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COVID-19

TESTING ON TRIAL

Widespread and varied testing alone
cannot help overcome the pandemic. A
robust health infrastructure holds the key



Cyclone Amphan: a new storm surge in the Bay of Bengal

P15

Lockdown meltdown: governments dilute laws to favour the industry

P22



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Multiple crises: the cost of wasted time

THE WORLD is paying for years of procrastination and prevarication. Already multiple back-breaking crises are unfolding, simply because we did not fix what was broken in the past. So, on one hand, we are confronted with COVID-19—leading to both health crisis and massive economic collapse; driving down the livelihoods of the poorest and the most vulnerable. As we can see from the upheaval across the world—from India to the US—it is the poor (black or brown) who have been disproportionately hit by the virus. They have suffered twice: they lost lives to the contagion and they lost livelihoods.

But even as this heart-breaking crisis is unfolding in front of our eyes, there is another looming disaster which is waving a red flag—climate change. In the last 15 days, the eastern side of India has been hit by a super cyclone, which has devastated lives and property. But this is not all, the western side—COVID-hit cities of Mumbai and Ahmedabad may also be hit by a cyclone very soon. This, when we know, the aftermath of these events is worse because it takes away the development dividend and years of investment into building infrastructure to improve the lives of people.



But this is also not all. There are swarms of locusts already devouring fields in the western states of India and countries of Africa, and threaten to do much more damage in the coming months as their inexorable flight continues across the continents.

The link to climate change of these disparate events is incontrovertible. What we are seeing today is the result of increased frequency and intensity of cyclones and variable and extreme rain events. This weather disruption is because of changes in temperatures on land and on sea. Not only is the number increasing and now, Indian scientists say, there is “rapidification” of cyclones because of changes in temperature between land and sea. This, in turn, is adding to the force of destruction and the unpredictability of the event.

The locust infestation is linked to this phenomenon. First in 2018, and then in 2019, there were a series of cyclones and extreme rain events in the deserts of the Arabian Peninsula and eastern Africa. Then, in 2019 and now in 2020, the same African regions and Indian deserts saw unseasonal rains and extended monsoons. The desert critter became ideal breeding grounds, and its growth went from what is called the individual stage to gregarious, and the infestation grew from being categorised as an outbreak to an upsurge. Much like COVID-19—when the WHO hummed and hawed about when it would upgrade the threat to pandemic—the Food and Agriculture Organization (FAO) too is “considering” when to declare the locust upsurge as a plague.

Much like COVID-19, when WHO procrastinated, FAO too is “considering” when to declare the locust upsurge as a plague

COVID-19 is the result of our progressively worsening dystopian relationship with nature. It is also the result of years of lost time, when we could have invested in public health and building a more equitable society where the poor are not doubly hit. It is the same with climate change and every other issue that stares us today. Too much time has been wasted in denial or just not to get our act together to act at the speed and scale that is needed. We do not have the luxury of time anymore. My generation has squandered the privilege away. And, this, please be clear, is only the beginning. Right now, the poor in the world—in the rich or the emerging world—are worst sufferers; they live on the margins of survival in the best of times. Now we are in the midst of the worst of times. But as I keep saying COVID-19 and climate change teach us that we are as strong as the weakest link.

So, what should we do? I can repeat all that we know. But I want to lay out, in my view, one non-negotiable fundamental that we must not do anymore. We must not deny or cover-up the problem. The multiple-crises happening together are going to make the world more insecure; it will make governments yearn to be more authoritarian and intolerant. We are seeing it everywhere. In India, our top law officer has called out people who draw attention to societal and governance problems as vultures—likening critics to birds of prey. There is also a fine line between what governments consider needless denouncement and what they consider unnecessary during a national crisis—this then becomes that time when it is best to self-censor, otherwise it will weaken governmental resolve! But this will not do. We need more information; not less. We also need to know what is happening on the ground so that our actions can be guided better; so that we do not make mistakes or repeat them. Let's always remember that COVID-19 is a global pandemic today because scientists in China or in the WHO did not have the courage to speak truth to power. Making us all cheerleaders will not make the problem go away. It will exacerbate the many crises that are here to stay.   @sunitanar

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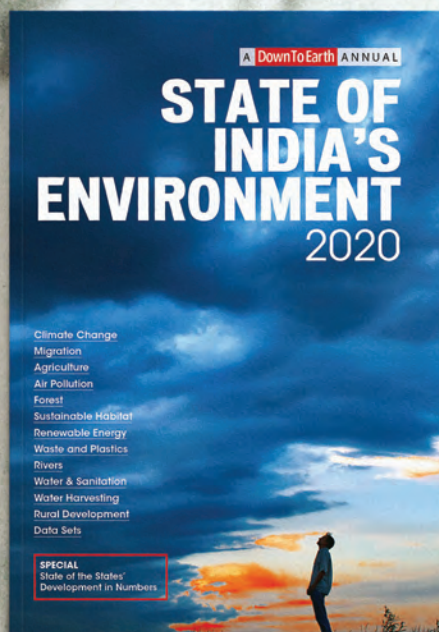
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Engage



Time to reassess

This is in reference to the editorial "Migrants: Future of work and production" (16-31 May 2020). The author has raised some very important issues on work and production. Firstly, the rural economy is based on agriculture and allied activities. However we are an over-populated country where farming cannot absorb all job seekers. Therefore the Union government has devised a policy to achieve 40 per cent urbanisation. This has worked but with a heavy social cost, resulting in slums, lack of healthcare, stress on civic infrastructure, among others. Migration of labour is an unavoidable concomitant of the policy. Secondly, about 50 per cent of the built-up space is unoccupied due to lack of demand. The realty sector is in deep trouble. Thirdly, our nation has got talent but it is valued more in developed countries than locally. Fourthly, most of the workforce, mainly unskilled and semi-skilled, comes from Uttar Pradesh, Bihar and Rajasthan—states that cannot absorb them due to lack of investments.

So we have homes where no one has work; we have workers without homes; we have jobs but no skills; we have skills but with low wages. The COVID-19 pandemic has given us a new vision to look at this imbroglio. The new policy of *atmanirbharata* (self-reliance) is probably the initial response of the government. How far will it be effective, time will tell.

SHREEKRISHNA PHADNIS
MUMBAI

Live and let live

We may be anybody—affluent, layperson or someone in quest to fulfil daily demands—but we also need to be aware of our environment, and it is our duty to keep it clean and green. If we feel the necessity to leave a safe zone for our future generations, we have to come up with a plan to preserve and upgrade the life process of our flora and fauna. We have to donate as per our capacity to reliable organisations that work for the society without any selfish interest.

World is a global village and we are world citizens who can, at least, bring the first phase of change in our disordered lifestyles for the sake of greater human welfare. We have no other option than to accept the Gandhian philosophy of simple living and high thinking. By accepting simplicity, one can develop one's thought process by considering the value of other living things as an integral part of our lives. Living for others is the message that Swami Vivekanand also propagated. Service to all living things in this beautifully created nature is our moral responsibility. Through that, we can dream of one world and universal religion—the concept of live and let (others also) live.

JAYANTA TOPADAR
ASSAM

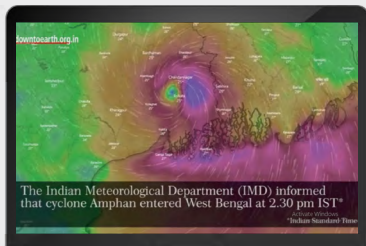
Promote small businesses

This is in reference to the editorial "COVID-19 has made the invisible visible" (1-15 May 2020). I agree that there is a very strong need to make each and every district self sustainable, not only in terms of employment opportunities but also in creating entrepreneurship opportunities. Promoting small businesses in India, and



Cyclone Amphan makes landfall

Cyclone Amphan caused widespread damage in parts of southern Bengal, including Kolkata, after it made landfall



near Sagar Island in the afternoon of May 20. Heavy rains and extremely strong winds (160-170 kmph), with flooding caused by tidal waves 4-5 m above astronomical tide, were reported. Amphan reached Kolkata around 7 pm. Half a million people in West Bengal and 100,000 in Odisha have been evacuated.

Re-emerging green in post-COVID India

The COVID-19 pandemic has caused unprecedented global distress. Though climate change threatens even greater impacts, there is a risk that short-sighted economic recovery will be fueled primarily by fossil fuels. How do we maintain momentum on climate action during this challenging time?

Workers sans rights

The COVID-19 pandemic is creating an economic crisis in India. As India prepares to lift the lockdown, some states seem to be in a rush to dilute laws meant to safeguard workers. The reason offered: to attract foreign investment.

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connecting them through e-commerce platforms can help this transition. No doubt, this transition will only occur when political will and economic feasibility help sustain such models, and corporate and multinationals allow work from home practices as a standard. On a different topic, education in rural areas will have to be strengthened and standardised to be on a par with urban schools, at every grade. There is a lot more that we can do.

SOURABH MANUJA
VIA EMAIL

Shut all zoos

This refers to "Should we say good-bye to zoos?", published online on April 21, 2020. Yes, it's time to close all the zoos and free the animals. Whenever, I visit a Zoo—have done so only two or three times in the past 30 years—I feel pained to see animals in captivity. It's very sad. However clean we maintain their cages, however good be the food we feed them, it is all at the cost of their freedom and their natural surroundings/habitats.

Yes, post-Corona, the governments should take this step of closing all the zoos and free the animals. And not just zoos, even aquariums. It's painful to see the fishes move around in a small glass cage. It's a crime.

PENNA SUDHAKAR
VIA EMAIL

Can't expect them to wear masks

This is in reference to "COVID-19: Slums in India provide fertile ground for outbreaks", published online on May 11, 2020. Besides the slum areas, there are

so many places in remote areas of the country with similar situation. For instance, the inaccessible areas of Uttarakhand where water is scarce and there are no medical facilities, roads or schools. Health and hygiene in such areas is extremely poor. If the disease reaches there, it will be very

difficult to tackle the same. The analysis of housing and basic amenities in slums and squatter settlements, and in remote areas, proves that people living there have to meet their immediate need for shelter without any safeguard for disasters and diseases. In such areas, we cannot expect people to maintain social distancing norms or wear masks.

CHAITANYA AGARWAL
VIA EMAIL



Nothing strange about it

This is in reference to "COVID-19 lockdown: Wild animals freely roam Bihar's forests and fields", published online on April 2, 2020. The Bihta air base premises hosts a diverse wildlife, including prey species. The leopard must have been using the campus since long. As far as *nilgai* is concerned, it is known to be present abundantly across the state, mainly the north of the Ganga.

SAMIR KUMAR SINHA
VIA EMAIL

Pesticides ban can be a great move

This is in reference to "Centre wants to ban a host of pesticides: Here's why", published online on May 20, 2020. Such a ban would be a great move for our country. If banning of these dangerous chemicals is a success, our people can expect safe food. We need to think of our future population, the environment and even other living organisms. Companies going against this move should not act selfish. They must not think only for their own survival but of all fellow beings and Earth.

ANU
VIA EMAIL

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DATA CENTRE

Global cases over 5 million

The number of people infected with COVID-19 in the world rose to 5,089,615 in 213 countries and territories, as of May 21, 2020. A total of 329,724 have died of the disease.

COVID-19 in India

The total number of COVID patients in India was 106,750 on May 20. There have been over 61,149 active cases, 41,298 cured/migrated patients and 3,303 deaths.

Uterus removal in India

The prevalence rate of hysterectomy is 17 per 1,000 women. A third of the women undergoing the operation are under 40. Andhra Pradesh and Telangana lead in the number of operations performed.

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Digest



WHAT'S INSIDE

Abul Kalam Azad rescues a child delivered and left along the road by an exhausted migrant **P12**

India's infant mortality rate varies widely among states. Why so? **P14**

Sea levels will rise faster than projected, unless the world reduces emissions **P15**

1,000 WORDS

VIKAS CHOUDHARY



A policeman gets himself sanitised as he stands behind a municipal vehicle spraying disinfectants at the Ghazipur Market on the Delhi-Uttar Pradesh border. In Delhi itself, about 140 police personnel have tested COVID-19 positive as of May 12

FOR MORE PHOTOS, SCAN



BACK TO CONTENT

A burden too heavy

"IN THE 30 years of my career, I have not seen anything as heart-wrenching as this," says Abul Kalam Azad, a social worker who works with the economically backward tribal communities of Sundargarh district in Odisha. On May 16, a migrant worker walking to her village in Maharashtra's Ankola district amid the COVID-19 lockdown delivered a child on the roadside and then abandoned him, so that she could continue her arduous journey home, with one less burden.

She was part of a group of eight, perhaps from somewhere in Jharkhand. The group had already walked non-stop for seven days and reached Bisra block, which acts as a transit corridor for people from Bihar, West Bengal, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh and even Maharashtra. The woman was hungry and in labour. She halted at San Nuagan village, begged a shopkeeper for bread and asked for direction to a hospital.

"But getting admitted to a hospital without a COVID-19-negative certificate and Aadhaar card is difficult, particularly if she is a migrant worker with no proof of identity or residence," says Azad. The woman delivered the child at a hospital gate without any help. When the child was born, no one wanted to touch them fearing they may have COVID-19. She too did not want to carry the child along in her exhausting journey. She informed a

Social worker Abul Kalam Azad saves a newborn when an exhausted and hungry migrant worker abandoned him along the road

SNIGDHA DAS

woman nearby that she had left the child on the roadside and resumed her walk.

"When we got to know about the incident, we rescued the child, conducted a thorough medical checkup and took him to our government-recognised children's home called Disha," says Azad. "The next day, with the help from the local administration, we managed to trace the mother. After several rounds of counselling and assurance that she would be sent home on a vehicle, the woman accepted the child," he adds.

But not everyone is as fortunate. There are 200 to 300 migrant workers who cross Bisra everyday on foot or on bicycle. Most work as domestic help or as daily wagers at brick kilns, mines or shops. They are hungry, and say people are reluctant to offer them food or shelter, or even touch their bicycle for repair. "They look so exhausted that I doubt if they would survive the journey. We mobilised some youth to grease their bicycles, repair punctured tyres and offered them food.

We have also made cloth masks for them," he adds. Last week, Disha arranged transport for six people who had reached Bisra after cycling non-stop from Pune, surviving only on puffed rice. They were headed for Purulia district in West Bengal, which is another 300 km.



Pandemic's domino effect

SNIGDHA DAS

AS THE world scrambles to get a vaccine ready to protect humanity from the COVID-19 pandemic, it seems to have forgotten about routine immunisation of children, putting at risk the lives of some 80 million children. The pandemic has substantially hindered routine immunisation in at least 68 countries, says a joint report by the World Health Organization (WHO), UNICEF, Gavi Vaccine Alliance and the Sabin Vaccine Institute, US.

Since March 2020, routine childhood immunisation services have been disrupted on a global scale that is unprecedented since the inception of WHO's

Expanded Programme on Immunization in the 1970s. As of mid-May, 27 countries had suspended campaigns for measles, mumps and rubella, and dozens had stopped campaigns for polio vaccination. Some countries have even suspended vaccination for fatal diseases like meningitis, yellow fever, typhoid and cholera.

In other countries, immunisation efforts have been thrown into disarray due to fear of infection, movement restrictions, unavailability of health workers and lack of protective equipment. In April, WHO said at least 21 countries had reported vaccine



shortage. "Disruption to immunisation programmes from the COVID-19 pandemic threatens to unwind decades of progress against vaccine-preventable diseases," says WHO's director-general Tedros Adhanom Ghebreyesus.

Several countries are already reporting measles outbreak. The situation is alarming in the Democratic Republic

of Congo and Chad, which declared a measles outbreak in June 2019 amid the Ebola epidemic. According to Médecins Sans Frontières, the outbreaks have killed thousands of children. These diseases are as deadly as COVID-19 and it is important that governments maintain the level of vaccination that protects the community.

'DEMAND FOR VACCINES WILL SHOOT UP ONCE LOCKDOWN IS LIFTED'

Chhaya Pachauli is a member of Jan Swasthya Abhiyan in Rajasthan. She tells *Down To Earth* that states must urgently start planning to cover the backlog

How has the lockdown affected immunisation programmes in India? Every village in India has a fixed day which they celebrate as village health and nutrition day. ASHA and *anganwadi* workers mobilise children and pregnant women to congregate at the *anganwadi* centres



where they are immunised and offered supplementary medicine. When lockdown was announced, state governments suspended this as a precautionary measure. Later, most states announced

that people could avail immunisation services at local healthcare centres. But they forgot that people in rural areas are not proactive about immunisation. Most are also reluctant to step out for fear of infection or in the absence of public transport. Only some like Chhattisgarh and Uttarakhand continued to provide these services at *anganwadi* centres, perhaps because they have few COVID-19 cases.

How to handle the backlog? WHO issued guidelines

for immunisation during the pandemic long back in March. But no one seems to have taken note of it. Now we have a backlog of two months. States will have to devise robust surveillance systems to identify children who have missed their vaccines and scale up immunisation sessions. They also need to register the children of migrant workers who are now back in their villages. They must ensure smooth supply of vaccines as demand will shoot up once the lockdown is lifted.

Infant Mortality Rate: too varied to celebrate

IT MAY bring some relief that the Infant Mortality Rate (IMR) in India has fallen from 50 to 32 per 1,000 live births over the past decade, but the wide variation in numbers across the country offsets the achievement. Data released recently by the office of the Registrar General of India in its Sample Registration System bulletin shows that the numbers vary dramatically among states and between rural and urban areas. Nagaland, for instance, reported the lowest IMR of 4, while Madhya Pradesh reported the maximum IMR of 48.

The bulletin has divided states and Union Territories into three categories—bigger, smaller and Union Territories. States and Union Territories with a population of more than 10 million as per Census 2011 are in the “bigger” category. While three “bigger” states—Delhi, Maharashtra and Tamil Nadu—have IMR within 20 (13, 19 and 15 respectively), in four states, IMR has crossed 40—Assam has 41, Chhattisgarh 41, Madhya Pradesh 48 and Odisha has 40.

The variation is wide even among smaller states—37 in Arunachal Pradesh and four in Nagaland. Similarly among Union



Territories, IMR varies between 16 and nine in Andaman and Nicobar Islands and Daman and Diu.

It is no surprise that IMR is higher in rural areas than in urban areas. In rural India, one in every 28 infants dies within the first year of their life, while the figure is one in 43 for urban areas, the bulletin states. Delhi, Tripura and Puducherry are the only places that have higher IMR in urban areas than in rural areas.

In Madhya Pradesh, IMR ranges from as high as 52 in rural areas—the highest anywhere in the country—to 36 in urban areas. Similarly, Uttar Pradesh has 46

IMR in rural areas but 35 in urban areas. Among smaller states, rural and urban IMR fluctuates from 35 to 17 in Meghalaya. In Dadra and Nagar Haveli, IMR in rural areas is 19, but nine in urban areas.

