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Issue Brief

Tackling the Second Wave: Lessons from a Year of COVID-19

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S*ummary*

Through effective contagion mitigation and disease control strategies, India managed to confine the COVID-19 to a minuscule section of the population, though at great economic cost. These lessons will now be vital in managing the advancing second wave. There is an urgency to ensure that the population in general, and government agencies in particular, do not drop their guard and that all mechanisms of surveillance, disease control and contagion mitigation function robustly.

A year has passed since the country imposed the world's largest contagion mitigation measure through a nation-wide lockdown, to safeguard 1.37 billion people from the epidemical impact of the Coronavirus (SARS-CoV-2). The virus had made landfall in India in late January 2020.¹ When the lockdown was imposed on March 24, 2020, a handful of thermal scanners at airports was India's only defence against the advancing pathogen. The limited production capability for masks and the almost non-existent capacity for RT-PCR kits, coupled with an abysmal public health infrastructure, meant that the country had minimum wherewithal to shield against a pandemic of such global proportions.

In fact, these were among the factors that weighed in favour of the decision to impose a nation-wide lockdown, at great cost to the economy, as a core contagion-mitigation measure. While the jury is still out on whether the course taken a year ago was the ideal one, it is beyond doubt that India successfully managed to keep the contagion confined to a minuscule section of its population. Its public health systems, despite being of third-world standards, functioned with resilience to implement disease control measures on a national scale and executed best practices that excelled advanced societies.

As India currently progresses towards inoculating a quarter of its population through a national immunisation mission by June 2021 (having started the exercise in January 2021), the sudden spike in daily and active caseloads in recent weeks have raised fears of a second wave of the contagion gripping the country. Is India prepared to handle the second wave with insights gained from a year of pandemic management?

The (elongated) epidemical curve

Notwithstanding criticism that the nation-wide lockdown did not take into account the enormous economic implications, the dominating view is that this core contagion mitigation measure was all about flattening the epidemical curve. Less considered is the fact that this strategy had managed to contain the contagion to less than one per cent of the population (at 11.5 million, as of March 18, 2021).

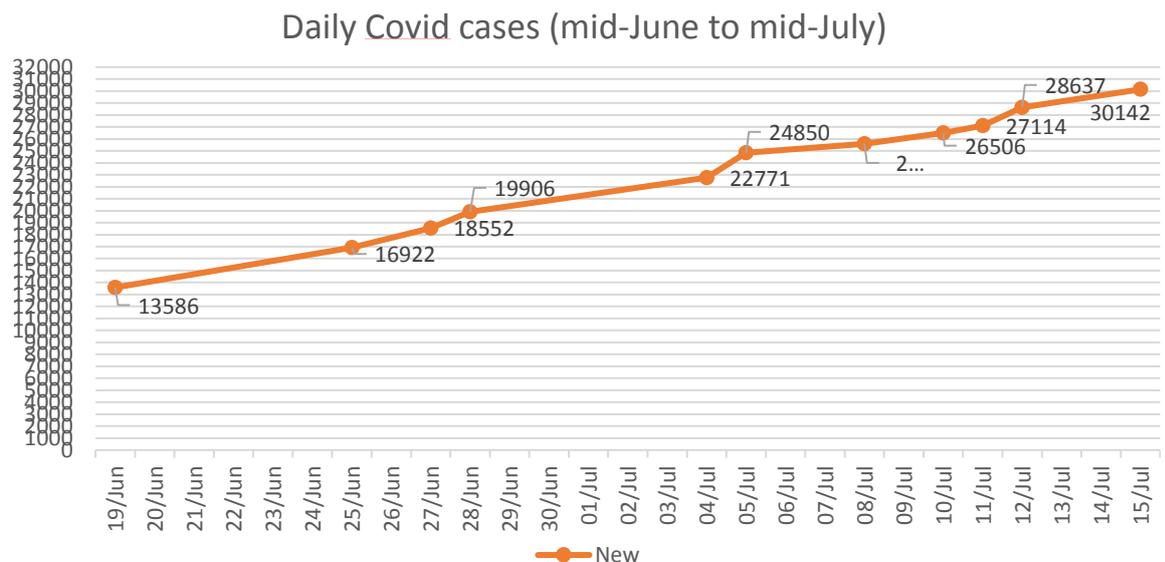
In mid-May 2020, when the second phase of the unlocking process was on, the number of infected was at .0072 per cent of the population (less than 1 lakh) and rose to around .015 per cent by early June (250,000 cases). Notwithstanding the rate of containment, the epidemical growth coinciding with the unlocking and augmented testing rate was rapid and put immense stress on public health and disease control apparatus.

