Culpable Carnage

How the Modi government's
failure to act led to India's
COVID-19 catastrophe

01 June 2021

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In India, death and devastation caused by calamities are often reduced to statistics. In the case of the COVID-19 pandemic, many have not even been accorded that privilege, as the government's official numbers have been widely disputed. Through collecting information about those who fell to COVID-19 from news reports, social media and their loved ones, this is an effort by *The Caravan* to memorialise some of our fellow citizens.

ON THE MORNING OF 17 APRIL, amidst a chorus of loud cheers, Narendra Modi walked across a stage to stand at a podium, all set to address an election rally in the city of Asansol, in West Bengal. As the prime minister found his place at the podium, he promptly removed his snugly-fit white mask, rubbed his face and stroked his flowing white beard. For a few seconds, Modi took in the cheering crowd through impassive eyes, before raising his hands in a namaskar above his head. The rally had begun.

Thousands of supporters of the Bharatiya Janata Party had gathered at Asansol's Nigha airbase. The venue was chosen because it could accommodate more people than the Asansol Polo Ground, which is where most local political rallies are usually held. BJP workers were

certain of a huge turnout and insisted that the large grounds of the airbase would allow them to ensure social distancing, as necessitated by the COVID-19 pandemic. By 10 am, as the crowd grew—people sat in plastic chairs squished next to each other, or stood huddled together in groups at the back—social distancing appeared to be a distant reality.

As Modi delivered his speech, taking jabs at West Bengal's ruling Trinamool Congress and its chief minister, Mamata Banerjee, a mass of faces looked on. Some attendees sported a loosely fitted saffron mask, often embellished with the BJP's lotus symbol. Others wore surgical masks around their necks or up to their mouths, leaving their noses exposed. And still others could be seen sitting without any masks at all, coughing into their hands, before looking up and waving at a camera.

Five minutes into his address, after delivering some preliminary remarks, Modi once again surveyed the crowd, before telling them that he wanted to express a *shikayat*—a complaint. "I have come here twice before, before the Lok Sabha elections, to ask for your vote," he said. "But, at those times, not even one-fourth of the crowd I see here was in attendance." He added, "*Aaj aapne aisa dam dikhaya hai, aisi takat dikhayi hai. Main jahan dekhta hun wahan mujhe log dikh rahein hain, baki kuchh dikhta nahin*"—Today you have shown such courage, such force. Wherever I look, I see people, nothing else. After that, the crowd erupted into chants of "Modi, Modi."

In mid April, as the health infrastructure in several states was collapsing during the second wave of the pandemic, Prime Minister Narendra Modi addressed a massive election rally in West Bengal. PTI

On the same day, about a thousand kilometres away, Manish Jangra, a 26-year-old doctor in Delhi, was going through one of the most traumatic days of his life. Jangra, who works at the central government-run Ram Manohar Lohia Hospital, had tested positive for COVID-19 a few days earlier. On 17 April, he began developing severe symptoms of the disease. He struggled to breathe, and his oxygen-saturation levels plummeted well beneath the minimum levels expected in a young and healthy adult. "So, without a second thought, my friend and I headed to RML on a scooter," Jangra told me. "I knew if I don't get oxygen support in time, I might not survive this."

A rude surprise awaited Jangra outside the hospital's trauma centre. Citing full capacity and a lack of beds, the guards outside the hospital refused to grant him entry. "I told them I am an employee," he said. "They knew me, I am sure, some of them even recognised me. It was heartbreaking, standing outside begging them to let me in." As Jangra's friend, a doctor himself, went to speak to senior administrative officials, he waited close to the hospital's triage ward for COVID-19 patients, sitting alongside desperate family members hoping to get loved ones

admitted to the hospital. Within a few minutes, Jangra felt like he was losing consciousness—he described it as "slipping into the darkness." "I felt like I couldn't just wait anymore; I was in panic and everyone around me was in the same state," he said. "As a doctor, I have never felt so helpless. I could hardly take care of myself, let alone others around me."

After an hour of waiting, Jangra was finally admitted to the triage ward, where patients were being given first-aid support until beds were available in the dedicated COVID-19 ward. The ward was brimming with severely ill patients, all in need of some level of oxygen support. Jangra shared a bed and the two of them passed the same mask back and forth. "Everyone was sharing a bed as well as oxygen at the ward," he said. Another long wait began, this time for admission to the COVID-19 ward. It was a ward he was familiar with, a ward where he had spent the past year tirelessly working to save lives.

Elsewhere in Delhi, similar scenes of despair and desperation unfurled. As a healthcare professional, Jangra was one of the lucky few who was able to fight his way to a bed with oxygen supply. Through the second half of April till early May, thousands waited outside hospitals or shuttled between various healthcare facilities in ambulances to secure treatment for their loved ones. At the time, Delhi's Aam Aadmi Party government said there were still a few thousand beds available in the national capital, but securing a bed with oxygen supply or inside an intensive-care unit was next to impossible.

COVID-19 patients share beds and oxygen cylinders inside the emergency ward at a Delhi hospital in late April. DANISH SIDDIQUI / REUTERS

In other parts of the country, public-health systems had already begun to crumble under the deluge of COVID-19 cases and deaths. In Gujarat, Modi's home state, patients were dying (https://caravanmagazine.in/health/covid19-patients-struggle-to-get-into-ahmedabad-hospitals)inside ambulances and outside of hospitals before they could access hospital care. At a gas crematorium, the metal frames of a furnace melted (https://caravanmagazine.in/health/from-hospitals-to-crematoriums-surat-is-overwhelmed-by-the-second-covid-19-wave) as bodies burnt round the clock. Open grounds were turned into mass-cremation sites, and families ferried bodies of deceased relatives to open fields in nearby rural areas because they were sick of waiting outside crematoria to perform last rites. As stocks of vital resources, including oxygen, medication and testing kits, were depleted across the country, the demand continued to surge and desperate families turned to the black market (https://www.bbc.com/news/world-asia-india-56757405), buying ineffective medication (https://www.altnews.in/remdesivir-is-not-effective-against-covid-19-

pooled-research-from-four-trials-shows/) at exorbitant rates. Defunct government helplines and a failing public-health system compelled people to send out urgent pleas for hospital beds, oxygen cylinders and medication via social media. Civil-society and volunteer groups stepped in to fill in the vacuum left by ineffective governance.

As India rapidly turned into the global epicentre of the COVID-19 pandemic, political leaders continued to hold massive election rallies, and to champion the gathering of millions of devotees for the Kumbh Mela. The newly appointed chief minister of Uttarakhand, Tirath Singh Rawat, (https://thewire.in/politics/uttarakhand-corona-covid-tirath-singh-rawat-kumbh-markaz)defended the decision to hold the massive religious gathering in his state amid rising cases. "Most importantly, Kumbh is at the bank of the River Ganga," he said. "Ma Ganga's blessings are there in the flow. So, there should be no corona." The Modi government spent hundreds of crores on the Kumbh, which saw the congregation of 3.5 million people.

The country's citizens paid a massive price for this. All evidence points to the fact that India's official figure of around three hundred thousand deaths from COVID-19 until the end this May is a gross underestimate. According to a report published by the *New York Times*, India's true death toll was at least two times the official toll reported by May 24. Even this, the report said, was a conservative estimate; it pegged a "more likely" death toll at more than five times the official count, at 1.6 million estimated deaths. A possible "worse scenario," the report said, might mean an estimated death toll of 4.2 million.

A COVID-19 patient waits to get admitted outside Delhi's Guru Teg Bahadur hospital on 23 April. DANISH SIDDIQUI / REUTERS

The magnitude of unseen and unacknowledged COVID-19 deaths was best reflected in the corpses found floating in the Ganga or buried in the sand along its banks. With crematoria running out of space in Uttar Pradesh, people began dumping bodies into the river. Instead of helping conduct the last rites of the deceased, authorities in the state were more concerned about removing the shrouds over their shallow graves and covering them with more sand, so that they were harder for journalists to capture in photographs.

As COVID-19 patients continued to die due to a lack of oxygen in Uttar Pradesh's hospitals, the Allahabad High Court observed that their deaths were "not less than a genocide." (https://www.livelaw.in/top-stories/allahabad-high-court-non-supply-of-oxygen-criminal-act-not-less-than-genocide-173607) International media organisations (https://www.nytimes.com/2021/05/01/world/asia/india-covid19-modi.html) called out the Modi administration (https://www.washingtonpost.com/outlook/modis-pandemic-choice-

protect-his-image-or-protect-india-he-chose-himself/2021/04/28/44cc0d22-a79e-11eb-bca5-048b2759a489_story.html)for choosing to protect its image over its people. "Despite efforts to squelch the bad press, everyone knows who is to blame for the fatal disaster unfolding today," an editorial in the *Washington Post* said. Editors of one of the world's most reputed medical journals, *The Lancet*, wrote that, at times, the Modi government "has seemed more intent on removing criticism on Twitter (https://www.nytimes.com/2021/04/25/business/india-covid19-twitter-facebook.html) than trying to control the pandemic."

The Modi government's inaction on four major counts can be described as criminal negligence. Firstly, it ignored historical wisdom and scientists' warnings about a second wave and mutant strains. Secondly, even as the second wave of the pandemic raged, there was no meeting of the national task force managing COVID-19, and the government continued to ignore scientific advice. Thirdly, it botched the vaccination rollout, leaving its population defenceless against the virus. Lastly, it failed to hire enough health workers in anticipation of the second wave and upgrade its health infrastructure to ensure adequate supply of oxygen and life-saving medicines. Addressing even one of these aspects could have significantly reduced the loss of lives. Instead, the government has come down with all its might against anyone who has wittingly or unwittingly exposed its blunders.

