

COVID-19: Identifying hotspots, breaking chain of transmission key for lockdown timeline

Newer tests to considerably reduce time taken to detect positive cases

- With India under a three-week lockdown amid the global COVID-19 outbreak, we hosted a discussion with Padma Shri Dr Raman Gangakhedkar, Scientist 'G' & Head, Epidemiology and Communicable Diseases-I (ECD-I) Division at the **Indian Council of Medical Research (ICMR)**, to understand the current COVID-19 situation in India and the approach undertaken to control the outbreak.
- Identifying hotspots (areas with a high density of COVID-19-positive cases) would be a critical determiner of whether the lockdown would be lifted at the national/regional level.
- Community transmission has been curtailed in the country due to the disease being imported and the government's current strategies proving effective in controlling the outbreak.
- Antibody-led testing would considerably improve the pace of testing, which would be beneficial from an industrial perspective as well. Furthermore, kits are currently being validated that would reduce the testing time to 15-20 minutes.
- Breaking the chain of transmission, either through isolating COVID-19-positive patients or religiously following social distancing, remains the key priority until there is a breakthrough in vaccine development.
- **Current status in terms of number of tests and infection spread**
Till date, around 84,739 tests have been conducted in India. Results indicate nearly 3,349 people have been infected thus far and 83 have died (as of 5th April 2020). The testing capacity of government labs is about 10,000 per day for 132 labs spread across India. 56 private labs, with a cumulative reach to 16,000 collection centers, have been approved.
- **Rationale behind Indian government's implementation of lockdown**
China declared its first COVID-19-positive case on 30th Dec'19. On 17th Jan'20, the Government of India, ICMR, and related agencies commenced discussions to formulate a strategy to control the outbreak in India. The first step was to initially implement travel restrictions on foreign nationals. The government also stopped issuing e-visas and visas. Moreover, isolation facilities were set up for foreign nationals, and due care was taken to conduct the test and carry out the subsequent diagnosis. COVID-19 symptoms, rather than mass testing, were among the key measures used to identify positive cases in the country. Considering that Indians who had returned from abroad had landed in different states, it was concluded that the threat of a potential outbreak could only be controlled through a lockdown.
- **Thoughts on lockdown timeline**
Continuous efforts are being undertaken to track and isolate areas with a higher density of COVID-19-positive cases (hotspots) across India. Lifting the lockdown nationally/locally would depend largely on these hotspots and people's willingness to voluntarily observe social distancing norms.
- **Factors curtailing community transmission**
COVID-19 is an imported disease. Also, it has largely infected people with a travelling history and those who have come in contact with these people. There are no signs yet to indicate that community transmission has occurred. While a recent gathering has posed a challenge, there is no conclusive evidence that suggests the number of districts affected due to this have caused community transmission.



Padma Shri Dr Raman Gangakhedkar, Scientist 'G' & Head, Epidemiology and Communicable Diseases-I (ECD-I) Division, ICMR

Dr. Gangakhedkar heads the division at ICMR, advising the Indian government on the COVID-19 outbreak. In fact, he played an instrumental role in the Zika Virus isolation in 2018 and arresting the Nipa Virus outbreak in 2019 in India.

He has been conferred with the title of Padma Shri for his path breaking work in science and engineering.

Indian Council of Medical Research (ICMR) is the apex body in India for the formulation, co-ordination, and promotion of biomedical research. It is among the oldest medical research bodies in the world.

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- **Thoughts on current volume of tests being administered**

Currently, the government has placed an order for ~5m antibody tests. India is currently equipped with 3.4m PCR tests. The size of the outbreak is controlled due to the proactive steps undertaken by the government and security forces. As we have a limited supply of tests, the strategy currently is to only test those people with potential symptoms rather than testing everybody. A fever and cough are common symptoms of influenza. Hence, every person with a cough and fever being tested for COVID-19 would have caused a panic among the masses. Also, even if diagnosis is carried out, the therapeutic treatment is yet to be established. Hence, breaking the chain of transmission is of utmost importance. This could only be done by observing social distancing, ensuring that people stay at home and follow physical distancing at the workplace.

