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## Covid death count, a reality check

An underreporting bias of 30x over the entire pandemic for the full country is unlikely. For the eight districts we analysed, it is roughly between 3-9x



TUSHAR GORE AND VIRAL V ACHARYA

THE IMPACT OF the second Covid wave in India has been investigated at many levels. After the initial reports — mostly images of packed crematoria and burials — many assessments have emerged about the undercounting of deaths. Analyses of death registrations show that “excess deaths” till May 2021 in some states compared to 2018 and 2019 were 30-40 times (x) the reported Covid deaths. A recent study estimated this undercount of excess deaths to be about 10x for the entire pandemic.

We have developed a patient-flow model to understand the drivers of fatality and to determine whether an undercount of 30x is possible. The model's calibration explains that only under certain circumstances — when healthcare facilities are overwhelmed — such an undercount is possible. It is not a country-wide and pandemic-wide phenomenon.

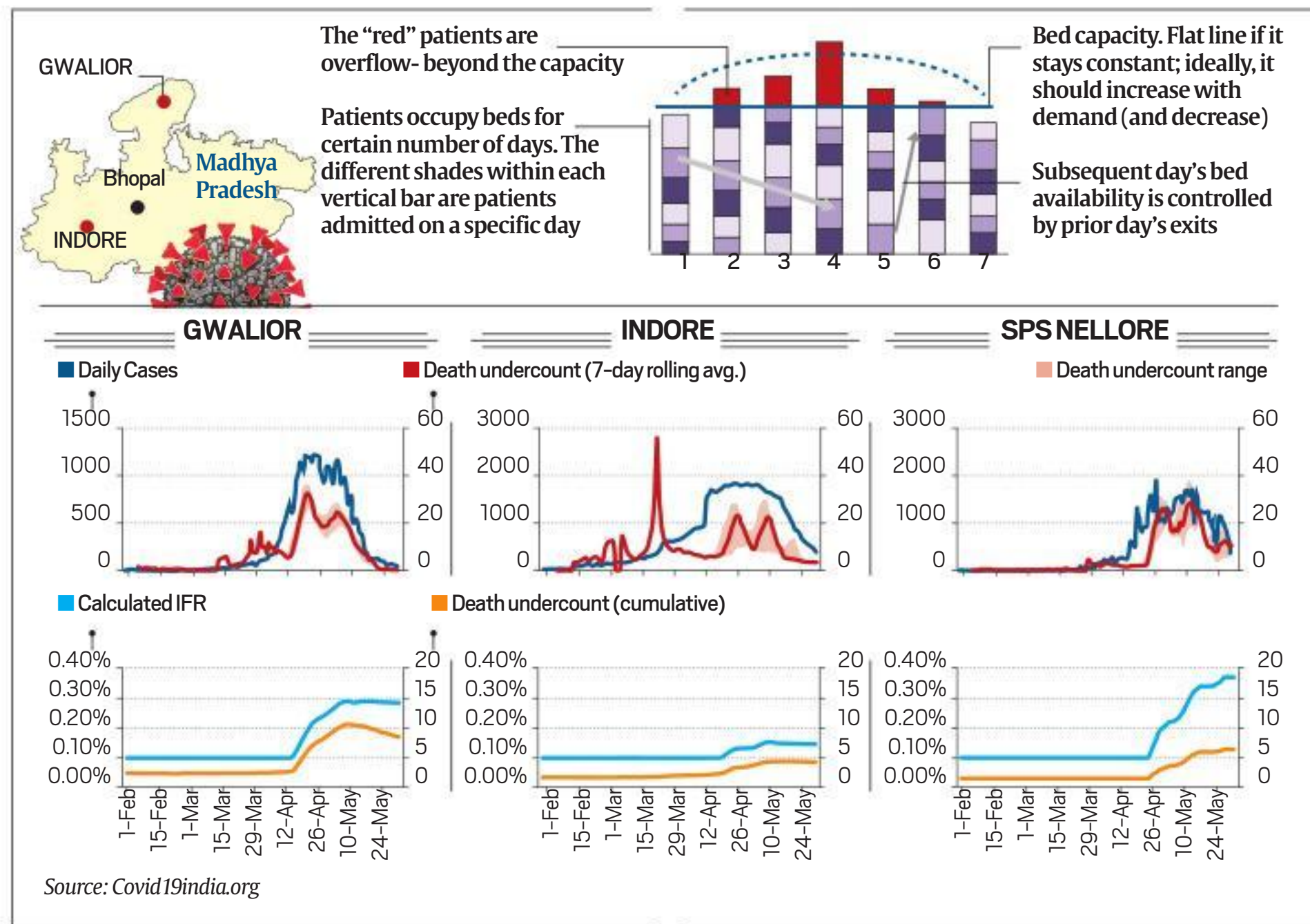
There has been much discussion on “flattening the curve” at the onset of the pandemic in 2020. The curve to be “flattened” is the curve of rising infections such that hospitalisations of the infected remain within the capacity of the healthcare system. Once this capacity is breached, the infection turns fatal for individuals who would ordinarily be saved. The number of deaths can rise rapidly in such an overwhelmed health system.

