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Information flow and COVID-19 recovery

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**Abstract**

This study examines whether the flow of information pertaining to COVID-19 helps to contain the pandemic. We capture the information flow of the pandemic using the Google Search Volume Index for the keyword 'coronavirus+covid' in 33 states and union territories in India. We find that the information flow is inversely related to positive cases reported in these regions. This result suggests that internet inclusion is a relevant factor in the fight against the pandemic.

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1. Background

The novel coronavirus (COVID-19) outbreak in China at the end of 2019 has spread widely across the world and infected more than 12.3 million people by 10th July 2020. As a response, several governments have declared lockdowns and adopted strict social distancing and quarantine measures. On the one hand, these measures are crucial for slowing transmission of the pandemic; on the other hand, these measures have had severe economic consequences (see, for instance, IMF, 2020; McKibbin & Fernando, 2020; Sumner, Chris, & Eduardo, 2020). The economic loss due to the pandemic is a function of how quickly the economy recovers and restarts its productive activities. Since the COVID-19 vaccine is not yet developed, the ideal strategy to contain the pandemic is through the proliferation of information pertaining to the coronavirus among the public and make them aware of the precautionary measures. As a result, governments all over the world and other institutions released online information to cope with the crisis.

India is not an exception. Since the first case reported in January, both state and central governments initiated various measures to tackle the spread of COVID-19. On 24th March 2020, the government declared a nationwide lockdown for 21 days; later, it was extended till May end. Despite these efforts, India is still fighting to contain its spread as the number of affected cases continues to rise. As of 10th July 2020, India registers 793,802 confirmed COVID-19 cases, out of which there are 276,682 active cases, 21,604 deaths, 495,515 cured cases, and 1 migrated case. The states which report the highest number of active cases are Maharashtra, Tamil Nadu, Delhi and Karnataka while the northeastern states are least affected.\textsuperscript{1} To contain the pandemic, various initiatives have been undertaken by the government through online platforms to make people aware of the symptoms and preventive measures. For instance, the government introduced a COVID-19 tracking mobile application (known as ‘Arogya Setu’) which has over 75 million installs.

2. Information flow and recovery from COVID-19

In this article, we examine whether the information flow through online platforms helps in containing the spread by raising public awareness. For this purpose, we examine the relationship between the number of new cases reported and the information flow on COVID-19. To capture the information flow, we rely on the Google Search Volume Index (GSVI) for the keyword 'coronavirus+covid' in each state of India. GSVI contains useful information about individuals’ interest and attention, considering the growing access to the internet through mobile devices (Narita & Yin, 2018). The Google trend data has also been used in previous studies for the surveillance of disease outbreaks (Carneiro & Mylonakis, 2009).

2.1. Data

We use the data of 33 units (28 states and 5 union territories) for the period ranging from 1st April to 07th July 2020.\textsuperscript{2} The choice of the study period is based on the availability of data. We gather

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\textsuperscript{1} Visit https://www.mohfw.gov.in/#state-data for current Covid-19 status in India.
\textsuperscript{2} Three Union territories (Dadra & Nagar, Daman & Diu and Ladakh) are not included in our analysis due to unavailability of data.
information on the number of confirmed cases, the number of tests conducted, and the population from https://api.covid19india.org/; and GSVI from https://trends.google.com/. Rather than using raw GSVI, we employ its moving average of 14 days. Therefore, it captures the average information flow of the pandemic for the last 2 weeks.

2.2. Findings

We present our estimation results in Table 1. We regress the number of new cases on the information flow along with control variables. The control variables include the previous day’s confirmed case, the total number of COVID-19 tests and the population (in log). In addition, to capture the state-specific effects, we also include state dummies in our model. The estimation results posit that coefficient of lagged GSVI is negative and statistically significant at 5 percent level. This result indicates that if the information is penetrating more, then it may help people to undertake necessary safety measures and can prevent the spread of the novel coronavirus. This finding suggests that the flow of COVID-19 related information through the internet might be an effective containment strategy against the pandemic.

3. Final remarks

Despite the nation-wide lockdown and lockdowns based on containment zones, the number of COVID-19 cases is still rising in India. In such a situation, using digital platforms to spread awareness about COVID-19 is one of the appropriate strategies that will complement the other containment measures of government. A corollary, internet inclusion is a relevant factor in the fight against the pandemic. We recommend the government to design policies to improve internet access among people.

Conflict of interest

The authors declare no actual or potential conflict of interest including any financial, personal or other relationships with other people or organizations within three years of beginning the submitted work that could inappropriately influence, or be perceived to influence, our work.

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| VARIABLES | Dependent Variable |
|-----------|-------------------|
|           | Confirmed cases    |
| GSVI<sub>t-1</sub> | -0.315** (0.134) |
| Confirmed cases<sub>t-1</sub> | 0.973*** (0.027) |
| Tests per thousand<sub>t</sub> | 0.579 (0.418) |
| Population<sub>t</sub> | 6.64** (3.064) |
| Constant | -93.35** (48.7) |
| State dummies | Yes |
| R-squared | 0.97 |
| Observations | 2395 |

Note: This table shows the relationship between information flow and recovery from COVID-19. The information flow regarding the pandemic is captured by the Google Search Volume Index (GSVI) of keyword coronavirus+covid. We employ the 14-days moving average of GSVI in the analysis. The (log of) population projection of the National Commission on Population is used. Robust standard errors in parentheses. **p < 0.01, *p < 0.05.