MUTATION OF COVID 19 SURGE IN INDIA: A CASE STUDY

Pradeesh A[1]* Ganeesh A[2]

1. Field Service Associate, Bio-Rad Laboratories, Chennai-600017
2. Lead Service Engineer, Cadence India Pvt Ltd, Bengaluru-560086
**Corresponding author: pradeeshkadirur@gmail.com*

Abstract

On 26 April India saw the highest daily tally of new SARS-CoV-2 infections ever recorded in the world, 360 960, taking its pandemic total to 16 million cases, second only to the US, and more than 200 000 deaths. The devastating second wave comes a year after the country imposed one of the most rigid lockdown restrictions in the world—and just three months since its health ministry declared that infections and mortality were at an all-time low.

INTRODUCTION

In some of the most badly hit states, like Delhi and Maharashtra, community transmission was so rampant that there have been several localised waves. Media reports have blamed lax social distancing and mask wearing, alongside mass political rallies for recent elections and religious events such as the Kumbh Mela, in which hundreds of thousands of Hindus gather at the Ganges river. Malls and theatres opened; there were sporting events, elections, and religious events. Politicians even made the unsupported claim that India had beaten the pandemic.

1.1 What is causing India's second wave, and why is it so much worse than the first?

The government was easing restrictions by what seemed to be the end of the first wave Malls and theatres opened; there were sporting events, elections, and religious events. Politicians even made the unsupported claim that India had beaten the pandemic [1]. A report published in the International Journal of Infectious Diseases in December 2020 concluded that the transmission rate fell significantly during the first lockdown but warned that lockdown was only a temporary measure to quell outbreaks [2]. The authors recommended ramping up testing and self-isolation to prevent secondary infections, yet India's testing rate remains among the lowest in the world. Comparisons are difficult, as India doesn't release daily test numbers for the country as a whole, but the health ministry said that a total of 1.75 million samples had been PCR tested by 27 April. The UK performs 500 000 PCR tests a day [3]. Then there is India's health infrastructure, already troubled before the pandemic and now overwhelmed. On 11 May 2020, soon after the first lockdown was lifted, the government's policy thinks tank NITI Aayog analysed the country's covid-19 response [4]. It found a severe dearth of medical equipment such as the testing kits, PPE, masks, and ventilators. It also noted the long running shortage of emergency healthcare and lack of professionals: the ratio of doctors to patients was recorded as 1:1445 and of hospital beds to people 0.7:1000, with a ventilator to population ratio of 40 000 to 1.3 billion. In the latest crisis, medical supplies and oxygen are being shipped in from 15 countries and international aid organisations such as Unicef. It was estimated that India would need about 500 000 ICU beds and 350 000 medical staff in the next few weeks. At present it has only 90 000 ICU beds, almost fully occupied [5]. India is also

struggling to vaccinate its population of 1.36 billion, despite boasting one of the largest pharmaceutical manufacturing capacities in the world [6].

1.2 Why did India's covid-19 infections drop at the start of 2021?

This remains unknown, it was likely to have been the true tapering off of the first wave. He noted that the "test positivity rate was falling by January-February, so we could safely assume that there was a drop in infections. There is a lack of transparency in the figures for infections and mortality too. One hardly knows who is responsible for them. It is definitely dependent on the number of tests done, and in many states, it could be argued that not enough tests were done. However, the numbers of deaths are a more robust indicator, and in the first wave deaths seem to have been less compared with other countries. The second wave is a totally different story. With a reported 16 million infections, the official figures in India are likely to be much lower than the actual numbers. Testing was limited, and so many who weren't tested were admitted [to hospitals]. When these patients die, their deaths are not recorded as covid-19 deaths, death can also occur much later after discharge [7].

1.3 How does the second wave differ from the first?

Earlier, individuals were affected, but today whole families are contracting covid. As the world's second most populous country, and with multigenerational households common, clusters were likely to occur. A study in Lancet Global Health in February indicated that the first wave infected up to 50% of people in urban areas [8]. The second wave seems to be spreading more to rural areas, where people travel far to get to the nearest health centres. In the state of Punjab health records show that over 80% of patients have severe symptoms once they arrive, because of the delays caused by travel [9]. People in the 30–50-year age group who go out to work seem also to be particularly affected by the new wave, at least in New Delhi. Anecdotal reports suggest a distinctly greater number of deaths among younger people this time. But it is not clear yet how much more younger people are being infected, because many may be without symptoms. There have been high profile reports of reinfections. For instance, the chief minister of the southern state of Karnataka, B S Yediyurappa, tested positive for SARS-CoV-2 twice in nine months.

In a study of 1300 people who had tested positive, published in March 2021 in Epidemiology and Infection, the Indian Centre for Medical Research found a reinfection rate of 4.5% [10] with a large proportion of these people having shown no symptoms the first time. Variants first identified in South Africa (known as 20H/501Y or B.1.351), Brazil (P.1), and the UK (B.1.1.7) are circulating in India, alongside a newly identified distinct Indian variant (B.1.617) first identified in October. All are likely to be a factor, but the extent of involvement of each is as yet unknown. The B.1.617 variant has spread rapidly in parts of India. Scientists are concerned about two mutations in B.1.617 (E484K and L452R), which have led it to be dubbed a "double mutant." The Indian SARS-CoV-2 Genomics Consortium (INSACOG), a group of 10 national laboratories, was set up in December 2020 to monitor genetic variations in the coronavirus, particularly B.1.1.7, but the lack of testing and sequencing capacity is hindering efforts. Government data show that India has sequenced

less than 1% of its positive samples, whereas the proportion is 4% in the US and 8% in the UK [11].