- **On whether other modes of testing, barring antibody and/or antigen, have proved effective**

One of India's research organizations is currently working on kits that could provide test results within 15–20 minutes. These tests could be administered outside the laboratory as well. The test has already been developed, and ICMR is in the process of validating it. Once approved, manufacturers would be given the samples to supply these kits. The assay test developed by Abbott can be self-administered at home or administered in a laboratory in the shortest possible time.

- **Thoughts on seasonality, herd immunity, and the BCG vaccine**

There is no conclusive evidence that seasonality controls the spread of the virus. If a large proportion of the population, say ~40%, was immune from the infection, then the infection would automatically begin to die down. The current evidence does not indicate herd immunity is helping to curb the outbreak. BCG vaccines are a far-fetched approach.

- **India's strategy v/s that of China and Korea**

- China's model was too aggressive and would be difficult to implement in a democratic country such as India. In Korea, the outbreak was observed in a group of people, who were able to be quarantined easily when attending a program at a church. The country also carried out mass testing, which helped the country isolate COVID-19-positive cases.
- In India, people coming from abroad had travelled to different states and were spread out in the country. Hence, curbing the spread was far more challenging. For this reason, implementing a lockdown was deemed the need of the hour.

- **Potential timeline to develop a drug that could treat COVID-19**

If the lockdown is followed dutifully, there may be no need for a cure, at least in this cycle, as we could successfully delay the peak. This will leave us with considerable time to develop the cure/treatment.

- **Potential timeline of COVID-19 curve**

It is difficult to gauge people's behavior in a lockdown, a rare step taken to curtail the outbreak. Over the next three weeks, the number of COVID-19-positive cases that emerge would help us understand whether the lockdown would continue at the national/regional level.

- **HCQS / Chloroquine phosphate as potential drugs to treat COVID-19**

HCQS is less toxic than chloroquine phosphate. Evidence from laboratory studies indicates this works well against COVID-19. But, the outcome of human clinical trials on a large scale needs to be observed before reaching any conclusion.

- **Potential timeline for creation of vaccines to treat COVID-19**

Thirty vaccines are in the development stage across the world. India has not done major work in the area as the outbreak was observed in India almost a month after it was in other countries. Three vaccines have moved to animal toxicity studies. They would be undergoing human clinical trials, which would take some time, even after considering that the process is being fast-tracked.

- **Availability of real-time data**

Data is available in real time. It is being shared at regular intervals.

- Thoughts on mass migration that occurred leading to higher risk of transmission**

The key point to note is the migrants were not travelling outside the country. Furthermore, contact tracing has been very high in these migrants even at a district level. Furthermore, they likely had minimal or no contact with others as they largely used highways to travel, thus lowering the risk of transmission.
- Thoughts on availability of ventilators**