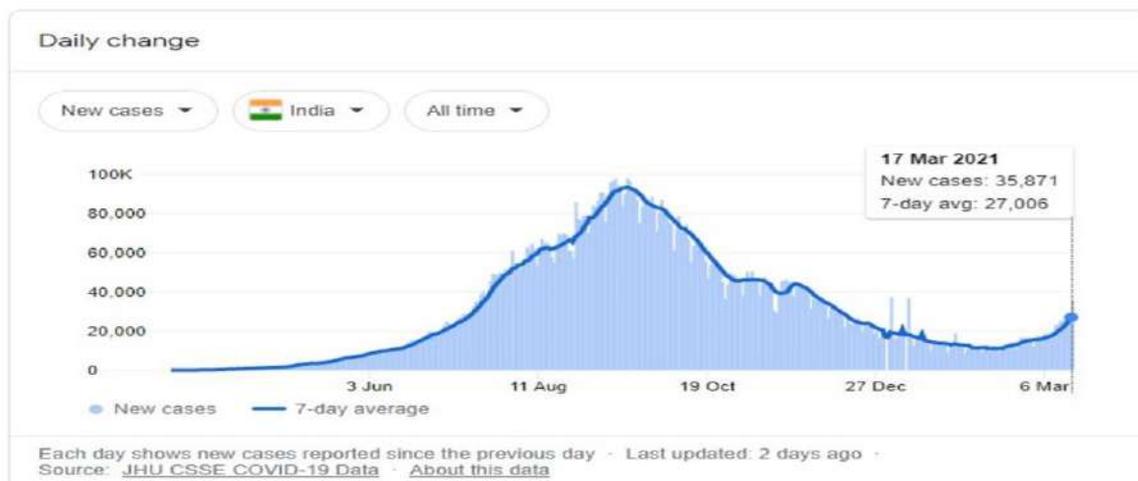
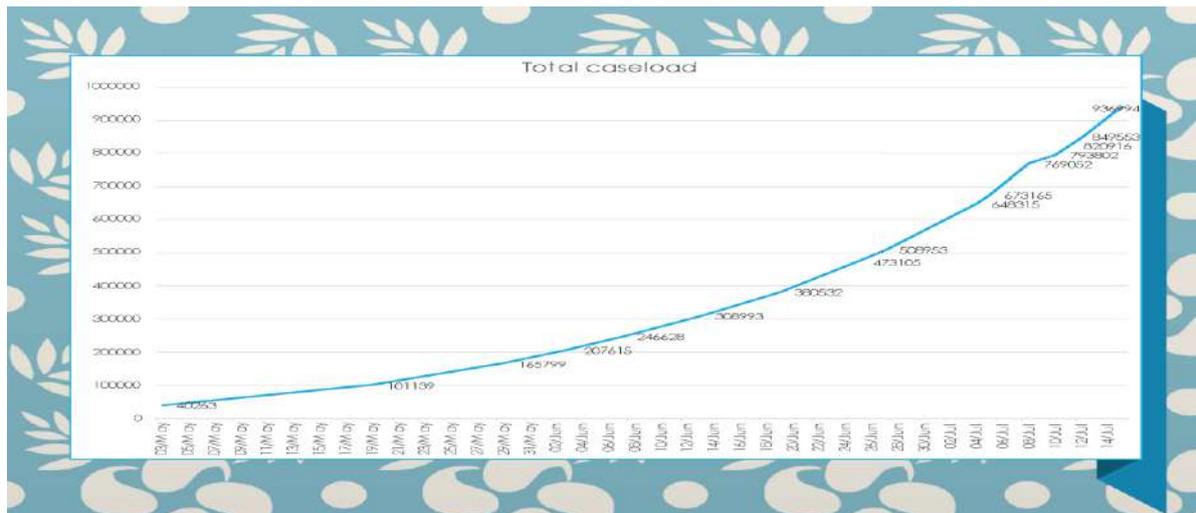
While it took 109 days to reach the one lakh mark, the 1.5 lakh mark was crossed just 9 days later and 2 lakh in another fortnight with more than 10,000 daily cases nationally. Similarly, the scaling from 8 to 9 lakh took just three days by mid-July,