Many countries faced this challenge at different timepoints during the pandemic indicating the difficulties in controlling the infection. In India, the second wave lasted for several weeks in April and May of 2021. As infections rose at an exponential rate driven by the then-new Delta variant, the number of individuals needing oxygen and ICU support increased. In situations wherein the oxygen-supported and ICU beds reached capacity occupancy, many additional patients needing this support likely succumbed to the disease.

The schematic illustrates this impact of exceeding healthcare capacity (the horizontal blue line). Each day, certain number of patients need oxygen and ICU beds and they stay in the hospital for, say, six days. Every day, a number of beds become available due to patient discharge or death. Once capacity is reached, there are new patients daily that cannot be admitted (shown in red) and contribute to overall deaths because of lack of care. This overflow number leads to the excessive death toll and high death undercounts (if the counting cannot keep up with out-of-hospital deaths).

The model estimates the daily numbers that need oxygen and ICU beds and the overflow number — ones that cannot avail these facilities. The following parameters are used — one, percentage of daily new cases that need such beds: This is estimated at 12 per cent in a pre-surge situation for cases caused by the delta variant. During the surge, since testing is constrained and a higher portion of positive cases are symptomatic, the percentage of cases needing assistance is higher. In our analysis, 15 per cent is taken as the baseline with 12 per cent and 18 per cent forming the bounds. Two, the number of hospital days on such care: This is taken as 14 days. Three, the total number of such beds (capacity data): This data is sourced district-wise from the latest (June 27-July 5th) district or municipal dashboards.

In addition to deaths due to overflow, there are deaths of patients succumbing to the disease even with the required care. The Infection



Fatality Rate (IFR) of the disease is used for this calculation. The second serosurvey estimated a national IFR between 0.084-0.121 per cent (including the confidence intervals). We use an IFR of 0.1 per cent for all districts to estimate these deaths from the total estimated infections in the district (after subtracting the overflow cases calculated above). Details of these calculations are explained in the online version of this article.

So, is 30x undercount in Covid deaths possible?

The charts below show the analysis for three example districts: Gwalior, Indore, and SPS Nellore. These districts are from states that had the highest estimated excess deaths till May 2021. (Total reported Covid deaths in the three districts as of May 31, were 5,83,134, and 818 respectively.) The picture is the same in all three districts. As the second wave unfolded with increasing daily cases (the blue line in the top plot on the left-hand scale), the daily death undercount (as a seven-day average) relative to the reported numbers (red line on the right-hand scale) spikes up — going close to 30x — for a short period during March-May 2021 and subsides as the wave recedes.

The charts show the impact of breaching healthcare capacity on the death undercount. For Indore, especially, the impact of the change in hospitalisation rate from 12 per cent (lower bound of the red shaded curve) to 15 per cent (solid red line) and higher leads to overflow and a spike in deaths and undercount.

The cumulative death undercount (black line in the bottom plot on the right-hand scale) is around 5-9x depending upon the district as it averages the actual and reported deaths over a longer time period. An important consequence of overflow is that the calculated IFR (purple line on the left-hand scale) loses its property of being only disease-specific at 0.1 per cent and gets driven by healthcare capacity constraints to 0.15-0.37 per cent depending on the district.