IMR is widely accepted as a crude indicator of the overall health scenario of a country or region, the bulletin states. In the past decade, IMR has witnessed a decline of 35 per cent in rural areas and 32 per cent in urban areas. Yet, one in 31 infants dies within the first year of birth, irrespective of urban or rural. This speaks volumes of the country's healthcare conditions.

EXTREME

1.6 billion

informal workers worldwide are at risk of losing their employment due to the lockdown imposed due to the COVID-19 pandemic

60% decline in earnings was witnessed just in the first lockdown month, largest being 81%, in Africa and Latin America

34 PERCENTAGE points is the expected relative poverty rate increase among informal workers. Relative poverty is the proportion of workers with monthly earnings below 50 per cent of the median earnings in the population

389 MILLION workers are engaged in four hardest-hit sectors—manufacturing, accommodation and food services,

wholesale and retail trade, and real estate and business activities

30% of the GDP is what these four sectors together account for

42% of women workers are employed in hardest-hit sectors, compared to 32 per cent men

Source: ILO monitor: COVID-19 and the World of Work

Shringaara



Haasya

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enough
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hundred
kilometres
and we will
reach home



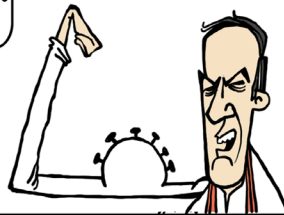
Roudra

Zero
tolerance
for the
lockdown
breakers!



Veera

We will
easily
fight back
corona



Bhayaanaka

More
days
without
maid?



Bheebhatsya

Today is
the 15th
day with
this same
old mask



Adbhutha

Booze
shops
are open
now?
Really!!!



Shaantha

Learn
to live
with
corona



FOR MORE CARTOONS, SCAN



Sea levels to rise faster than believed

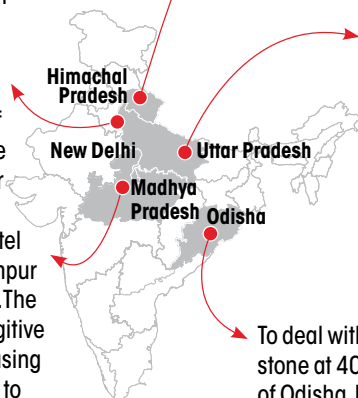
UNLESS GLOBAL emissions are reduced immediately, sea levels will rise much faster than believed. A survey conducted by a conglomeration of 106 specialists shows that by 2100, sea levels will rise by more than a metre. Coastal cities, therefore, must prepare for an impact that will hit sooner than predicted by the United Nations. By 2300, sea levels could rise by 5 metres. The United Nations Intergovernmental Panel on Climate Change predicts 1.1 metre rise by 2100 in the worst case scenario.

The new study, however, estimates that with rising emissions

and global heating of 4.5°C above pre-industrial levels, the surface of the world's oceans in 2100 will be between 0.6 and 1.3 metres higher than today. This would engulf areas home to millions of people. However, if human beings succeed in cutting carbon dioxide emissions, and halting temperature increase to below 2°C, the rise would be a more manageable 0.5 metre. The study highlights the growing concerns of the world's two biggest ice sheets, in Antarctica and Greenland, that are melting faster than most computer models had predicted.

The National Green Tribunal (NGT) has asked the Delhi Jal Board (DJB) to "expeditiously" seal all borewells identified illegal in Mayapuri, Delhi. As many as 141 had been identified as illegal, but only four were sealed. NGT has also asked DJB to assess and recover compensation from those operating them.

NGT has ordered closure of a ready mix plant and stone crusher unit operating near the Government Girls High School and residential hostel at Dhulkot village in Burhanpur district in Madhya Pradesh. The unit had the potential of fugitive dust emission and was causing air and noise pollution due to transportation of raw material. The project did not comply with the Air (Prevention and Control of Pollution) Act, 1981 and the Water (Prevention and Control of Pollution) Act, 1974.



NGT has directed to stop further construction of an 11-storey hotel/apartment on agricultural land in Shimla, Himachal Pradesh. It was learnt that the project proponent did not have environmental clearance and the project did not comply with the Air and Water Acts

Observing that irreparable damage was being caused to the ancient ghats of the river Yamuna due to illegal construction on its bed at Vrindavan-Mathura, NGT has ordered action so that the river's flow is not adversely affected

To deal with illegal mining of laterite stone at 40 sites in Khurda district of Odisha, NGT has asked the state government to prepare an action plan, assess the damage caused and calculate the compensation to be paid to the affected. Neither environmental clearance nor consent to operate were obtained before starting the mining.

So far...



Number of cases on environment and development tracked from January 1, 2020 to May 12, 2020

Supreme Court	High Courts	National Green Tribunal
22	27	168

Compiled by DTE-CSE Data Centre

FOR DETAILED VERDICTS, SCAN



"How safe is Aarogya Setu?"

CAN THE Centre guarantee that the information collected by the mobile application Aarogya Setu will not be misused at any time? A Kerala High Court bench has sought a statement from the Centre in this regard.

The bench made the query after the Thrissur District Congress Committee general secretary John Daniel moved court saying that the Centre's directive to

compulsorily download the application violated people's fundamental rights and there are chances of misuse of personal data, pushing the Centre to announce recently that it will release the code of the Android application for the public.

The Centre has claimed it will reward ₹1 lakh to individuals who identify any bug or security lapse in the application.

BITS

IMAGINE HOW prepared people would be if those living in flood-prone areas were told beforehand the extent of damage a flood could cause to their houses. An augmented reality smartphone application does just that. Scientists at the University Corporation for Atmospheric Research, USA, have released the application called Storm Surge AR which allows the user to visualise the impact of a flood from a bird's eye view, explore the condition of the house in case of flood, and assess the result



of flood mitigation strategies like sandbagging. It is available on iOS or Android and will help people visualise these risks, see the possible impacts and prepare for it, says Tsvetomir Ross-Lazarov, who led the research.

GORILLAS AND their great ape cousins—the chimpanzees, bonobos and orangutans—face the threat of contracting COVID-19 as they share 98 per cent of their DNA with human beings. Though no COVID-19 case has been reported among them as yet, research by the University of Calgary in Canada suggests the apes may be particularly susceptible to SARS-CoV-2. Over past three decades, a third of the world's wild gorillas have died due to Ebola, estimates Peter Walsh, a conservationist at Cambridge University, UK.

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A NEW STORM SURGE

Amphan's rapid intensification underlines how cyclones are becoming terrifyingly unfamiliar

AKSHIT SANGOMLA
NEW DELHI and
JAYANTA BASU
KOLKATA

BARELY AN hour—that's what saved the Sundarbans from being washed away on May 20 as Amphan made landfall in this densely populated, ecologically fragile delta of West Bengal. "Strong winds and heavy rains, accompanied by a surge in seawater, raged through the island even before the super cyclone made landfall at 2.30 pm. It continued till 3.30 pm," recalls Joydeb Das, headmaster of a school at Sagar island. "After an hour's lull, it started again as Amphan crossed us and headed towards Kolkata. The storm surge was more intense in the second

phase," he says. That was also the time when high tides start returning, causing waves as high as 4.5 m. People were dreading an Aila-like situation when, in 2009, the cyclone's high intensity phase coincided with the peak tide, causing seawater to rise 6-7 m, flooding paddy fields with seawater and displacing 2.3 million people. But this time the intensity of Amphan reduced by 7.30 pm, just an hour before peak tide. And a head-on collision was averted.

"The combined effect of the high tide and Amphan pushed water levels to 5.45 m at Sagar island at 8.38



Amphan has washed away 90 km of embankment guarding low-lying islands of South 24 Parganas

pm—about 0.7 m above the forecast level,” says a source associated with the Kolkata Port Trust. Yet, the devastation caused by the first super cyclone to form over Bay of Bengal in the past two decades is as severe as the 1999 super cyclone. [In the Sundarbans alone, it has washed away](#) about 90 km of embankments that guarded two-thirds of islands in the South 24 Parganas district. Seawater has swept 10 km inland, inundating 50,000 ha of land. At places, jetties that connect the islands to the mainland have collapsed. Initial estimates show that the super cyclone, which also hit other parts of West Bengal [and coastal Odisha](#), has damaged 2.5 million houses and affected 10 million people; close to 90 have lost their lives. As the authorities try to cope with the double emergency, providing food, shelter and other relief measures to the affected while ensuring that they maintain social distancing to avert any outbreak of COVID-19, the super cyclone, the first this year, underlines how cyclones are changing their behaviour and becoming more intense in a warming world.

NO LONGER FAMILIAR

Since 1999, Amphan is the third super cyclone to occur in the North Indian Ocean region, which includes the Bay of Bengal, Arabian Sea and the northern part of the Indian Ocean. The other two super cyclones were Kyarr in 2019 and Gonu in 2007.

But what worries weather scientists most is the pace at which Amphan intensified. From a very severe cyclone with wind speeds of 140 km per hour, it went on to gain energy and became a super cyclone with 260 km per hour wind speed

in a span of just 18 hours. On the night of May 18, the Joint Typhoon Centre of the US recorded wind speed of 270 km per hour and called it the strongest storm recorded in the Bay of Bengal in over a decade.

Weather scientists say this rapid intensification of Amphan might signal a warming Bay of Bengal. “It was because of many favourable conditions over the Bay of Bengal like high sea surface temperatures, low vertical shear winds and enough moisture in the middle layers of the atmosphere, all of which aid in the development of a cyclone,” says Mrutyunjay Mohapatra, direc-

WARM AIR, OCEAN SURFACE TEMPERATURES HAVE INTENSIFIED BAY OF BENGAL CYCLONES DURING PRE-MONSOON SEASON, IN MAY

tor general of the India Meteorological Department (IMD) and a well-known cyclone expert.

Raghu Murtugudde, climate scientist at the University of Maryland in the US, says, “The development of Amphan definitely qualifies as rapid intensification even though we may not be able to use the same definition as those developed for hurricanes and we will need to develop our own scale for the Indian Ocean cyclones.” Rapid intensification happens when there is an increase of maximum sustained winds of a cyclone by at least 55 km per hour within 24 hours. This phenomenon has been recorded and studied in the case of hurricanes but not as much in the case of cyclones. Both are tropical cyclones but named differently according to the ocean in which they form.

A February 2019 study published in *Nature Communications* has

found a detectable increase in the rate of intensification of hurricanes in the Atlantic Ocean between 1982 and 2008. It has also established a link between rapid intensification and global warming, though it requires more data and a better climate model to reach a conclusions.

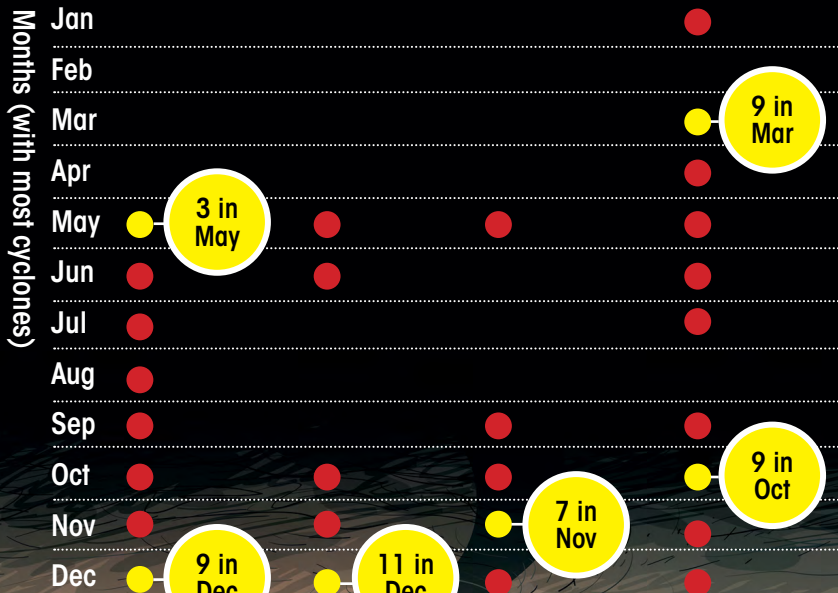
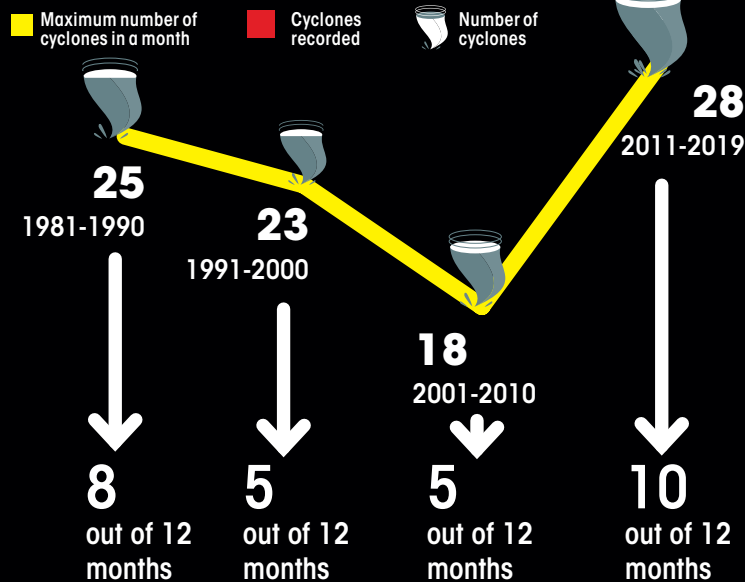
Murtugudde agrees that there is a lack of long-term observational data for cyclone intensification rates in India. Thus, no robust statement can be made about rapid intensification over the North Indian Ocean. However, he says, the phenomenon might become more frequent in the Indian Ocean, especially considering its rapid and monotonic warming. Such rapid intensification was observed last year when cyclone Vayu formed in the Arabian Sea just after the onset of the south-west monsoon season. He advises that strategies for collecting necessary data to track rapid intensification be established urgently.

A latest research, however, says warming may not be the only reason for such rapid intensification of cyclones. Simon Wang, professor of climate dynamics at the Utah State University, US, who is part of the study, says, “It is probable that due to the COVID-19 pandemic and reduced human and economic activity, the amount of aerosol (pollutants) in the atmosphere in South Asia plummeted.”

This reduced concentration of aerosols may have added to the already high sea surface temperatures in the Bay of Bengal, causing the rapid intensification of Amphan, he says. The study, accepted on May 11 for publication by *Environmental Research Letters*, says atmospheric warming has twice as much effect on cyclone intensity as sea surface temperatures. “Warm

UNQUIET TIMES

Last decade, as many as 28 cyclones formed in the North Indian Ocean, the highest in four decades



More and more cyclones formed in North Indian Ocean are of severe category

2015-2017

TOTAL CYCLONES FORMED
11

SEVERE CYCLONES
5 (45%)

2018-2020

TOTAL CYCLONES FORMED
16

SEVERE CYCLONES
12 (75%)

air and ocean surface temperatures have significantly intensified the Bay of Bengal cyclones, especially during the pre-monsoon season and in May,” says Wang. His co-researcher Jin-Ho Yoon says the new environment with much less aerosols and greenhouse gases provides a new testbed for climate change impact studies.

Irrespective of the reason, there is no denying that cyclones are becoming more severe and frequent in recent decades. An analysis by *Down To Earth* (DTE) shows from 2015 to 2017 five of the 11 cyclones that formed in the North Indian Ocean had turned severe. In the past two years, 12 of the 16 cyclones have turned severe, including 7 very severe cyclones, 3 extremely severe cyclones and two super cyclones. This is an increase from 45 per cent to 75 per cent.

To estimate the frequency with which these cyclones are forming, DTE analysed all the cyclones formed in the North Indian Ocean since 1981 (see ‘Unquiet times’). Between 2011 and 2019, as many as 28 cyclones have developed, the highest in last four decades. They are now occurring at times when they usually did not. For example, before 2011, cyclones never occurred in January, March and April. In the last decade, cyclones have occurred every month except February and August. The months with the maximum number of cyclones has also changed from December and November in the past decades to October and March. Since cyclones form over warm sea surfaces (above 27°C) the analysis shows seas are now warm throughout the year, leading to an increased possibility of cyclone formation at any time of the year. [DTE](#)

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UNDER THE COVER OF LOCKDOWN

With lockdown in force, governments across the globe are scrambling to implement steps they were unable to take due to opposition from people and political parties. India is no exception, and the government is blatantly diluting crucial laws in favour of the industry

KUNDAN PANDEY analyses changes in labour laws, **ISHAN KUKRETI** on environmental laws and **SHAGUN KAPIL** on agricultural laws



SOON AFTER the world observed International Labour Day, India has scurried along a road that curtails the rights of its workers. On May 6, Uttar Pradesh increased the labourers' working hours from eight to 10. The state announced it would suspend 35 of the 38 labour laws for next three years. The step, it said, would bring "on track" economic activity that has stopped due to the lockdown clamped after the COVID-19 pandemic outbreak. "New investment opportunities would need to be created along with fastening the business processes and productivity," a statement issued by the state government said.

To formalise the process, the state has issued an ordinance. Once enforced, Uttar Pradesh would barely have a few functional labour laws. The Trade Unions Act, Industrial Disputes Act, Act on Occupational Safety and Health, Contract Labour (Regulation and Abolition) Rules, Interstate Migrant Workmen Act, Equal Remuneration Act and the Maternity Benefit Act would all be put on hold.

Madhya Pradesh, Gujarat and Assam have also hurriedly changed laws to loosen regulatory control on industry and tighten it for workers. Madhya Pradesh has amended the Shops and Establishments Act and allowed shops to function from 6 am to 12 in the night. People will now have to work 18 hours. The state has nullified its Industrial Relations Act 1960, a tool to settle disputes between employees and employers. For the next 1,000 days, new factories would be exempt from the Industrial Disputes Act, 1947, allowing employers to make labourers work as per their convenience. The labour department and the labour courts would no longer be required to intervene in actions taken by the industry. With the changed Industrial Employment (Permanent Order) Act, 1961, factories employing up to 100 workers would be exempt from its provisions. Factories with less than 50 workers can now be inspected only after permission from the labour commissioner.

Madhya Pradesh has also changed the Contract Labour Act, 1970. Now, business establishments need registration only if they have more than 50

workers, as against the earlier 20. Worse, employers would no longer be required to pay ₹80 per worker they now pay to the Madhya Pradesh Labour Welfare Board for workers' security.

Gujarat has increased working hours from eight to 12. It has suspended key labour laws for 1,200 days. Assam and Tripura are ready to issue ordinances to change their labour laws. The Centre has said it is talking to other states as well to change their labour laws.

"All these measures are to empower employers so that they can hire and fire employees at will," says Amarjeet Kaur, general secretary of All India Trade Union Congress. The worker cannot raise disputes. Business establishments with less than 50 workers would function without any control. With inspections withdrawn, the worker's basic rights on wages, compensation and safety would become meaningless.