"This is not just neglect and apathy," Jangra said. "We shouldn't hesitate to call it what it truly is." He has now recovered and is back to attending COVID-19 patients at the hospital. "Our government abandoned us to die," he added. "These are murders."

IN THE BEGINNING OF 2021, India's COVID-19 caseload and mortality had reduced significantly from the preceding year. In early February, the country recorded around ten thousand new cases every day—at the peak of the first wave of COVID-19, last September, it had recorded about a

hundred thousand cases per day. A lull in cases allowed for complacency and unchecked optimism, which was only reinforced by triumphant statements from political leaders.

In late January, in a virtual address at the World Economic Forum's "Davos Dialogue," Modi declared India successful in curtailing the pandemic. "In this battle, everyone in India performed their duties with patience and turned the fight against corona into a people's movement," he said. "Today, India is among those countries which have succeeded in saving the lives of the maximum number of its citizens." A few months later, in early March, when cases were already rising at an alarming rate across the country, the union health minister, Harsh Vardhan, declared India to be in the "endgame" (https://www.hindustantimes.com/india-news/harsh-vardhan-says-india-is-in-the-endgame-of-covid-19-pandemic-101615128329364.html) of the pandemic. This ignorance displayed by the government was its first major failure, especially since it had already received warnings from the scientific community about an upcoming second wave of the pandemic.

"It is one thing to have ignored the signs until January–February, but in March, if the government really did not think this was coming, then that is criminal of them," Dr Bhramar Mukherjee, a professor of epidemiology and biostatistics at the University of Michigan, told me. Mukherjee has been closely monitoring pandemic-related data in India since March 2020. "I have looked at it at such a granular level everyday since this pandemic hit us," she said. "My family says I am obsessive to a fault."

The magnitude of unseen and unacknowledged COVID-19 deaths was best reflected in the corpses found floating in the Ganga or buried in the sand along its banks. With crematoria running out of space in Uttar Pradesh, people began dumping bodies into the river. RITESH SHUKLA / GETTY IMAGES

On 14 February, Mukherjee was scrolling through the Covid19.org (https://www.covid19india.org/)website on her phone and sipping coffee as part of what had become her morning routine. She told me she remembered the date because it was Valentine's Day. The website is a crowdsourced repository of official data and statistics on COVID-19 in India, and Mukherjee and her students frequently rely on it for their disease-modelling exercises.

On that morning, Mukherjee was rattled by two observations that she had gleaned from surfing the internet: first, that her friends and family in India had begun socialising, partying and planning vacations as if they had never heard of the pandemic; and second, that cases were rising in three Indian states. "It was not just the rise in cases that was concerning, it was the fact that the rate of increase was tremendous," she said. "It clearly signalled at something ... It was this deadly cocktail of pandemic

fatigue, mixed messages from the government and rapidly rising cases that truly scared me."

The three states with sharp rises in daily cases were Maharashtra, Punjab and Chhattisgarh. At the time, the government did not identify a rise in cases in a particular state as a cause for concern for the entire country. Even until April, the central government was dealing with surges state-by-state, writing letters to their governments and sending teams of public-health experts to investigate the situation on the ground. "It's ridiculous for them to act like the pandemic was only surging in certain states, as if the virus will respect state boundaries," Mukherjee said.

On 28 February, Mukherjee turned to Twitter (https://twitter.com/BhramarBioStat/status/1365845535572316165) to express her concerns over the rapid increase in cases across the country. She noted that the effective reproduction number of COVID-19—a measure of how many people each COVID-positive person was infecting—had risen above one. If the effective R is below one, it indicates dropping case numbers, but an effective R above it signals exponential growth of infections. "The data was there for all to see," Mukherjee said. "But even when data is thrown in their faces, our government has remained in denial."

While not many wield the statistical and epidemiological expertise to sift through databases to accurately predict impending waves of a pandemic, there were some other warning signs that policymakers could easily have picked up on. One such sign was embedded in the history of epidemics, which tells us that most—if not all—epidemics have manifested as a series of waves of infections. A second wave in India was inevitable.

"History is more important to science than we care to admit," Dr Vikram Patel, a professor at Harvard University's TH Chan School of Public Health, told me. "We could have picked up on two historical moments here to anticipate this wave: the 1918 influenza pandemic and, in more recent history, the first COVID wave itself."

More than a century ago, during the 1918 influenza pandemic, India bore the largest burden of mortality among all the countries affected by the disease. Though the first wave of the pandemic, which hit India in May 1918, was relatively mild, the second wave, which hit India around September that year, was much more severe and claimed countless lives. "History repeats itself also in the way that the influenza pandemic spread across India in 1918, and how similar it is to the way infection spread across India in the first COVID wave and now the second COVID wave," Patel said. "It started with urban centres like Mumbai, then to Delhi and other metros before spreading to rural areas. I am surprised that our policymakers and scientific advisors didn't take a moment to be like, 'Hey! Wait a minute, this is exactly how transmission progressed last year.'"

Patel admitted that it would be unfair to expect the government to accurately predict the severity of the second COVID-19 wave or the exact dates at which it would hit the country. "But governments and policymakers need to look out for the worst-case scenario and prepare themselves for that," he said. "They cannot limit their preparations on the basis of the most optimistic scenario. The fact that they stood by and did nothing, then compounded the problem by holding election rallies—it is undeniable that they are at fault. They might have not lit the fire, but they decided to pour a can of gasoline on it."

By early February, the proverbial fire that Patel referred to had already begun in Maharashtra. The state had more than 5 million confirmed cases by the end of May, and in mid March, the union health secretary, Rajesh Bhushan, said (https://www.ndtv.com/india-news/60-of-all-active-coronavirus-cases-in-maharashtra-health-ministry-2392769) that sixty percent of all active reported COVID-19 cases in the country were from Maharashtra. Five of the ten districts with the highest caseloads anywhere in the country were in Maharashtra, and most of these districts had remained hotspots for the virus through the entirety of this pandemic. "But this time around it was different, there was something

odd about the way this disease was progressing," Dr Subhash Salunke, a faculty member at the Public Health Foundation of India and a member of Maharashtra's COVID-19 task force, told me.

To take account of the situation in Maharashtra, the union health ministry dispatched a team of experts. Its report (https://www.thehindu.com/news/national/coronavirus-as-covid-19-cases-spike-government-report-points-to-pandemic-fatigue/article34006914.ece) was shared with the public in early March. The report pointed to a lack of compliance with COVID-appropriate behaviour, pandemic fatigue, large social gatherings and diminishing public fear of the disease as possible causes for the rise in cases. However, Salunke, who was part of a delegation sent to investigate the situation in Amravati district, knew that there was something else at play. "Pandemic fatigue was everywhere in the country, social gatherings were happening everywhere, how could these factors contribute to a rise in cases solely in Maharashtra then?" Salunke said. "It doesn't add up."

In February, the daily number of new cases in Amravati jumped from an average of a hundred to a thousand. To curb transmission, the district announced a 14-day lockdown. "The rate of transmission in the district was beyond what one could imagine," Salunke told me. "Whole families were falling sick, whole neighbourhoods were coming down with the virus. This was not how the virus behaved in the first wave at all, this was much scarier." Further, random sampling in the district revealed a positivity rate of more than fifty percent. "This means that, in the 650 samples we had collected, at least fifty percent turned out positive," he explained. To put this in perspective, the World Health Organisation says that a pandemic can be deemed under control if the positivity rate in a population is less than five percent.

Concerned and eager to understand the situation, Salunke called colleagues from the National Institute of Virology in Pune to discuss what his team had discovered. When Salunke and his team alerted

officials from the state as well as the union health ministry, along with members of the National Centre for Disease Control, they were asked to submit samples from positive patients for genome sequencing. They submitted these samples to laboratories within the Indian SARS-CoV-2 Genomics Consortium, or INSACOG—a network of ten laboratories formed by the health ministry in December 2020 to expand genomic sequencing of the virus. The government took this step in light of concerns over the spread of a variant first documented in the United Kingdom, named Alpha by the WHO, which was a much more infectious strain of the virus that fuelled a second wave of infections in the United Kingdom at the end of last year.

Just as Salunke had suspected, INSACOG laboratories detected a new variant. As early as 18 February, the *Indian Express* (https://indianexpress.com/article/cities/mumbai/mutation-found-in-samples-in-amravati-and-yavatmal-covid-spike-in-21-districts-7193268/) reported (https://indianexpress.com/article/cities/mumbai/mutation-found-in-samples-in-amravati-and-yavatmal-covid-spike-in-21-districts-7193268/) that two key mutations on the spike protein of the virus had been detected in samples from Amravati and neighbouring Yavatmal district. One of these mutations, E484K, which was found in the Amravati samples, had also been detected in the highly transmissible variants first documented in the United Kingdom, Brazil and South Africa (https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/scientific-brief-emerging-variants.html). Another mutation, named N440K, found in a sample from Yavatmal, had earlier been detected in samples from Andhra Pradesh, and is known to evade immune response.