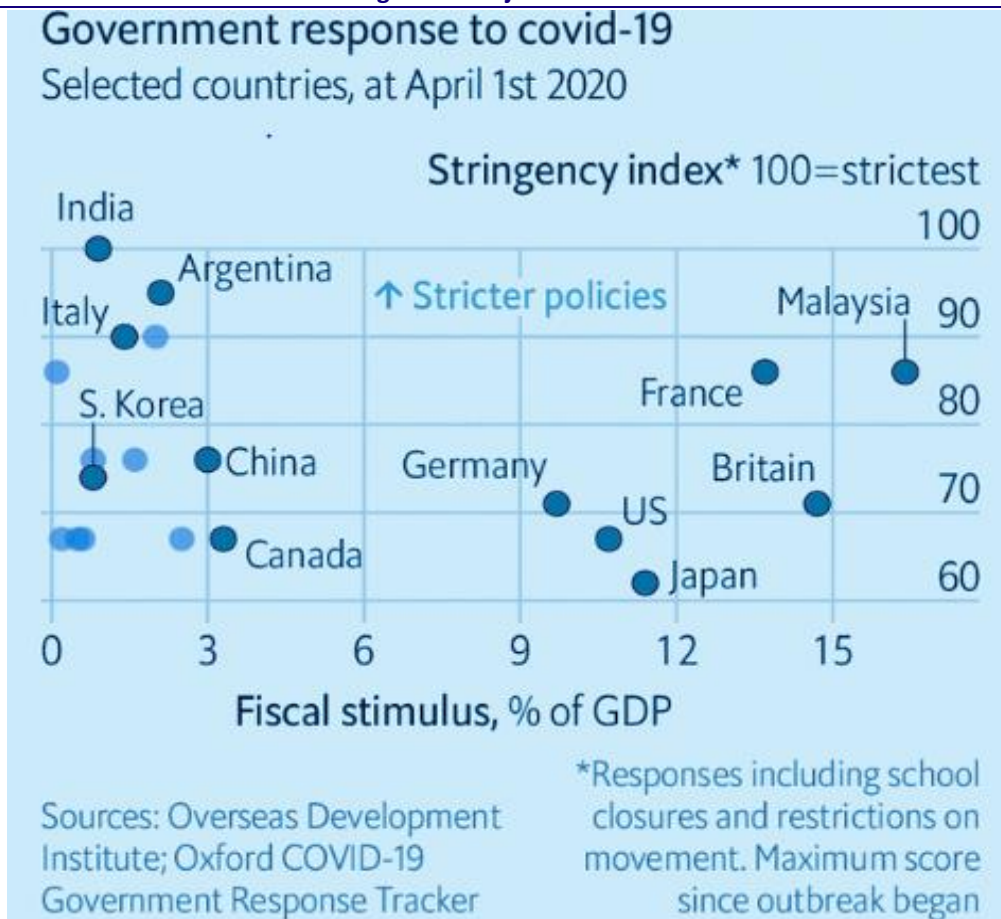
This is a cause for concern given the size of the country. Bharat Electronics is expected to supply 30K ventilators (10K would be supplied immediately and 20K in a month's time). Steps are being undertaken to ensure the availability of ventilators / ICU beds in large metropolitan cities as well as high-density areas.
- Nature of disease observed in India – S-type or L-type**

If the disease is S-type, the infection tends to be slow, and if the infection is L-type, the infection is considered severe and highly transmissible. ICMR has done considerable work in this area. Interventions and community response have been more important than classifying the disease. Essentially, three types have been observed in India. An interesting quality of the virus is that it does not tend to kill the host, given that it needs to survive. Thus, progressions are such that the virus may become more transmissible, but less pathogenic for its own survival from a long-term perspective.
- On loss of smell being an early indicator in identifying a hotspot**

Loss of smell is also a symptom of influenza, and it is a very crude marker. Also, different people are sensitive to different smells. Thus, antibody tests, which are far more objective, are preferred.
- Standard operating procedures (SOPs) to be followed for COVID-19-positive cases**

ICU management is critical, and hospitals need to be given a sufficient number of ventilators to combat the virus. Additionally, HCQS and azithromycin should continue to be provided in the first line of treatment. The booster lopinavir is an alternate regimen. If an effective drug is found or developed through the recent studies conducted, ICMR would be quick to adopt it.

Exhibit 1: India has taken the strictest action among all the major countries



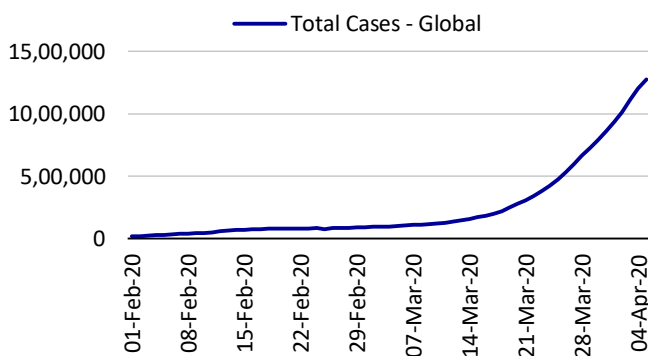
Source: The Economist

Exhibit 2: COVID-19 cases have spread aggressively in the US and Europe

Country	Total Cases	Total Active Cases	Total recovered	Total Deaths	Deaths/1 M Population
USA	336,673	309,080	17,977	9,616	29
Spain	131,646	80,925	38,080	12,641	214
Italy	128,948	91,246	21,815	15,887	218
Germany	100,123	69,839	28,700	1,584	11
France	92,839	68,578	16,183	8,078	62
China	81,708	1,299	77,078	3,331	2
Iran	58,226	34,887	19,736	3,603	38
UK	47,806	42,737	135	4,934	35
Turkey	27,069	25,453	1,042	574	3
Switzerland	21,100	13,970	6,415	715	58
India	3,219	2,862	274	83	0.0006