Criticising the government's measures, India's two leading industrialists—Azim Premji, chairperson of Wipro Ltd and Rajeew Bajaj, managing director of Bajaj Auto—have said it will only create mistrust between industry and labourers.

"People are already rattled by the pandemic, but the government is using lockdown to suppress the rights of workers and trade unions,"

says Kaur. Calling the government's actions anti-people and autocratic, the Centre of Trade Unions observed a nationwide protest on May 22. The Bharatiya Janata Party-affiliated Bharatiya Mazdoor Sangh, too, organised a protest on May 20.

FLAWED ARGUMENTS

"There is no doubt that lockdown has been catastrophic on industry. In fact, micro and small enterprises are facing an existential crisis and many units may not recover at all," says Jayati Ghosh, economist and professor at Jawaharlal Nehru University. The government says it is changing labour laws to make conditions favourable for companies that wish to relocate from China to India. But labour is only the fourth constraint in India, shows a 2012 World Bank report titled *The Role of Labour Market Regulation, Institution*

INDIA'S TWO LEADING INDUSTRIALISTS—AZIM PREMJI AND RAJEEV BAJAJ—SAID THE CHANGES THAT STATE GOVERNMENTS HAVE MADE IN THEIR LAWS WILL ONLY CREATE MISTRUST BETWEEN INDUSTRY AND LABOURERS

India is violating ILO convention

The country is no longer a welfare state and has lost its inherent benevolence

BY KR SHYAM SUNDAR

THE INSENSITIVITY with which the political establishment and bureaucrats have handled the COVID-19 pandemic has been striking from Day One. The Centre should have got a cue from the protests in Delhi and Surat during the first phase of the lockdown. Unfortunately, it failed to introduce a planned public policy.

With a fragile finance system, the government should have done two things—given fiscal stimulus to suppliers and provided income support to those on the demand side. But the government kept sending advisories, which had no legal binding. The crisis has been created because of the neo-liberal character the state has acquired over the years. [The welfare state has eroded](#), because of which it has lost its inherent capacity of benevolence.

In India, the movement for labour laws began in the 1870s. Over time, working hours were reduced to 14 from 16, and then to 12 per day. It is eight hours at present. In one stroke, all this has been destroyed. We have returned



to the 19th century.

In a way, the government is telling workers that they would have to work as per the employers' whims; that it would not interfere in any industrial dispute; and that labourers cannot form trade unions or go to labour courts. It is all being done for a few foreign companies, which want to relocate from China. This is a shut-shop model or mini-labour market internal emergency where all rights are frozen. It is just short of anarchy.

India is violating the ILO Convention on Tripartite Consultation (C-144) which provides for social dialogue. The state governments did not engage with trade unions while amending laws. There was hardly any effective social dialogue on the four codes that were introduced. India ratified the C081 Labour Inspection Convention as well, which provides for an independent inspectorate with provisions to allow thorough inspections. The Madhya Pradesh government has said there would be no routine inspection and factory owners could go with third-party audits. Many other states have given similar orders. India also ratified Employment Policy Convention, 1964, which requires an organisation to have an employment policy in place. The country does not have an employment policy even after 70 years of economic planning and growth.

(The author is a labour economist and professor at the Xavier School of Management, Jamshedpur)

and Programs.

"The argument that weak labour protection laws will attract private investment is analytically flawed and empirically invalid," says Ghosh. That high labour cost can hinder private investments is also incorrect as India has the cheapest labour force and accounts for a relatively small proportion of the total

industrial costs. The Annual Survey of Industries, 2017-18, states that workers' wage was less than 3 per cent of the total input costs in India, with 2.6 per cent in Uttar Pradesh and only 2 per cent in Gujarat and Madhya Pradesh. In fact, a 2017 study conducted by the V V Giri National Labour Institute in Rajasthan, Andhra Pradesh, Haryana and Uttar



Pradesh found that such amendments neither attract big investments, nor boost industrialisation and job creation.

This apart, the dilutions in laws can hardly create an impact as 94 per cent of the country's workforce is out of the ambit of trade unions, says Kaur. In 2011-12, India had 474.2 million workers, of which only 40 million were working in the organised and formal sector, states a 2018 Azim Premji University working paper titled *'Of Missing Middle' and Sized-based Regulation: A New Frontier in the Labour Market Flexibility Debate*. Only 20 per cent of the organised sector workers are trade union members.

CENTRAL PUSH TO AMEND STATE LAWS

Some 40 Central and 200 state laws govern industry. "Many laws are redundant and at times overlap," says Sitakanta Panda, assistant professor of economics at the Indian Institute of Technology, Bhilai. Even labour unions agree on the need to reform them. When the Narendra Modi government came to power, it promoted industry and pushed for labour "reforms". In 2014, the Centre introduced three laws in Parliament, but these were rejected because the ruling National Democratic Alliance did not have a majority in the Rajya Sabha. Since the BJP was in power in Rajasthan, it introduced changes in the Factories Act, Contract Labour Act, Industrial Dispute Act and Apprentice Act. Soon, Nripendra Mishra, the then principal secretary to the Prime Minister, wrote to all chief secretaries to make changes similar to Rajasthan. Almost 10 states followed suit.

In 2014 itself, the Centre launched Shramev Jayate Yojana to support its Make in India campaign that encouraged the manufacturing sector. But it had no participation of labour unions. On August 15, 2015, when the Prime Minister announced to merge all the 44 labour laws into four codes, the government again did not consult trade unions. The Indian Labour Conference, the apex consultative committee in the Ministry of Labour and Employment to advise the government on issues concerning

workers, is scheduled to take place annually. It has not been held in the past five years, says Kaur.

"Consulting labour unions is mandatory as India is a signatory to the Tripartite Consultation International Labour Standards Convention, 1976, which requires the ratifying governments to consult the stakeholders who are employers' bodies and workers bodies (trade unions)," says K R S Shyam Sundar, labour economist and professor at the Xavier School of Management, Jamshedpur (see 'India is violating ILO convention', p24).

Clearly, the government has been high-handed in dealing with workers' rights. On January 8, for instance, when trade unions were protesting the government's anti-labour policies, Minister of Labour Santosh Gangwar tabled an amendment in the Trade Unions Act, 1926.

After lockdown 4.0, Union Finance Minister Nirmala Sitharaman, on a spree to relax laws for the private sector, announced the codes on wages as a reform, which was passed by Parliament in 2019.

The codes are to boost the employer, not the employee. It makes legal representation and access to form trade unions an impos-sible task.

"The government has misused the COVID-19 outbreak as an opportunity to amend labour laws in industry's favour," says Aruna Roy, founder member of Mazdoor Kisan Shakti Sangathan. People are voluntarily

staying inside their houses and will not come out on the road to protest. The government's step is very undemocratic, she adds.

NO RETHINK ON ENVIRONMENTAL LAWS CENTRE GOES INTO AN OVERDRIVE AND CLEARS 112 PROJECTS, WITHOUT CARING TO DISCUSS THEIR PROS AND CONS

"All changes that the government had proposed before the lockdown are being carried out now, as per its plan. There has been no rethink on it. It is as if the pandemic never occurred," says

**DILUTION OF LAWS WILL
HARDLY HAVE AN IMPACT AS
94 PER CENT OF THE
COUNTRY'S WORKFORCE IS
OUT OF THE AMBIT OF TRADE
UNIONS, SAYS AMARJEET
KAUR, GENERAL SECRETARY OF
ALL INDIA TRADE UNION
CONGRESS**

Tragedy of lost opportunities

Rollback of laws for adivasis and forest-dwellers has reversed years of constitutional progress

BY SHOMONA KHANNA

AS A democracy, the people of India expect a polity grounded on the principles of justice, liberty and equality. This means special measures are necessary for communities—Adivasis and forest-dwellers for instance—that have faced historical discrimination. A complex architecture of constitutional and statutory protections has ensured this. With the enactment of the Panchayats (Extension to Scheduled Areas) Act in 1996, the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act in 2006, and a plethora of subordinate legislation, executive instructions and judicial verdicts, one would expect that constitutional mandate is truly on the path to fruition.

Since March 2020, when the World Health Organization declared the coronavirus pandemic, the cessation of economic activity and travel witnessed a resurgence of the natural world. Optimists hoped that governments would seize the opportunity to review the development path. Instead,



the government has rolled back environmental laws and legal protections for adivasis and forest-dwellers, while fast-tracking mining and other industries inroads into traditional and community lands.

On May 1, Ministry of Tribal Affairs urged states to increase Minimum Support Price for Minor Forest Produce (MFP) when the season to collect MFP was over. In his speech during the lockdown, the Prime Minister announced a ₹20 lakh crore economic package.

Instead of making an allocation for MFP support for adivasis and forest-dwellers, the package makes a passing nod to creating jobs for them by approving up to ₹6,000 crores from the Compensatory Afforestation Fund (CAF). CAF has been notoriously used to undermine CFR Management Committees, and demands by adivasis that CAF be controlled by the gram sabha have been ignored. Instead, the forest bureaucracy has used CAF resources for forcible plantations on adivasi lands, often targeting particularly vulnerable tribal groups. The officers are undeterred that such encroachments are criminal offences.

Among the many tragedies unfolding during the lockdown is the inexorable advance of disaster capitalism and impunity, and the tragic loss of an opportunity to honour the wisdom of our indigenous people.

(The author is a Supreme Court advocate and former legal consultant with the Ministry of Tribal Affairs)

Kanchi Kohli, a researcher at Delhi-based non-profit Centre for Policy Research.

In the past two months of lockdown, state pollution control boards have given industry a free hand to operate. Factories now get

automatic extension on Consent to Operate without the need to fulfil compliance norms; successful bidders under the Mineral Laws (Amendment) Act, 2020, would not require Forest Clearance for the next two years; movement inside

protected areas has been restricted; the Union Ministry of Environment, Forest and Climate Change (MOEFCC) has appraised 298 projects for Environmental Clearance through virtual conferences.

All that the government has

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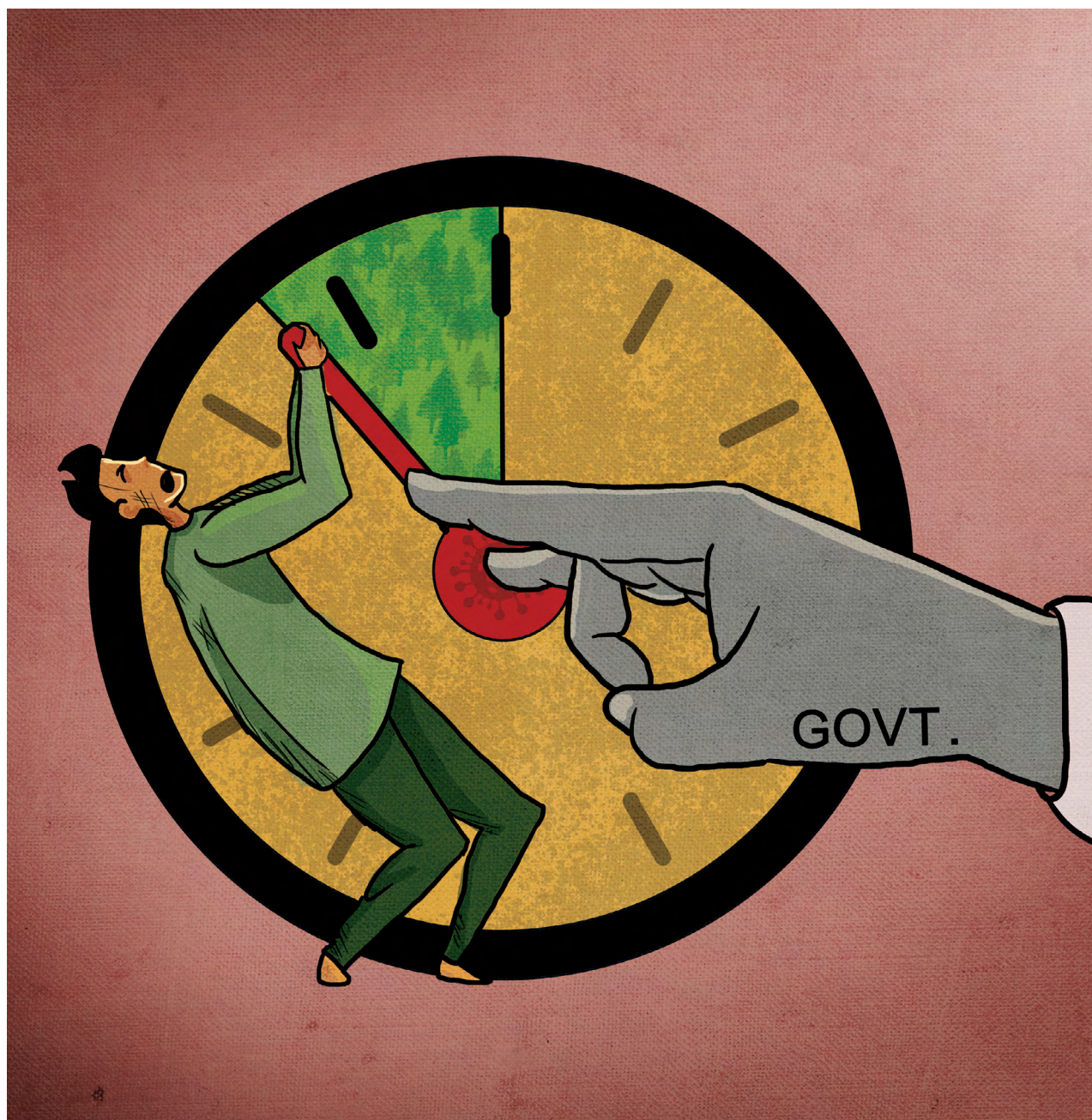
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done is make logistic changes—work out a different way of conducting meetings and talk about a new policy to conduct public hearings with social distancing, say experts. “The ministry has found technological solutions to some of the problems created by the pandemic, without really addressing ground-level challenges. Some of the public-level interface role of the government has taken backseat,” says Kohli.

CLEARING PROJECTS FRANTICALLY

After the lockdown, the Centre went into an overdrive and appraised 298 projects in 21 meetings conducted over video-conferencing. The meetings were held with the Expert Appraisal Committee (EAC), Forest Advisory Committee and National Board for Wildlife to grant environmental, forest and wildlife clearances. Of these, 112 projects were cleared. The ministry is yet to upload the status of



the remaining projects on its website.

During the EAC meeting on industrial projects held on April 13-15, project proponents were given 10 minutes each to present their proposal. "Usually on every project, about 10 expert members present their views. This is not possible if the time slot itself is only 10 minutes," state-level Environment Impact Assessment Authority members told *Down To Earth* on condition of anonymity.

Expressing surprise that the government was appraising projects like brewery and limestone mining, an EAC member said, "Mining is not essential in these times. It just shows the government's attitude," adding that there is palpable pressure on the environment minister to speed up the process of giving clearance to projects.

"The Environment Impact Assessment notification, 2006, clearly says the project's agenda must be put up 15 days before the meeting so that there is time to look at the proposal. Now, we are intimated four to five days before the meeting. There's this rush, which is not necessary," the member said.

Every proposal consists of a 500-odd page report. In every meeting there are 10 such proposals. "Does the government really expect us to read so much information in so little time?" the member asks.

NO HOLDS BARRED

The scramble to clear projects is aimed at weakening the compliance mechanism. On March 31, MOEFCC issued a notification stating that successful bidders under the Mineral Laws (Amendment) Act, 2020 would be granted deemed forest clearance for two years. The new lessee would function with the same set of terms and conditions stipulated for the previous lessee for two years. "There have been violations in clearances and litigations in several cases. The government assumes the guidelines will sort out all these liabilities within two years," says Kohli.

Experts see this as violation of the Forest Rights Act (FRA), 2006 (see 'Tragedy of Lost opportunities,' p26). "Most of mining leases were given before FRA was implemented. Fresh forest clearance would have made it possible for gram sabhas to get their

rights recognised. But with the dilution, government has denied people this right," says Shomona Khanna, a Supreme Court advocate and former legal consultant with the Ministry of Tribal Affairs. As per a 2009 ministry circular, forest clearance can be given only if the rights under FRA are settled.

This apart, the state pollution control boards have decided to extend the Consent to Operate for industries in case it expired around March 31. Goa has extended it till June 30, Maharashtra till September 30, Tamil Nadu till June 30 and Telangana till August 15.

While announcing the stimulus package, Sitharaman said there is a need to reduce the compliance burden on industry. "Instances such as LG polymer gas leak and Raigarh gas leak, however, show the need to tighten monitoring. The Union government's message is to limit the burden on industry, not the environment," says Kohli.

LAWS TWEAKED FOR PRIVATE PLAYERS, NOT FARMERS

IN AGRICULTURE SECTOR, AMENDMENTS ARE BEING MADE TO GET RID OF MSP, PDS

On May 15, when the finance minister announced the third tranche of the ₹20 lakh crore economic package to help the economy tide over the effects of the pandemic, it was mostly for the primary sector. "As an immediate step, we will provide ₹1 lakh crore to strengthen farm-gate infrastructure such as cold chains, storage centres and post-harvest management," she said. At a time when farmers need immediate relief for the losses incurred over the past two months, the economic stimulus seemed a hogwash. "Farm-gate infrastructure is needed, but will take six to eight months to be set up," says G V Ramanjaneyulu, executive director at the Centre for Sustainable Agriculture, Andhra Pradesh Agricultural University.

Sitharaman also announced an amendment to

the Essential Commodities Act, 1955 to help farmers get better price for their produce. It would be used to deregulate trade in cereals, pulses, oilseeds, potatoes and onions—no stock limits would apply for food processing units, value-addition corporations and exporters (see ‘Non-essential amendments’, p32).

Related to agriculture markets, the second intervention would provide marketing choices to farmers. A Central law to provide barrier-free inter-state trading of farm produce is also on the cards. At present, farmers have to sell their produce to licensees at Agricultural Produce Market Committees (APMCs). The Agricultural Produce Market Regulation Act, 2003 mandates that notified agricultural commodities can be traded only at specified market areas or APMCs, rather than in the open market. “I don’t call these reforms. It is just an attempt to get rid of the Minimum Support Price (MSP) and Public Distribution System (PDS) regime,” says food and agriculture policy analyst Devinder Sharma. “The MSP offered in APMC *mandis* is a better mechanism for price discovery than the markets. Thanks to the procurement undertaken by these APMC *mandis*, India has escaped food crises and we have managed to keep buffer stock during the lockdown,” he says. “If PDS stops, its requirement will stop, and the government doesn’t have to do procurement. If procurement is not done, there is no need for paying MSP. If that happens, then you do not need the APMCs too,” he argues.