¹ Though many Chinese cities that faced outbreaks had followed the tight lockdown model started in Wuhan in January 2020, there are no confirmed reports of a nation-wide shut-down as followed in the Indian case. For a recent analysis, see [Wuhan lockdown: A year of China's fight against the Covid pandemic](#), *BBC*, January 22, 2021.

when daily cases catapulted to beyond 36000. These numbers were consistently on an upward spiral, crossing 50,000 mark in late July, 70,000 by mid-August, 94,000 by early September and crossing the 1 lakh per day mark on 2nd October, thus marking the peak of the pandemic before subsiding to around 50,000 of daily cases by first fortnight of November. By then, the total caseload touched close to 85 lakh with around 1.25 lakh deaths.

That the final phases of unlocking coincided with the festival season and full reopening of the economy were seen as among reasons for the surge and peaking around September to early November period. This was also a period when India trailed the US and Brazil on highest number of cases. Despite a rapid decline by the final days of 2020, the total caseload had crossed the 10 million mark by the start of 2021. This was due to the continuing surge in some states like Maharashtra and Kerala, among others, and the advent of new strains, namely the UK (B.1.1.7), Brazil (P.1) and South Africa (B.1.351) variants, some of which found their way into the country.





As these figures show, India had a unique contagion mitigation experience through its ability to flatten the curve for an extended period and restricting the contagion to under one per cent of the population. This provided ample time for the fragile public health systems to establish essential and widespread clinical infrastructure. Various serosurveys, however, have shown a slightly larger exposure of the population to the virus with a huge imprint of asymptomatic characteristics and prevalence of large-scale natural immunity, even though the scope for herd immunity remained marginal.

The first serosurvey by the Indian Council of Medical Research (ICMR) covering the initial months till April revealed only 0.73 per cent of the population (based on 28,500 samples from 65 districts) as having been exposed to the pathogen in some form. However, it also revealed then that 15-30 per cent of the population were exposed in over 10 hotspot districts. This indicated quite early the scope for rapid community spread, which was subsequently visible in many hotspots across the country.

The second survey in June covering 40,184 samples pegged this figure at 28 per cent, thus illustrating the wider spiral. The third ICMR serosurvey done during the final months of the first wave, from mid-December 2020 to January 2021, found that

around 21.5 per cent (from 28,589 samples) were exposed to the pathogen.² Around the same time, however, a serosurvey in Delhi revealed that in some parts of the state, over 50 per cent of the population had developed antibodies, indicating exposure to the virus.

Among the key insights provided by these surveys was not just the fact that herd immunity was far from achievable with less than 25 per cent of the population being infected or exposed in some manner, but also the unique phenomenon of over 70-90 per cent of the exposed sections being asymptomatic. In fact, even the assessments for the initial months from January to April 2020 (from 4 lakh tests and 18,601 positive samples) reported that around 69 per cent of Covid cases were asymptomatic.

Similarly, a positive aspect of contagion mitigation and disease control strategies was the substantial recovery rate (around 60 per cent) seen at the national level even during the peak period, which ensured that the fatality rate remained at around 1.60 lakhs or 1.37 per cent of the caseload (by March 2021).

Disease control

A major reason for such gains is the efficacy of not just the contagion mitigation actions but also of effective disease control mechanisms and their national-level implementation. Owing to the absence of specific anti-viral treatment for COVID-19, a major element of disease control was the widespread application of generic clinical medications and placebo solutions for symptomatic treatment of mild and moderately-affected patients.