Note that the calculated IFR and undercount need not be correlated because undercounts depend upon the actual reported Covid deaths and the calculated IFR reflects the deaths due to overwhelmed capacity. As an example, Indore has a similar undercount but a lower IFR as compared to SPS Nellore. Presumably, Nellore infrastructure was overwhelmed to a larger ex-

Despite its dependence on several parameters, the patient-overflow approach to assessing Covid fatalities highlights the criticality of limiting overflow in the healthcare system and can provide insights into important factors to control. An overwhelmed system leads to a steep ramp-up in deaths. This model shows that high death undercounts, however, are limited to short time spans when the capacity is overwhelmed. Therefore, an underreporting bias of 30x over the entire pandemic for the full country is unlikely. For the eight districts we analysed (three shown here) using the described parameters, it is roughly between 3-9x.

tent as compared to Indore, but both districts were similar in the manner the deaths were counted.

In addition to sensitivity to model parameters, the accuracy of output from this model depends upon the granularity of data used. The first aspect is geographic granularity. A state-level model will add up the healthcare capacity of districts that cope with hospitalisations with those that are overwhelmed. It's likely that the total capacity that comes out of this calculation is sufficient to manage the combined patient load. In this situation, the model will erroneously under-predict the overflow whereas overwhelmed districts will report overflow and increased deaths.

Similarly, a granular time-scale is important. Every day, the overflow is determined by the total number of patients needing breathing assistance and the bed capacity of such equipment. Ideally, daily data, wherever available, should be used. Using averages (or other fixed numbers) across the entire wave causes inaccuracies because of differences in the average value and the daily value. Adequate oxygen flow is another confounding factor. Any limitation in oxygen supplies will reduce the effective bed capacity. We believe this dependence on multiple factors is precisely the reason for the wide range of death and undercount estimates.

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## WHAT THE OTHERS SAY

“The US can't unilaterally define the ‘guardrails’ between the two countries out of its own interests, because they need to be defined by both China and the US to advance the interests of both countries.” — GLOBAL TIMES, CHINA

## The difficulty of being Yediyurappa

A Mandal politician in a Hindutva party, he does not owe his rise to the central BJP, but his vulnerabilities have caught up with him



SUGATA SRINIVASARAJU

KARNATAKA CHIEF MINISTER B S Yediyurappa is pragmatic enough to know that there is too much at stake for him and he has little choice but to make a quiet exit. He is aware that his vulnerabilities far outweigh his strengths. But there is a voice within him, which will taunt him if he meekly surrendered and retreated. Hence, when his vulnerabilities summon him, he appears obedient before the media, but when the taunt takes over, he dials numbers that will handle the ridicule. Yediyurappa is faithful to both voices inside him. He is genuinely conflicted and there are many reasons for that.

The biggest reason is that he made the BJP an electoral success in Karnataka in an era of Vajpayee and Advani, but without much of their input or intervention. After their era ended, he didn't need either Modi or Shah to strategise, pool resources or post election victories. He owed next to nothing to his national leadership. In 2008 and 2018, twice when Yediyurappa fell slenderly short of a clear majority, he arranged it himself, albeit through devious means. The formula he created for the party in the state was indigenously developed. It was quite independent of the RSS's Hindutva. In fact, it was more an extension of caste identity politics that Karnataka had witnessed for decades, under chief ministers like S Nijalingappa, D Devaraj Urs and H D Deve Gowda.

The fact that Yediyurappa belonged to the dominant Lingayat community helped, but he was shrewd enough to realise that if he did not build a broad coalition with sections of backward classes and Dalits, there was little chance of coming to power. He stitched a coalition patiently, and got a number of backward communities, and also a neglected section of the Scheduled Castes and Scheduled Tribes on his side. He snatched these communities from under the nose of an arrogant Siddaramaiah, who claimed to be the leader of all backwards, and an indifferent Mallikarjuna Kharge who presided over the Dalit constituency. He started working on this when he first became a deputy chief minister in 2006 and sort of perfected it by the time he became chief minister in 2008.

While Yediyurappa was busy with Mandal politics, H N Ananth Kumar tried to become the voice of Hindutva in the state. Yediyurappa looked askance at the RSS agenda that Ananth Kumar was promoting. He allowed it to be a thin air cover at best but never allowed it a grassroots existence. He also looked away from the toxic Hindutva experiments in the coastal districts by presenting them as an aberration. Yediyurappa is not perceived as communal in Karnataka but is thought of as a caste leader. He is essentially a Mandal politician with a Hindutva air cover.

