

# COVID-19 BULLETIN

**15 SEPTEMBER 2020**

- #CSIRFightsCovid19
- Corona Research Snapshot
- Corona Innovations
- COVID-19 Dashboard
- Corona Q&A
- COVID-19 Myth Busters

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Council of Scientific & Industrial Research (CSIR)

Dr KS Krishnan Marg, New Delhi-110012

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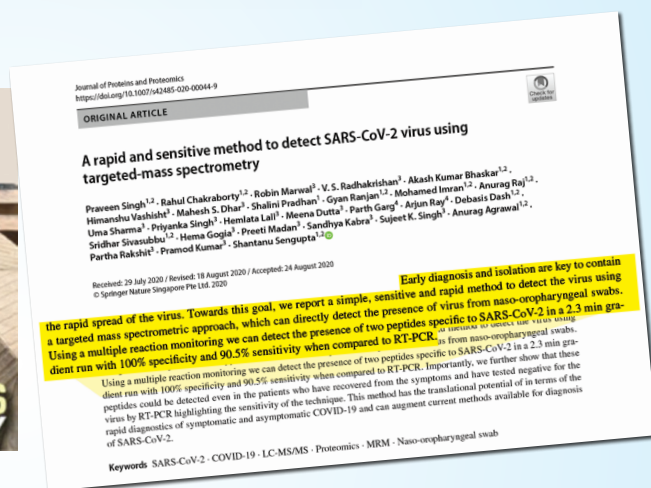
14 Satsang Vihar Marg, New Delhi-110067





# #CSIRFightsCovid19

*Ever since the Coronavirus pandemic broke out, CSIR has mounted a strategic, well-coordinated and integrated approach towards mitigating the Coronavirus outbreak ranging from containing the spread of the virus by providing sanitisation and disinfection solutions to equipping the frontline workers and health warriors with protective gear, and from exploring repurposing of existing drugs to discovering new drugs and vaccines. Here are some major developments this week.*



## ➡ Rapid & Safe Technology for COVID-detection Developed by CSIR-IGIB

CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB), New Delhi, has developed a rapid and sensitive method to detect individuals affected from SARS-CoV-2, the virus causing COVID-19, using Mass Spectrometer. This work was done along with NCDC (National Center for Disease Control), Delhi and IIT (Indraprastha Institute of Information Technology), Delhi.

“The test is rapid – from samples to results in 30 minutes,” says Dr Shantanu Sengupta, a senior scientist at the CSIR-IGIB. “The method is safe since the virus is immediately killed as the swab is collected in a vial containing detergent. It is also accurate since it involves direct detection of

the viral peptides, without the requirement of hybridization or amplification, thus reducing the potential of returning false-negative results. Most importantly, the cost of reagents used is very less. This can even off-set the high cost of the mass spectrometer, which can be potentially recovered in 3-4 months.”

There are immense possibilities of deployment of this technology in public/private diagnostic testing centres across the country. The rapid and safe technology can be employed for COVID-detection in airports as well.

The method was recently published in the *Journal of Proteins and Proteomics*, the official journal of Proteomics Society, India (<https://link.springer.com/article/10.1007/s42485-020-00044-9?s=04#auth-Hemlata-Lall>).

### ➔ CSIR-IIIM Novel COVID-19 Test Kit Awaits ICMR Approval



A novel COVID-19 test kit devised by CSIR-Indian Institute of Integrative Medicine (CSIR-IIIM), Jammu in partnership with the Reliance Industries is awaiting a nod from the ICMR.

### ➔ Sero Survey by CSIR-IGIB Finds Persistence of Antibodies for 60-80 Days

A serological survey conducted jointly by the CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) and Max Hospital over five months has revealed that antibodies in a person who has recovered from coronavirus infection persist for 60-80 days.

The study used 780 samples from hospital workers and individuals who visited the hospital during the pandemic for the serological testing. The study is a step towards better understanding of the infection recovery and re-infection pattern. It will help in understanding whether asymptomatic

The new Reverse Transcriptase-Loop Mediated Isothermal Amplification (RT-LAMP) assay-based COVID-19 diagnostic kit does not require sophisticated and expensive equipment like a real-time PCR machine, required for RT-PCR test kits. This makes it a cheaper and faster testing kit.