Mutations in a virus are not always a cause for concern. Like all organisms, viruses evolve by accumulating these mutations over time. However, in comparison to most other organisms, viruses typically have a much higher rate of accumulating genetic variants. "In SARS-CoV-2 the rate of accumulating genetic variants has remained fairly constant and

therefore is a factor of time," Vinod Scaria, the principal scientist at the Institute of Genomics and Integrative Biology in Delhi, an INSACOG affiliate, told me. "The more we prolong the pandemic, the more probability that the virus accumulates more genetic variants." Mutations in specific areas of the virus can give it different characteristics that make it a variant of concern—it can acquire a propensity to evade immune response and detection through diagnostic tools, decrease susceptibility to one or more effective therapies, or increase transmissibility.

On 24 March, the health ministry revealed that a new variant of the virus, which was subsequently called the B.1.617 strain, had been found in fifteen to twenty percent of samples collected from Maharashtra by INSACOG. The strain showed two particular mutations, identified as as E484Q and L452R. While E484Q was similar to the E484K mutation earlier detected in Amravati, L452R was a new mutation known to cause immune escape. Their combination earned this particular strain the misnomer "Double Mutant." In fact, the strain has many more mutations, but it is these two mutations that are key to making it more dangerous. A press release from the ministry stated that these mutations conferred "immune escape and increased infectivity" on this new variant, but also attempted to underplay the significance of this discovery: "These have not been detected in numbers sufficient to either establish a direct relationship or explain the rapid increase in cases in some States."

Since March, more than a hundred and fifty thousand Indians have died of COVID-19, according to official data, which reflects only a conservative estimate (https://caravanmagazine.in/health/how-gujarat-is-undercounting-its-covid19-deaths) of mortality in India. Meanwhile, the central government remains ambiguous regarding the clinical effects of the novel viral strains on its population. According to the sequencing data available to Scaria and his INSACOG colleagues, it is B.1.1.7, the Alpha variant, and B.1.617, with its sub-lineages B.1.617.1 and B.1.617.2, that are driving infections in most states across India now. In mid April, it was reported

(https://indianexpress.com/article/cities/mumbai/maharashtra-double-mutant-found-in-61-samples-tested-7272524/) that B.1.617 was detected in 61 percent of samples collected from Maharashtra between January and March by the National Institute of Virology. On 10 May, the WHO officially classified (https://www.ndtv.com/india-news/who-labels-coronavirus-strain-in-india-as-variant-of-concern-report-2439064) B.1.617.2 as a variant of concern. The Indian government is still quiet on the matter.

"The government has been hesitant from the start to officially identify the variant as a VoC, but the way and speed in which it is spreading in India, there is no doubt in my mind that this is in fact a variant of concern," a member of INSACOG told me.
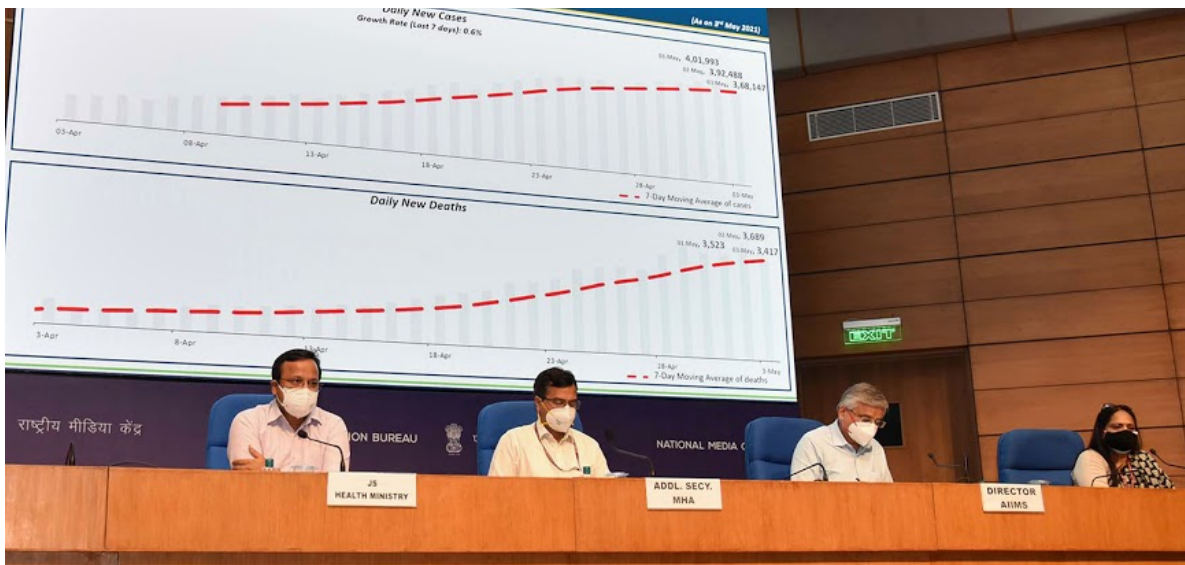
The member told me that it was clear by early March that the variant had a larger role to play in India's second wave. "There were concerns then as well," they said. "There was a report sent by the NCDC to the health ministry in the first week of March, and it is two weeks later that the government briefed the media about this." The member and other scientists from INSACOG revealed that they do not have direct access to policymakers or the prime minister's office. Their findings are relayed to the National Centre for Disease Control, which in turn communicates with members of the health ministry, as well as the 21-member national task force for managing COVID-19.

While members of INSACOG had already registered their concern over the rising number of cases detected with B.1.617, in its 24 March press statement the health ministry did not say that there was anything to be concerned about. A report (https://www.reuters.com/world/asia-pacific/exclusive-scientists-say-india-government-ignored-warnings-amid-coronavirus-2021-05-01/)by Reuters on 1 May revealed that the government had ignored warnings by scientists. On 10 March, INSACOG members had submitted a report to the NCDC, clearly stating that the new variant is more infectious and can potentially evade antibody

response. The report also warned the government about an upcoming surge in cases driven by the new variant. The NCDC had in turn submitted this report to the health ministry.

Rakesh Mishra, another INSACOG member, confirmed the contents of the Reuters report. Mishra, who recently retired as director of the Centre for Cellular and Molecular Biology, said that the consortium was aware of the potential threat of the new strain as early as mid February. He also confirmed that the first sample containing the mutant strain was collected in October 2020 from Maharashtra and sequenced by December. "But, in December, we weren't sure if there was anything to worry about regarding this new strain," Mishra said. "In the months after, when we noticed a higher frequency of this strain in the samples we collected, we realised that this mutant is more infectious. It was diminishing the presence of other strains in the population."

⬈ (https://caravanmagazine.in/health/modi-government-failure-led-india-covid-19-catastrophe/attachment-17159)

On 3 May, two days after a Reuters report revealed that the government ignored scientists' warnings about new variants of the virus, the health ministry held a press conference in Delhi. The officials evaded questions regarding the variant, giving vague answers and promising to disclose more about the variant's clinical properties in subsequent conferences. PIB

ON 3 MAY, two days after the Reuters report was published, the health ministry held a press conference (https://www.youtube.com/watch?v=qtgc79vo4zg&ab_channel=PIBIndia) in Delhi. In line with their previous responses, officials evaded questions regarding the variant, giving vague answers and promising to disclose more about the variant's clinical properties in subsequent conferences. When asked whether the strain was more infectious than the original strain of the virus, Lav Aggarwal, a joint secretary at the health ministry, said: "All the variants that we talk about, the field action in terms of management of disease, in terms of management of spread of infection remains same. From a public-health perspective, we epidemiologically study the mutation, analyse it and advise the states. Some mutants increase transmissibility, and some other factors are there which we will tell you about. But I want to request everyone. Mutant or no mutant, it's imperative that the actions we take in terms of control of COVID-19 remains same." Dr Randeep Guleria, the director of the All India Institute of Medical Sciences in Delhi, who was also present at the conference, added, "Regardless of mutations, the principles of management remain the same."

Public-health experts I spoke with saw severe shortcomings in Agarwal and Guleria's approach. Expanding sequencing and conducting more studies to understand how a new strain progresses through the population can help frame crucial and timely public-health interventions. "There are three key things about mutant strains that we need to urgently study—one, whether the strain is more infectious, secondly whether it is more virulent, and thirdly whether it evades vaccine-produced immunity," Dr K Srinath Reddy, president of the Public Health Foundation of India, told me. Failing to adequately pay heed to public-health experts' opinions on how to manage the second wave was the government's second biggest goof-up.

According to Reddy, knowing whether a virus is more infectious allows us to take stringent measures in advance, enforcing localised lockdowns

in places where a particularly dangerous strain is more prevalent. Establishing how virulent the virus is allows governments to prepare resources to treat severely ill patients in hospitals, because higher virulence is likely to make a larger population of infected individuals severely ill. "Lastly, if we know that a strain evades vaccine-induced immunity, which lowers the efficacy of existing vaccines, we can engineer our vaccines to be more efficacious or conduct studies to understand which vaccines work against a particular strain," Reddy said. "All of this information is important if we want to be better prepared and save more lives."

With limited genomic sequencing and even more limited research available on the clinical characteristics of the variants circulating among India's population, there is no clarity on the ways in which particular variants are driving the current surge of infections. "All that can be said is that it is a much more infectious strain, and this conclusion is also based on observational and anecdotal evidence," Reddy said. "For now, we need to take the evidence we have seriously, even if it is observational, so that we take ample precaution."