The pontiffs who have been crowding Bengaluru in his support in the last few days are those who wear the saffron of caste and not the saffron of religion.

In Karnataka, the backward castes and sub-castes, Dalit communities included, have imitated the organisational structure of the Lingayats — they all have independent seminars and pontiffs, and have devised political play around them. Yediyurappa's cleverest act was to empower them with land and largesse, and put them in an orbit of worldly pursuits. He deepened the existing caste identity politics with a distinct shade of saffron. It was debauchery of democracy. Nevertheless, he pursued it unabashedly.

Therefore, when the BJP national leadership decided to nudge this Lingayat stalwart to step down, they strategised a systematic attack over the last few months by deploying legislators from his own community against him. They created fiery debates of victimhood and inadequate representation of populous sub-castes inside the community. However, the legislators who were dressed up as challengers to the Lingayat throne commanded very little inside the community and among the larger electorate. But still, they were given the liberty to abuse their leader without the liability of disciplinary action. Yediyurappa indirectly portrayed them as traitors of the Lingayat community acting at the instance of B L Santosh, a Brahmin without a base. He would have easily survived the attack of the legislators but there were other vulnerabilities, including allegations of corruption and nepotism that progressively weakened him.

Even before Pegasus made headlines, there were thick rumours of electronic espionage in Karnataka and it went by an interesting epithet: “CD politics”. The pun is unintended. In his first term, Yediyurappa had to step down because he had to go to jail on corruption charges. He had then collaborated with the notorious Bellary miners who permanently dented the political culture of the state. In a party with definite ideological moorings, Yediyurappa had choreographed a vulgar dance of mammon to survive. This time around, though, he'll be stepping down because he never learnt lessons from his first debacle. Apparently, in 2010, when Modi had run into Yediyurappa at the party's national executive, he had offered some unsolicited advice: “God will not always save you, correct yourself”. That correction never happened and it has mired his legacy.

It is natural to ask where the RSS, the BJP's chief mentor, was when all this mess was being heaped? Santosh, who is now the national organising secretary of the BJP, was attached to the state unit when Yediyurappa had begun his consolidation. He was tasked with developing a long-term vision and grooming an alternative leadership to Yediyurappa. Instead of fulfilling this mandate, he anointed himself for the future. He cultivated weaklings who could never step out of his shadow. He became a part of the problem and never the solution, and that problem persists to this day.

The writer is a senior journalist and author



SAKINA DHORAJIWALA, RANADHEER MALLA AND RAJENDRAN NARAYANAN

## Holes in the safety net

Persistent delays in MGNREGA payments are worsening pandemic precarity

THE MAHATMA GANDHI National Rural Employment Guarantee Act (MGNREGA) was a pivotal shock absorber during the first wave of the pandemic. Its functioning hinges on sufficient budget allocation, reliable payment systems, and ease of access to wages. However, the Government of India (GoI) not only reduced the MGNREGA budget this year but also neglected it in subsequent relief measures post the second wave. The MGNREGA, among other social security programmes, can be a powerful safety net for the poor. But delays in payments continue even in such precarious times.

Under the Act, workers should get wages within 15 days of completion of work failing which they are entitled to compensation for delays. The MGNREGA payment process consists of two stages. After work is completed, a Funds Transfer Order (FTO) with worker details is digitally sent to the GoI by the panchayat/block. This is the state's responsibility. The GoI then processes the FTOs and transfers wages directly to the workers' accounts. This is called Stage 2 and is entirely the GoI's responsibility. The Act's guidelines say that the first stage must be completed in eight days and the second within seven days after Stage 1. However, as per official data, only 26 per cent of the transactions of the first quarter of this fi-

ancial year were credited within the stipulated seven-day period by the GoI.

Until recently, every MGNREGA FTO consisted of multiple transactions of workers across caste categories. On March 2, the GoI issued a circular to change the payment system so that payments can be made separately based on the caste of workers (SC, ST and “Others”).

To understand the efficacy of this circular, we obtained all wage transactions from April 1, 2021, to May 23, from 26 randomly sampled blocks of Jharkhand. The objective was to assess the difference in Stage 2 of the payment process across caste categories. We calculated Stage 2 delays for these transactions and combined them with the caste category of the workers. Out of 3,14,710 transactions for which the FTO was sent to the GoI, 54.3 per cent of transactions remained unpaid as of May 23. The caste category of workers was missing for 7,097 transactions. We were, therefore, able to calculate caste-wise Stage 2 delays for 1.43 lakh transactions.

