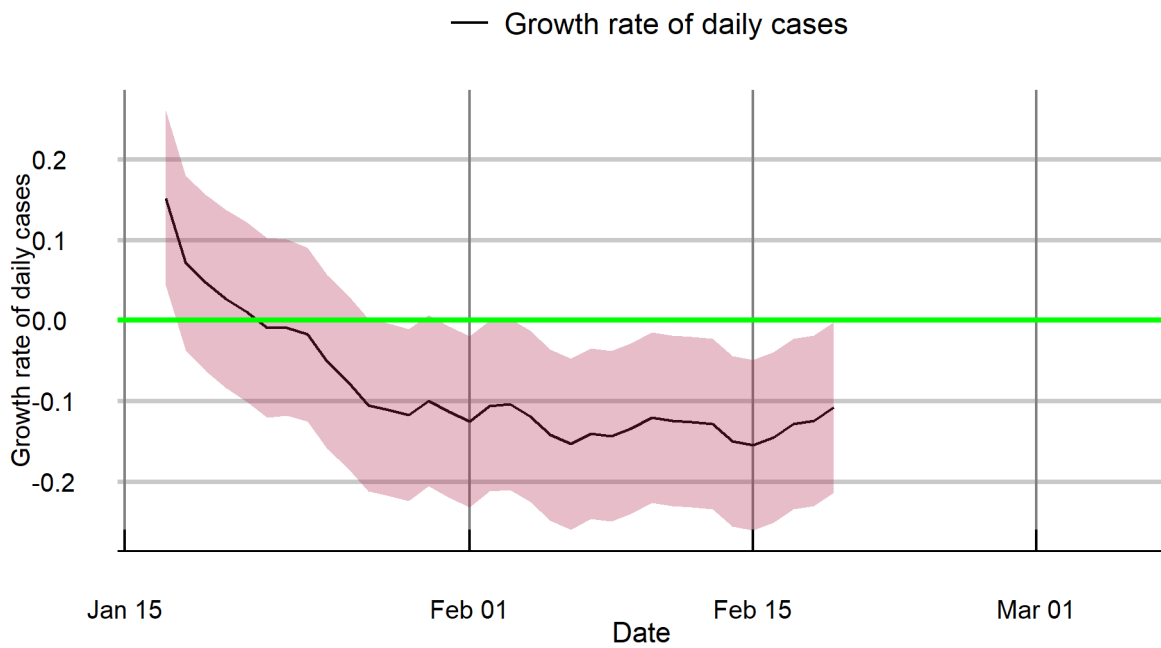
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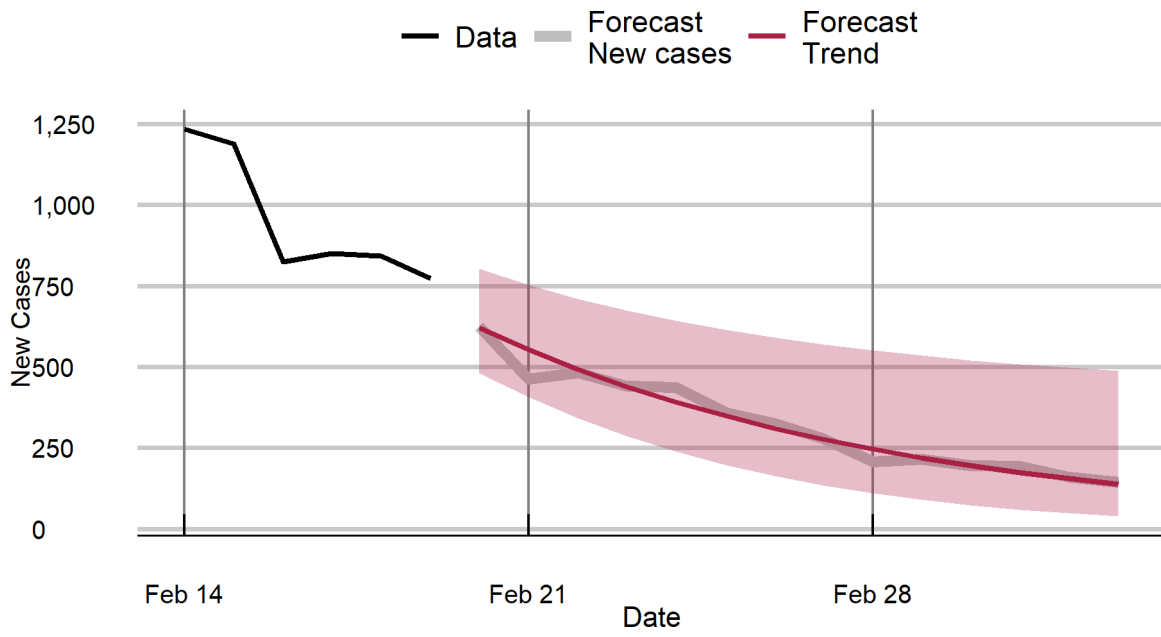
Uttar Pradesh

West Bengal

West Bengal

Notes

This tracker was developed by researchers at Cambridge Judge Business School and National Institute of Economic and Social Research, working with Health Systems Transformation Platform in India, as part of a pandemic monitoring series devoted to India and its states and union territories. It provides short term forecasts of the trajectory of the pandemic, identifying states and union territories that are at risk of increases in infection incidence.

Data: COVID-19 confirmed cases data are sourced from Johns Hopkins University (JHU), Center for Systems Science and Engineering (CSSE) and COVID19-Bharat API.

New cases: forecasts. Forecasts above are based on a structural time series model that uses all the data in estimation but adapts to the trend emerging in the most recent period.

The method is described in: Harvey, A. and P. Kattuman (2020). Time series models based on growth curves with applications to forecasting coronavirus. *Harvard Data Science Review*, Special issue 1 - COVID -19. https://hdsr.mitpress.mit.edu/pub/ozgjx0yn/release/2 , and Harvey, A., P. Kattuman, and C. Thamotheram (2021). Tracking the mutant: forecasting and nowcasting COVID-19 in the UK in 2021. *National Institute Economic Review*. 256, 110-126. doi:10.1017/nie.2021.12.

New cases: growth rate. The filtered trends presented for daily growth rates of cases are estimated using the Kalman filter, applied to the observed series. The method filters out day of the week effects and random noise to reveal the underlying signal. Unlike methods such as the moving average, this method adapts the trend to changes in real time and characterises underlying patterns of surges or attenuations that are hidden in the volatile series. The method is described in the papers listed above.

***R*:** The *R*-estimates are based on the nowcast of the growth rate; the estimation approach is described in Harvey, A. and P. Kattuman (2021). A farewell to R: Time series models for tracking and forecasting epidemics. Journal of the Royal Society Interface, 18, 20210179, https://royalsocietypublishing.org/doi/10.1098/rsif.2021.0179. The confidence interval is based on one standard deviation, with coverage of 68%.

Note: The accuracy of forecasts rely on the quality of the published data. Further, changes in government pandemic policies and in transmission relevant social behaviour may lead realised numbers to deviate from forecasts.

Andrew Harvey[*], Paul Kattuman[*], Rajeev Sadanandan[#], Stefan Scholtes[*], Craig Thamotheram[+]

[*]University of Cambridge.
[#]Health Systems Transformation Platform.
[+]National Institute of Economic and Social Research

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