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[highest daily toll](#) since the pandemic began last year. Overall, nearly 190,000 people have died from COVID in the country, while more than 16.6 million have been infected.

The new outbreak in India is so severe that hospitals are running out of oxygen and beds, and many people who have been taken ill are being turned away.

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World's highest daily rise in COVID cases in India, record deaths

Disruption in oxygen supply kills 22 COVID patients in India

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New Zealand, Hong Kong, the UK and the US have either banned direct flights to and from India, or have advised citizens against travelling altogether; and the list may well get longer.

The UK's prime minister, Boris Johnson, who is keen to secure a post-Brexit trade deal with the country, has been forced to [cancel a planned trip to India](#) this coming week and, instead, plans to meet with President Narendra Modi virtually.

For a country where COVID numbers appeared to be dropping dramatically just a few weeks ago, what has gone so wrong in India?

The Indian variant, known as B.1.617, appears to be [wreaking havoc](#) in the country. Since April 15, India has been reporting more than 200,000 cases of coronavirus every day and its capital, Delhi, recently announced a week-long lockdown after a rise in cases there [overwhelmed the healthcare system](#).

“If we don't impose a lockdown now, we might face a bigger calamity,” Delhi Chief Minister Arvind Kejriwal said as he addressed the city on Indian television on April 19. Worryingly, bed spaces and [oxygen supplies in hospitals](#) appear to be stretched, with reports of sick patients being turned away from hospitals and social media feeds filled with distraught family members whose loved ones cannot access the healthcare they need.

On Wednesday this week, as the COVID toll was rising, Delhi's highest court took the

unusual step of publicly criticising the central government and its approach to managing the country's oxygen crisis. The court was hearing a petition filed by Max Hospitals seeking urgent help to tide over the oxygen shortage it was facing in six of its hospitals in the capital. "Human lives are not that important for the State it means. We are shocked and dismayed that government doesn't seem to be mindful to the extremely urgent need of medical oxygen," the Bench stated. "We direct Centre to provide safe passage...so that such supplies are not obstructed for any reason whatsoever," it said. "Hell will break loose [if oxygen is not supplied]." Damning words for the government in a time of crisis.

It is not entirely clear why this surge has happened in India, but it is likely to be because of crowded events organised in the run-up to elections – President Modi himself hit the campaign trail addressing election rallies in Kerala, Tamil Nadu and Puducherry on March 30 as the upturn of cases began. Large groups and social gatherings during religious festivals have also played a part, as well as the re-opening of public spaces and easing of lockdown measures which took place gradually throughout 2020 with the final "unlocking" of restrictions happening in December 2020.

There is also much concern about the emergence of new variants of the coronavirus in India. It is thought the dominant strain in the country now is the variant which was first identified in the UK, and which has shown to be up to 60 percent more transmissible between humans.

On March 25, it was further announced that a [new "double mutant" variant](#) had been detected in India, now known as the "Indian variant". This development is what has other countries spooked.

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The Indian authorities do not think this new variant has yet become the dominant COVID strain in the country, but it is likely to be contributing to the increasing numbers.

Genome sequencing of the new variant has shown that it has two important mutations:

1. The E484Q mutation: This is similar to the E484K mutation identified in the Brazil and South African variants, which have also been reported in recent months. The concern is that this mutation can change parts of the coronavirus spike protein. The spike protein forms part of the coronavirus outer layer and is what the virus uses to make contact with human cells. Once contact has been made, the coronavirus then uses the spike protein to bind to the human cells, enter them and infect them. The immune response that the vaccines stimulate creates antibodies that target the spike protein of the virus specifically. Therefore, the worry is that if a mutation changes the shape of the spike protein significantly, then the antibodies may not be able to recognise and neutralise the virus effectively, even in those who have been vaccinated. Scientists are examining whether this may also be the case for the E484Q mutation.

2. The L452R mutation: This has also been found in a variant thought to be responsible for outbreaks in California. This variant is thought to increase the spike protein's ability to bind to human host cells, thereby increasing its infectivity. A study of the mutation also suggests it may help the virus to evade the neutralising antibodies that both the vaccine and previous infection can produce, though this is still being examined.