“These are clear indications that the government is withdrawing from purchasing farmers’ produce and giving the job to private players,” says Manpreet Singh Grewal, adviser to the Punjab Agricultural University Kisan Club. Private players are likely to force small and marginal farmers to settle for low prices. Rajaram Tripathi, president, All India Farmers Alliance, says if the government’s objective is to ensure better prices for farmers, it must penalise the buying of produce below MSP.

ATTEMPTS TO AMEND APMC ACT

In April, NITI Aayog recommended suspension of the APMC Act for six months. It is not the first such

attempt. In 2003, the government had proposed the Act to mandate direct purchase from farmers, private wholesale markets and contract farmers. In 2017, the Ministry of Agriculture and Farmers Welfare brought out the Agricultural Produce and Livestock Marketing (Promotion and Facilitation) Act. This legislation tried to break the hegemony of *mandis* and create a national common market for agricultural products by allowing large buyers like food processing companies and retail chains to purchase directly from farmers. The aim was to reduce the number of agents in the supply chain and help farmers capture a higher share of the final price.

The Centre has been pushing states to adopt these changes but with little success. States get a good amount as tax from *mandis*, says Pratap Singh BIRTHAL, professor, National Institute of Agricultural

Economics and Policy Research, Delhi. In the last two years, Maharashtra tried twice to amend the Act, but failed due to protests from APMCs.

Reforms in the APMC Act are crucial. The APMC traders (commission agents) are known to monopolise trade that has prevented development of a competitive marketing system. “There are several inter-

mediaries in the supply chain. So there is much difference in what the consumer pays and what the farmer gets. Even the *mandi* fee that the traders should pay is mostly deducted from the farmers’ final payment,” says BIRTHAL.

APMC markets are dens of corruption and blackmail for poor farmers, says Alok Verma of Bharatiya Kisan Union, Uttar Pradesh, adding that “farmers do not even get MSP”. But can allowing private players and retailers solve the problem? The experience in Bihar speaks otherwise. The state revoked the Act in 2006 to invite private investment. In 13 years, the situation only worsened. Farmers do not get MSP there either, says Sharma. No one is interested in creating a competitive market because private players just want to feed off the laid structure of regulated APMCs, he adds.

THERE ARE CLEAR INDICATIONS THAT THE GOVERNMENT IS WITHDRAWING FROM PURCHASING FARMERS’ PRODUCE AND GIVING THE JOB TO PRIVATE PLAYERS, SAYS MANPREET GREWAL, ADVISER TO PUNJAB AGRICULTURAL UNIVERSITY KISAN CLUB



IN THE NAME OF COVID-19

Across the globe, governments are using the pandemic as an excuse to promulgate controversial laws

US

The Trump administration has used the COVID-19 pandemic to announce that it is **doing away with the stronger fuel efficiency standards for cars and trucks** introduced under Barack Obama



Hungary

The parliament has **given Prime Minister Viktor Orbán authority to rule by decree with an unending term**. The government has also passed controversial legislations, such as ending the legal recognition of transgender people



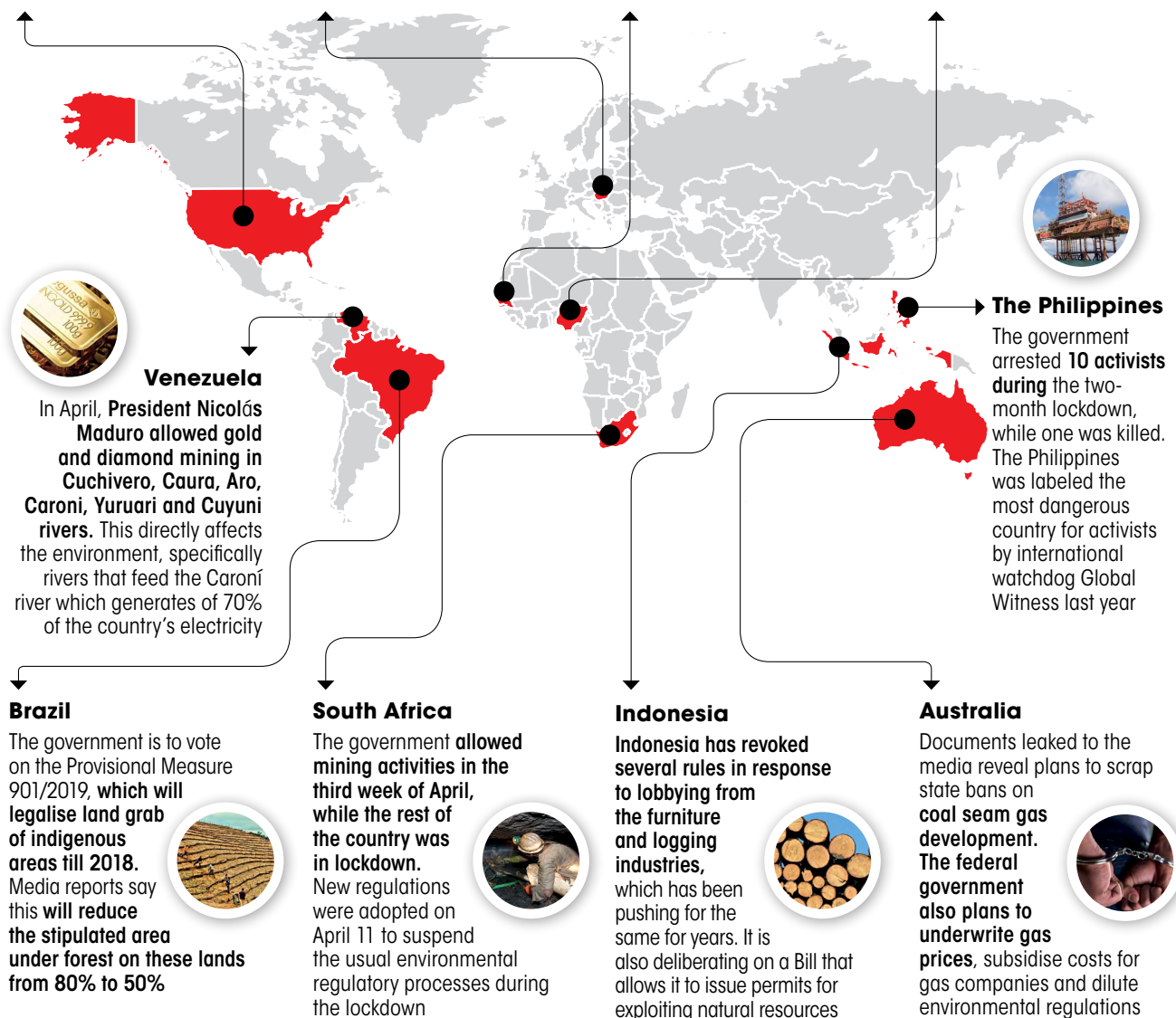
Senegal

The government has suspended **one of the provisions of the anti-plastic law: the ban on water sachets**. The provision, which has a strong economic and social impact, will only be reinstated after the pandemic is over



Nigeria

Nigeria has enacted **16 state and federal regulations that justify derogation of constitutionally protected rights**. It also tried to pass a draconian law allowing the police to apprehend people with infectious diseases



Source: Media reports

Non-essential amendments

The government cannot abdicate its fundamental role to govern

BY G V RAMANJANEYULU

WHEN FINANCE Minister Nirmala Sitharaman announced the amendment to the Essential Commodities Act (ECA), 1955, she said it was to help farmers fetch better prices. She said the government wants to exempt some essential commodities, such as cereals, edible oils, oilseeds, pulses, onions and potatoes, from the purview of ECA. While amending an archaic law was welcome, this was the only law that could prevent hoarding of foodgrain.

There was no discussion before passing the amendment. Imagine the situation had a handful of companies hoarded foodgrain or other essential commodities over the past two months. It is important that the government has some control over foodgrain stocking. At present, ECA regulates the amount of commodity an individual or organisation can hold. Once this law goes, anyone can hoard any amount of any commodity. The government has said it will have the power to re-invoke ECA under



exceptional circumstances. But how do we define exceptional circumstances? The definition has become critical for deregulating commodities under this Act.

The Act regulates two important things—price and supply. The general feeling is that till now the government regulated these but now after amendment, market forces will regulate these commodities. The government should define how market forces will do it, and what the government

will do in case they fail. The role of the government is governance. It cannot withdraw completely.

If we look back, there are a number of occasions when the government has used ECA to regulate food prices and ensure availability of food, or any other product, in the market. In 2004, when the price of cotton seeds shot up, it was regulated under ECA and its price was brought down.

The moment this power goes, it will become difficult for the government to take such steps. It has to build a proper process for exceptional circumstances. It has to define the exceptions. Is there a committee or an officer to decide what the exceptional condition is? If any law is amended, replaced or dismantled, it is important to define how the regulation will be dealt with in the future.

*(The author is executive director of the Centre for Sustainable Agriculture, Andhra Pradesh Agricultural University)
(As told to Shagun Kapil)*

Maharashtra deregulated fruits and vegetables by taking them out of the APMC system, but farmers say there are no buyers because the government did not establish a proper infrastructure for sale.

India has around 7,000 *mandis*. As per the APMC Act, there should be one *mandi* within every 5 km radius. This means the country should have 42,000 *mandis*. “Instead of amending the APMC Act, the government should set up parallel private markets in areas that do not have regulated *mandis*. This will also check cartelisation in the APMC market. The

regulatory authority should, however, remain with the APMCs,” says Sharma.

While the world faces its biggest health and economic crisis ever, governments are quietly diluting laws. Across the globe, countries are scrambling to change legislations (see ‘In the name of COVID-19’, p31). The resurgent state is asserting that its actions would help rebuild society. But in truth, it is the vulnerable sections of society that will be hit the hardest. **DTE**

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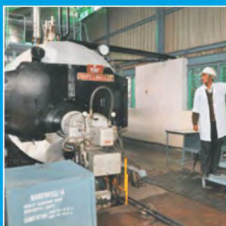


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MIGRATORY DILEMMAS

Around 100 million informal workers in India have returned to their villages due to job loss because of the lockdown. But the government's revival package has offered them only more debt

AS THE monsoon clouds enveloped Kerala, thousands of workers from across India were migrating to their villages. Even though they had been surviving on daily wages, May is the month they would normally return to their original—and seasonal—source of livelihood: farming. But this year the seasonal migration back to village was not about a romantic notion of people still rooted in their ancestral occupation—there was no aura of a homecoming with hopes and the joys of producing critical foodgrains for a few months, and, there was no eagerness to reach home and inform their families on a big saving to be invested in many essentials, including on farms. On the contrary, India's monsoon season has begun with a deluge of woes—for workers, farmers and farming. And this is going to be the most devastating spillover of the COVID-19 pandemic.

Amid the lockdown—India's 68 days is the longest in the world—the country not only reported a consistent rise in COVID-19 cases, it also willingly reconciled to live with the virus (see infographic 'Newer targets' on p37). By May 31, when most of the restrictions were lifted, the enormity of the pandemic simply shrunk into oblivion, masking another crisis of a much bigger scale.

FORCED MIGRATION

For the past two months, millions of workers were forced to return to their villages. But this was not



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the usual monsoon reverse migration; they were left unemployed due to the cessation of economic activities in cities and towns. "It seemed there were more people on the roads than in villages," says Vivek Mishra, a correspondent with *Down To Earth* who has been walking with migrants to track and chronicle this unfolding economic mayhem. Their "forced" migration made the pandemic look insignificant, in terms of human suffering. Headlines changed: pandemic as a prefix to this crisis was succinctly replaced with the economic crisis.

Ekta Parishad, a non-profit helping migrant workers return home across India, has collected primary information of 31,424 migrants between April 11 and May 20. Of the 24,681 stranded adults, 37 per cent were daily-wage earners, followed by industrial labourers such as construction workers (30 per cent), farm labourers (26 per cent), and labourers employed in the service sector (7 per cent).

It is estimated that 100 million workers have moved away from urban areas in these two months. That would make it the biggest-ever movement of people in India's history. But it is also the most disruptive economic development. India's villages were already economically wrecked, forcing people to migrate to towns and cities for livelihood. Now, with millions returning to the villages, an urgent expansion of the rural economy is required to sustain this transition.

To begin with, each of these workers has a family to sustain. Together, these informal workers contribute around 10 per cent to India's GDP. Add to it the fact that the agriculture sector's contribution to GDP is 15-16 per cent; which also primarily comes from these workers. Put together, they decide the economic fate of the country.

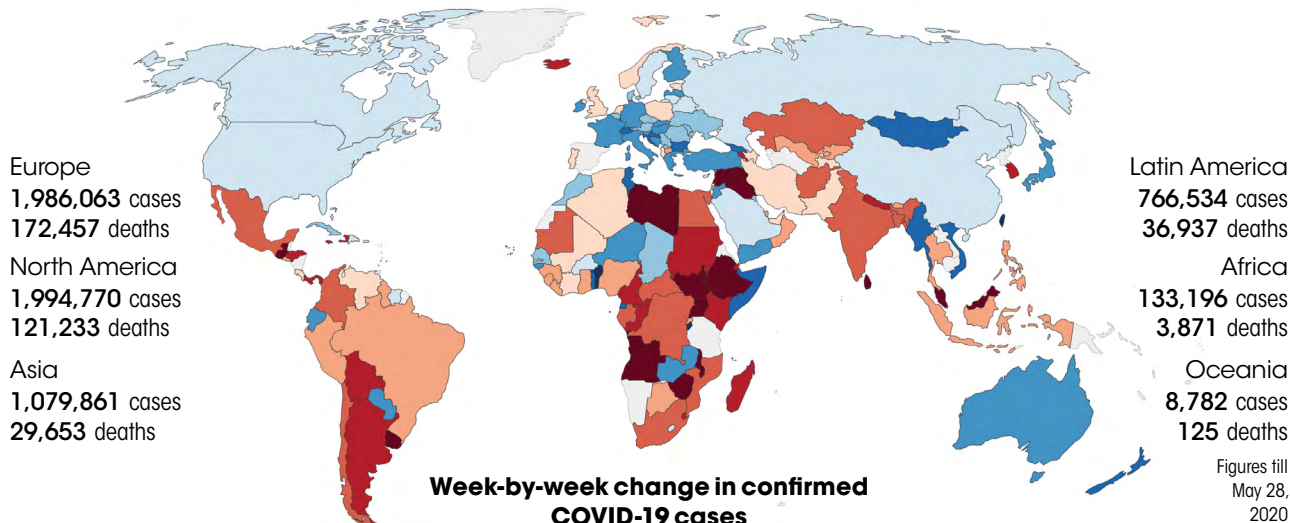
The challenge now is how to reinvent an economy of such scale immediately to sustain the homecoming workers. The great migration is happening at a time when, in fact, policymakers were expecting migration out of rural areas, given the economic situation existing there. For instance, since January unseasonal rains and extreme weather events damaged the winter cash crops. Due to a low demand in the markets, farmers were not even earning a fair price for their produce, thus taking a further cut in their meagre earnings.

DISPLACED PEOPLE, MISPLACED MINDSET

Internal displacements because of disasters like cyclones and floods are common in India. There were more than 5 million new displacements in 2019—the most in the world—according to Geneva-based Internal Displacement Monitoring Centre (IDMC). And the bulk of the displacements were triggered by extreme weather events that are linked to climate change. In terms of scale, India saw the wettest monsoon in 25 years in 2019, which triggered 2.6 million new displacements. Cyclone Fani was responsible for another 1.8 million new displacements in the same year. Similar numbers are expected this year too due to Cyclone Amphan and the near definite signs of a weak monsoon.

However, the lockdown—coinciding with the harvesting season for





Europe
1,986,063 cases
172,457 deaths

North America
1,994,770 cases
121,233 deaths

Asia
1,079,861 cases
29,653 deaths

Latin America
766,534 cases
36,937 deaths

Africa
133,196 cases
3,871 deaths

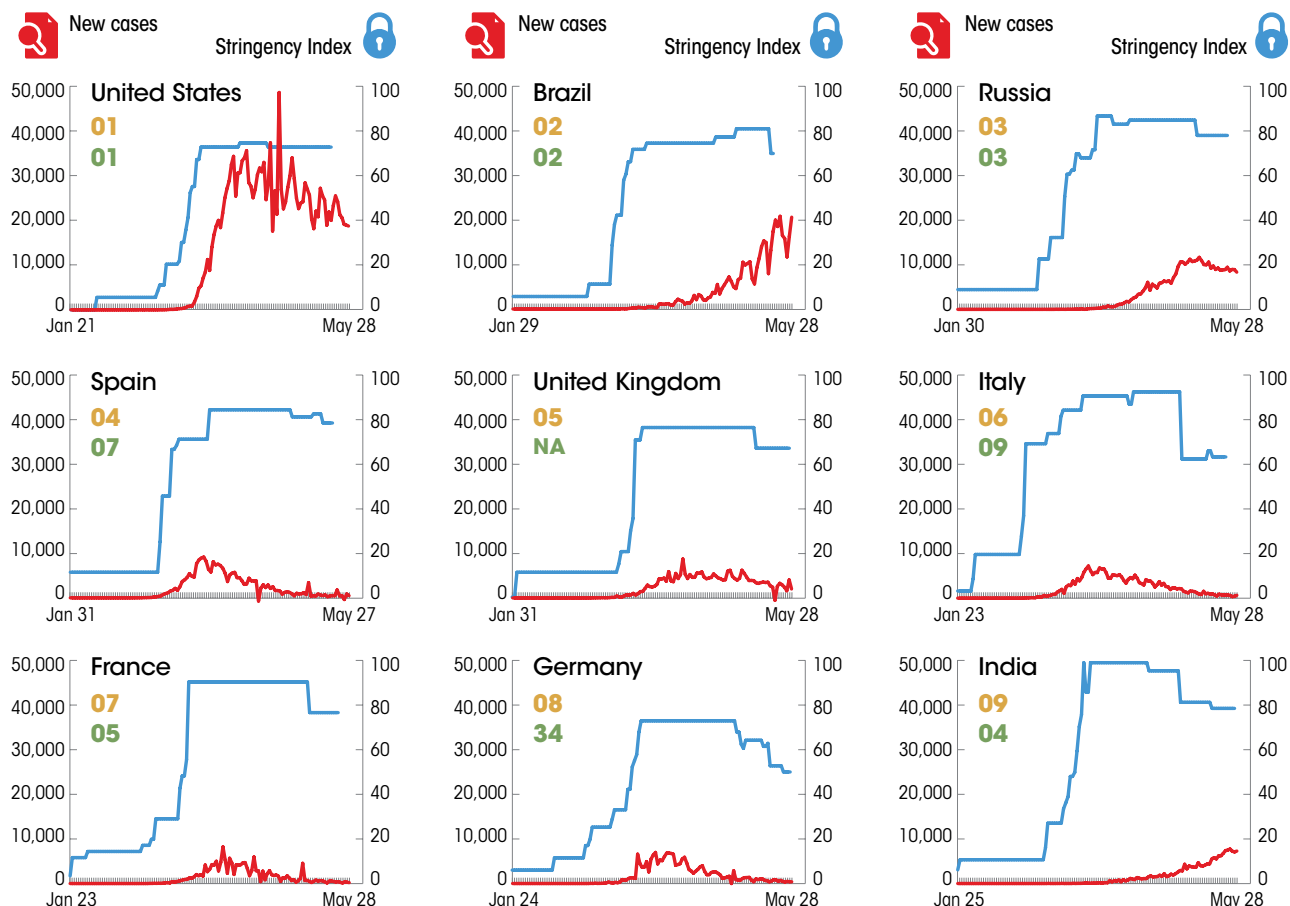
Oceania
8,782 cases
125 deaths

Figures till
May 28,
2020

NEWER TARGETS

While new cases remain static or are on a downhill in North America, Europe and Australia, countries in Latin America, Africa and certain parts of Asia are emerging as the new hotspots

India and Brazil are two of the nine worst-hit countries. Governments are easing stringency measures even as new cases continue to mount. India ranks 4th globally in terms of active cases; Brazil 2nd



00 Rank (total cases); 00 Rank (active cases)

Source: European Centre for Disease Prevention and Control



winter crops—means that the farmers are losing a significant chunk of their earnings. More than half the farmers who harvested their crops this year suffered a lower yield during the nationwide lockdown, compared to the last season of sowing the same crop, says the survey of 1,500 farmers in 200 districts across 12 states. The lockdown also forced 55 per cent of farmers to store their crops as they were unable to sell them.