Reddy is a part of the 21-member national task force for COVID-19 formed by the Indian Council of Medical Research. The ICMR task force, comprising leading scientists from across the country, was intended to serve as the key advisory body to the Modi government for its pandemic response. Ever since its conception, however, the government has flagrantly ignored the advice of these scientists and public-health experts, choosing instead to promote pseudoscientific remedies (https://caravanmagazine.in/health/the-bad-science-and-poor-ethics-of-patanjali-coronil-research)and adopt an unscientific approach (https://caravanmagazine.in/health/gujarat-modi-science-denialism-coronavirus-pandemic) towards managing the pandemic. "I cannot but feel that we are in this situation because of the basic anti-science and anti-intellectual stance of the current political party in power, that has

always belittled data and knowledge," K Sujatha Rao, a former union health secretary, told me.

In April 2020, *The Caravan* reported (https://caravanmagazine.in/government/modi-administration-did-not-consult-icmr-appointed-covid-task-force-before-key-decisions) that the Modi administration did not consult members of the ICMR task force before extending the nationwide lockdown till 3 May. The report revealed that the task force did not even meet in the week preceding the decision. This March, the BBC reported (https://www.bbc.com/news/world-asia-india-56561095) that there was "no evidence of key experts or government departments being consulted prior to the lockdown being implemented." Journalists from the BBC had filed 240 right-to-information applications to extract this information. Two members from a 12-member ICMR subcommittee on epidemiology and surveillance, which was charged with advising the government on when to impose partial or full lockdown, confirmed that they were not consulted before implementing the nationwide lockdown in March 2020. "We are basically just there as a prop to show that they are taking scientific advice," a physician and infectious-disease epidemiologist who is part of the subcommittee told me. "Our role is redundant. We come up with research plans mostly, but it was very clear from the beginning that our advice is not welcome."

A similar cycle of events unfolded prior to the second wave of the pandemic. In April, *The Caravan* reported (https://caravanmagazine.in/health/india-covid-19-taskforce-did-not-meet-february-march-despite-surge-say-members) that the national task force did not meet even once throughout the months of February and March, even as cases continued to surge. Despite it being abundantly clear a second wave was on the horizon by mid February, the team did not convene for a meeting until 15 April.

"It is frustrating. There are so many programme-oriented, public-health interventions that we want to implement, to discuss during these meetings, but no matter how much you reach out to the officials, you never hear back from them," a public-health expert who is a part of the task force told me. "Everything, from the uptick in cases to the concerning trends in transmissibility caused by the new strain, was shared with the big bosses, but what did they do about it?"

I spoke with two members of the national task force, and two members of the subcommittee on epidemiology, all of whom acknowledged that the task force and its subcommittees only played a symbolic role for the Modi government. Meanwhile, decision-making remained independent of, and uninformed by, scientific inputs. "They came in with a fixed agenda to discuss," an epidemiologist who is also part of the national task force said. "If you had to say anything more than that or wanted to discuss anything besides that agenda, you could try and bring it up after the meeting ended, but everyone knew that any recommendation you make post the meeting will fall on deaf ears."

The "they" the epidemiologist was referring to are the prominent members and de-facto leaders of the task force, who act as an interface between these advisory committees and the government. These leaders include Guleria, the AIIMS director; Balram Bhargava, the director general of the ICMR; and Vinod K Paul, a member of the Niti Aayog—the public-policy think tank formed by the Modi government in 2014. The public-health expert from the task force said that these leaders "are expert clinicians, good scientists, but they are not public-health experts. They don't know how things work on the ground. Do they know what's happening in rural India? Do they know what the woes of a district health officer are? Do they know what our ASHAs and ANMs"—local women trained as community-health workers—"are facing every day? These are people who sit in their ivory towers, and their decisions are detached from the reality on the ground."

India's pandemic response cannot be scrutinised without understanding the role played by Vinod K Paul, a member of the Niti Ayog, which has become the "backroom" for hashing out all policies that the prime minister's office thinks of. ANUSHREE FADNAVIS / REUTERS

India's pandemic response cannot be scrutinised without understanding the role played by Vinod K Paul. In addition to leading the national task force, Paul heads the National Expert Group on Vaccine Administration, or NEGVAC, the group responsible for drafting the country's COVID-19 immunisation programme and making decisions on the procurement and administration of vaccines across the country. As a member of Niti Aayog, Paul was also behind the strategy document for the National Health Stack (https://niti.gov.in/writereaddata/files/document_publication/NHS-Strategy-and-Approach-Document-for-consultation.pdf)—a proposal to digitise the healthcare system in India. "He is the star of the show, he calls all the shots," the public-health expert said.

A paediatrician and eminent neonatologist, Paul was a member of the faculty at AIIMS in Delhi, where he headed the paediatrics department for several years before retiring and joining the Niti Aayog. Before retiring in 2017, he was in the running for the position of AIIMS director,

along with Guleria and Bhargava. "Everyone thought he would get the position, there was no doubt," a former civil servant who has worked with the health ministry told me. "But when Guleria got appointed instead of him, the government rewarded him with the Niti Aayog position, which has probably worked out better for him."

The former bureaucrat said that in the past few years, the Niti Aayog has emerged as the "backroom" for hashing out all policies that the prime minister's office thinks of. Such is the power of the Niti Aayog, he said, that once a decision is made by the think tank, no ministry has the power to question it. "This is an unhealthy policy structure," he said. "At least with all the problems that previous governments had in India, they certainly had ministries that had some strength, had some degree of responsiveness to the press, civil society and court." The former bureaucrat said that the role of the health ministry has been diminishing over the past few years, adding that all major health-policy decisions, including the government's flagship Ayushman Bharat scheme—a heavily funded national-level health insurance scheme—are now initiated by the Niti Aayog.

Paul is at the centre of all health-related policymaking in the country, and now the authority on pandemic-related decision-making as well. Members of the national task force, as well as a former senior consultant from AIIMS who has worked closely with Paul, described him as amicable and warm, a "good listener and articulate speaker." "But all of these capabilities do not necessarily make him a public-health expert," the former AIIMS consultant said. "He is of course a highly qualified and capable man, but decisions cannot be made by one man alone."

The infectious-disease epidemiologist who is part of the subcommittee on epidemiology told me that Paul stopped coming to the body's meetings early on. "What we were discussing was clearly not relayed to higher authorities and, if it was, then of course it was disregarded by our politicians," he said. "It was evident from early on that the political class

was not interested in what we had to say. Public health is about politics after all, good public-health interventions are a result of good politics. And, with the current political scenario, I do not have much hope for us." Paul did not respond to questions sent to him over email.

The public-health expert from the national task force believed that decision-making led by babus and their chamchas has led us to the current humanitarian crisis. "Then again, if you aren't a chamcha in this government, how do you reach that position of power at all?" he said, referring to Paul and other leaders of the national task force, who have access to the prime minister's office. "If you prioritise scientific thinking and timely public-health intervention over pleasing the prime minister, then your opinion is worthless to this government."

SUNITA RANI, a 41-year old ASHA worker from Haryana's Sonipat district, was living through an unrelenting daily nightmare. "*Dehshat hai*, madam, *dehshat, jeene ka matlab kya hai samajh nahin aata*"—It's complete horror, I don't understand the point of living anymore—Sunita told me over the phone in mid May. In her native village and neighbouring villages around the Halalapur area of Sonipat, she said, people had been dying before they even realised they were sick, let alone getting hospital care. "We don't even know if it's COVID," she said. "People are dying before we can test them, there are no tests anymore." Amidst chaos and despair, many are now eager to get vaccinated, and they call her every day to ask for information, often with inquiries about when they can get their second dose of the vaccine. "But what do I tell them, there are barely any vaccines," she said. "So many line up outside our sub-centre, but we have to send them home because there is simply not enough supply."

Until the end of March, Sunita told me, there was an adequate supply of vaccines, and her work focussed on convincing villagers to get

vaccinated. "People had heard rumours about the side effects of the vaccines and, frankly, yes, many people did feel side effects but the point was that they had to get vaccinated if they wanted to be safe," she said. "So, we worked round the clock, conducting door-to-door surveys and asking eligible members of the family to come out for vaccination."

As an ASHA worker, Sunita is responsible for providing community-health services to Shriram Colony. "We had to administer the second dose in mid April, but we finally ended up vaccinating them on 12 May, a month later!" she said. "And we only got a hundred doses, when there were 140 people waiting for their second dose. If people had gotten vaccinated in time, maybe they would have had a better chance of survival." Sunita's own brother died of COVID-19 a few days before he was scheduled to get his second dose. "Now there is no point counting on vaccines to save us," she said. "There is no point counting on anything really."

The third major failure of the government was its vaccination program. Today, India faces an acute shortage despite being the largest manufacturer of vaccines. While the health minister maintained (https://www.hindustantimes.com/india-news/vaccine-supply-on-4th-or-7th-day-health-minister-harsh-vardhan-on-reports-of-covid-19-jab-shortage-101618651706536.html) that there was no shortage of vaccines, vaccination sites have been periodically shutting down (https://www.ndtv.com/india-news/delhi-government-says-140-vaccine-points-shut-due-to-covaxin-shortage-2441866) across the country due to disruptions in supplies. Scrambling to secure more doses, at least nine states have declared that they will float global tenders (https://indianexpress.com/article/coronavirus/india-covid-vaccine-shortage-global-tender-coronavirus-vaccines-7311015/) to purchase vaccines for their citizens. "To the best of our understanding, in no other country are constituent states shopping nationally or globally for vaccines," Dr Rajib Dasgupta, a professor at Jawaharlal Nehru University's Centre of Social Medicine and Community Health, told me.

