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Man versus Microbe

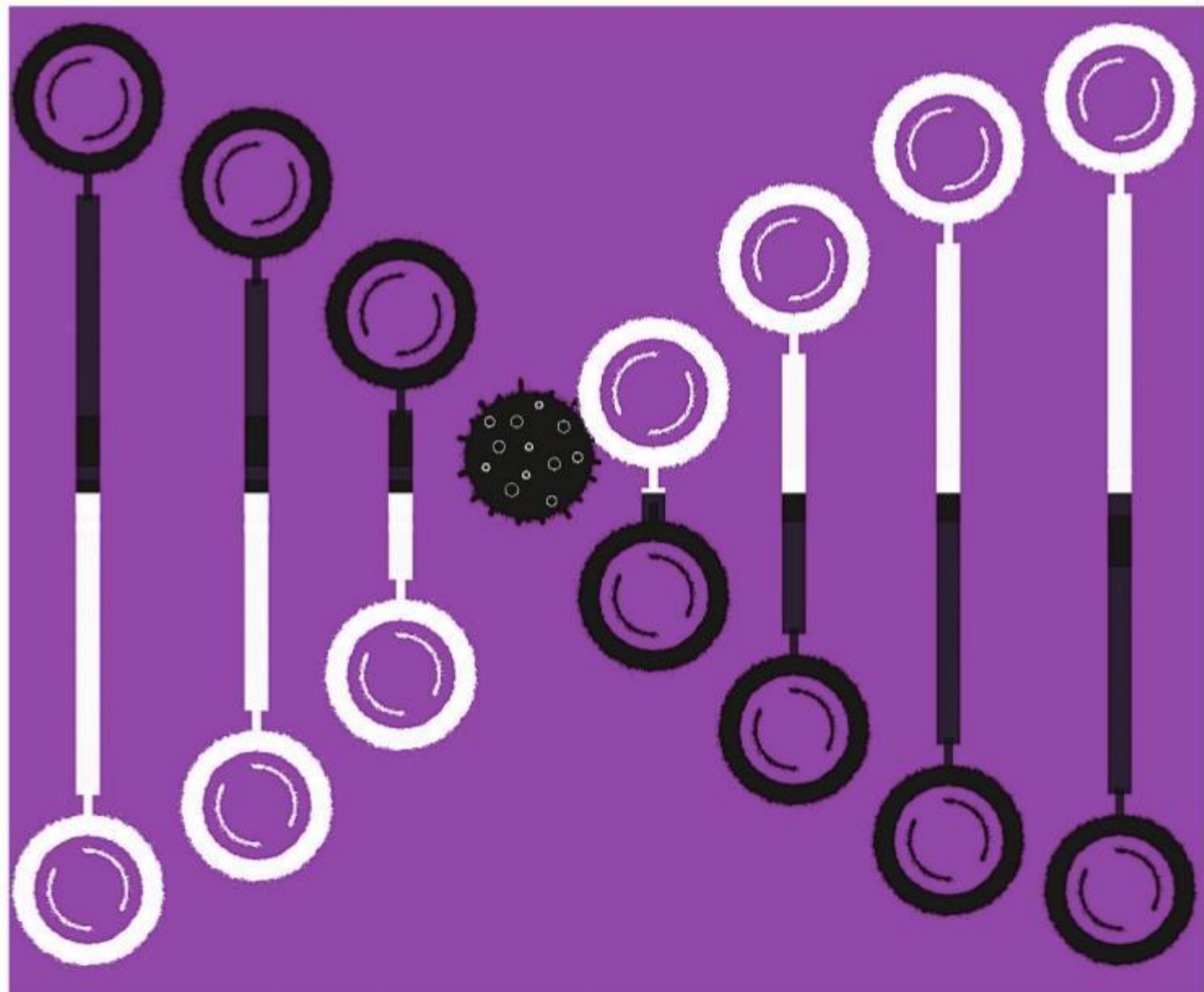
The COVID-19 virus seems to have the upper hand for now. But new technologies are emerging that will greatly enhance the speed of large-scale testing, relieve pressure faced by frontline healthcare providers