The IDMC survey—aimed to evaluate the impact of lockdown on agricultural production and livelihood—was conducted by the Harvard TH Chan School of Public Health, Public Health Foundation of India and the Centre for Sustainable Agriculture from May 3 to May 15, 2020. Farmers in Andhra Pradesh, Bihar, Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab, Rajasthan,

PHOTOGRAPH: REUTERS



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- ➔ Sequestering and fixing carbon to a tune of 1080 tonnes by planting 5.44 lakhs tree in community & private land in last five years in addition to economic benefits.
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PREVIOUS EDITIONS ON COVID-19

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Telangana, Uttar Pradesh and West Bengal participated in the survey. About 40 per cent of farmers who experienced a yield loss say this was due to lack of labour, storage or transport options. Unexpected weather change was also cited as a reason for the loss in yield by 80 per cent of farmers, found the survey.

“We call this the Great Lockdown, because, if you look around the world, the containment measures that have been put in place...are generating the scale of contraction and activity that are just historical numbers,” says Gita Gopinath, chief economist of IMF in a podcast. On May 22, the Governor of Reserve Bank of India Shaktikanta Das declared the Indian economy would shrink, for the first time in 41 years, or there would be negative growth. The top six industrialised states in India, which account about 60 of industrial output, are severely impacted by the COVID-19 lockdown. These are the states that have reported the maximum outflow of workers. This means that employment generation would be very difficult in these states in the near future.

RELIEF: NOT RUPEES, BUT LOANS

The Union government announced a ₹20 lakh crore economic stimulus package, which the government has claimed will provide relief to migrant workers, farmers and other sections of society that suffered from the nationwide lockdown. The package, however, seems to consist more of loan offerings, rather than a comprehensive stimulus. When Finance Minister Nirmala Sitharaman explained the details in press conferences—stretching over five days—the announcements seemed more of a loan offering, with calls to privatise national assets.

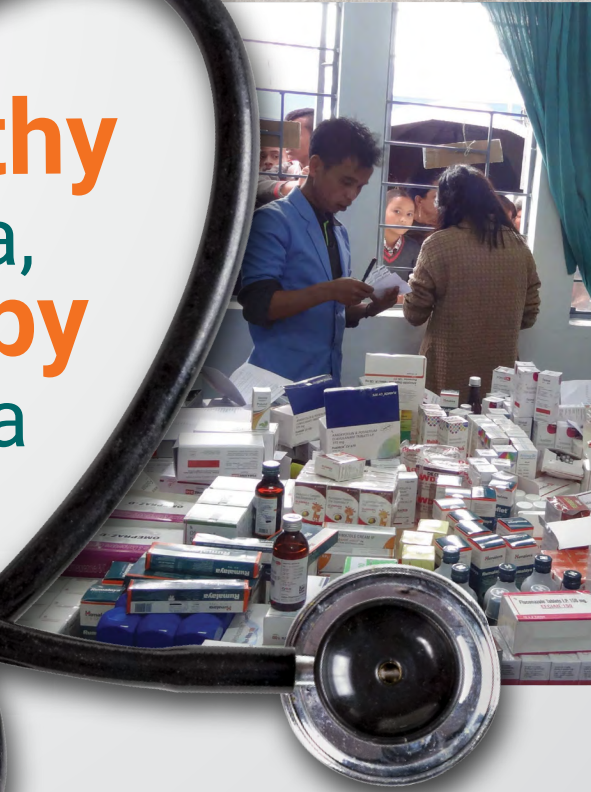
Everything the government offered was a loan, except for the decision to give free ration to poor families and a meagre amount of ₹500- ₹1,000 for Jan Dhan account holders, widows, the elderly and the differently abled. If one were to interpret the government's version, people have to first take loans, invest in businesses, and, then wait for results to get relief—something that may take years to come.

The finance minister also announced a credit programme for street vendors as well, where they can take loans of ₹10,000. But it is unclear as to who will be chosen for the programme. Is there a database of street vendors and what documents they will need? The same is the case for farmers, where Sitharaman relied too much on Kisan Credit Cards, despite the fact that only 40 per cent of India's small and marginal farmers are covered by formal credit, as of 2019, according to the Reserve Bank of India. The economic package may have stolen the attention from the pandemic itself, but the economic infection is only now going to unfold. **DTE**

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Healthy India, Happy India

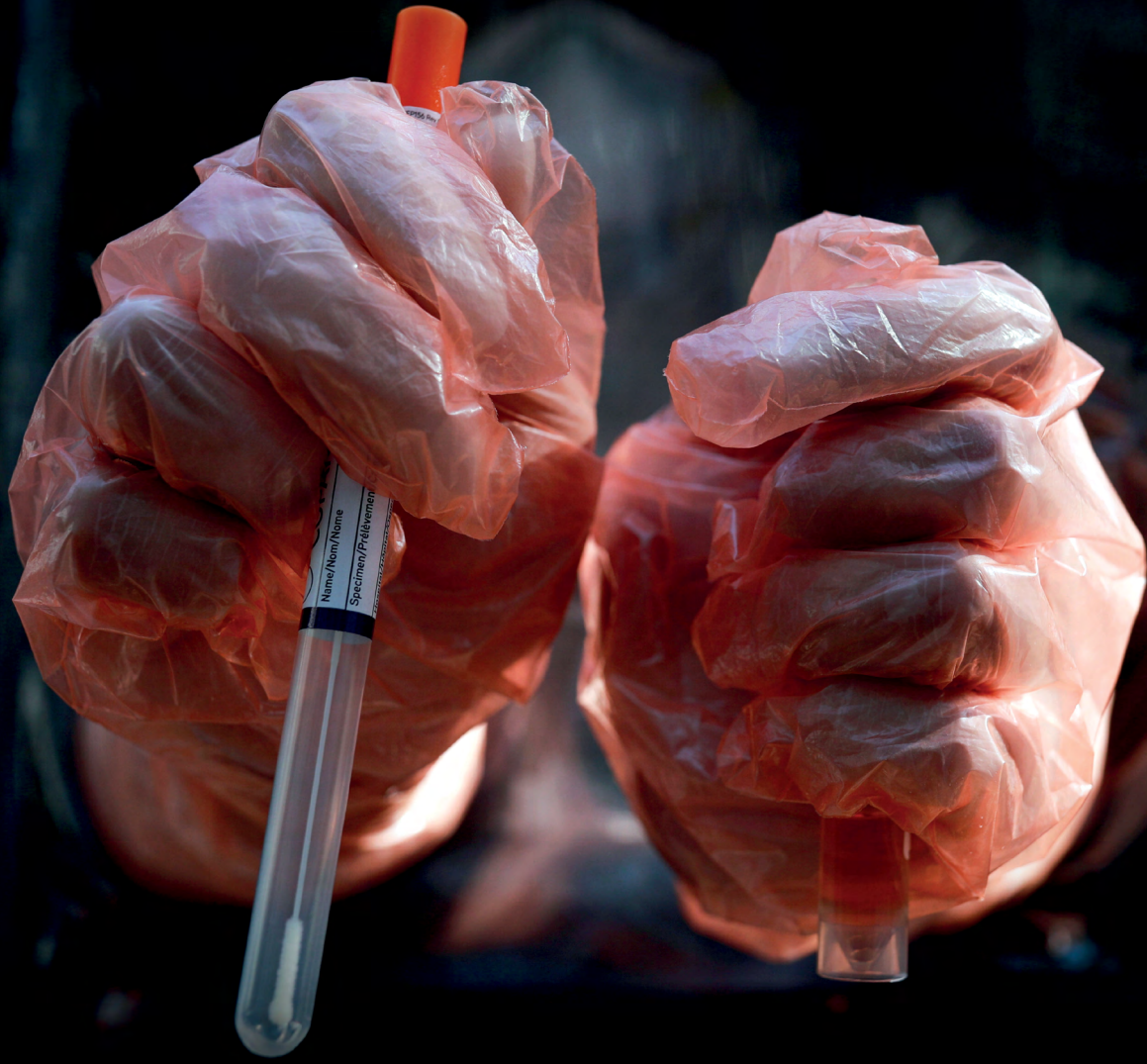


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Similar camps have also been conducted in Rajasthan and in more than 378 schools in Bengaluru.



SAMPLE THE UNKNOWN

Testing is no doubt the cornerstone of the fight against COVID-19. But the world's growing obsession with tests might weaken our response to the pandemic.

VIBHA VARSHNEY explains

THE WORLD is in a rush to reopen. After some five months of closure due to the COVID-19 pandemic and amid the forecast of a 3 per cent drop in the global economy—the steepest since the Great Depression of the 1930s—governments are easing stay-at-home orders, lifting restrictions and even drafting new laws to make up for the lost days. But with no antidote or vaccine in sight, they are in a fix; any careless move can undermine the hard-fought gains and lead to an explosion of new cases. In India, where the Union government has been relaxing restrictions while extending the lockdown, states are nervous as the infection count continues to rise. But as Australia's Prime Minister Scott Morrison says about easing lockdown: "It's going to be step by step, there is going to be some trial and error, this is completely uncharted territory."

The world is frantically looking for role models—countries that have weathered the pandemic storm and have worked out plans to reanimate their economies. One country that has emerged as a sign of hope is South Korea. Rising like a phoenix from the ashes, it has come out stronger from a similar crisis in 2015 when an outbreak of the highly-fatal Middle East Respiratory Syndrome (MERS), also caused by a coronavirus, sickened 186 people and killed 38. So on January 20 this year, when the country reported its first COVID-19 case, health officials knew they had to quickly quarantine the infected and trace those who came in contact with them before they could spread the disease further. Its biotech industry had, in fact, started working on a diagnostic kit much earlier, as soon as China, the country of origin of the disease, released the genome of the virus, SARS-CoV-2. By February 12, when the total number of cases were way below 100, the Korea Centers for Disease Control and Prevention had approved the test kit by one local biotech company, Seegene, on a fast track basis. Such approvals typically take a minimum of six months. Soon, other companies joined forces.

With the diagnostic kits in hand, the country launched a massive testing and contact-tracing campaign. Even asymptomatic people could get themselves tested for free. Since hospitals had turned into hotbeds of infection during the MERS outbreak—paralysing the healthcare delivery system—this time the



country kept the testing and treatment facilities separate. By early April, it flattened the curve and held the parliamentary election. It now has a huge infrastructure for COVID-19 diagnosis—638 testing centres, including 80 drive-through screening kiosks, and a capacity to test 23,000 people a day. It did not have to resort to lockdowns. The International Monetary Fund (IMF) says the country's GDP would shrink only by 1.2 per cent this year.

Small wonder, widespread testing has become the mantra for defeating COVID-19. In the US, as President Donald Trump wants Americans to return to work and get the economy running, state governors are pushing and fighting for more tests. In the third week of May when the death toll neared the 100,000 mark—the highest in the world—the White House rebuked its top health agency, the Centers for Disease Control and Prevention (CDC), saying “it let the country down” on providing testing.

^
A drive-through testing facility in South Korea. Using its experience from the MERS outbreak in 2015, the country has not only set up a huge infrastructure for testing but also kept them separate from treatment facilities to avoid the spread of infection

CDC had botched up the testing kit it was asked to develop. It was only on February 28, a month after the first case was reported in the country, that CDC decided to rope in other public and private entities for developing tests. By April 27, the Food and Drug Administration (FDA) had issued emergency-use authorisation to 70 test developers. That day, Trump unveiled two documents—[Testing Overview](#) and [Testing Blueprint](#)—and said a big part of “opening up America again” depends on testing to determine how many had been exposed to the virus. By May 21, it was conducting 39.42 tests per 1,000 people; South Korea's testing rate is 15.65 per 1,000.

In Africa, authorities are meanwhile struggling to compete with richer countries for procuring testing material on the global market. Even where there is enough money, many African health authorities are unable to obtain the supplies needed, says a [commentary published published in](#)

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Refreshing the Planet

[The Lancet scientific journal on May 7.](#)

There's no doubt that testing is the cornerstone of this fight against COVID-19. But it seems more than helping in the combat, it has led to confusion and chaos worldwide. Can governments rely on them for reopening economies?

Here's an uneasy answer

First, let's delve into the world of diagnostic tests where every reaction and every chemical matters

Broadly, two methods of tests are available for SARS-COV-2: molecular, which looks for the presence of the virus or its genetic material in the sample of nasal mucous or saliva, and serological, which looks for the presence of antibodies in the blood.

The first one is based on a routine lab technique, reverse transcription polymerase chain reaction (RT-PCR), which amplifies the minuscule amount genetic material in a pathogen and helps identify it. The technique has to be customised as per the disease by using primers, or short nucleic acid sequences, specific to the pathogen's genetic material. Typically, the procedure involves sticking a swab, similar to an earbud, but uses nylon instead of cotton, deep into the nose or throat, retrieving mucous sample, placing the swab in buffer solution to transport and isolate the virus, replicating its genetic material using chemicals or reagents like primers, enzymes and nucleotides, and then detecting it with fluorescent probes. Once the sample reaches lab, the entire process takes six hours (see 'Not so easy hunt', p47).

The serological test kit, on the other hand, is simpler and portable, just like a pregnancy test kit, and can give results in 20-30 minutes. It is also cheaper—in India, a rapid antibody test costs about ₹400 compared to RT-PCR that costs ₹4,500. Based on a drop of blood, these test strips look for antibodies that are produced as a natural defence mechanism of the body when exposed to a pathogen. Thus, it not only helps find out those who were infected and subsequently recovered, it also helps

identify asymptomatic patients who could have silently spread the infection.

But the effectiveness of any medical test depends on accurate diagnosis. This is assessed in two ways: specificity and sensitivity. Sensitivity is the ability of a test to correctly identify those with the disease (true positive), whereas specificity is the ability of the test to identify those without the disease (true negative). This is crucial as the disease would continue to spread if a positive patient is reported negative. If someone tests false positive, then he or she would have to go through needless treatment and duress. Both the tests are mired in these specificity and sensitivity issues. This limitation is now getting more pronounced because of the haste with which the testing tools and kits are being developed and approved. Besides, never before has the world seen such a huge demand for tests. This has overwhelmed developers as well as suppliers, triggering shortages everywhere.

BOTH THE TESTS HAVE LIMITATIONS. FOR ONE, NONE OF THEM CAN TELL FOR SURE IF A PERSON IS COVID-19-POSITIVE OR NEGATIVE. THESE FLAWS ARE NOW MORE PRONOUNCED BECAUSE OF THE HASTE WITH WHICH THE TESTING MACHINES AND KITS ARE BEING DEVELOPED, REVIEWED AND APPROVED

Let's examine RT-PCR

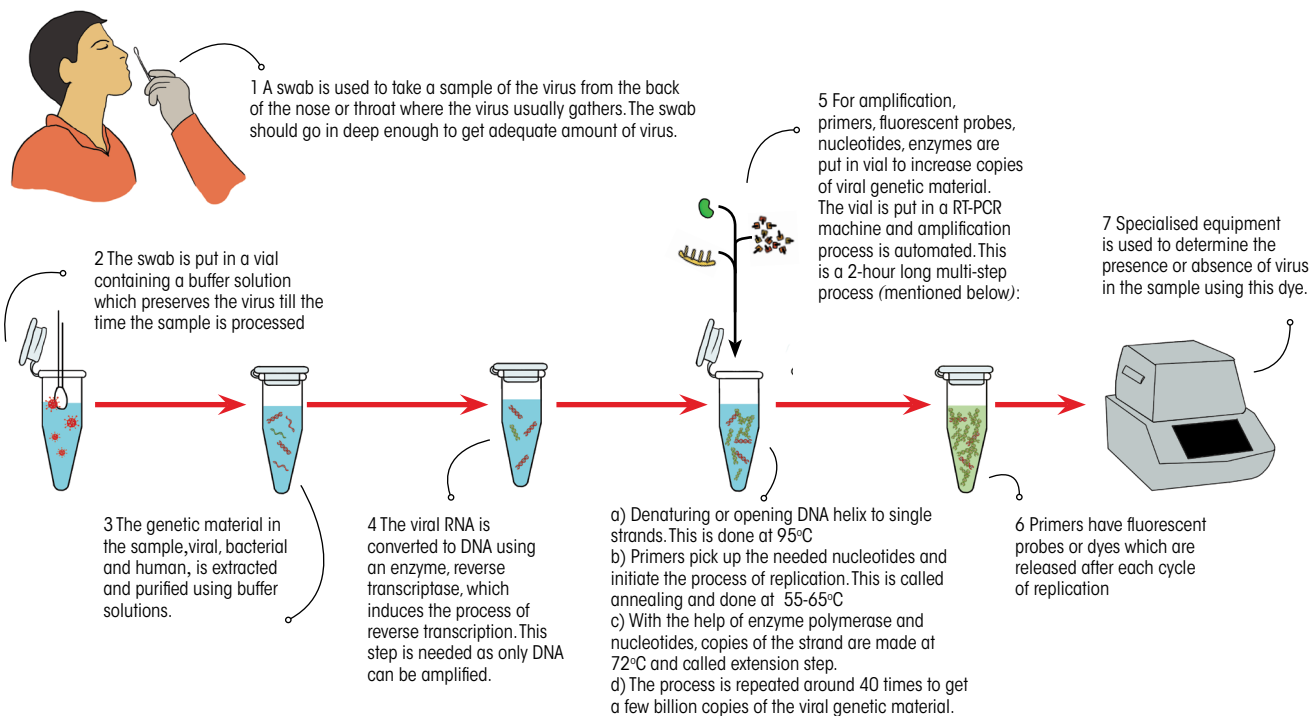
This test, considered the gold standard for COVID-19 diagnosis, depends on a robust supply chain for each and every ingredient. That's its major drawback

Between February and April, as active cases kept mounting, the world faced a shortage of COVID-19 RT-PCR testing kit components, right from swabs and buffer to enzymes. In the US, Colorado received 7 per cent of the swabs it had requested from the federal government till April 24. California received 90,000 of the 350,000 swabs it had asked for. To maximise the available swabs, CDC revised its guidelines on March 9 and asked technicians to collect one specimen swab instead of two.