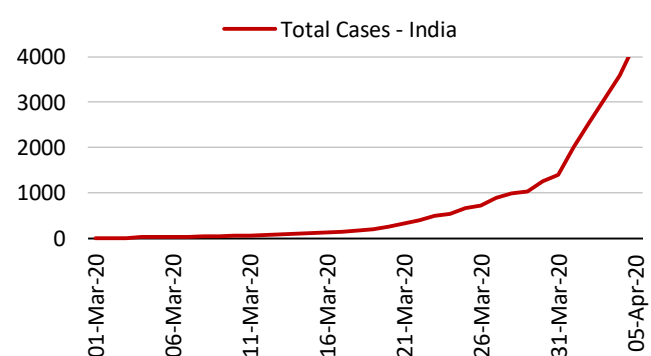
Source: Worldometers.info, Government of India

Exhibit 3: Global cases have crossed 1.2m



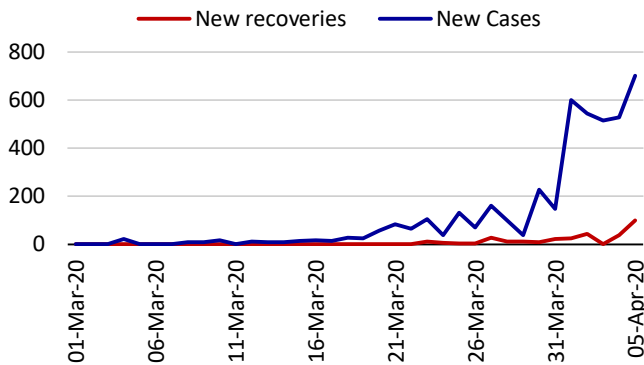
Source: Worldometers.info

Exhibit 4: Cases in India also on the rise



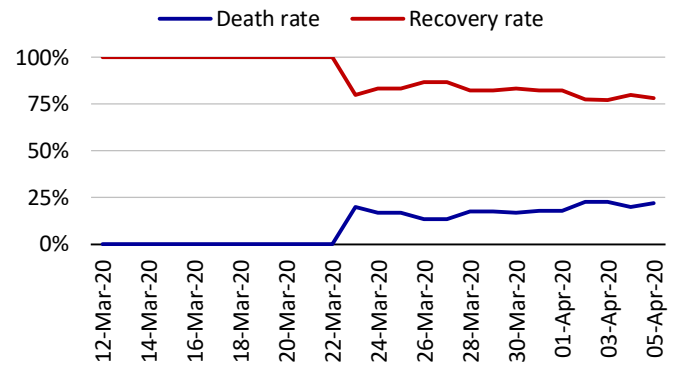
Source: Worldometers.info

Exhibit 5: New cases spiked in India in late March



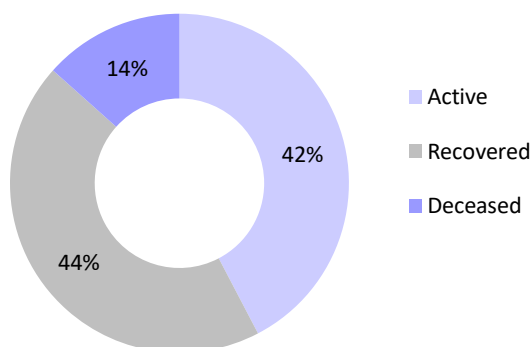
Source: Worldometers.info

Exhibit 6: Death rate at ~2.6% of total cases in India



Source: Worldometers.info

Exhibit 7: Positive cases have reached ~3,000 mark in India



Source: Ministry of Health and Family Welfare, GoI

Exhibit 8: Number of cases has spiked due to testing

State	Confirmed	Active	Recovered	Deceased
Delhi	503	478	18	7
Maharashtra	490	429	42	19
Tamil Nadu	485	476	6	3
Kerala	306	255	49	2
Telangana	269	230	32	7
Uttar Pradesh	227	206	19	2
Rajasthan	200	179	21	-
Andhra Pradesh	190	188	1	1
M.P.	165	156	-	9
Others	742	293	87	33
Total	3,577	3,219	275	83

Source: Ministry of Health and Family Welfare, GoI