With the pace of infection still increasing with every passing day, large-scale diagnostic methods are required that can detect the virus in populations quickly, safely and at a low cost. Repeated testing of populations is also essential to devise long-term strategies to contain outbreaks.

or symptomatic seropositive individuals are protected for COVID-19 and if so for how long.

The study observed an increasing trend of seropositive cases amongst the hospital staff, over a period of four months, from April to July reflecting the increasing spread of the infection in these months. Among the healthcare workers the seroprevalence increased from April (2.3 per cent) to July (50.6 per cent). The cumulative seroprevalence observed in the study is 16.5 per cent (74/448). According to the study, the prevalence observed in the general population is 23.5 per cent (78/332).



**CSIR Researchers to Explore Ways to Utilise PPE waste**



With masks and personal protective equipment becoming the norm to keep COVID-19 away, the next crisis in waiting could be the safe disposal of the enormous waste generated from their usage. It is estimated that almost one third of the biomedical waste will be in the form of disposable PPE kits, masks, testing swabs and pipes used in the management of Covid-19 patients.

Four CSIR institutes, namely, CSIR-Indian Institute of Petroleum (IIP), Dehradun; CSIR-National Chemical Laboratory (NCL), Pune; CSIR-Central Mechanical Engineering Research Institute (CMERI), Durgapur and CSIR-Indian Institute of Toxicology Research (IITR), Lucknow have come together to devise methodologies to convert discarded PPE kits and other plastic waste into pellets that can be used for road construction or moulded for other applications.

The CSIR labs have also roped in private firms for working on recycling plastic waste from discarded PPE kits, masks and disposable testing equipment. The researchers aim to utilise the recycled material to pave roads, make bricks and interlocking tiles or reuse them for biomedical purposes after sterilizing them by microwaving.

**CSIR-CSIO Disinfection Machine Selected Among Top COVID-19 Innovations**


ENCEESPRAY project has been selected as one of the top Covid-19 innovations for COVID19 Ignition Grant award of 1 crore for scaling up in India and US. The device

is a joint development by CSIR-Central Scientific Instruments Organisation (CSIR-CSIO), Rite Water Solutions Pvt Ltd. Nagpur and University of Florida. ENCEESPRAY is an electrostatic disinfection machine comprising of electrostatic sprayer and electro-hypo generator – an ideal solution for surface disinfection for COVID-19.

 Eliminates virus and bacteria within 2 minutes

 Removes Odors



 Disinfects in a single-step process

 Sanitizes both hard and soft spaces

**Webinar in Odia as part of Communication Series in Indian Languages**

As part of CSIR’s outreach programme in Indian languages, CSIR organized a webinar in Malayalam on “CSIR Fights COVID-19 – Computation to Testing and Beyond” on 5 September 2020. Apart from opening remarks by Dr Shekhar C. Mande, Director-General, CSIR and Dr Sudhasatwa Basu, Director, CSIR-Institute of Minerals and Materials Technology (IMMT), Bhubaneswar the other speakers included Dr S.K. Barik, Director, CSIR-National Botanical Research Institute (CSIR-NBRI); Dr Debasis Dash,

CSIR-IGIB; Dr Debasis Mohanty, National Institute of Immunology (NII) and Dr Trupti Das (CSIR-IMMT).

The effort was aimed at disseminating information about CSIR’s efforts in the fight against COVID-19 and also clarifying doubts and queries in the minds of the general public about the various issues and concerns related to treatment and testing for COVID-19.

The webinar that went live on Facebook was moderated by Dr Pushpanjali Tripathy, Scientist, CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR).





### CSIR-NEIST Branch donated Hand Sanitizers to RIMS

Source: IT News

Imphal, August 28 2020: A team led by Dr H Birkumar Singh, Senior Principal Scientist, CSIR-NEIST Branch Lab, Lamphelap, Imphal donated Alcohol based Herbal Hand Sanitizers to RIMS, Imphal, today.