The GoI took 26 days on average to process the transactions in the second stage. We do not find any evident difference in the time taken to complete this stage of the payment process across SC, ST, and “Others” categories. In a previously conducted study of 90 lakh transac-

tions across 10 states, we found that Stage 2 alone was taking more than 50 days. These delays were completely unaccounted for as they were not reflected in the MGNREGA MIS. Based on these findings, in 2018, the Supreme Court gave strong orders reprimanding the GoI for not paying compensation for the delay it was causing. Three years hence, the GoI continues to violate the Act and court orders. What is more surprising is that such inordinate delays are being observed at the beginning of the financial year, when the programme is meant to be flush with funds.

During such an unprecedented crisis, the move of segregating payments by caste categories raises apprehensions. While affirmative action is important, experimenting with the payment architecture without transparent discussions or a justified rationale appears bizarre. The Secretary of the Ministry of Rural Development (MoRD) told the media that the purpose was to assess how much the SC/ST communities benefited from MGNREGA. While the purpose of knowing the amount of money accrued to SC/ST households is useful, it can easily be calculated after the wage payments are completed. Tinkering with the payment process, without consultation, sends a worrying signal, given that there have been at-

tempts to erode the universality of MGNREGA. For instance, in 2016, the then Joint Secretary of the Ministry had sent WhatsApp messages to field functionaries saying “While the Act does not distinguish between APL and BPL and vulnerable/non-vulnerable, we have to intelligently communicate to the district/block/GP authorities to learn to target.”

The digital payments system of MGNREGA has been a laboratory of many experiments since 2012. However, no mechanism to solicit feedback from workers to evaluate the robustness of these systems has ever been created. In this case, there was no consultation with the state governments either. It is no surprise then that Stage 2 of the payment process is taking three times more than it should. India boasted 4,355 crore digital retail transactions in 2020-21 as per RBI data. These are usually completed within a day if not in a few minutes. In comparison, MGNREGA transactions, which are only 1.6 per cent in the volume of these, get routinely delayed. Why should the timely payment of subsistence wages in MGNREGA continue to be so elusive?

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## LETTERS TO THE EDITOR

### THEN AND NOW

THIS REFERS TO the item, ‘Darbara resigns’ in ‘Forty Years Ago’ (IE, July 23). The Punjab imbroglio forty years ago contrasts sharply with the events of today. The choice of including this item was very apt — it reflects the decline of the Congress over the years. The firm way in which Prime Minister Indira Gandhi dealt with the situation and the confusing methodology adopted today around the CM-Sidhu imbroglio paints a telling picture

Ravi Raman, via email

### ORWELL SMILED

THIS REFERS TO the article, ‘The us in Pegasus’ (IE, July 23). The Pegasus expose looks increasingly like an Orwellian nightmare, with serious questions raised over the very nature of our democracy. From muzzling of dissident voices to allegedly toppling Opposition governments, the message sent couldn't be more explicit. The bogey of national security, it seems, can indeed justify even outright violations of privacy. The Centre must come clean on its involvement and judicial intervention is necessary to uphold the right to privacy.

Ila Railkar, Mumbai

### ANNUAL TRAGEDY

THIS REFERS TO the report, ‘Heavy rains at Konkan, many areas flooded’ (IE, July 23). Several pictures of the devastation caused by the torrential rains during the past few days, in Mumbai, Thane district, Konkan make for sad reading. The loss of lives and property is heartbreaking. At many places, this is an annual story, year

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after year people are put to inconvenience. Who is responsible for this state of affairs? We all, the authorities and the people, need to introspect.

Melville X D'Souza, Mumbai

### ACT, DON'T QUIBBLE

THIS REFERS TO the editorial, ‘A summary response’ (IE, July 23). Rather than name-calling and quibbling about who has really been derelict, it's time that the governments at the Centre and states started buttressing the ailing health infrastructure through cooperation, especially when health experts have predicted the certainty of the imminent third wave. The Centre can flesh out a graded response action plan and a high-level task force to ensure the equitable availability of life-saving drugs and oxygen cylinders at the grassroots level.

Vinay Saroha, Delhi