"The fragmentation in procurement shall necessitate a range of recalibration that states will have to cope with." In May, the vaccine companies Pfizer and Moderna refused to sell their vaccines directly to Punjab as, according to their policy, they only dealt with national governments.

One of the biggest failures of the government was its vaccination program. Today, India faces an acute shortage despite being the largest manufacturer of vaccines. ASHISH VAISHNAV / SOPA IMAGES / LIGHTROCKET / GETTY IMAGES

Until now, immunisation programmes in India have followed a policy of the central government being responsible for procuring and distributing all vaccines among states, while the states have control over the ways in which they administer doses. Under India's Universal Immunisation Programme, approximately 390 million doses of vaccines are administered annually to pregnant mothers and newborn children across the country. The UIP is dependent on an intricate supply chain that has been fortified over the years to increase vaccination coverage to more than sixty-two percent of the national population. "This system was there for the taking for the COVID-19 immunisation programme as well, for universal and equitable access to the vaccines, but the centre, perhaps to cover up for its failure in procuring enough vaccines, has come up

with this botched-up policy now," Dr Prabir Chatterjee, a community-health doctor in West Bengal's Bankura district who previously served as an immunisation consultant for UNICEF, told me.

In the first two phases of India's COVID-vaccination programme, the central government was the sole procurer of vaccines. On 21 April, prior to opening up vaccination to all adults, the central government issued the new "Liberalised Pricing and Accelerated National COVID-19 Vaccination Strategy." (https://www.mohfw.gov.in/pdf/LiberalisedPricingandAcceleratedNationalCovid19 This strategy stipulated that domestic manufactures sell fifty percent of their stock to the centre, while the rest can be procured directly by state governments or private hospitals. It also allowed for private hospitals and industries to procure directly from manufacturers, while removing the price cap of Rs 250 on commercially sold doses, allowing them to fix charges as they pleased. This "liberalised" approach to the vaccination programme, the government said in its strategy document, "would, on the one hand, incentivize vaccine manufacturers to rapidly scale up their production and on the other hand, it would also attract new vaccine manufacturers."

In the aftermath of this policy, as states continued to reel under growing demand and simultaneously diminishing supply of vaccines from the centre, eligible adults searched for a slot (https://www.bbc.com/news/world-asia-india-56912977) on the government-developed CoWIN platform, but to no avail. Not only have states now turned to global manufacturers to secure supplies, they are also trying to source supplies from COVAX (https://indianexpress.com/article/cities/ludhiana/punjab-global-platform-covax-procure-vaccines-directly-buy-covaxin-for-industrial-workers-covid-7314232/), an initiative by the Global Vaccine Alliance to ensure equitable distribution of vaccine doses across the world.

"The government has fragmented the market completely, made it opaque and inefficient, and completely abdicated their responsibility towards securing healthcare needs of their people," R Ramakumar, a professor at the School of Development Studies at the Tata Institute of Social Sciences in Mumbai, told me. Ramakumar, who has been closely monitoring India's developing vaccine policy, said that, since vaccines are a public-health good, the central government's failure to provide equitable access to them is a direct violation of the constitutional right to health.

The government's "liberalised" strategy, Ramakumar added, is a botched attempt at covering up its failure to anticipate demand and procure vaccines in advance. As of May, the Modi government was sourcing all vaccine doses from the Pune-based Serum Institute of India, which manufactures Covishield, and the Hyderabad-based Bharat Biotech, which devised the indigenous Covaxin in collaboration with the ICMR. Both these vaccines were approved for use in January 2021. In the operational guideline (https://www.mohfw.gov.in/pdf/COVID19VaccineOG111Chapter16.pdf)s issued by the health ministry last year, the government stated that it intends to vaccinate 300 million people in the first phase of its vaccination drive. By 27 May, a little more than 200 million doses of the vaccine had been administered, out of which less than 44 million were second doses, which means that most vaccinated individuals remained to be fully immunised.

Amid the lag in administering vaccines, the central government presented an optimistic picture of its procurement plans in a press conference on 13 May, claiming that, between August and December, India would be flooded with over 2 billion vaccine doses. In a presentation, the government explained that this can be achieved by ramping up the capacity of the two existing domestic manufacturers and supplementing their output with doses of the Russian-manufactured Sputnik V vaccine, as well as other vaccines that are currently still under

development. "This is a highly optimistic prediction, which our government is unlikely to achieve," Dr Chandrakant Lahiriya, a vaccinologist and public-health expert, said. "This is the best-case scenario. In reality, there are many complex challenges in scaling up production. If it were that easy, we would have done that already. Plus many vaccines that the government is depending on are currently in the development stage. How can one predict when and how these will be approved?"

The claims made at the press conference also appeared in an affidavit (https://www.livelaw.in/pdf_upload/centres-affidavit-in-suo-moto-covid-case-supreme-court-393164.pdf) filed by the central government in the Supreme Court on 10 May, in response to questions raised by judges about the government's management of the pandemic. The government revealed that Serum Institute of India has the capacity to manufacture 50 million doses per month, which was then ramped up to 65 million doses. Bharat Biotech's capacity of 9 million doses per month has been increased to 20 million doses and is expected to be ramped up further to 55 million doses per month. Even if SII manufactures 65 million doses every month without fail for the central government, it would take almost a year for it to manufacture the 750 million doses of Covishield that the government claimed would be available between August and December this year. At the rate at which Bharat Biotech is manufacturing Covaxin, it will take at least ten months to reach the government's target of 550 million doses over the same period.

"The math just doesn't add up, these are baseless predictions," Ramakumar told me. He said that the government has remained inexplicably lax in its efforts to secure supplies. "If you wish to inoculate all your population over the age of 18 by the end of 2021, we need to give at least 54 lakh doses per day, when we are now administering a little over 20 lakhs."

Despite knowing the limits of the pooled production capacities of SII and Bharat Biotech, the government continued to make unachievable projections of vaccine coverage. It opened vaccination up to all adults in India knowing fully well that the supply chain to administer the vaccine to such a large population was not in place. NK Arora, the chairman of the National Technical Advisory Group on Vaccines, revealed (https://economictimes.indiatimes.com/news/politics-and-nation/shots-for-18-44-yr-group-was-a-political-decision/articleshow/82812610.cms?from=mdr) that the group had advised the government to limit the COVID-19 vaccination drive to those above the age of 45 years for the time being. Arora said the government knew it had only enough vaccines to inoculate priority groups above the age of 45.

As early as November 2020, before any vaccines were considered for approval in India, the parliamentary standing committee on health issued a report (https://rajyasabha.nic.in/rsnew/Committee_site/Committee_File/ReportFile/14/1. which it advised the government to devise a plan to manage the availability of vaccines. "The vaccine production capacity in the country has to be considerably ramped up for making the vaccine accessible to its citizens," the report said. The committee also asked the government to administer vaccines as per the WHO's "strategic allocation" plan, which prioritises at-risk groups until vaccines are available for all. "That should have been the plan, of course," Lahiriya said. "It is essential for each vaccination programme to have an assured supply chain before it is initiated. So, of course the current approach is disastrous, because we opened up the vaccination programme to three times more the population while the supply remained the same."

Ramakumar explained that the government failed in three crucial ways in its procurement strategy. For one, it refused to grant approvals to foreign vaccines in time. "It denied approval to the Pfizer vaccines because of a lack of bridging trial, when SII was granted approval before its bridging trial was completed," he said. "These were just tactics to

ensure that only vaccines manufactured in India are available, to show how *aatmanirbhar*"—self-reliant—"India is." The second issue, Ramakumar said, is that the government did not make adequate investments in the manufacturing companies, thereby giving them less of an incentive to gear all their supplies towards the Indian market at a highly subsidised rate.

Adar Poonawalla, the CEO of SII, has claimed (https://www.livemint.com/companies/news/serum-institute-of-india-defends-covid-19-vaccine-pricing-11619260720433.html) that he was able to supply Covishield at a lower price to the international market as compared to the Indian market because international buyers had made "at-risk investment" in the company by placing orders in advance, which he claims the government of India refused to do. "The US for example, invested $2 billion in their vaccines even before it was in its development state," Ramakumar said. "India, on the other hand, did not and now has no moral high ground to dictate prices to these companies." This was the third failure according to Ramakumar, the failure to place orders in advance. When the government finally placed orders, Ramakumar said, most capacities were already locked down for supplying to other buyers.

Even without investing in manufacturing companies, or spending money to make advance purchases, the government could have easily scaled up production of Covaxin because it shares intellectual-property rights (https://www.thehindu.com/news/national/icmr-to-get-royalty-from-covaxin-sale/article34474504.ece) over the vaccine with Bharat Biotech. Ownership over the rights allows the government to share the technology with other local vaccine manufacturers. "If you had these rights, why not allow more companies to produce this simultaneously?" Ramakumar asked. "Why were exclusive rights given only to Bharat Biotech?" A month ago, the central government granted permission (https://www.news18.com/news/india/mumbais-haffkine-institute-gets-centres-nod-to-produce-covaxin-as-maha-reports-over-61k-fresh-infections-3644624.html)to the Mumbai-based Haffkine Institute to

produce Covaxin. The institute's managing director has said (https://indianexpress.com/article/cities/mumbai/will-have-capacity-covid-vaccine-doses-a-year-covaxin-7308732/)that it will take at least eight to ten months for the company to start rolling out doses. Apart from this, Bharat Biotech plans to rope in (https://www.indiatoday.in/coronavirus-outbreak/story/bharat-biotech-to-scale-up-covaxin-production-to-1-billion-doses-a-year-1805007-2021-05-20)a few other manufacturing units to begin production of Covaxin, and has claimed this will ramp up production to 2 billion doses a year. However, it is unlikely the company will be able to reach this capacity by the end of this year. Vaccine manufacturers have also expressed doubts regarding the government's optimistic procurement goals.