This new wave in India has been devastating for the country. A coordinated response is needed between Indian states and central government to manage the supply of oxygen and essential drugs if the number of COVID-related deaths is to be brought under control. There is also a concern that we [do not know the true number of deaths](#) from COVID, as some people have died at home before they could get to hospital and many others in India, particularly in rural areas, have had difficulty accessing testing facilities.

Pressure urgently needs to be lifted off the healthcare system and the only way to do that is to ramp up the vaccination programme, strengthen social distancing

procedures and re-introduce lockdown measures.



[Illustration by Muaz Kory/Al Jazeera]

In the doctor's surgery: Teaching medical students during a pandemic

One of my passions as a doctor is being able to pass on my knowledge to the doctors of tomorrow. I have done it for years and am a senior lecturer at two UK universities.

A large part of the teaching I do involves getting my students to speak to and examine patients. This has been a challenge in the last 12 months as bringing patients into the surgery for them to see students has been too risky, and the patients that tended to have the illnesses the students needed to see were generally shielding to reduce the chances of them catching COVID-19.

Medical students have been lending a helping hand to COVID-ravaged hospitals all over the world, and their assistance has been welcomed by many. But we also need to prepare them for a world beyond COVID and, in the limited time we have with them, to ensure they are prepared for a wide range of medical conditions from the physical to the mental. But how can we do that if they were unable to see patients as normal?

Technology has been the answer. Our surgery, where I work as a family doctor in Bradford, northern England, is lucky enough to have a clinical skills lab that students can learn in. This is a room that has “model” body parts that the students can use for examination purposes.

Students can come into the surgery and, initially, hold telephone consultations with patients, speaking to real patients who ring in about their ailments. The students record a medical history by speaking to the patients and attempt to come up with a management plan which they then run past me or another doctor for approval.

Because the students cannot examine the patients physically, we then make a list of the examinations the students would have done and, once their clinic list is complete, move over to the clinical skills lab. I then ask them to practice the examination they would have done on the models. This might include a chest exam, a rectal or vaginal exam. The models can be adjusted so that each time the student uses them they will make a different examination finding, such as a new lump or abnormal breathing sounds. It really is quite clever.

Although it will never really replace the real thing, this method has allowed us to keep medical education going throughout the pandemic – something that has challenged medical schools the world over.



[Illustration by Muaz Kory/Al Jazeera]

And now, some good news: Exercising can reduce the risks of COVID

A new [study](#) by Glasgow Caledonian University in Scotland has shown that regular exercise can reduce the risk of getting infections like COVID-19 by up to 37 percent. The researchers conducted a full-scale systematic review of 16,698 worldwide epidemiological studies published between January 1980 and April 2020, with world-renowned immunologists and epidemiologists from University College London (UCL) in the UK and Ghent University (UGent) in Belgium, as well as exercise and sports scientists from Cádiz University in Spain and a public health consultant from NHS Lanarkshire (NHSL) in the UK.

They found that doing 30 minutes of exercise which gets you out of breath and a bit sweaty five times a week strengthens your immune response to infectious diseases. It is thought that regular exercise increases the number of immune cells in the body acting on the first line of defence – the mucosal layer of antibodies. These cells are responsible for identifying foreign agents or “germs” in the body without depressing the rest of the immune system, so it’s perfectly safe and protects you against infectious disease.

We have known for some time about the benefits exercise can have for a person's overall physical and mental health. Now, in the time of COVID, it has been shown to help boost your immune system too. So the message is clear; get outdoors and exercise if you can or to the gym if it is in keeping with your local COVID guidelines. If neither is possible, your kitchen or living room is a perfectly good place to do 30 minutes of dancing, jumping or whatever floats your boat!

Reader's question: Is it safe to go to my hospital appointment during a pandemic?

Over the past 12 months, people have repeatedly been told that the safest place for them is home and that hospitals are busy dealing with COVID-19 patients. While that is true, it is also important to remember that other illnesses have not gone away.

I have found that many of my patients are not attending their appointments for other conditions because they are worried about catching COVID or think their illness is not as important as coronavirus. Hospitals and GP surgeries all over the world have gone out of their way to make large parts of their buildings COVID-free. This means that they can be used for non-COVID-related services and staff working there will not be crossing over to cover COVID wards or clinics. So, if you receive an appointment to attend a clinic or hospital service, it is really important that you do go.

SOURCE: AL JAZEERA

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