1.4 How will the crisis affect India's vaccine rollout?

India launched its vaccine drive on 16 January 2021, mostly relying on Covishield, a version of the Oxford-AstraZeneca vaccine produced by the Serum Institute of India. A smaller number of people get India's domestically developed Covaxin, manufactured by Bharat Biotech [12]. The government had set a target of vaccinating 250 million people by July. So far India has vaccinated about 117 million people, according to Oxford University's Our World in Data, and around 17 million have received the full two doses of a vaccine. The government has stopped exports of Covishield, a decision that has affected vaccine rollouts all over the world, including the global COVAX initiative. Reports allege that the government has approved a $610m (£440m; €503m) grant for the Serum Institute of India and Bharat Biotech to ramp up production in the days ahead, which some critics said should have been done before the second wave [14]. Approval and import of other vaccines have been slow, with the likes of Pfizer facing requests for further domestic clinical trials. The government could have allowed more vaccines to be imported, for the large segment of the urban population who may be willing to pay the price. It would ease the pressure on the public infrastructure, which is under great strain. In the face of the crisis the government has approved the use of Russia's Sputnik V. The Russian sovereign wealth fund that is marketing the vaccine globally has signed agreements with five Indian manufacturers for more than 850 million doses a year, with the first doses due to be available on 1 May.15 As infections have risen, hospitals in hotspots have been running out of vaccines [15] said that shortages were one thing; another is how fast India is able to vaccinate.

CONCLUSION

Our health infrastructure at present may not be able to do it fast enough even if there were enough supplies of vaccines. The government has to plan a real campaign to cover as much of the population in as short a time as possible. And although vaccines for people above the age of 45 and frontline medical workers have been paid for by the federal government, doses for other age groups will have to come out of local budgets. State governments have been asked to negotiate with vaccine manufacturers directly to purchase the stocks they need, a move criticised as arbitrary and discriminatory between states, as they have widely different budgets and healthcare systems.

REFERANCE

1. IndiaFightsCorona. Twitter. Jan 2021. https://twitter.com/COVIDNewsByMIB/status/1353954055995887616.
2. 2 Gupta M, Mohanta SS, Rao A, etal. Transmission dynamics of the COVID-19 epidemic in India and modeling optimal lockdown exit strategies. Int J Infect Dis 2021 ;103:579 -89. doi: 10.1016/j.ijid.2020.11.206 pmid: 33279653
3. Our World in Data. Daily covid-19 tests. https://ourworldindata.org/grapher/full-list-covid-19-tests per-day.
4. Covid-19 in India: a swot analysis. NITI Aayog. May 2021. http://niti.gov.in/covid-19-india-swot analysis.
5. India will need 500 000 ICU beds, 350 000 medical staff in next few weeks." Business

Standard. 29 Apr 2021. https://www.business-standard.com/article/current-affairs/india-will-need-500- 000-icu-beds-350-000-medical-staff-in-next-few-weeks-121042900588_1.html.

6. Thiagarajan K. Covid-19: India is at centre of global vaccine manufacturing, but opacity threatens public trust. BMJ 2021 ;372:n196. doi: 10.1136/bmj.n196 pmid: 33509837
7. Pulla P. What counts as a covid-19 death?BMJ 2020 ;370:m2859. doi: 10.1136/bmj.m2859 pmid: 32680851
8. Malani A. Seroprevalence of SARS-CoV-2 in slums versus non-slums in Mumbai, India. Lancet Glob Health 2020;(Nov). doi: 10.1016/S2214-109X(20)30467-8. pmid: 33197394
9. https://indianexpress.com/article/india/punjab-covid-deaths-rural-urban-7293303.
10. Mukherjee A, Anand T, Agarwal A, etal. SARS-CoV-2 re-infection: development of an epidemiological definition from India. Epidemiol Infect 2021 ;149:e82. doi: 10.1017/S0950268821000662. pmid: 33766185
11. Chaba AA. In second wave, Covid claiming more lives in rural Punjab than urban pockets. Indian Express. 29 Apr 2021. https://www.thehindubusinessline.com/news/national/variants-may-bedriving-indias-covid-surge-but-it-cant-know-without-tests/article34260292.ece.
12. Thiagarajan K. What do we know about India 's Covaxin vaccine? BMJ 2021 ;373:n997. doi: 10.1136/bmj.n 997 pmid: 33879478
13. Ahmad A. India to fund capacity boost at Serum Institute, Bharat Biotech as vaccines run short. Reuters. 20 Apr 2021. https://www.reuters.com/world/india/india-fund-capacity-boost-seruminstitute-vaccines-run-short-source-2021-04-19.
14. India to receive first batch of Russia 's Spotnik V covid vaccine on May 1. Mint. 27 Apr 2021. https://www.livemint.com/news/india/india-to-receive-first-batch-of-russia-s-sputnik-v-vaccine on-may-1-rdif-11619481002481.html.
15. Bellman E, Agarwal V. India faces covid-19 vaccine shortage as cases surge. Wall Street Journal. 9 Apr 2021. https://www.wsj.com/articles/india-faces-covid-19-vaccine-shortage-as-cases-surge/11617970632.