On the other hand, attempts were made, following global examples, to repurpose various existing anti-viral drugs for the treatment of severely ill COVID-19 patients. These drugs included remdesivir (developed to treat Ebola), Lopinavir/ritonavir (HIV), tocilizumab (Arthritis), favipiravir (Influenza), as also rampant usage of anti-malaria drug, Hydroxychloroquine, as prophylactic for frontline health workers.

Most of these drugs were tested for the World Health Organisation (WHO) trials to assess their efficacy as a COVID-19 anti-viral, though the trials provided mixed results and hence were recommended only for extreme situations. Similarly, plasma therapy was also tested out in some states, though it was recommended only for severe and emergency clinical use owing to evidence of limited efficacy.

Another factor in effective disease control was the formidable testing infrastructure and network set up on a national scale in a short period. Besides undertaking a huge industrial effort, even during the lockdown, towards large-scale manufacturing of testing kits and essentials including masks and sanitising products, great emphasis was laid on building a network of laboratories on a war footing. Over 650 government-run facilities were set up across the country by July 2020, with capacities to test over 5 lakh samples per day.

² ICMR sero survey: [One in five Indians exposed to Covid-19](#), *BBC*, February 5, 2021.

While these measures enabled the extensive availability of RT-PCR (Reverse transcription-polymerase chain reaction) kits as the mainstay of the testing mission, a breakthrough for this plan was the mass deployment of Rapid Antigen technology, which facilitated a two-phase testing strategy of quick positivity detection through the antigen test and a subsequent confirmation through RT-PCR.

While this testing combination emerged as a game-changer in the peaking months, the development of new platforms like Kavach (National Institute of Virology) and Corosure (IIT, Delhi) and reconfiguration of existing systems like TrueNat (TB detector) also aggressively augmented the national testing infrastructure, besides ELISA (enzyme-linked immunosorbent assay) coming handy to detect antibodies and aid the serosurveys.

The job mission

Notwithstanding these accomplishments, a major turning point in this pandemic management endeavour was the breakthroughs attained in the development of vaccines, both at the global and national level. Thanks to the global strides made in the rapid development of vaccines, a handful of candidates attained emergency use approvals by the end of 2020 and the beginning of this year.³

The Oxford Research Group's Covishield, co-produced by AstraZeneca and the Serum Institute of India, received emergency use approval in India by the first week of January 2021, along with clinical use approval⁴ for the indigenous vaccine, Covaxin, developed by Bharat Biotech. Both vaccines became the mainstay for the first phase of India's job mission which was kicked off on January 16, 2021, and covered frontline health and medical workers.

While over 5 million inoculations were completed by early February, the second phase covering the above-60 and 45-60 (with co-morbidities) age groups started in the first week of March and is expected to be completed by June, following which the third phase covering larger sections of the population is likely to be initiated. As per the existing plan, it is estimated that India would need over 66.6 crore doses (111 for every 50 beneficiaries or 2 doses to 20 crore people) to inoculate a major section of the populace so as to halt the further spread of the pathogen and/or trigger herd immunity in a wider cross-section.

By the end of March, India could have crossed over 50 million inoculations for the vulnerable sections, which, in itself, could emerge as a major shield against the aggravation of the second wave. Such optimism apart, a significant aspect of the immunisation drive and its ability to stem the second wave is the ambiguity surrounding the durability of antibodies before being susceptible to the pathogen.

³ There were over 150 vaccine development projects worldwide. These included the Oxford Vaccine Group-Jenner Institute's ChAdOx1 nCoV-19, Moderna and US NIH's mRNA-1273, Pfizer's mRNA vaccine, Johnson and Johnson, China's Sinovac Biotech and Sinopharm ventures, Russian military funded project (Sputnik), etc.

⁴ Phase I human trials test safety and tolerability, Phase II its anti-body creation and Phase III involved testing of long-term effects on larger population.

While most of the vaccine candidates had demonstrated the efficacy of greater than 90 per cent in the second and third phases of clinical trials,⁵ the Oxford vaccine's listing of around 67-70 per cent in overall results could be seen as an indicator of how efficacy may not be sustainable or could diminish over the extended immunisation period.⁶ Even as assessments are currently being done to understand the durability of the immunisation effects, the element of adverse events,⁷ on the other hand, continues to be shrouded in mystery as health authorities continue to be reluctant to attribute causality of recorded events with the inoculation.⁸

Is the second wave here?