VIRANDER S CHAUHAN

THE STRUGGLE FOR survival between microbes, like viruses and bacteria, and humans is as old as humankind itself. Microbes, particularly viruses, have only one goal — to find a suitable host and multiply. Viruses, however, do not multiply by themselves. They need the cell machinery of the host for replication. Around two-thirds of all infections in humans are caused by viruses. The current COVID-19 outbreak caused by a coronavirus, SARS-CoV2, has brought this struggle to light once again. As of now, the virus appears to have an upper hand. It seems highly successful because it spreads rapidly from human to human and has a lower rate of mortality. Humans have faced new viruses at regular intervals. These include the Ebola, Zika, HIV, the Flu virus H1N1, the Middle East Respiratory Syndrome (MERS), and Severe Acute Respiratory Syndrome (SARS) — the latter two are from the coronavirus family. It is noteworthy that these viruses have all appeared in the last few decades, having jumped from their animal reservoirs to humans. Many of these viruses have a much higher mortality rate than the SARS-CoV2 that caused COVID-19. Like before, humans will come out of the present crisis as winners but that will happen at a huge cost, in every sense of the word — untimely loss of human lives, economic losses and a general loss of confidence in the human ability to deal with a tiny unknown enemy.

The first step in dealing with any new viral outbreak is to be able to accurately test, detect and track the spread of the virus, and isolate the infected persons to stop further spread. To do this, it is important to obtain information on the genetic makeup of the virus, which forms the basis of developing highly specific diagnostic tests. Currently, the most reliable and widely-used test is based on a technique called RT-PCR (Reverse Transcription Time Polymerase Chain Reaction). This test aims to detect the viral RNA, the genetic material of SARS-CoV2. The testing begins with the careful collection of swabs taken from the nose or the back of the throat of the patient and extraction of the viral RNA. However, this extracted viral RNA from the swab is too tiny an amount for direct detection. The RT-PCR, through many different reactions that include the conversion of viral RNA to DNA — its amplification and detection — makes it possible to confirm the presence or absence of the virus. The testing kits contain all chemicals and materials required for carrying out the RT-PCR based tests, which are performed by government-approved laboratories such as India's National Institute of Virology. However, many more testing centres, including those run by private players, have now been allowed to carry out the tests in many countries to bridge the huge demand and supply gap. It is now clear that countries which were able to scale up the testing of the virus in patients at an early stage were able to control the spread of the disease far better than those which did not. Given that there is no cure or vaccine for the control of COVID-19, testing of infected patients much more quickly and



CR Sasikumar

tracking their contacts to isolate them till they clear off the virus is currently the only viable control measure.

Fortunately, there is good news of a relatively new but powerful technology called CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats), which is highly specific in directly detecting viral RNA and confirming the presence or absence of the virus. Interestingly, viruses also attack bacteria and the discovery of CRISPR itself was based on understanding how bacteria cut off the viruses. The CRISPR-based test is quick and circumvents the need for both expert handling as well as PCR machines and can be done at multiple locations in about half an hour. It can also fend off delays and other logistic problems in collection and transportation of test samples. These tests are being validated and readied for approval. Two companies, separately founded by the two scientists who discovered the CRISPR technique, have also announced that they are ready with their CRISPR-based test for validation and approval. They have claimed that these tests can be performed within 10 minutes and can be conducted by using a paper strip format. Another company, Abbott Laboratories, has recently announced the approval of their portable test for coronavirus, which the company claims can provide the results in five minutes. Such a point of care test will not only greatly enhance the speed of large-scale testing but will also relieve the tremendous pressure faced by frontline healthcare providers.

These above described RT-PCR and the newly developed CRISPR based tests are needed for scaling up the testing but many individuals infected with the virus do not

show symptoms of the disease and recover completely. How to test these cases to gather realistic information on the spread of the virus? Such information will be necessary for designing future control strategies. This is done with serological tests, which are carried out in blood samples collected from a large population and are based on the detection of antibodies that are produced in response to the viral infection. These tests are relatively easier to develop and use, less expensive, and also do not need much sophisticated infrastructure or highly trained manpower. Serological tests for COVID-19 have already been developed by many groups and are already in use. India also plans to carry out serological tests to examine the actual spread of the disease in different parts of the country.