Sixty nine (69) nos of Hand Sanitizer bottles including spray type which is formulated by CSIR-NEIST Branch, Lamphelap, Imphal handed over to Director, RIMS Prof A Santa Singh at his office chamber.



CSIR-NEIST Branch donated Hand sanitizers to RIMS

The Director thanked the CSIR-NEIST Lamphelap, Imphal team for donating the said items during this COVID-19 pandemic situation.

### CCMB chief: Need to study reinfections

Amrita Didiyala | TNN | Aug 27, 2020, 04:22 IST

✉ 📄 A- A+



Doctors participating in Candle light march holding placards demanding Exgratia for Doctors how died with Covid-19. Read More

Hyderabad: All reports of Covid-19 reinfection need to be watched closely and investigated, Dr Rakesh Mishra, director, CSIR- Centre for Cellular and Molecular Biology (CCMB), Hyderabad, has said.

The most dominant clade (sub-strain) of the virus has changed from A3i to A2a in Hyderabad. A3i, which was dominant in the southern part of the country, is weaning out. The senior scientist said Covid-19 reinfection was not impossible but rare at the moment and could happen due to a variety of reasons. CCMB would like to research the cases, if it gets support from the authorities having samples of the suspected cases, he added.

### IITR tests over 50K samples

PNS ■ LUCKNOW

The Indian Institute of Toxicological Research (IITR), an ICMR and state approved COVID-19 testing facility since May 4, has accomplished a landmark of testing over 50,000 samples for coronavirus infection in the last 16 weeks to become the first CSIR lab in the country to reach this milestone.

The IITR is receiving samples from various districts of Uttar Pradesh.

IITR Director Alok Dhawan said that while the COVID-19 cases were shooting up to an alarming stage during the second phase of Lockdown, as an emergency response, CSIR IITR created a state-of-the-art facility for COVID-19 testing as per national norms.

"In a meeting with chief secretary of UP government as well as Med Education Minister Sui Khanna, we apprised the full preparedness for test and assured support to the to enhance the testing cap

ty for COVID-19. The cell-culture facility of the institute was repurposed to BSL2+ laboratory to serve as COVID-19 testing facility," he said.

He said IITR formulated standard operating procedure (SOP) and obtained approval from CSIR, ICMR and state authorities.

"A team of about 10 personnel had been imparted training by Department of Microbiology, King George's Medical University (KGMU) on biosafety measures, sample receiving, real time PCR based testing, data analysis and data reporting. They in turn trained the other staff of CSIR IITR involved in institutional COVID-19 testing facility. Procurement of consumables such as testing kits, PPE, plastic ware were made at rapid

He said that UP government provided full support by deputing a medical microbiologist and two technicians at the IITR COVID-19 testing facility. "Initially, the institute had testing capacity of 50 samples per day which is now ramped up to 1,200 samples per day. In a short span of less than four months, the IITR has reached a major landmark by finishing over 50,000 tests. The IITR is the first CSIR laboratory to reach this milestone. This was made possible only by the untiring and persistent efforts of numerous scientists, technical and various other staff, who have been working continuously for seven days a week. The IITR is also contributing in capacity building," he said.

The IITR is providing

### Second Pune firm gets approval to make Covid-19 test kits

Sayanarayan Iyer | TNN | Updated: Sep 5, 2020, 15:50 IST

✉ 📄 A- A+



Image used for representational purpose only

PUNE: Yet another Pune-based company has received approvals to make RT-PCR kits. After MyLabs' -- Patholab, GenePath Diagnostics' has indigenously developed Covid-19 RT-PCR test kit -- Covidex One and received approval for manufacture and sale in India from the Central Drugs Standard Control Organization (CDSCO) on August 31, 2020.

The kit was validated by the Council of Scientific and Industrial Research's Center (CSIR) in Hyderabad and approved by the CDSCO earlier in the year. The CDSCO has given approval to GenePath's manufacturing partner, to

## Outlook

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### THE NEWS SCROLL

02 SEPTEMBER 2020 Last Updated at 10:22 PM | SOURCE: PTI

### IGIB scientists develop rapid and sensitive test for coronavirus detection



New Delhi, Sep 2 (PTI) Scientists at the Institute of Genomics and Integrative Biology have developed a rapid and sensitive method to detect coronavirus infection in 30 minutes using a mass spectrometer.

