COVID-19 TRACKER: INDIA

16 May 2021
This tracker\(^1\) has been 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 near term forecasts of the trajectory of the pandemic, identifying states and union territories that are at high risk of increases in infection incidence.

The forecasts are based on a structural time series model that uses historical data in estimation but adapts to the trend emerging in the most recent period. The model is described in: Harvey and Kattuman (2021) "Time series models based on growth curves with applications to forecasting coronavirus". *Harvard Data Science Review*, Special issue 1 - COVID -19.

*Newly reported COVID-19 cases in India will likely decline to just under 150,000 per day by the end of May 2021. With few exceptions, Indian states and union territories are now past the peak and entrained on downward trajectories.*

*Trend values of daily cases are forecast to increase significantly in Tripura, Meghalaya, Manipur and Tamil Nadu over the next two weeks. The filtered daily growth rates at the end of the observation period on 16 May imply doubling times of 12 days for Tripura, 13 days for Meghalaya, 19 days for Manipur and 30 days for Tamil Nadu.*

*Following the peak in reported cases, daily deaths attributed to COVID-19 in India appears to have peaked now. The trend value of daily deaths will likely decline steadily to under 3,500 per day by the end of May 2021.*

Mean absolute percentage error of the forecasts in the 9 May tracker of daily cases in India for the week beginning 10 May 2021 is 7.2%.

The accuracy of forecasts rely on the quality of the reported data. Near term changes in government pandemic policies, as well as transmission relevant social behaviour will cause realised numbers to depart from forecasts. Volatility in data, observed in particular for Goa, Himachal Pradesh, Jammu and Kashmir, Mizoram, Nagaland and Sikkim, make forecasts less accurate.

\(^1\) CJBS COVID-19 Tracker for India can be accessed at: [www.jbs.cam.ac.uk/covid-india](http://www.jbs.cam.ac.uk/covid-india)

The companion spreadsheet contains all the estimates and forecasts.

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Forecasts of daily new cases for the period May 17 to 30, 2021, based on data till 16 May 2021.

The filtered trend in the growth rate of daily new cases. Final date: 16 May 2021.
India: Forecasts of daily deaths
17 to 30 May, 2021

Data, Forecast Trend, Forecast
$R_t$ : as on 16 May 2021
Dadra and Nagar Haveli

**New Cases**

- Data
- Forecast New cases
- Forecast Trend

**Growth rate of daily cases**

- Growth rate of daily cases

Date:
- Apr 15
- May 01
- May 15
- Jun 0
Madhya Pradesh

New Cases

Date

Apr 15  May 01  May 15  Jun 0

10,000
5,000

Data  Forecast  New cases  Trend

Madhya Pradesh

Growth rate of daily cases

Apr 15  May 01  May 15  Jun 0

0.15
0.10
0.05
0.00
-0.05
Maharashtra

- Data
- Forecast New cases
- Forecast Trend

New Cases

Apr 15 | May 01 | May 15 | Jun 0

Growth rate of daily cases

Apr 15 | May 01 | May 15 | Jun 0
Odisha

- Data
- Forecast New cases
- Forecast Trend

New Cases

15,000
10,000
5,000

Date

Apr 15  May 01  May 15  Jun 01

Odisha

Growth rate of daily cases

0.20
0.15
0.10
0.05
0.00

Date

Apr 15  May 01  May 15  Jun 01
Uttarakhand

- **Data**
- **Forecast**
  - New cases
  - Trend

### New Cases

<table>
<thead>
<tr>
<th>Date</th>
<th>April 15</th>
<th>May 01</th>
<th>May 15</th>
<th>June 0</th>
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<tbody>
<tr>
<td>Cases</td>
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### Growth Rate of Daily Cases

- **Growth rate of daily cases**

<table>
<thead>
<tr>
<th>Date</th>
<th>April 15</th>
<th>May 01</th>
<th>May 15</th>
<th>June 0</th>
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<tbody>
<tr>
<td>Rate</td>
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Notes

Data: COVID-19 confirmed cases and deaths data are sourced from COVID19-India API: https://api.covid19india.org/


Forecast accuracy: When estimated with data up to May 2, the mean absolute percentage error of the forecasts for the 7 day period, May 3-9, is 6.1%. Forecast accuracy will in general be lower for the smaller states / union territories. It is important to pay attention to the confidence interval around the forecasts. The coverage of the confidence interval presented is 68%, implying there is 16% probability of the upper bound being exceeded.

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.


The quality of forecasts rely on the quality of the published data. Further, near term changes in government pandemic policies, as well as transmission relevant social behaviour will realised numbers to depart from forecasts.

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