The world is still grappling with the present unprecedented public health crisis. It is imperative that large-scale testing is implemented at the earliest in as many locations as possible. Lockdowns are essential to control the disease but long-term strategies to deal with the disease would be based on the knowledge of its actual spread. The newly-developed point of care tests should be successfully able to bridge the existing gap in the testing of the virus. This will also assist in gearing up facilities to treat the severely sick as well as relieve and protect frontline health providers. Meanwhile, hopefully, efficient drugs therapies and efficacious vaccines against COVID-19 will also be discovered soon.

The writer is former chairman UGC and former director of the International Centre for Genetic Engineering and Biotechnology, where he currently holds the Arturo Falaschi Chair

WHAT THE OTHERS SAY

"While the world is preoccupied with battling the Covid-19 contagion, elements within the Indian establishment, unfortunately, are still busy stirring up mischief in Kashmir."

—DAWN

Lives and livelihoods

Success of lockdown will depend on implementation. So far, poor and marginalised share a disproportionate burden



DEEPAK NAYYAR

INDIA HAS been in a complete lockdown since March 25. Its 1.3 billion people, except for those providing essential services, are confined to their homes. In effect, this began three days earlier and might well continue beyond April 14. The rationale is to slow down the spread of COVID-19, and to reduce the peak level of infections, breaking the chain of transmission through social distancing. The objective of saving lives is unexceptionable. However, for the well-being of people, saving livelihoods is just as important.

Given the massive population and our dilapidated public health system, it might seem that a total lockdown is the only way to manage the spread of the virus. But this is not a fail-safe solution. The outcomes will depend upon its feasibility and implementation.

Social, or physical, distancing is feasible among people who live in homes that have doors providing private spaces but is impossible in urban slums or shanty-towns where people live cheek-by-jowl, or even in rural India where the poor live in cramped spaces. The lockdown might simply distance the poor from the rest.

The geographical size and distances of India might make it exceedingly difficult to maintain the supply of essentials to people, particularly when the entire country and its production systems are largely shut down. Supply chains are as good as their weakest links or binding shackles.

So far, the lockdown is an administrative fiasco that could turn into a nightmare. The police are a problem rather than the solution. Citizens are being harassed, intimidated, even beaten. More than half of the 12 million trucks have been stopped, supposedly for carrying non-essentials, on highways. Many truck drivers have abandoned their trucks and left. Insufficient supplies, exacerbated by hoarding, are already driving up prices of necessities imposing a disproportionate burden on the poor.

The government's latest Labour Force Survey yields telling evidence. In 2017-18, our total labour force was 465 million. Of this total, 52 per cent were self-employed, 25 per cent were casual labour on daily wages, 13 per cent were in informal employment without any social protection, and only 10 per cent were in regular employment of which a significant proportion were contract workers without most usual benefits.

In the lockdown, only those in regular employment — less than 10 per cent of the labour force — will continue to receive their incomes. The rest are at risk. Among them, other than agriculture, where employment is seasonal and limited, the most vulnerable sectors, are construction (54 million), trade (47 million), transport (22 million), and hotels & restaurants (9 million) — a total of 132 million. Of this, only five million have regular employment, while 127 million people are self-employed, casual labour or informal workers.

The plight of migrants in our cities — construction workers, street vendors, restaurant employees, delivery persons, rickshaw drivers, and so on — is grim. Deprived of their work, and their dignity, uncertain about where their next meal will come from, most of them are desperate to return to their homes in villages. There is no public transport during the lockdown. Yet, there is a mass exodus. Thousands are setting out on foot, carrying their children, to walk hundreds of miles, braving the sun, their hunger, and the police.