In the study by the scientists of IGIB, an institute under the Council for Scientific and Industrial Research (CSIR), the rapid test method can detect two peptides, QIAPGQTGK and AIVSTIQRKYK, from structural spike glycoprotein and replicase polyprotein with a sensitivity of 90 per cent and specificity of 100 per cent.

This method involves direct detection of the viral peptides, a compound consisting of two or more amino acids linked in a chain.

"The method developed is safe since swab sample can be collected in tube containing detergent, which immediately kills the virus," said Shantanu Sengupta, one of the scientists who authored the paper which has been published in the Journal of Proteins and Proteomics.

The samples for the study were provided by National Centre for Disease Control, while Indraprastha Institute of Information Technology (IIIT Delhi) was involved in computational work, Sengupta said.

Mass spectrometry, the equipment used for diagnostics in this method is an analytical tool useful for measuring the mass-to-charge ratio (m/z) of one or more molecules present in a sample.



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# Hyderabad's CCMB expects therapeutic antibody treatment to be more effective than COVID-19 plasma therapy

Scientists believe that immunotherapy is more effective and feasible than plasma therapy. The antibodies, raised in horses using inactivated coronavirus, are fractionated and purified to produce antibody fragments F(ab')<sub>2</sub> for neutralizing coronavirus in the patients for recovery.

BioVoice

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## CSIR-CDRI conducts serological testing for antibodies against SARS-CoV-2

CSIR-CDRI is carrying out a research study that involves testing of people for antibodies against SARS-CoV-2. The serological testing was conducted from 9th-11th September

By BioVoice News Desk - September 11, 2020 58 0

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COVID-19 UPDATE


Ministry of Science & Technology

### Serological Testing at CSIR-CDRI, Lucknow for antibodies against Corona Virus (SARS-CoV-2)

CSIR-CDRI is carrying out a research study that involves testing of people for antibodies against SARS-CoV-2

Posted On: 11 SEP 2020 5:07PM by PIB Delhi

CSIR-CDRI (Central Drug Research Institute) is carrying out a research study that involves testing of people for antibodies against SARS-CoV-2. The serological testing is conducted from 9<sup>th</sup>-11<sup>th</sup> September. For the past 7 months we are in the midst of a pandemic of coronavirus (COVID-19) infection with more than 45 lakh individuals being infected with the virus which has resulted in more than 76,270 deaths in India.




सौरसआइआर-आइआइटीआर में 50 हजार से ज्यादा कोविड-19 परीक्षण पूरे होने पर निदेशक के संबोधन • छोटी सेनाजव : तस्खान