Interestingly, no clear agreement exists on what constitutes a second or subsequent waves, and whether the second wave has already happened in some areas or whether a second wave is in the making on a national scale. Many public health experts deem states like Maharashtra, Kerala and Delhi, among others, having already experienced a second wave and, therefore, likely moving into a third wave.

Nonetheless, when seen from a national denominator, the rapid spiral from the middle of February — when it was around 12,500 cases per day to over 46, 951 by March 22, amply indicates the advent of another wave of contagion, though largely confined to a few states where it was not decisively contained.

While it might sound like a saving grace that the spiral is mostly on account of the surging cases in states like Maharashtra, rapidly rising numbers in other states including Delhi, Punjab, Madhya Pradesh, Tamil Nadu, Karnataka and Uttarakhand, is sufficient reason to assume the arrival and exacerbation of the second wave. With upcoming elections amassing crowds in various states and events like Mahakumbh likely to emerge as hotspots, the imperative of a nation-wide spread cannot be ruled out particularly with over 7000 mutations reportedly being recorded in India, along with the new strains, and some having potential for mass virulence.⁹

Furthermore, that third waves are now reported in Europe and the US could have their domino impact in India as well, owing to air corridors that are already in service or when opened for full-swing operations. Moreover, stringent contagion mitigation

⁵ Some of the claimed results include: Pfizer (95 per cent), Moderna (94 per cent), Aztrazeneca (70 per cent), Sputnik (95 per cent) by 3rd phase. Moderna initial trials had shown side-effects up to 67 per cent.

⁶ Oxford vaccine was tried on 1102 in Phase I (April), 1000 in Phase II (May), 5000 in Phase III along with 'human challenge trial' on select few 'healthy' volunteers. Oxford Phase I showed development of antibodies and T-cell for immunity, and was found effective for around 70 percent users after first two phases. *Lancet*, meanwhile, declared Covaxin as better than similar vaccines based on 3rd phase interim results. See Raches Ella (et.al), "[Safety and immunogenicity of an inactivated SARS-COV-2 vaccine, BBV152: a double-blind, randomized, phase 1 trial](#)," *The Lancet*, January, 21, 2021.

⁷ There were initial reports that over 8,563 adverse event following immunisation (AEFI) were reported (amounting to 0.2 per cent of vaccinated individuals), whereas 34 people needed hospitalisation. A recent report, however, pegs it as 234. "[Covid vaccination: Just 8,500 of 44 lakh recipients reported adverse events](#)," *The Economic Times*, February 5, 2021.

⁸ 71 deaths were reported in India of immunised persons as of March 13, 2021. Teena Thacker, "[Panel Finds No Causal Link Yet Between Jabs and Deaths](#)," *The Economic Times*, March 18, 2021.

⁹ Sandhya Ramesh, "[Covid 'X Men' – the 7,000+ mutations in India, how to understand them & where they came from](#)," *The Print*, February, 26, 2021.

measures of early pandemic days — including tight borders controls, contact tracing, route mapping and strict quarantine protocols, lock-down and staggered work timings, among others, may no longer be functionally feasible, owing to huge economic costs.

Accordingly, the emerging situation coincides with notable gaps in institutional and community surveillance and monitoring, which could result in the rapid emergence of hotspots and community spread. Hence, despite the lessons learnt from an effective contagion mitigation record of the past year, the wherewithal and options to deal with a surging second wave might not be as effective, flexible or feasible as in the first wave.

While the option of concentrated lockdowns and access control in limited areas with high contagion could still be explored (as in the case of Nagpur), the national strategy will have to be largely confined to three segments, namely augmenting the testing infrastructure on a national scale; rapidly increasing immunization coverage to all sections of the adult population; and maintaining the readiness of public health and clinical infrastructure, including field hospitals, to deal with a surge in the contagion.

Though a return to the conditions and decisional templates of the previous year may no longer be conducive, there is an urgency to ensure that the population in general, and state governments in particular, do not drop their guard and that all mechanisms of surveillance, disease control and contagion mitigation function robustly.

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