The government's decision to liberalise vaccine supply has also set the stage for vaccine inequity (https://caravanmagazine.in/health/modi-liberalised-vaccination-policy-mistake-that-other-countries-avoided), leaving the economically underprivileged and marginalised to scramble for a crucial public-health good. "All countries in the world are securing vaccines centrally apart from India. All of them," Lahiriya said. "Competitive pricing, along with a shortage of vaccines and no price cap in sight, means that the vaccine will remain unaffordable for most, while the rich pay a hefty sum to procure it from private companies."

While vaccines will not necessarily work to save lives during the current wave of the virus, they will be essential in mitigating the effects of future waves. For vaccines to completely prevent a new wave of the disease, at least sixty to seventy percent of the population needs to be vaccinated. With the current rate of vaccination, it is difficult to believe that such a large population—between 800 million and a billion people—will be fully vaccinated in India by the end of 2021. However, even if they do not completely stop transmission of the disease, vaccines are crucial in saving lives during the pandemic. In March, *The Caravan* reported (https://caravanmagazine.in/health/why-vaccinated-healthcare-workers-are-testing-positive-for-covid-19)on how, even though vaccinated

healthcare workers were testing positive for the disease, they were protected from severe symptoms and hospitalisation.

As for whether vaccines protect against the dominant B.1.617 variant of the virus, a preliminary study (https://www.business-standard.com/article/current-affairs/covaxin-neutralises-the-double-mutant-coronavirus-strain-says-icmr-121042101342_1.html) conducted by the ICMR and the NIV suggests that Covaxin produces enough antibody response to neutralise it, besides the Alpha and Gamma variants. (The Gamma variant was first documented in Brazil.) Rakesh Mishra told me that studies conducted in his own lab at the Centre for Cellular and Molecular Biology have shown that Covishield also effectively neutralises these three strains. However, Shahid Jameel, a virologist and director of the Trivedi School of Biosciences at Ashoka University, told me that he is wary of results produced by these studies. "These are early studies, done in vitro, in a lab. How things pan out in real life is a different question." Jameel was chairing the scientific advisory group overlooking INSACOG until he resigned on 17 May. "Of course, these vaccines will still have some efficacy against these strains, but it will definitely be reduced," he added.

Apart from these studies, Mishra's lab also conducted another significant study, which gave less optimistic results. Mishra and his team tested the B.1.617 variant against serum collected from nine individuals who had been injected with the first dose of the Pfizer vaccine, and found that vaccine-induced antibodies in the sera were slightly less effective in neutralising B.1.617 as compared to earlier strains. Notably, in the same study, the researchers also identified breakthrough infections in 33 healthcare workers in Delhi, all of whom had been vaccinated with two doses of Covishield. Upon sequencing the serum collected from the workers, the researchers found that most had been infected either by B.1.617 or other B lineage variants, such as B.1.1.7. Pfizer has claimed that its vaccine is "highly effective" against the B.1.617 variant and is currently negotiating with the Indian government, seeking fast-track approval for

its vaccine in India. The US-based pharmaceutical company has asked the Indian government to indemnify it from financial liabilities in the country as part of a potential purchase agreement.

There is still a long way to go to ascertain the clinical characteristics of the new strains. Jameel said that INSACOG was now working with all hands on deck, sequencing at full capacity and simultaneously working towards increasing its output. The consortium had also already begun identifying more minor variants of the virus. Advanced detection and robust clinical research on these variants might help prepare India for subsequent waves of the pandemic.

⬈ (https://caravanmagazine.in/health/modi-government-failure-led-india-covid-19-catastrophe/attachment-17162)

COVID-19 patients inside a general ward at the government hospital in Bharuch, Gujarat. In mid April, a 26-year-old resident doctor manned a ward with seventy seriously ill COVID-19 patients. SHAHID TANTRAY FOR THE CARAVAN

THE FIRST DAY OF MAY started out as stressful as all the days the previous week had been for Dr SLC Gupta, the medical director of

Delhi's Batra Hospital. His 500-bed private hospital was about to run out of oxygen.

The hospital had 315 COVID-19 patients, of which 250 were dependent on high-flow oxygen to survive. It had spent the past few days scrambling to secure a daily supply of 8,000 litres of medical oxygen, though it received a maximum of only 5,000 litres a day. Gupta and his team sat down every morning to take account of the oxygen stock and make desperate calls to authorities to ensure that at least some of their supply reached the hospital before the oxygen completely ran out. "We were living from one oxygen cylinder to the next, depending on minute-to-minute delivery of oxygen and just about securing enough to save lives on time," Gupta said. But, on 1 May, the tragedy that the hospital had been barely averting finally occurred. The oxygen supply ran out, and 12 patients, including a doctor employed at the hospital, died.

"You cannot even fathom the horror, the trauma of wondering every minute if we'll get a cylinder on time, while planning for the event that deliveries don't reach on time," Gupta told me. By 11 am on 1 May, the hospital knew that the situation was worse than usual, because in the past few days it had been able to secure at least some amount of supply by that time of the morning. In order to conserve the existing supply, hospital staff began picking out patients who were in most need of oxygen and transporting others to a ward where there was no oxygen supply. "It is hard, of course, to make that decision," Gupta said. "No one should be put in that position, but we had to do it. We went around wards, picking two to three patients and sending them to a separate building."

Gupta estimated that the hospital ran out of oxygen between 12.30 and 12.45 pm. With the liquid-oxygen supply exhausted, the hospital had also used up the last of its oxygen cylinders. The hospital had already tried calling all authorities involved, and written to the chief minister himself, pleading for more cylinders. "Our tanker was stuck at Burari, so in the

meanwhile we were hoping some other tanks or cylinders closer to us could be directed our way," Gupta recalled, his voice shaking over the telephone. The hospital even reached out to the media. In a clip posted by NDTV (https://twitter.com/ndtv/status/1388395083804725250) just before 1 pm that day, Dr Sudhanshu Bankata, the hospital's executive director, announced that its oxygen supply would run out in ten minutes. "The Delhi government is trying to help us, but I believe the tanker is quite far from us," Bankata said in the clip. Meanwhile, as oxygen ran out, staff members stood by helplessly while patients gasped for air. "Can you imagine the horror, the trauma our young staff went through?" Gupta said. "Years of training they have had for the most dire of circumstances, but they could never be prepared for this. Our staff is broken."

In late April and early May, many hospitals broadcasted SOS messages on social media (https://twitter.com/maxhealthcare/status/1385416435325755395?lang=en) as their oxygen stores threatened to run out, unable to secure their supply in time even after reaching out to all authorities involved. While most hospitals, with the aid of state officials, were able to access oxygen just in time to avert the crisis, others were not so lucky. On 23 April, 25 patients died (https://www.indiatoday.in/coronavirus-outbreak/story/20-covid-19-patients-die-due-to-oxygen-shortage-at-jaipur-golden-hospital-in-delhi-1794499-2021-04-24)due to oxygen shortage at Delhi's Jaipur Golden Hospital. In Karnataka's Chamarajanagar district, 24 people died due to oxygen shortage at the district's civil hospital. "These are all preventable deaths, like most deaths that have occurred during this pandemic," Yogesh Jain, a public-health worker, told me. "Fifteen out of hundred infected patients need oxygen support, out of which 12 can be managed on high-flow oxygen and perhaps three will need intensive care. So, if we had enough oxygen, then of course most of our patients would have survived." The government's apathy towards ensuring supply of oxygen and life-saving medicines, and hiring adequate manpower before the second wave hit us was its fourth biggest blunder.

Frustrated with the central government's failure in supplying adequate amounts of oxygen to the capital, the Delhi High Court remarked that the centre might choose to "dig its head like an ostrich in the sand" (https://www.livelaw.in/news-updates/delhi-high-court-oxygen-shortage-covid-19-delhi-government-173740) but the court could not afford to do the same. A division bench of Vipin Sanghi and Rekha Palli, hearing a series of petitions on oxygen shortage and pandemic mismanagement, asked the central government whether "they are living in ivory towers," unaware of the collapse of the city's health systems and the resulting death toll.

⤢ (https://caravanmagazine.in/health/modi-government-failure-led-india-covid-19-catastrophe/attachment-17164)

With all oxygen diverted towards medical use, there are concerns over contaminated oxygen cylinders that were earlier used to transport industrial oxygen being used in medical settings. It is suspected to be one of the causes behind the rising infection rates of mucormycosis, or "black fungus." ISHAN TANKHA

Before COVID-19, the nationwide demand for liquid medical oxygen was roughly one thousand tonnes a day. As of May, the daily demand for medical oxygen in Delhi alone exceeded seven hundred tonnes. According to information submitted by the central government to the Supreme Court, the demand for LMO across the country during the peak

of the second wave was more than eight thousand tonnes a day. Last year, even during the peak of the first wave of the pandemic in September, the daily national consumption of medical oxygen was around three thousand tonnes.