A major problem with RT-PCR tests is that it depends on proprietary ingredients, protected by a registered trade name. These cannot be quickly developed by other manufacturers to meet the shortfall. Although other versions of the ingredients might work, it's not easy to simply switch to a different type as even tiny changes

NOT SO EASY HUNT

RT-PCR technique is a gold standard test for infectious diseases. It is in high demand for diagnosis of COVID-19



can make the test fail. False results can be disastrous in this fight against COVID-19. In March-end, the Netherlands faced shortage in reagents. It asked Roche, which supplies to most Dutch labs, to share the recipe for its buffer solution. Under pressure from the European Commission, Roche agreed but shared a generic recipe available in text books. That month US also saw short supply of extraction reagent developed by Dutch company Qiagen.

“We will never have enough testing as reliance is on proprietary reagents. There needs to be more sources of PCR reagent, including from domestic producers,” says Leena Menghaney, lawyer with humanitarian group Médecins Sans Frontières.

To overcome the shortage, researchers have come up with alternatives. One US-based Formlabs is working on 3D printing with pliable resin, which can replace the nylon swabs. Others are working on testing methodologies that simply would not require swabs. To reduce the dependence on buffer solution, dry swabs are

also being developed. Some have found that a saline solution or standard buffer solution work equally well as the specialised ones. But these need to be validated by regulatory agencies before they are put to use. Any glitch can further reduce the reliability of RT-PCR, already fraught with accuracy issues. An analysis of the available RT-PCR kits for COVID-19 shows some have sensitivity of just 90 per cent and specificity of 96 per cent. In real world conditions, this could be just 66 to 80 per cent, which means one in every three would be falsely tested as negative.

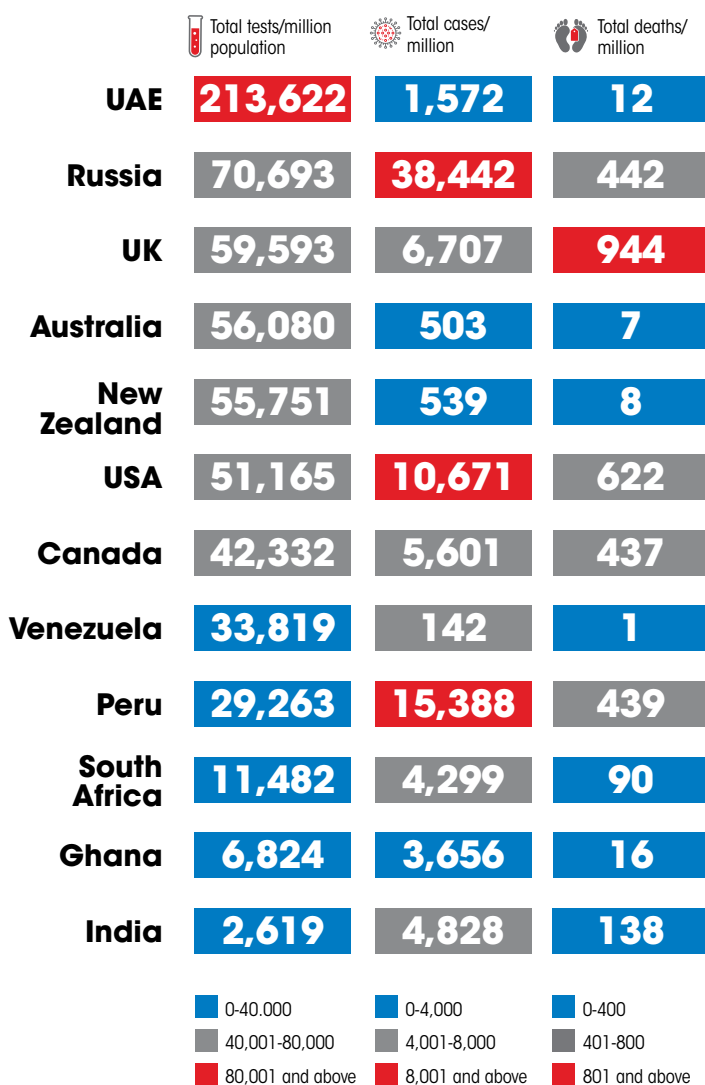
Pitfalls mar antibody test too

It is portable, faster and cost-effective. But it isn't a diagnostic tool and can, at best, be used for research

The reason for this is simple. Our body develops antibodies only after a week or 10 days of being infected by a pathogen. Since rapid antibody test works by sensing these antibodies, it often fails to diagnose active cases. In a [study posted on preprint server](#)

Fighting blindfolded?

As countries focus on widespread testing, there seems to be little correlation between tests, disease burden and prevention of deaths



Source: <https://www.worldometers.info/coronavirus/>
Data as on May 30, 2020

Methodology: *Down To Earth* selected from each continent two countries conducting maximum number of tests and compared their test rates (tests per million population) with the rates of cases (per million) and deaths (per million) in those countries. The countries have been ranked using a simple scale created on the basis of the rate values. For example, the US carried out low number of tests but had high number of cases and moderate number of deaths

[medRxiv on April 20](#), researchers from the Oxford University, analysed nine COVID-19 rapid tests used in UK. Their specificity was good, between 85 and 100 per cent, but sensitivity was low, between 55 and 85 per cent. Due to low sensitivity, a positive result would indicate that the person was infected and has antibodies against the virus. But in case of a negative result, it is difficult to rule out if the person is infected. Thus, the researchers say, these tests are good for population-level surveys, but inadequate for patient applications.

The unreliability of antibody tests have been long known. In the case of influenza, its sensitivity is as low as 70 to 75 per cent, and thus false negative results are a major concern. Tests for dengue have variable performance, depending on the developer, serotype, medical history and duration of sickness. Even pregnancy kits that have been in use since 1976 and are generally considered reliable, have not been validated for reliability.

So when the World Health Organization (WHO) asked countries to “test, test, test”, it talked only about RT-PCR. But a dipstick analysis shows that there is little correlation between widespread use of these tests, disease prevalence and prevention of deaths (see ‘Fighting blindfolded?’).

Down To Earth selected from each continent two countries conducting maximum number of tests and compared their test rates with their rates of cases and deaths. Let's consider UK, Australia, New Zealand and US whose testing rates are almost same—they are conducting 50,000 to 60,000 tests per million population. As on May 30, fatality rates in Australia and New Zealand were just seven and eight per million, whereas the figures were a massive 944 for the UK and 622 for the US. While the Oceania countries have managed to keep their rates of infection at around 500, it has crossed 10,000 in US and reached 6,707 in UK.

This shows there are other factors that play a critical role in winning the battle than just widespread testing.

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BATTLE-READY

From sophisticated techniques to easy-to-use strips, the world has deployed all kinds of tools to fight COVID-19

RT-PCR

MEDICAL PROFESSIONALS vouch for the accuracy of Reverse Transcription Polymerase Chain Reaction when it comes to diagnosis of infectious diseases. The test is based on PCR technique, which replicates genetic material of the pathogen and helps identify it. But PCR is customised to replicating DNA and for pathogens where the genetic material is RNA, as is the case of SARS-CoV-2, an additional step of converting the RNA into DNA is added. This step is Reverse Transcription. After a sample of mucous is collected from the nasopharynx using a swab, it is kept in a buffer solution which also helps in extraction of the virus. Then, using RT-PCR, its genetic material is replicated many times over—usually 40 times. During the replication process, primers (which are specific to the viral genetic material), enzymes, nucleotides and fluorescent probes are added. The fluorescent probes offers a visual signal as soon as a strand is successfully copied. The test is thus also called as real-time RT-PCR (rRT-PCR or qRT-PCR, where q stands for quantitative).

- Looks for viral genes
- Takes 6 hrs
- Conducted in labs with high biosafety levels, BSL-2



Automated RT-PCR

RT-PCR test can also be automated. India has so far allowed two such tests which run on proprietary machines: TrueNat, by Molbio Diagnostics of India, and Xpert® Xpress, by Cepheid of USA. Both were originally used to test for TB.

TrueNat was approved for COVID-19 by ICMR on April 4. Its battery-operated kits are the size of a telephone and can be taken out into the field to test as many as 15 individuals a day. ICMR allowed the use of **Xpert® Xpress** on April 19 under emergency use authorisation. The test is fully automated and provides the results in 45 minutes. Four tests can be performed simultaneously. Both tests require positive results to be confirmed by RT-PCR.

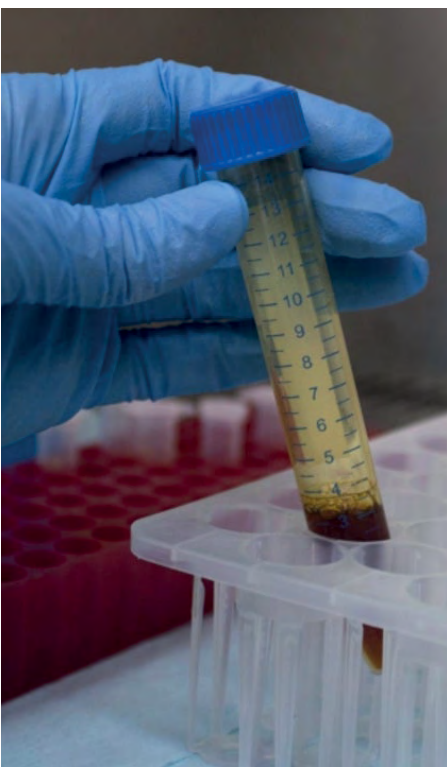
- Looks for viral genes
- Takes 35-50 minutes
- Conducted in BSL-2 labs, portable
- Positive results have to be confirmed by RT-PCR

Antibody tests

THESE CAN be manual or automated immunoassays. They identify the IgM and IgG antibodies developed against the SARS-CoV-2. For the test, whole blood, serum and plasma can be used and if antibodies are present in the sample, these bind to the antigen immobilised on the test strip and give a coloured reaction. Such test kits are easy to use, provides quick results and are also effective in identifying asymptomatic patients. There is a risk of getting false positives and results need to be confirmed using a more advanced test. In case of **ELISA**, (enzyme-linked immunosorbent assay) antibody test, as many as 90 tests can be run simultaneously. The results are more reliable than strip tests and can also provide quantitative data. The test provides results in around 2.5 hours.

- Looks for antibodies
- Takes 20 minutes to 2.5 hrs
- To be conducted under doctor's supervision
- Useful only for experimental or surveillance purposes





Antigen rapid tests

ANTIGEN IS a foreign substance produced by a pathogen, which induces an immune response in the body, especially the production of antibodies. The technique thus detects the presence of antigen or viral RNA in the sample. The test is being developed by E25Bio, a Massachusetts-based biotech startup. The test relies on a patient's nasopharyngeal swab. It resembles an over-the-counter pregnancy test and provides visual results within 15 minutes by detecting the presence of the virus in the sample. The company is in the process of obtaining clearance under USFDA's emergency use authorisation model. Another company, OraSure Technologies Inc, has also received funds to develop a kit based on this technique.

- Looks for viral genes
- In development stage

CRISPR

THIS TEST identifies the virus using the CRISPR genome editor, which uses tags that carry enzymes to the target DNA and cut it. For identifying the virus, a special tag has been developed whose enzyme, instead of cutting the gene, gives off a signal that it has reached the target. A diagnostic kit based on CRISPR received emergency use authorisation by USFDA on May 7. Sherlock™ CRISPR SARS-CoV-2 kit is based on the specific high sensitivity enzymatic reporter unlocking technique. The genetic material is extracted from the patients' sample, amplified and incubated and detected with Cas13 enzyme. A commercially available paper dipstick is then used to confirm the presence of the virus with the naked eye. A similar kit, DETECTR™, is being developed by Mammoth Biosciences and UC San Francisco.

-
- Looks for viral genes
 - Takes 30 minutes
 - As accurate as RT-PCR



Dogs

This experiment involves training dogs to sniff out people suffering from COVID-19. The three-month trials would be led by the London School of Hygiene & Tropical Medicine and are backed with £500,000 of government funding. The UK hopes these dogs would be part of the country's strategy to test people. Each dog is expected to screen as many as 250 people every hour. The dogs would include breeds like labradors and cocker spaniels. Dogs are already used to detect a host of diseases such as cancers and malaria. The dogs use specific odour that a sick person gives out. Samples of breath and body odour can come from a number of sources like used face masks.

-
- Looks for odour
 - Under trial
 - Can test 250 people per hour

TO TEST OR NOT

As India begins to relax lockdown rules, there is a growing demand for tests on a mass scale. But it might not help

WITH DENSELY packed cities, widespread malnutrition and a rickety health infrastructure, India has little margin for error when it comes to handling the COVID-19 pandemic. But so far, the two things that have helped the country from a tsunami of cases are its past experience and staying nimble, says the Indian Council of Medical Research (ICMR). "We learned from the 2009 Swine flu epidemic," it says in a recently released *Intelligent Testing Strategy*. Then only two institutes—the National Institute of Virology and the National Centre for Disease Control—had the capacity to perform molecular tests essential for pathogen diagnosis. But now, there is a network of virus research and diagnostic laboratories (VRDL), 13 of which were roped in for testing in cities with international airports even before the country reported its first cases.

Imposing nationwide lockdown, dubbed the biggest and stringent, is also part of this testing strategy, ICMR says. This provided time to create adequate facilities to trace, track, test, quarantine and treat before the disease spread uncontrollably. As on May 28, at least 641 public and private laboratories and those in research and development institutions, universities and public and private medical colleges have been roped in to ensure that the load of testing does not overwhelm the system at any time. At places where these could not be provided, a system to transport samples to the nearest testing facility has been set up or automated machines like TrueNat have been provided, says the document.

The government has also been revising

its testing guidelines to iron out glitches as the pandemic spreads and throws new challenges (see 'Staying nimble...'). Today, India has the capacity to test around 0.14 million samples a day, which the government plans to ramp up to 0.2 million. At least 35 developers, including 20 domestic ones, are providing RT-PCR kits. While antibody tests are not part of the guidelines, they too are being employed in the country and supplied by 15 developers, including 10 domestic ones. Using rapid test kits, on May 12, ICMR initiated a community-based serological survey to estimate the prevalence of COVID-19 in the population. It is also carrying out a hospital-based surveillance to monitor the trend of infection in all districts.

In the absence of treatment, these tests would not be of any help to patients, but the data helps understand the progress of the pandemic. For instance, online database ourworldindata.org that provides information on the number of tests a country conducts to find one COVID-19 case, says most countries see a fall in the ratio as their outbreaks grow. Once the number-of-tests-to-positive-case ratio starts rising again, it suggests that country has controlled the pandemic. As per the database, as on March 13, India was conducting 86.667 tests to find one case, meaning fewer people were infected. This number has gradually been going down and on May 26, it was as low as 21.503, suggesting that India is heading towards the peak of the epidemic.

In India, the level of testing is low. On May 26, it performed 0.075 tests per 1,000 population, which is way lower than the 1.167 tests by the US per 1,000

**THE
PREVALENCE
OF CASES DOES
NOT INCREASE
WITH THE
INCREASE IN
THE NUMBER OF
TESTS, OF
COURSE
BARRING HOT
SPOTS IN CITIES
AND IN SOME
DISTRICTS THAT
REPORT HIGH
INFECTION**



population. Public health experts, however say widespread testing might not provide much insight into COVID-19 prevalence or help contain it. Russia for instance, performed 11,603.5 tests to find one positive case on March 5 and then 12,841.5 tests for one on the very next day. However, this high level of testing did not help the country, which is now the third worst-hit by the pandemic. On May 26, it reported one new case per every 25.919 tests performed.

K R Antony, Kochi-based public health consultant and former director of the State Health Resource Centre, Chhattisgarh, says, "In India a seven-fold increase in testing after March 27 at the national level did not have a corresponding increase in positive cases. Of the total test samples, positive cases continued to hover around 3.9 per cent. This suggests the prevalence of

^
States like Bihar and Odisha have deployed thermal screening and RT-PCR tests to detect infections among returning migrant workers

STAYING NIMBLE IS KEY

India has been changing its testing guidelines as pandemic spreads and throws new challenges

FIRST GUIDELINE MARCH 17

Fourteen-day home-quarantine for asymptomatic people after international travel; test if they develop symptoms like fever, cough and difficulty in breathing; isolate them and treat as per protocol if test result is positive.

Home-quarantine all contacts of lab-confirmed positive cases; test if they become symptomatic; isolate and treat if they are positive.

Test healthcare workers managing respiratory distress or Severe Acute Respiratory Illness (SARI) if they show symptoms.

ADDITIONS MARCH 20

Test all hospitalised patients with Severe Acute Respiratory Illness.

Test all direct contacts of confirmed cases within 5-14 days of contact

ADDITIONS APRIL 9

Test within 5-14 days all those who came in contact with a confirmed case at hotspots and clusters and in large migration gatherings and evacuees centres.

All those showing influenza-like illnesses like fever, cough, sore throat, runny nose should be tested within 7 days of illness with RT-PCR. After 7 days, they should be provided with an antibody test. Negative result to be confirmed with RT-PCR.

ADDITIONS MAY 18

Test hospitalised patients who develop symptoms with influenza-like illnesses.