The irony in the asymmetry is striking. The rich or the middle-class who travel abroad carry the virus. The poor who can never dream of travel abroad must carry the burden. The government chartered Air India planes with medical staff to bring migrants home from affected countries in Asia and Europe. When the closure of Indian airspace was imminent, the super-rich reportedly chartered private jets to bring home their children studying in the UK and Europe. In contrast, migrants in our cities, who have lost their livelihoods to the lockdown, must find night shelters and open kitchens run by local governments or charities, which are nowhere near enough.

In response, the government has announced a Rs 1.7 trillion package to help the poor, of which Rs 0.7 trillion are disbursements for existing schemes or drawdowns from funds available with state governments, without any new resource allocation. Of the remaining Rs 1 trillion, apart from an extra 15 kg of wheat or rice and 3 kg of pulses for poor households over three months (which should have been double if not triple these quantities given the massive stocks of foodgrains), the other components are far from sufficient and will be even less when implemented. This timid response, shaped by fiscal conservatism, simply cannot suffice.

Even if the lockdown ends on April 14, it will take much longer for economic activities that have shut-down to return to normal. In the meantime, the poor in urban and rural India would have experienced a massive cut in their meagre incomes, while accumulating debt for survival. Their already low nutrition levels will be even lower, which in turn is bound to reduce their resilience and lower their immunity to any infection, let alone COVID-19.

History does not repeat itself. But it would be wise to learn from history. In 1918, Spanish influenza, which spread worldwide, led to an estimated 50 million deaths. Around 18-20 million deaths were in India. The influenza came to India through 1.25 million soldiers returning after the war, through Bombay port, and going to their homes on trains. More than half of those who died were women — caregivers — because their nutrition levels, resilience and immunity were low.

The lockdown could have been introduced in phases, as it was in China and South Korea. It should have come with a prior plan to provide social safety nets for the poor. It should have anticipated the plight of migrants in our cities. And it could have been implemented better. We can only hope that the COVID-19 bug does not survive the high temperatures of our summer, but we must prepare for the worst.

The writer is an economist and former vice-chancellor, University of Delhi



RANDEEP SURJEWALA AND MUHAMMAD KHAN

Include, learn, fight

Centre must use resources, skills of states, Opposition in battle against COVID-19

IT IS a fundamental tenet of political theory that given a crisis large enough, humanity will unite to resolve and address it. This makes sense because a crisis offers opportunities for bipartisanship. Indeed, we have seen this in the state of Kerala, where the Left government and the Congress-led Opposition are working together to ensure that the COVID-19 crisis is tackled in a manner that utilises every possible resource and skill.

The approach of the BJP government at the Centre seems to run counter to this belief. The prime minister has not sought to involve or invite the Opposition, led by the Congress, which has a rich body of expertise and leadership to assist in times like these. It is also emerging that the PM did not consult with state leaders (at least non-BJP state leaders) before announcing the lockdown. Nonetheless, we place these recommendations in the public domain. We hope that the government may find them useful.

First, involve and learn from states like Chhattisgarh, Punjab and Rajasthan. In Chhattisgarh, which has a robust PDS system, free rations of rice are being given to around 6.5 million families for April and May. Industries have been directed to provide free rations to workers and the panchayats are being provided with two quintals of rice for those who may need it. The state was among the first to set up state-of-the-art quarantine centres and as a result, there were only around seven confirmed cases in the state at

the end of March. Rajasthan, in addition to similar measures, has ensured the rapid manufacture of over five lakh hand sanitisers, innovatively, through sugar mills and distilleries, for healthcare workers. The government has also sought to ensure that migrants do not face unnecessary harassment while travelling. Punjab was one of the first states to respond to reports of police excesses and take immediate action. The state leadership also coordinated with the government of Bihar to ensure that migrant workers from the latter are adequately taken care of.

These are scalable experiences if only the Centre would create a task force comprising representatives of the states to meet every day (through teleconferencing), coordinate responses and share information in real-time. There is no viable justification for working in silos without such a central coordination committee.

