COVID-19 TRACKER: INDIA

13 June 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 short term forecasts of the trajectory of the pandemic, identifying states and union territories that are at 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.

As of 12 June 2021, the estimated Reproduction number (\(R_t\)) for India stood at 0.81. Newly reported COVID-19 cases are likely to decline to about 37,000 per day by 26 June 2021.

The daily reported cases are in rapid decline in all Indian states and union territories. The trend value of the daily growth rate of cases was -5.2% as of 12 June 2021. This implies that reported new cases can be expected to halve in 13 days, under the assumption that the growth rate remains constant.

There are indications that the growth rates of cases, though still negative, have reversed direction from their downward paths in recent days in Chandigarh, Delhi, Goa, Haryana, Kerala, Maharashtra, Meghalaya, Rajasthan, Uttarakhand and Uttar Pradesh.

Mean absolute percentage error of the forecasts of daily cases in India given in the 6 June tracker, for the week beginning 7 June 2021, is 5%. The accuracy of forecasts rely on the quality of the reported data. Changes in government pandemic policies and in transmission relevant social behaviour may cause realised numbers to depart from forecasts. Data have been volatile for Chandigarh, Haryana, Meghalaya and Sikkim, making their forecasts less accurate.

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\(^1\) 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 13 June 2021 to 26 June 2021, based on data till 12 June 2021. New COVID-19 cases is likely to decline to about 36,000 per day by 26 June 2021.

The filtered trend in the growth rate of daily new cases. Final date: 12 June 2021.
Bar chart shows point estimates of $R_t$ and the ±1 standard deviation confidence intervals.
Daily Cases forecast: States and Union territories

Andhra Pradesh

- Data
- Forecast New cases
- Forecast Trend

New Cases

May 17 | May 24 | May 31 | Jun 07 | Jun 14 | Jun 21 | Jun 2

Growth rate of daily cases

- Growth rate of daily cases

May 17 | May 24 | May 31 | Jun 07 | Jun 14 | Jun 21 | Jun 2
Arunachal Pradesh

- Data
- Forecast New cases
- Forecast Trend

New Cases

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Arunachal Pradesh

- Growth rate of daily cases

Growth rate of daily cases

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Puducherry

New Cases

May 17  May 24  May 31  Jun 07  Jun 14  Jun 21  Jun 2

Growth rate of daily cases

Growth rate of daily cases

May 17  May 24  May 31  Jun 07  Jun 14  Jun 21  Jun 2
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 June 6, the mean absolute percentage error of the forecasts of cases for India over the period, June 7 – 12, is 7.9%. Forecast accuracy will in general be lower for the smaller states / union territories. It is important to pay attention to the confidence intervals around the forecasts. The coverage of the confidence intervals 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.

R: The R-estimates are based on the nowcast of the growth rate; the estimation approach is described in Harvey, A. and P. Kattuman (2020b). A farewell to R: Time series models for tracking and forecasting epidemics. Center for Economic Policy Research (CEPR) working paper, 51. https://cepr.org/content/covid-economics. The confidence interval is based on one standard deviation, with coverage of 68%.

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.

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