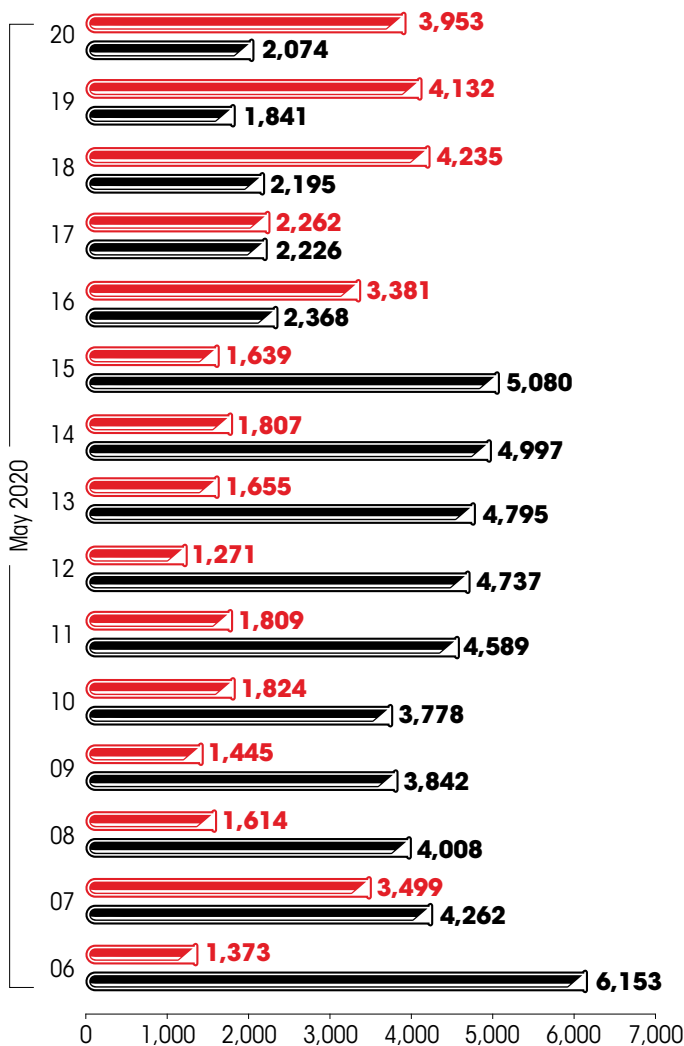
Test returnees and migrants with influenza-like illnesses within 7 days.

No emergency procedure (including deliveries) be delayed for lack of test. However, samples can be sent for testing.

Backlog burden

An analysis of COVID-19 diagnosis in Delhi shows on most days in May pending tests exceeded the samples tested

00 Samples tested **00** Samples pending



Source: [Department of Health and Family Welfare, Government of National Capital Territory of Delhi](#)

cases does not increase with the increase in the number of tests, of course barring hot spots in cities and districts that report high infection. In fact, the more we widen the net of sample collection to the general population the lower will be the positivity rate," he says. This is particularly true for India where almost half of the districts are not affected by the pandemic.

"Due to the complexity of the disease

in terms of high proportion of asymptomatic cases and the uncertainty surrounding the testing and its validity, sole dependence on testing and seeing it as a magic bullet to the problem of COVID-19 is incorrect," says Mathew George, professor at the Centre for Public Health, Tata Institute of Social Sciences, Mumbai. The age of the patient, comorbidities, whether symptomatic or asymptomatic, occupation, staying single or with a family of elders—all these factors decide the course of action more than the test results, he adds.

Gaps in the pandemic control system can also lead to spread of the disease. Consider the national capital Delhi, which has 32 labs—15 are government-run and 17 privately owned. Following a Delhi high court order on May 4, Delhi has been putting all data related to daily tests, positive cases and pending cases in the public domain. A quick analysis of these data shows massive backlogs. There are days when the backlogs match the number of tests done that day (see 'Backlog burden'). Other than infrastructure, shortage of technicians is a reason for such backlogs. "This is because no earlier planning was done for such type of viral pandemic in India," say A R Deshmukh and S N Bhattacharjee, of Delhi-based All India Medical Laboratory Technologist Association.

Besides, the cost of performing the test for a large majority of people who have not been exposed to the coronavirus could be prohibitive in a country, whose per capita expenditure on public health in 2018 was ₹1,657—way less than RT-PCR test which costs ₹4,500. Understandably, the government is trying to reduce the testing burden. On April 13, in areas with low prevalence of COVID-19, ICMR said pooled samples (genetic material from five patients) could be tested using RT-PCR. In this, all patients need to be tested only if the pooled sample tests positive. However, the desperation of several other countries is not limited to cost-cutting.

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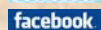
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ULTIMATE CURE?

The idea that those who have had COVID-19 will, indeed, be immune to the virus is fraught with scientific, ethical and legal issues



IMMUNITY OFFERS hope and reassurance. So, governments worldwide are desperate to identify those who have recovered and developed antibodies against SARS-COV-2. Some say this could serve as the basis for an “immunity passport” that would enable individuals to travel or to return to work assuming that they are protected against reinfection. Chile is poised to become the first country to provide such certificates to recovered COVID-19 patients, which will be valid for three months.

In March, Germany tested its populat-

^
Doctor extracts mucous sample using a swab at a newly installed Walk-In Sample Kiosk in a government-run hospital in Chennai. India faces an acute shortage of testing kits for diagnosing COVID-19

ion for immunity against COVID-19 using the rapid test kit. In Gangelt municipality, 14 per cent of the 500 people tested were found to have antibodies against SARS-cov-2. Swab tests showed 2 per cent were sick. Based on the findings, Germany planned to conduct serological tests across the country to issue immunity certificates so that people could resume work. But on May 5, it decided not to go ahead unless the study is cleared by its ethics council.

Alexandra L Phelan, professor at the microbiology and immunology department and an adjunct professor of law at the

PHOTO: REUTERS

Georgetown University Law Center, the US, [wrote in *The Lancet* on May 4](#) that the potential discriminatory consequences of immunity passports might not be expressly addressed by existing legal regimes, because immunity from disease (or lack thereof) as a health status is a novel concept for legal protections. In their column in *New York Times*, Kenneth Roth, executive director of Human Rights Watch, and Annie Sparrow, a critical-care pediatrician and assistant professor of population health science and policy at the Icahn School of Medicine at Mount Sinai, USA, wrote that employers might insist on antibody certificates simply to minimise absenteeism or medical costs among their workers; employees might find it easier to work with colleagues who have antibody certificates rather than to continue with face masks and social distancing.

But in this fight some are willing to make sacrifices. These are the countries that hope to achieve “herd immunity” naturally. The debate around their quest is so intense that “herd immunity” along with 30-odd other words and phrases related to the pandemic has made its way into *Oxford Dictionaries* (online version) in recent weeks. The dictionary defines herd immunity as “protection from a disease that happens if a large percentage of the population is immune to it.” Proponents believe once adequate immunity develops in a population, the spread of COVID-19 would stop. Vaccines are usually used to create such herd immunity against infectious diseases like measles, mumps, polio and chickenpox.

But can we actually bank on our own immunity system to tide over the pandemic? If yes, to what extent?

Researchers are racing against time to find the answers. An [analysis by the Center for Infectious Disease Research and Policy, US](#), made public on April 30, says COVID-19 is not likely to be halted until 60 to 70 per cent of the population is immune. However, studies on isolated populations shows no city has so far

WHO'S IMMUNE
60-70%
of population
must develop
immunity against
COVID-19 to halt
the pandemic.

SO FAR
no city has
achieved this
magical state.

New York city, US

19.9%

London, UK

14.8%

Madrid, Spain

11.3%

Boston, US

9.9%

Stockholm,
Sweden

7.3%

Barcelona, Spain

7.1%

Santa Clara, US

4%

Los Angeles, US

2.8-5.6%

Note: Figures for Santa Clara, Los Angeles for April; rest for May; Sources: Government reports; *study by Stanford University, US, researchers published on MedRxiv on April 30; **press release by University of Southern California, April 20

managed to achieve this magical state.

In Spain, the fourth worst-hit nation in the pandemic, the government launched a rapid serology test on April 27 to gauge the exposure of people to SARS-CoV-2. It found only 11.3 per cent and 7.1 per cent people have developed antibodies against COVID-19 in Madrid and Barcelona, which have paid the highest price in fatalities.

In the last week of April, New York city, the epicentre of the pandemic in the US, also launched an antibody study by testing 15,000 people at grocery stores and community centers across the state. Its findings show 12.3 per cent people now have COVID-19 antibodies. A similar study by the city government of Boston, in Massachusetts state of the US, finds 9.9 per cent people have antibodies against COVID-19. In UK, the COVID-19 Surveillance Report shows that 14.8 per cent people in London had antibodies against COVID-19.

Sweden, which has not imposed lockdown, is hopeful that herd immunity would see it through the pandemic. When COVID-19 broke out there towards the end of February, the government issued guidelines banning gatherings of over 50 people. Restaurants, schools and parks remained open. It estimated that in Stockholm 60 per cent people would develop antibodies against the virus by May-June. But its Public Health Agency says only 7.3 per cent people have developed antibodies by the end of April. Speaking to local media, Anders Tegnell, the country's chief epidemiologist and brain behind the strategy, has said, "Either the calculations made by the agency and myself are quite wrong...or more people have been infected than developed antibodies."

Naturally developed immunity following a sickness is dicey. Even if adults develop immunity against the disease—a study posted on *medRxiv* on March 30 says older patients develop more antibodies against COVID-19 than the younger ones—it can circulate among children and infect those with weakened immune systems. Besides, there is no evidence to show how

long the immunity would protect from COVID-19. Other viruses like the flu mutate over time. So antibodies from a previous infection provide protection for less than a year. In case of COVID-19, many patients who tested negative after treatment are testing positive again. As per one theory, these people getting reinfected might have developed low immunity during the first round of infection. But there is no conclusive evidence on this. When researchers from China tried to reinfect the rhesus monkeys recovered from COVID-19 infection, they did not succeed. The monkeys developed immunity against the disease, says [a study published on preprint server bioRxiv on March 13](#). However, researchers at Fudan University, Shanghai, who studied blood samples from COVID-19 patients released after treatment, found nearly a third had low levels of antibodies. In some patients, antibodies could not be detected.

A [review by the Norwegian Institute of Public Health](#) has also found limited evidence on immunity after infection with SARS-CoV-2. “Two studies showed sustainable immunoglobulin G (IgG is an antibody) levels one to two years after SARS-CoV infection, but it is uncertain whether this finding can be generalised to SARS-CoV-2,” notes the document published in April.

A [paper published in Immunity on May 3](#), however, sheds some light on how antibodies behave in people who had recovered from COVID-19. It compared the immune responses of 14 patients—eight recently discharged with six follow-up patients. When compared with healthy controls, all recovered patients had higher levels of antibodies against COVID-19. But when compared among themselves, newly discharged patients had more antibodies than follow-up patients. But for how long would this immunity last? Will they get reinfected if exposed to high quantities of virus or their physical state weaken? Scientists do not have answers to these probing questions so far.

It seems we have to live with the virus for some time even after a vaccine is ready.

BESIDES, THERE IS NO EVIDENCE TO SHOW HOW LONG THE IMMUNITY WOULD PROTECT FROM COVID-19. OTHER VIRUSES LIKE THE FLU MUTATE OVER TIME. SO ANTIBODIES FROM A PREVIOUS INFECTION PROVIDE PROTECTION FOR LESS THAN A YEAR

Vaccines do not provide 100 per cent immunity. Flu vaccine, for one, is 59 per cent effective in adults and 27 per cent in keeping a person out of a hospital. A 2012 review says BCG vaccine, primarily used against tuberculosis, was 60 per cent effective in the first five years after inoculation. The effectiveness decreased to 56 per cent between five and 10 years and to 46 per cent for up to 15 years. But vaccines against diphtheria are effective.

The COVID-19 vaccine has been put on a fast track and there are chances that it might not be tested very robustly. This can pose a serious risk. In an interview with US-based natural health activist Joseph Mercola, Robert Kennedy Jr, an environmental lawyer and anti-vaxxer, narrates the problems with vaccines against coronavirus. He says they trigger the production of two kinds of antibodies. While neutralising antibodies help fight the disease, the binding ones make the body more vulnerable. In 2012, four vaccines were tested on ferrets who showed good antibody response. But when they were exposed to the wild virus, they died. This again happened in 2014 when dengue vaccine DENVAX was administered on children in the Philippines. When they got infected with dengue, 600 of them died.

However, some communities may have an advantage over others when it comes to immunity. This natural defence mechanism of the body trains itself and evolves as people get constantly exposed to pathogens. Being challenged daily with diseases like tuberculosis, malaria, dengue and chikungunya, Indians are more immune to infections compared to several other nationals. There is also evidence that Indians have evolved to gain more genes that protect them against viral infections.

“These genes enable natural killer (NK) cells, a type of white blood cells in our body that provide a first line of defense against viral infections,” says Rajalingam Raja, director of Immunogenetics and Transplantation Laboratory at the University of California in San Francisco,



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US. Two families of genes, KIR genes and HLA genes, play a part in this protective function. Indians have more KIR genes than the Chinese and caucasians, says Raja in [an article in *Genes and Immunity* in 2008](#). He says Indians have also evolved to gain unique genes that regulate T and B cells, which produce specific and long-standing immunity to infection and could make Indians more immune to SARS-COV-2. However, the authorities cannot take a decision on easing the lockdown based on this special immunity of citizens. As Raja says, the number and type of genes are highly variable between individuals. "We do not know which gene is protecting from the SARS-COV-2 infection."

So, how to live with it?

COVID-19 remains a big unknown.

The only evidence we have is it is highly infectious and has a fatality rate 10 times higher than that of flu


But we still do not know of all its symptoms and have little understanding about its long-term health impacts. So most researchers are in favour of taking precautions. "We should maintain the current levels of infection or even reduce the levels until a vaccine becomes available. This will take some level of continued physical distancing for an extended period, likely a year or longer, before a highly effective vaccine can be developed, tested and mass produced," says Gypsyamber D'Souza, epidemiologist with the Johns Hopkins Bloomberg School of Public Health, US. But waiting for this vaccine might not make much sense for countries like India, which have pathetic vaccine coverage—as per the National Family Health Survey of 2015-2016, the percentage of fully immunised children ranged from 91.3 per cent in Puducherry to 35.7 per cent in Nagaland.

As of now, the virus seems unstoppable, stirring second wave in countries like South Korea that had contained it the first time. The way to go ahead would be to have a mix of testing, physical distancing, imposing quarantines and lockdowns, and

**BEING
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NATIONALS.
THERE IS ALSO
EVIDENCE THAT
INDIANS HAVE
EVOLVED TO
GAIN MORE
GENES THAT
PROTECT THEM
AGAINST VIRAL
INFECTIONS**

ensuring sanitation and healthcare, but all implemented at the correct time and as per the need. Analyst Joe Hasell at [ourworldindata.org](#) compares testing strategies followed by South Korea, Italy, UK and US. All these reported their first cases in January. While South Korea tested early, monitored the outbreak and managed to curb it, Italy, UK and US focussed on testing quite late, resulting in runaway cases. New Zealand too followed the "go hard, go early" approach despite inadequate infrastructure to contain the pandemic. Its prime minister Jacinda Ardern now claims that the country is on track to eliminate the virus. Australia, which ranks among countries that have successfully fought against COVID-19 despite moderate restriction measures, allowed local governments to impose lockdowns while ramping up health infrastructure.

To help people return to normality while keeping the virus under control, the focus is now more on localised and targeted measures. On May 28, the UK has launched the Test and Trace service, with 25,000 contact tracing staff and the capacity to trace the 100,000 contacts per day. Its idea is to ensure that the R0 number remains lower than 1 such that one infected person does not infect more than one person. While the infected person would be tested, an intensified effort would be on to trace down their contacts who would then be asked to self-isolate for 14 days. This would reduce the need to quarantine and lockdown large areas. Scotland and Northern Ireland too have introduced similar systems of test, trace and break the chain strategy.

To deal with the pandemic, the world needs to urgently innovate and change the way it deals with diseases. While the health infrastructure needs to be made robust, not only in one country but across the world, health care requires more than just tests and ventilators. It requires identifying what strategy works where and when as the battle is not going to be over anytime soon.  [@vibhavarshney](#)

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Questions that hang over remdesivir

A MERICAN DRUG giant Gilead, patron saint of the voluntary licence (VL), has handed out five licences to Indian and Pakistani pharma companies to manufacture its experimental anti-viral drug remdesivir. The drug, which was developed by Gilead to treat the Ebola virus but failed to do so, found a new lease of life when Chinese health authorities—scrambling to contain the deadly outbreak in Wuhan—found it effective in treating COVID-19 when used in combination with chloroquine. Since then, the drug has dominated the headlines as the most likely treatment for the disease, despite a clutch of trials failing to prove conclusively that it had a significant effect in containing the virus.

Since January, remdesivir has seldom been out of the news; every development—even if negative—only went on to push up Gilead's stock prices and hopes of a cure. The irony is that most of the news on clinical trials on the drug should have acted as a dampener. First was the publication of what was titled the “Compassionate use of remdesivir for patients with severe COVID-19”. The trial was conducted on just 53 patients by the company itself and was neither a randomised nor a controlled test, which is the standard to assess a drug's efficacy. It provoked a sharp reaction from pharmacologists and medical experts, one of whom described the data as “almost uninterpretable” and said it was unethical of the *New England Journal of Medicine* to have published it.

Then came the leaked results of a much-awaited clinical trial conducted in China. This showed remdesivir had failed to speed up the improvement of patients with COVID-19 or prevent them from dying. The data was

“inadvertently” posted on the the World Health Organization website and then pulled down. Although Gilead said it was an incomplete study, terminated prematurely, but claimed the trends indicated there was “potential benefit” for patients treated early with the drug.

It is against this backdrop that the US Food and Drug Administration (FDA) issued an emergency use authorisation for the drug on May 1, just two days after the National Institutes of Health's (NIH) clinical trial “showed promising results”. It was swift and surprising to say the least. With this official stamp of approval for a drug that the company was till recently describing as “an investigational product that has not been approved anywhere globally”, and cautioning

Indian drug firms have signed voluntary licences with Gilead, even though trials are yet to prove the drug is effective against COVID-19

that “the safety and efficacy of remdesivir for the treatment of COVID-19 is not yet known” Gilead is on a roll.

So are Indian generic companies selected for the

VLs. That's Cipla, Hetero Labs, Jubilant Lifesciences and Mylan—the fifth is Ferozsons Laboratories in Lahore—among them some of them old partners of Gilead. They have been given royalty-free VLs and also the technology to make this ‘difficult’ drug. Other terms of the VL are also more agreeable than in the past. The companies are free to set their own prices and can export to 120 countries, mostly in Africa and Asia. Meanwhile, US clinical analysts are cautiously optimistic. They say the NIH trial results seem promising, but want details. They have reminded FDA that it is important to look at the overall results from other trials of remdesivir and of other treatments as is the usual case. But these are not normal times. **DTE**

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Palette



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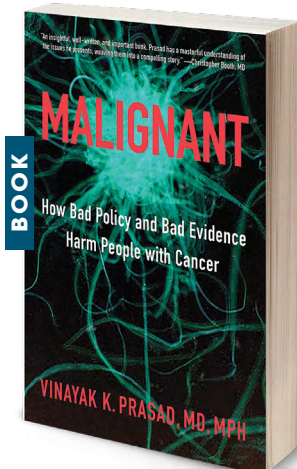


DOCUMENTARIES



It is touted to be India's first made-at-home documentary. *Lockdown: India Fights Coronavirus*, produced by National Geographic, captures the heroic efforts of medical personnel, police officers, government officials and journalists. It has been virtually directed and produced without a single member of the crew stepping out of their houses, and covers major cities like Delhi, Mumbai, Bengaluru and Chennai. This entailed footage shot by the protagonists themselves and remotely-conducted interviews via video-conferences.