During that peak, *The Caravan* had reported how hospitals were running out of oxygen in Maharashtra (https://caravanmagazine.in/news/covid19-oxygen-run-low-in-maharashtra-hospitals-due-to-lack-of-infrastructure), operating on last-minute deliveries of oxygen, and dealing with the threat of similar disasters to what occurred in hospitals such as Batra across the country in April and May this year. Even then, when the need for oxygen was concentrated in a few states and the demand was around three times lower than it is now, the government was struggling to secure the oxygen supply chain. The government had also failed to regulate oxygen prices (https://caravanmagazine.in/health/despite-price-caps-hospitals-are-paying-hefty-sums-to-meet-daily-oxygen-needs) during the first wave of the pandemic. "This war will now be fought with oxygen and, unless the government intervenes to maintain the supply chain, I don't know how long we can go on like this," Sameer Chandrate, a Nashik-based doctor, told me last September, when his city was overwhelmed with cases.

Since September 2020, the demand for LMO has nearly tripled. On average, India used to produce between seven thousand to eight thousand tonnes of liquid oxygen per day. However, more than eighty percent of this supply was reserved for industrial use. Now, with all oxygen diverted towards medical use, there are concerns (https://www.business-standard.com/article/current-affairs/experts-to-study-if-black-fungus-cases-are-linked-to-industrial-oxygen-use-121052400006_1.html)over contaminated oxygen cylinders that were earlier used to transport industrial oxygen being used in medical settings. It is suspected to be one of the causes behind the rising infection rates of mucormycosis, or "black fungus."

"The production per se has never been the problem—we produce enough oxygen and have been able to ramp it up quite quickly as well," a senior manager at one of India's largest LMO producers told me. He said that his company alone had ramped up production from 2,400 tonnes to 3,400 tonnes per day in April. "Now the problem remains, as it had been in September, how do we transport oxygen from the states where it is produced to the states that need it? That also in time to save lives?"

Transportation of liquid oxygen requires large cryogenic tanks. These tanks are kept at bigger hospitals for storage and used by producers and middlemen to transport large quantities of liquid oxygen. Apart from this, the medical-oxygen delivery system in India is supported by oxygen cylinders, which contain oxygen in gas form and are often utilised by smaller hospitals and even individuals at home. "As demand for all kinds of oxygen increases, we need all kinds of infrastructure to support it," the senior manager said. "We have not gotten better at it. We are even airlifting empty tankers to our base before refilling them and sending them back to Delhi by road. But, of course, had we anticipated such a need and streamlined our delivery system, many more lives would have been saved in the last few months."

One solution to the oxygen-transportation problem was to install an adequate number of pressure-swing-absorption plants close to the government hospitals that cater to the greatest numbers of patients. PSA plants can segregate gases in the atmosphere to supply concentrated oxygen to hospital beds through a pipeline, thereby eliminating the need to source oxygen directly from plants that are typically located far away from hospitals. In April, *Scroll (https://scroll.in/article/992537/india-is-running-out-of-oxygen-covid-19-patients-are-dying-because-the-government-wasted-time)* reported (https://scroll.in/article/992537/india-is-running-out-of-oxygen-covid-19-patients-are-dying-because-the-government-wasted-time) that the central government had delayed the process of installing 162 such PSA plants at district hospitals across the country. The Central Medical Services Society, an autonomous body

under the government, issued the tender for installing these units as late as October 2020, even though the money for funding these units, meant to come from the Prime Minister's Citizens Assistance and Relief and Emergency Situations fund, had already been collected by March 2020. The PM-CARES fund had received donations worth Rs 3,000 crores within only a few days of its creation that month. Installing the 162 PSA plants would have taken around Rs 201 crores (https://www.pmindia.gov.in/en/news_updates/pm-cares-fund-trust-allocates-rs-201-58-crores-for-installation-of-162-dedicated-psa-medical-oxygen-generation-plants-in-public-health-facilities/).

⤢ (https://caravanmagazine.in/health/modi-government-failure-led-india-covid-19-catastrophe/attachment-17165)

Exhausted healthcare workers sit on the rear step of an ambulance inside a crematorium in Delhi. The government has done little since last year to address the massive shortage of health workers. ALTAF QADRI / AP PHOTO

The *Scroll* report found that by April 2021, of the 60 hospitals the media outlet checked with, only 11 of these units were installed and only five were operational. A few hours after the report was published, the health ministry tweeted (https://twitter.com/MoHFW_INDIA/status/1383651682270072846?s=20)that it had installed 33 PSA plants and was planning to complete

installing eighty such plants by the end of May. Still, the ministry's response did not explain why these plants had not been installed in time to anticipate such high demand for oxygen. "There is absolutely no excuse why the 163 oxygen plants were not put or powers used to direct all major hospitals set up their own oxygen plants," K Sujatha Rao told me.

"It is a lack of preparation; what else is there to say? A lack of preparation in terms of oxygen, drugs, beds," Jain said. "The misery that this is causing, it's not just the deaths in itself, it is that a country has lost faith in its systems. It is devastated and it is hopeless. It doesn't know where to look for support anymore."

IN MID APRIL, *The Caravan* reported from inside a hospital in Gujarat's Bharuch (https://caravanmagazine.in/health/three-hours-in-an-understaffed-bharuch-hospital-with-dying-covid19-patients) district, where a 26-year-old resident doctor was manning a ward with seventy COVID-19 patients, aided only by five nurses. In the absence of medical attention, patients inside the ward were fiddling with the dials for their oxygen supplies to reset levels according to their needs. We witnessed how the doctor and his limited staff had to make the hard decisions of prioritising the sickest patients, while almost all patients in the ward teetered near death, gasping for air.

Gearing up for a potential public-health crisis like the one India is facing today does not demand a particularly sophisticated hospital set-up. "No country, even the wealthiest ones, were prepared for this pandemic, but anticipating this second wave, all we needed to do was set up a huge tent with beds and high-flow oxygen assistance," Vikram Patel, the Harvard professor, told me. "Of course, it would also have needed healthcare workers to look after these patients. Beyond oxygen and a bed, these patients need attention and care, people who can monitor their vitals and hook them on to these machines. I can't believe that a government

that can make a vaccine in record time cannot prepare such a rudimentary set-up to save lives."

India has a chronic shortage of healthcare workers. Even before the pandemic, the country had only one doctor for every 1,404 people (http://164.100.24.220/loksabhaquestions/annex/173/AS90.pdf) and 1.7 nurses for every 1,000 people, when the WHO recommends a ratio of three nurses and one doctor per thousand people. When the pandemic hit, this shortage was felt more than ever. Inside wards, doctors and nurses were essential in managing oxygen levels, monitoring vitals, taking frequent samples for tests and performing the laborious task of proning—flipping patients onto their stomachs so as to increase their oxygen-saturation levels. Outside of hospital wards, community-healthcare workers and paramedical staff conducted surveillance activities, mass testing and contact-tracing.

"We are carrying out all the activities needed for managing this pandemic, from testing to delivering dead bodies at the crematorium," Harjit Singh Bhatti, the national president of the Progressive Medicos and Scientists Forum, told me. "Still, the government either did not have the foresight to conduct mass hiring drives or didn't care enough to do so." In the absence of adequate healthcare workers, Bhatti said, existing staff continued to be overworked, underpaid and exploited. "They are sending us out in the field now without proper gear," Sunita Rani, the ASHA worker from Sonipat, said. "We have no PPE, no mask, just a half-litre bottle of sanitiser to split among five of us."

Exposed to the virus, countless doctors and nurses have died while on COVID-19 duty. According to official data from the standing committee's report, at least 573 healthcare workers had died by October 2020. This is only a conservative estimate, compiled by the Indian Medical Association. Since then, countless other doctors and nurses have passed away, but there is no official data on these deaths. In January, *The Caravan* reported on how healthcare workers had to keep count of their

dead (https://caravanmagazine.in/health/health-workers-counted-their-covid19-casualties-because-the-government-did-not)as the centre abdicated its responsibility to do so. The pandemic also took a great toll on the mental health of doctors, many of whom took their own lives (https://indianexpress.com/article/cities/delhi/another-aiims-doctor-commits-suicide-third-in-the-past-month-6555338/).

"We are completely burnt out," Sathish Gurjar, a 26-year-old resident doctor at Vadodara's Sir Sayajirao General Hospital and Medical College, told me. "Wearing PPE kits for eight hours, watching people die every minute—we can't go on living like this." Gurjar said that a team of 25 resident doctors from the hospital was looking after three government-run COVID-19 centres, with a total of 1,200 beds. The residents are supported by nursing staff and medical staff, as well as senior consultants who make occasional rounds of the ward. "But that is still not enough, we need more resident doctors and nurses, who are the main workers on the ground," he said. After the second wave hit, he added, SGH hospital did hire 15 more medical officers on a contractual basis. "But that was in April, and now we need even more staff, so that the rest of us have some breathing room. We are humans after all; we can't work like machines."