Second, testing is key to prevention. We must focus our resources and energies on ensuring tools for quick, contactless mass testing. Countries such as Germany have already introduced these measures. These will help us accurately identify and contain centres of concentration before they spread. It is equally vital to ensure the safety of our healthcare professionals and frontline workers. It is short-sighted of the central government to delay the ban on the export of surgical masks till as late as March 19 and ventilators, hand

sanitiser and other breathing equipment till March 24. We must look at a clear import and manufacturing policy before it is too late.

Third, create a safety net to deal with the looming economic crisis. Even dedicated and unwavering supporters of this government are urging the PM to adopt the Minimum Income Guarantee scheme proposed by Rahul Gandhi, called Nyay, to offset the inevitable wave of unemployment. The government must also identify and listen to leaders with experience in dealing with situations like this. The Congress-led UPA government in 2009 battled the H1N1 virus as it spread throughout India and the same was ultimately contained. The lessons of that era are likely to be of great relevance and value.

Fourth, resist the urge to turn everything into a platform for personal vanity and applause. Activities like thali-clapping are no substitute for fighting this issue on a targeted, scientific and daily basis. Giving impassioned speeches does not remedy the fact that people were, once again, given only four hours before midnight to stock up on medication, essentials and to make travel arrangements. Assuming the central government had planned this a week in advance, sufficient time to the people would have alleviated the unmitigated suffering of millions of migrant workers walking home without food, medicine or shelter. The disruption in the supply chains that has caused artificial inflation of all essential commodities could have been

avoided.

The Opposition and the people have stood with the government in adhering to and supporting the decision of the 21-day lockdown. However, it is the constitutional duty of the Opposition to ask relevant questions such as how the economic package will be implemented to the benefit of the people. What about the plight of farmers, given that the harvesting season is here? How will we address resulting unemployment in a country where almost 80 per cent of the workforce is in the informal or unorganised sector? How will we address the concerns that threaten to devastate MSMEs and imperil the middle class?

A Common Minimum Relief Charter is necessary to provide clarity. The government is elected to serve the people and the actions it takes cannot be construed as charity to be celebrated in fawning tributes. The PM should remember the maxim by which all governments must abide — Salus Populi Suprema Lex (the good of the people is the highest law).

There were several ways to deal with this crisis. None of them involved treating citizens like the problem. This crisis will require improvisation and adaptation on a scale never seen before. We need to stand together if we are to rise to the challenge.

Surjewala is the AICC media in-charge and an advocate. Khan is an advocate

LETTERS TO THE EDITOR

STRONGER, AFTER

THIS REFERS TO the article, 'Opportunity in the crisis', (IE, April 3). A crisis offers a rare opportunity to assess the robustness of a system. This global pandemic will compel us to revisit all progress humanity has made over the years and our vulnerability. Be it the political institutions, diplomatic alliances, technological prowess or the trade and finance system, the scale of this health catastrophe has shaken almost every aspect of mankind.

Sudip Kumar Dey, Kolkata

NO BLAME GAME

THIS REFERS TO the editorial, 'Life and death' (IE, April 3). That the National Security Advisor visited Nizamuddin at 2:00 am to convince leaders of the Tablighi jamaat to ask all those in the area and beyond who are their followers to get tested and quarantined speaks volumes. It is a testament to the restraint shown by the government in dealing with an unprecedented crisis.

Krishan Kumar Chug, Delhi

SHORT SHRIFT

THIS REFERS TO the article, 'Carte blanche and a blind eye' (IE, April 3). The Supreme Court's judgment clearly

LETTER OF THE WEEK

SEE THEM

THIS REFERS TO the article, 'Virus, in social context', (IE, April 1). The inflow of economic migrants keeps the wheels of the economy turning. Despite their invaluable contribution to their host city, migrants are often disenfranchised on the basis of domicile qualification, they are treated as mere guests and their interests never figure in the priority lists of the local politics of the region. It is high time that we acknowledge that the migrant population is an indispensable part of the local economy of any big city

Sudip Kumar Dey, Kolkata

shows that it has seen the whole issue through the government's lens. Along with other recent verdicts, the one concerning migrants' plight also casts a shadow over the judiciary's independence. Daily wagers, who have suffered the most due to the lockdown, have been given short shrift.

Tarsem Singh, Mahilpur