Inside Italy's COVID War looks at the crisis through the eyes of an emergency room doctor, Francesca Mangiatordi, as she attends to her patients, her staff and her family. The visuals are stunning—patients' faces are covered by ventilators; the doctors by masks. Later in the film, the doctors themselves fall ill and are quarantined in their homes. "I want people to understand the emotional and psychological impacts the pandemic has had on healthcare workers and those severely affected," says director Sasha Joelle Achilli.



Hospitals across the world, including in India, are witnessing a steep drop in the number of non-urgent surgeries due to the COVID-19 scare. But another reason for this decline is revealed in a new insider study by oncologist Vinayak Prasad. The author exposes how financial conflicts of interest within the private healthcare sector "incentivize the pursuit of marginal or unproven therapies at lofty and unsustainable prices". Prasad says how doctors promote novel cancer therapies, even before credible data are available to support such treatment. He adds that doctors exaggerate potential benefits of new therapies that cost millions of rupees or dollars to unwitting patients.

The long walk home



AS INDIA WITNESSES ITS LARGEST MOVEMENT OF WORKERS, *DOWN TO EARTH'S* **VIVEK MISHRA** WALKS WITH THEM FOR OVER 500 KM, CHRONICLING THE CRISIS. THIS IS THE FIRST OF A TWO-PART REPORT

HORRIFIED WITH the stories of workers walking thousands of kilometres to their homes, it occurred to me that the best way to document their hardship was to join them and see it for myself. I started on May 16 without a destination in mind. A friend had told me that a large number of people were on the Delhi-Ghaziabad-Amroha road; so I decided to take that route. As I file this report on May 21, I am about 100 km from Bahraich, a district in eastern Uttar Pradesh, roughly 600 km from Delhi.

MAY 16: DELHI TO HAPUR

11 am: I left home in Mayur Vihar for the Anand Vihar Interstate Bus Terminus near Ghaziabad in the hope of finding people headed in the direction I had chosen. Close to the bus station, I saw a middle-aged worker and thought of striking up a conversation: “*Kya kaam karte hain* (What do you do)?” I asked.

He responded in a disinterested and irritated manner. “*Welder kaa kaam karte hain* (I am a welder).”

India has about 100 million migrants who have lost jobs due to the lockdown

Kahaan rahte hain (Where is home)?" I posed a second question.

"Farukhabad," he grumbled.

"To achaanak se chal diye (Why did you depart suddenly)?" I said.

"Arrey khaayenge kya? Na paise hain, na ration (What do I eat? I've no money, no food)," he snapped.

I reached Anand Vihar at around 12 noon, tried to cross over to Uttar Pradesh via the Ghaziabad border, which was sealed and where migrants were being herded around by the police, sometimes with the help of lathis, to nowhere. I met Vinod Kumar, who was headed towards Bahraich, with his 11-year-old brother-in-law. The child was carrying luggage that weighed more than him. Vinod, even more. We took several detours, walked through a *shamshan ghat* and along a *nahar*, to avoid the police to enter Uttar Pradesh via the Ghaziabad overbridge at around 6 pm. *"Ab kabhi waapas nahin lautunga* (I will not return)," Vinod remarked.

He had been in Delhi for 15 years, working at a sock factory that was now shut. "I have land. I will farm in my village," he said.

We moved ahead and saw about 70 migrants at a police checkpoint. The police stopped us too and put Vinod, along with the other migrants, on a bus to return to Delhi. All his day's walk gone waste. I too couldn't do anything. Being a reporter, I was allowed to leave. I continued moving with a group headed to Banda.

9 pm: After having walked about 30 km in the day, we reached Lal Kuan (see 'The route'). The group decided to spend the night there, but I along with three others took the highway, crossed Hapur and stopped at one Haryana Dhaba around 4 in the morning. I wanted to sleep but could not as I had to guard my mobile phone while



charging it. Still, I could rest for a couple of hours.

MAY 17: TO AMROHA

9 am: I left for Amroha district and must have walked about 10 km when I learnt that thousands of migrants can be seen near one Baba-Mama Yadav Dhaba in Hapur. I returned and found that the administration was arranging for buses to send them to Uttar Pradesh and Bihar. From there, I moved towards Brij Ghat, another location where I had heard migrants were stranded. I reached Brij Ghat at around 10 pm and found that the police had barricaded the route and the migrants were told they would be taken ahead in buses. But there was no arrangement for their stay. They were just asked to stay put on an open ground that had concrete surface. I stayed the night to talk to them and heard unbelievable stories of hardships. I saw a woman trying to arrange milk for her month-old baby; two men making the journey with their families in their cycle-rickshaws; and a group that had been duped of ₹17,000 by a driver.

MAY 18: SHAHJAHANPUR

2 pm: My interactions with the people at Brij Ghat the previous day had made the police suspicious. I was also asking officials to help out migrants. To get rid of me, the police made me take a bus to Shahjahanpur. On the bus, I met Brij Kishore and Jagdish, brothers travelling from Panipat with their families and relatives—a group of eight. Both worked as dailywage labourers. I asked if I could accompany them to their village. I wanted to see how the village was treating its migrants. They agreed.

8 pm: The bus dropped us at Sadar in Shahjahanpur where a cousin was waiting. Our group had two children who left for the village, Ratanpur Kunda, with the cousin on his motorcycle. We were told by officials at the bus station to collect the ration being provided by the government at the quarantine centre at Punaya, about 22 km from Sadar and about 5 km from our village. Completely drained out but without option, we walked to Punaya. The family received five kits of wheat, rice, pulses, potato, refined oil and spices, each kit weighing about 40 kg. Since they were too heavy to be carried, we arranged for an ambulance to drop them home, while we walked.

11:30 pm: Reached Ratanpur Kunda. There was no electricity. As Jagdish's wife unlocked the house, their relatives from adjacent houses came out. Over 40 members of the family live in the village. Among them was their uncle Ram Bharose, the eldest member, who said he was glad they had all made it back. There was no overt display of emotion. Noticing a stranger in their midst, one of the relatives addressed me: *"To aap aaj yahin rahenge* (You'll stay here tonight)." It did not sound like a question. **DTE**

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Burst of orange

THE LITTLE-KNOWN UTILITIES OF THE UBIQUITOUS GULMOHAR TREE

CHITRA BALASUBRAMANIAM



The most common way to consume Gulmohar flowers is to make it into a *pakora*

IF YOU want to see a burst of orange in all its glory, take a look at the beautiful Gulmohar tree. Come April, this leafless tree slowly starts to sprout fresh springs of green. Soon the young green leaves cover it, and then specks of flowers start appearing. In May, the tree is a riot of red and orange. It is a tree that

almost everyone in Delhi looks forward to. But it was admired from only far away. It is only recently a friend tipped me about how she had seen Gulmohar flowers being used for cooking on a TV show and how we had neglected it even when it grew so profusely in our backyards.

Further digging not only

PHOTOGRAPH: VIKAS CHOUDHARY / CSE

confirmed this, but it came to light that its tart-tasting flower has its faithful followers. I am told cows love to feed on its leaves and flowers. Scientifically called *Delonix regia*, it is known by several names such as Royal Poinciana, flame of the forest, flame of the tree, and in India, it known as Gol Mohr. It is also called Krishnachura or the crown of Lord Krishna.

The tree was discovered in Madagascar in the early 19th century and introduced to Singapore in 1840. In India, it is supposed to have been introduced in 1848 in Mumbai. It is one of the most prolific cultivated ornamental plants. The brilliant flowers have been a source of inspiration for writers; Delhi's Gulmohar Park is named after it.

MULTIPLE UTILITIES

It is a very adaptive tree which can grow almost anywhere. It needs plenty of sun to flower and grow. What is not well known is the fact that the entire tree has utilities. The wood is used as a fuel and has a high calorific value. It is used for

value, and decoctions are used to cure various ailments.

A charming tale as to how the tree got its flame orange flowers is that when Jesus was crucified, there was a small Royal Poinciana tree near his cross. His blood is said to have shed on the flowers of the trees and they got the deep red colour. This is the belief of Saint Thomas Christians of Kerala.

A shade-giving tree, it is hugely popular in cities. It is also used in tea plantations to prevent soil erosion. It grows easily and requires plenty of sunshine, and hence, comes handy to provide shade and hold soil. The dried seed pods of the Gulmohar tree are used to make a unique percussion instrument called *shak-shak* or *maraca*.

A study published in the *International Journal of Chem-Tech Research* in 2011, indicates that the flowers have a rich source of potentially useful natural antioxidants like polyphenol and flavonoids. Flowers of *Delonix regia* also contain carotenoids, tannins, saponins, steroids, alkaloids. It concludes saying,

GULMOHAR FLOWERS HAVE BEEN USED TO CURE BRONCHITIS, ASTHMA AND MALARIAL FEVER. WATER EXTRACTS OF FLOWERS ARE USED IN TRADITIONAL BEVERAGES IN AFRICAN COUNTRIES

wood working—making soft and small items like combs. The tree is a host for lac insects, which secrete a resinous pigment.

The seeds are used to extract Karanga oil, which has anti-bacterial and insecticide properties. The oil is used to make soaps and the oil cake is also used as a fertiliser. The seeds are strung as beads into ornaments too. The gum extract is used by the textile industry. The leaves are said to have medicinal

“These constituents play a pivotal role as an antioxidant and have organ protective properties.” The entire tree has medicinal properties, from the leaves, flowers, bark and to the seeds. A study published in the *Journal of Pharmacognosy and Phytochemistry* in 2016, says that the flowers have anti-diabetic, anti-bacterial, anti-diarrheal, anti-microbial and anti-inflammatory properties. The flowers are also used to make bee

RECIPE GULMOHAR PAKORA

INGREDIENTS

A handful of petals—separated from the flowers
3 tbsp: *besan* (gram flour)
A pinch of *hing* (asafoetida)
¼ spoon *ajwain* (bishop's weed)
Salt to taste
Red chilli powder as per option
Water to make a batter
¼ cup oil for deep frying


METHOD

Make a thin batter by mixing all the ingredients, except the petals. Dip the petals individually into the batter and deep fry them. It has a unique soft taste.

forage. In a paper published in the *International Journal of Pharmacy and Pharmaceutical Sciences* (Volume 7, Issue 8), the author gives references to many traditional cures using Gulmohar flowers. They speak of how the infusion of flowers was used to cure bronchitis, asthma and malarial fever. The Shaiji community in southwestern Bangladesh used the flowers to cure chronic fever. “The people of Yanadi (a tribal community in Andhra Pradesh, India) used the flowers to treat dysmenorrhoea. The water extracts of flowers are also used in traditional beverages in several African counties,” the author says, adding that the Gulmohar flowers can also be used to make sunscreen.

But how is it used in cooking? Given their taste, edible properties, they can be also used to make liqueurs, jams and floral teas. But one of the most common ways to consume them is by making them into *pakoras* (see recipe). **DTI**

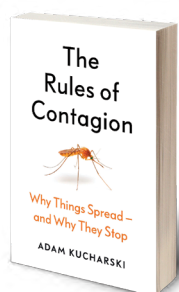
(The author is a freelance writer. Among other things, she writes on unusual food)

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The order of spread

THE RULES OF CONTAGION IS LESS ABOUT DISEASES AND MORE ABOUT THE UNDERLYING PRINCIPLES OF CONTAGION

ANSHIKA RAVI



The Rules of Contagion

By Adam Kucharski

Publisher: Wellcome Collection

Pages: 352;

Price: ₹1,837

THE PERPETRATOR of *The Rules of Contagion* is not the COVID virus the world cannot stop talking about.

Written by epidemiologist and mathematician Adam Kucharski's contagion transcends the realms of biology and deep-dives into social and behavioural norms and narrates how similar rules can be applied to the disparate worlds of finance and social media. The hero of the book is Ronald Ross, a British doctor, who discovered

that malaria is caused by mosquitoes. A journey that spanned over 50 years—during which he also won the Nobel Prize—Ross turned to mathematics to find the answer to a very pertinent question: how to control the spread of malaria without eliminating every mosquito.

Ross made some crucial discoveries that revolutionised how the world looked at contagion. For example, he found that even if there were 48,000 mosquitoes in



an area, on an average, they would lead to only one human infection. That is, the disease would fade out if the mosquito populations were reduced below a critical level. It would take many more years for the world to fully adopt mosquito control. “The world requires at least 10 years to understand a new idea, however important or simple it may be,” Kucharski quotes Ross.

His indignation was probably not uncalled for: He did not live to see all his ideas translate into practice. But more than a century later, we continue to borrow his methods—to study the spread of loneliness and obesity as much as infectious diseases. Ross’ mosquito discovery paved the way for another interesting question: what causes epidemics to end?

Biochemist Ogilvy Kermack and epidemiologist A G Mckendrick postulated the SIR model, according to which any population facing a disease outbreak comprised three types of people—susceptible, infectious and recovered. An epidemic sparks with a certain number of infectious people, and everyone else become susceptible to the infection. As infected people recover and become immune, the probability of the remaining susceptible people catching the infection shrinks.

From here arose the concept of “peak” and “herd immunity”. At the time of writing this review, several countries that recorded thousands of COVID-19 cases and deaths through March and April this year began to witness a downward spiral of the curve. Or “the worst was over”, as one may be inclined to think.

Kucharski says, “According to the SIR model, outbreaks need three things to take off: a

sufficiently infectious pathogen, plenty of interactions between different people and enough of people who are susceptible.” But can an epidemic end if the population is yet to experience a peak? Kucharski says this can also happen when the pathogen itself becomes less infectious as the epidemic progresses. Or when the population has acquired herd immunity making it possible to control the infection without vaccinating every person. Then there is ‘R’, or the reproductive ratio of a virus.

Scientists expanded on these findings to form the “Theory of Happenings”, comprising dependant and independent happenings. In real life, events involving a pathogen are dependant happenings—what happens to one person depends on how many others were affected.

THE 2008 FINANCIAL CRISIS WAS DUE TO A COMPLEX NETWORK OF HIGH-RISK PEOPLE LINKED TO LOW-RISK ONES, MAKING THE INFECTION SPREAD SLOWLY AT FIRST, AND THEN ALL AT ONCE

“Some happenings simmered over time, gradually affecting everyone. Others rose sharply, and then fell. Some caused large outbreaks that settled down to lower levels. Some came in steady waves, rising and falling with seasons, and outbreaks that recurred sporadically,” Kucharski says. Scientists could have gone further to answer questions as to how a disease outbreak is linked to demography and public health. But the study was limited to only three papers. Ross’ ideas did evolve, but over decades. It was even longer before scientists could make their way into other aspects our lives.


The rules of contagion are not

only limited to infectious diseases. “From innovations to infections to finance, contagion is often a social process,” Kucharski says. It is remarkable how he navigates through many worlds and theories that fit the mould. He explains the 2008 financial crisis through a complex network of high-risk people linked to low-risk ones. Known as disassortative network, this makes the infection spread slower at first, and then all at once.

This was precisely how the Lehman Brothers spread the financial contagion widely—through a mesh of exposures where no one had the faintest clue who owed what to whom. The multiple hidden routes in the giant network only fashioned more ways of transmission. It was a recipe for a colossal disaster.

Another interesting aspect of the book is the mathematical modelling of fake news—a tweet/Facebook post that makes an epidemic of purported deceit and lies; a phenomenon not uncommon; and, a phenomenon that a

pandemic feeds off. Kucharski weaves theories within theories about the many heterogenous worlds we see and experience today. He sets a lot of skewed, layman concepts straight. But the book is less about infectious diseases and more about the underlying principles of contagion, which the reader may, at some point, feel offers more than he/she bargained for in COVID-19 times. Yet, Kucharski’s insights inform us of the ways we can improve our understanding of disease transmission and social and financial networks. The world needs more of that for now. **DTE**

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Who will be more powerful?

AS WE reopen the economy, we are going to witness a bitter battle for supremacy between the worker and the employer classes. By lifting lockdown measures, India has sent out the message of the economy taking precedence over the health emergency. And it is inevitable for a dominantly informal market like us. Before the millions of jobless workers settle down in their villages with uncertainty, the debates outside revolve around that pertinent question: will they ever come back to cities for work? This question is raging because of the torturous homecoming of workers from business centres, feeling abandoned. Also, when the exodus was at its peak, state governments started diluting labour laws. The changes in such laws have watered-down the already-flimsy labour protection offered in the informal market. And the unspoken belief behind these changes was that workers didn't have any option to not work. This has revived the age-old polarisation between the worker and the employer classes.

Somehow, this polarisation never survived long in our polity—maybe due to its affiliation to Communist movements. But all along, the fault line remained—visible to a point of not erupting into a full-fledged class fighting, and also tolerable to a level that wouldn't beget a violent expression. COVID-19 has provided a never-before-situation of deliberately halting the economy completely. None of the two sides had any role in it. But each now realises the importance of the other. The power for supremacy now rests on who will blink first.

The mass exodus due to the lockdown has widened this fault line. First, for over a decade now employers of the informal sector have been vocal about rising wage rates, even scarcity of labour. Official data, however, doesn't support this argument. Second, their complain is mostly centered around the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) that guarantees 100 days of manual work at

government wage rate. Trade associations have demanded that their work too should be brought under this Act to tide over labour scarcity. The point of contention is informal job seekers found MGNREGA lucrative than to work in places far away from their villages. Cheaper foodgrain provided by states under the public distribution system has also led labourers to not opt for work that didn't offer higher wages than MGNREGA. This is because food expenditure—a major percentage of overall household budget—has been low due to government subsidy. The job guarantee scheme and the cheaper foodgrain entitlement provided workers a rare bargaining tool to negotiate with employers on wages. If they didn't offer better wages, they didn't get labour.

Now there is panic among businesses as we reopen the economy. If truth be told, it would take months—if not years—before they come back to cities to work. Here, they would be economically wrecked. This would mean they would be also forced to take up jobs at low wage rates. This is how the employers perceive

The bitter battle for supremacy between the worker and the employer-classes has begun

the situation. But, there is a catch. In villages, states are already planning to increase local livelihood options, again through schemes like MGNREGA. Similarly, there are already provisions for free, but temporary food and cash transfers. Even if all the returning workers don't get these facilities, they at least have the assured support of the government. In this situation, the working class will have a bargaining tool with their employers. The extended government support will further strengthen their negotiating power. On the other hand, the employers would have also got government support to facilitate faster return to normalcy. And for this, they need the working class, in big numbers, and quickly.

The battle has begun. If workers were stripped of their working rights, they now have an upper hand. But this is only if governments continue to help them with survival support. For both sides, it seems, governments are going to play a critical role. The question remains: which side will they tilt more? **DTF**

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