As Bhatti said, there was no concerted effort to hire healthcare workers en masse in the period between the first and second waves of the pandemic. Some state governments (https://www.hindustantimes.com/cities/others/fill-vacant-doctors-post-soon-bihar-cm-directs-officials-as-covid-19-cases-rise-101619334485709.html) and local bodies did make attempts to hire more workers at the last minute, but failed to fill these vacancies. "It is harder to find new people when the pandemic is already raging," Bhatti said. "It is too unstable a time to fill vacancies." Joldin Francis, the secretary general of the United Nurses Association, told me that these vacancies are often not filled because nurses are hesitant to take up contractual jobs. "It's low-paid work, exploitative, and there is no job security," he

said. "After all that we have gone through, young aspirants are not ready to settle for such jobs."

As the pandemic rages on, the failure to hire enough healthcare workers will impose great costs on the lives of the infected population. "No country, hospital or clinic can keep its patients safe unless it keeps its health workers safe," Dr Tedros Adhanom Ghebreyesus, the director general of the WHO, warned in a press release (https://www.who.int/news/item/17-09-2020-keep-health-workers-safe-to-keep-patients-safe-who) last September.

IN HIS 1948 NOVEL *THE PLAGUE*, the French-Algerian author Albert Camus tells the story of a fictional Algerian town named Oron, which is besieged by the bubonic plague. Early in the story, the protagonist—a doctor called Bernard Rieux—tries to convince local authorities to implement prophylactic measures in anticipation of an epidemic. The authorities find the idea highly unappealing—implementing such measures would mean acknowledging that the town was indeed grappling with a plague. Rieux insists that he does not care much for the label used to describe the situation. "My point is that we should not act as if there were no likelihood that half the population would be wiped out; for then it would be."

Like the officials in the fictional town of Oron, our health ministry refuses to admit (https://www.thehindu.com/sci-tech/health/no-community-transmission-of-covid-19-yet-harsh-vardhan/article31508666.ece) that India is in the community-transmission stage of the pandemic—an epidemiological term used to describe a stage of a pandemic where the infection is so prevalent that it is no longer possible to track and trace the source of each infection. Even countries with a much lower caseload than India's have identified themselves as being at the community-transmission stage. India continues to officially place itself in the milder "cluster of cases" category,

implying that cases can still be traced to definitive clusters across the country.

Now, more than a year into this crisis, the Modi government's adamance on resisting the community-transmission label remains of little consequence. The calamitous impact of the pandemic and the sweeping prevalence of infection is there for all to see. "You can fudge the numbers, but you can't hide the dead bodies, can you?" Bhramar Mukherjee, the epidemiologist from the University of Michigan, said. This "data denial," as Mukherjee put it, is emblematic of the government's larger pandemic response: holding on to false narratives of success, while suppressing authentic data (https://www.nytimes.com/2021/04/24/world/asia/india-coronavirus-deaths.html) and ignoring scientific advice.

Public-health experts and statisticians who have closely analysed pandemic data are wary of India's official figures. Between April and May of 2020, Murad Banaji, a mathematician at Middlesex University with an interest in disease-modelling, scrutinised COVID-19 data in Mumbai and found that there was an inexplicable drop in the cases-to-fatality ratio in the city. "Although the disease continued to spread fast, the death rate was dropping, and fewer people were dying than expected," Banaji told me. "Not in absolute terms of course—many people still died—the numbers were less than expected given the size of the epidemic in the city." In June, the Bombay Municipal Corporation added an excess of 1,700 deaths to the official toll in the city, confirming Banaji's suspicion that the city had under-reported deaths in the past few months. "After this reconciliation, there appeared to be a genuine improvement in COVID-19 fatality recording in the city," he said.

Using international data and his extensive study of Mumbai's data, Banaji estimated that the real death toll in the country could be between three to eight times the official toll recorded by the government. "And this is an estimate I made for the first wave of the pandemic, the true

death toll during the second wave could be higher of course," Banaji said. The mathematician's estimate is close to Mukherjee's, who told CNN (https://edition.cnn.com/2021/04/27/india/india-covid-underreporting-intl-hnk-dst/index.html) in late April that India might be under-reporting deaths between a factor of two to five.

During the second wave of the pandemic, reports of undercounting emerged from across the country. As crematoria burnt bodies around the clock, a comparison between crematorium data and official figures (https://www.reuters.com/world/india/non-stop-cremations-cast-doubt-indias-counting-covid-dead-2021-04-19/) revealed a large discrepancy in figures, pointing to massive undercounting of fatalities. In Gujarat, a state that Banaji said produces some of the most unreliable official figures, *The Caravan* found (https://caravanmagazine.in/health/how-gujarat-is-undercounting-its-covid19-deaths) that officials were excluding the deaths of COVID-19 patients with comorbidities from their official mortality counts for the disease, choosing instead to record the comorbidities as the cause of death. The estimates published in the *New York Time (https://www.nytimes.com/interactive/2021/05/25/world/asia/india-covid-death-estimates.html)s* in late May also cast doubt on the government's numbers.

Undercounting cases is inevitable because a large population of COVID-infected individuals remain asymptomatic, giving them no reason to get themselves tested. "But our testing has also remained extremely insufficient, especially during this current wave of the pandemic," Rijo M John, a Kerala-based health economist, told me. John said that a simple comparison between the test-positivity rate at the peak of the last wave and the test-positivity rate at the peak of infections during this wave reveals how inadequate testing has been during this wave, despite the country having more of the necessary resources this time around. "Even at the peak of the last wave, the national test-positivity rate was between

eight to ten percent, but this time around it was upwards of twenty percent," John said.

Citing the WHO guideline that anything above five percent indicates that the pandemic is out of control, John said, "By this logic, since we are reporting about 2 lakh cases now on an average, and testing about 20 lakh people, we need to at least double our testing to keep the positivity rate below five per cent." The health economist also pointed out that, while India reported four times more cases during the peak of this wave as compared to the last wave, testing only increased by about fifty-five percent. "Which is also a clear indicator of the fact that our testing capacity hasn't caught up with the scale of infection," he said.

⬈ (https://caravanmagazine.in/health/modi-government-failure-led-india-covid-19-catastrophe/attachment-17166)

A woman weeps during the cremation of her husband, who died from COVID-19, at a crematorium in Delhi in May. Crematoria have been a more reliable source of data in times when the government has been obsessed with fudging numbers to maintain its image.
ADNAN ABIDI / REUTERS

Whether it is ramping up testing, accepting the dangers of evolving strains, stocking up on oxygen supplies and life-saving medicines, or investing in human resources—all of these are steps that the Modi

government could have easily taken in time to save thousands of lives. "All of these measures have wide support among my fellow scientists in India," Shahid Jameel wrote in a column (https://www.nytimes.com/2021/05/13/opinion/india-coronavirus-vaccination.html) for the *New York Times* just a few days before he resigned as the chief scientific advisor to INSACOG. "But they are facing stubborn resistance to evidence-based policymaking."

As of mid May, daily COVID-19 case numbers had officially begun to drop again, leaving room for more optimistic analysis and declarations that the country had surpassed the peak of the second wave. This implied that case numbers were only going to drop from now on. Such optimistic projections, however, are based on official figures—figures that scientists know better than to rely on. Further, even if this current wave is truly on a decline, there is no certainty as to how this pandemic will pan out in the next few months. Government officials have already declared that a third wave (https://news.abplive.com/health/corona-3rd-wave-inevitable-given-amount-of-circulating-virus-timelines-difficult-to-predict-luv-agarwal-health-ministry-1456961)of the pandemic is well on its way.

Regardless of how early officials predict another wave, the country will continue to lose more lives unless its leaders change the way they respond to this humanitarian crisis. Currently, the government is responding by filing first-information reports (https://www.thenewsminute.com/article/25-arrested-delhi-posters-criticising-pm-modi-over-vaccine-shortage-148939) against those who question its vaccination policy, booking desperate family members (https://scroll.in/latest/993484/up-fir-filed-against-man-who-sought-twitter-help-for-oxygen-for-grandfather)for posting appeals on social media in order to secure oxygen for a dying relative and harassing overburdened healthcare workers (https://www.thehindu.com/news/national/other-states/fourteen-doctors-in-uttar-pradesh-resign-over-misbehaviour-mental-harassment-

by-admin-officers/article34548885.ece) into resigning from their posts. "In short, you are spending valuable resources to control information and manage perception," Patel said. "It is despicable. People will never forget this violation of their trust in governmental systems and institutions."

As a former health secretary who has closely observed how healthcare systems operate in India, Rao said that it is still not too late for the Modi government to rectify its mistakes and fall back on the mechanisms that helped India deal with public-health crises such as the AIDS and polio epidemics in the past. "There are clear-cut boundaries laid down as to what the centre must do and what states must do in matters of infectious diseases," Rao said. She believed that these guidelines should be followed by the Modi government instead of changing things around and centralising processes merely to claim credit for the job. "And as for the credits, the prime minister does not need his photo on the vaccine certificate," Rao said. "If lives are protected and people feel they are cared for, such outward demonstrations are not required. People know."

Nawab Malik, the minister of minority development in the state of Maharashtra, had a reasonable take on the issue. "The way PM Modi's photo is put on vaccination certificates, we demand that PM's photo should be put on death certificates also," Malik said. "If they are taking credit for COVID-19 vaccination, then, they will have to take responsibility for deaths too."

This piece has been revised in accordance with the WHO's recommendations on labelling SARS-CoV-2 variants.

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KEYWORDS: health policy(/tag/health-policy)   COVID-19 Deaths(/tag/covid-19-deaths)

Covid-19 vaccine(/tag/covid-19-vaccine)   public health(/tag/public-health)   INSACOG(/tag/insacog)