## आइआइटीआर 50,000 से अधिक नमूनों का परीक्षण कर अब्वल

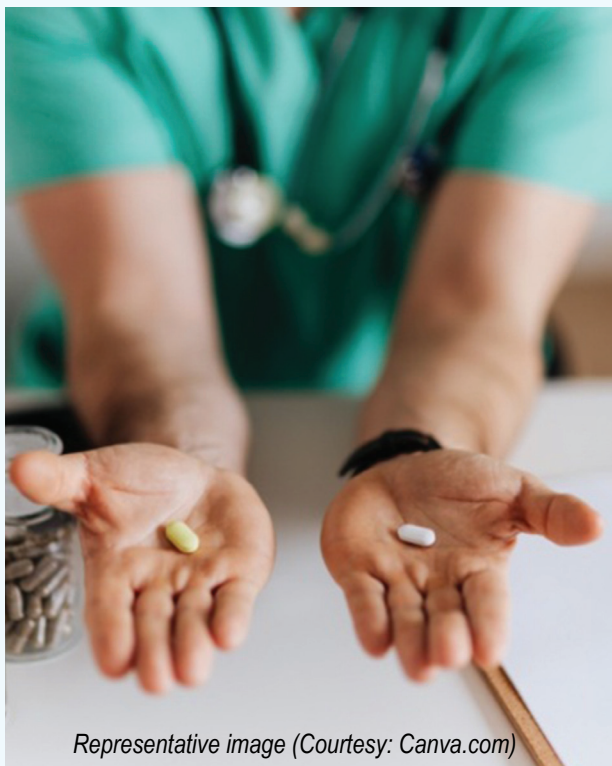
जागरण संवाददाता लखनऊ : तैयारी के बारे में अवगत कराया। राज्यसानी स्थित ( भारतीय विधिचिज्ञान अनुसंधान संस्थान ) आइआइटीआर ने पिछले 16 हस्तों में कोविड-19 के 50 हजार से अधिक नमूनों का परीक्षण करके सीएसआइआर ( वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद ) की प्रयोगशालाओं में अब्वल स्थान प्राप्त किया है। संस्थान चार माई से प्रदेश के विभिन्न जिलों में नमूनों की जांच कर रहा है। आइआइटीआर के निदेशक प्रो. अशोक धावन बताते हैं कि बढ़ते कोरोना वायरस मामलों में जांच का काम बड़ना प्रमुख जिम्मेदारी थी। चिकित्सा शिक्षा मंत्री सुले खन्ना, मुख्य सचिव के साथ हुई बैठक में संस्थान में कोविड-19 परीक्षण किए जाने की परामर्श की। इसकी

केजीएमयू के माइक्रोबायोलॉजी विभाग द्वारा जैव सुरक्षा उपकरण, नमूना प्राप्त करते, रिसल्ट टाइम पीसीआर आधारित परीक्षण, डाटा विश्लेषण और रिपोर्टिंग पर लगभग 10 कर्मचारियों को एक टीम को प्रशिक्षण दिया गया। वैज्ञानिकों ने मानकीकृत प्रक्रियाओं के अनुसार माईक टैरिटींग को उभर परीक्षण शुरू किया। प्रति दिन 50 नमूनों की परीक्षण क्षमता थी जो अब बढ़कर प्रति दिन 1200 तक पहुंच गई है।



## CORONA RESEARCH SNAPSHOT

### ➔ Steroid treatment is effective in lowering deaths due to COVID-19



Strong evidences have been found that severely ill patients with COVID-19 are less likely to die if they are given steroid-based COVID-19 drugs. A preliminary study reported that the steroid dexamethasone minimized the number of deaths in COVID-19 patients who were on ventilators. Scientists of the University of Bristol, UK did a meta-analysis on the pooled data from seven clinical trials conducted on severely ill patients. These trials include more than 1700 patients from 12 countries. The participants were randomly assigned the steroid and placebo and were analyzed for 28 days. The scientists found strong evidences of lowering deaths due to COVID-19 in case

of steroid treatment of severely ill patients. The scientists suggest that steroids should be part of standard treatment for severely ill patients with COVID-19. The detailed study is published in the *Journal of American Medical Association* after peer review.

Source: *J. Am. Med. Assoc.*; DOI: [10.1001/jama.2020.17023](https://doi.org/10.1001/jama.2020.17023); 2020

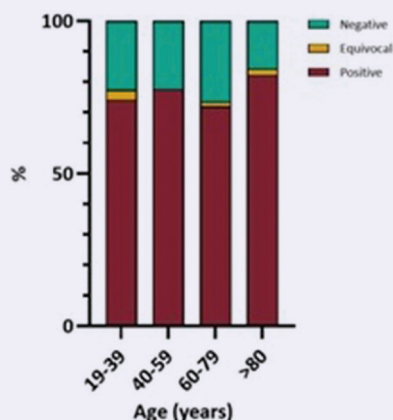
### ➔ Evidences for antibody persistence in human body



In the earlier studies, antibodies produced in response to COVID-19 infection were found to be petering out very quickly. The quick disappearance of antibodies makes the individuals vulnerable to re-infection. Researchers at *deCODE Genetics-Iceland* who performed a sero-survey on roughly 30,000 individuals including 1200 COVID-19 infected people found that antibodies are enduring in the bodies for four months after infection. The findings of this study have been published in the *New England Journal of Medicine* recently after peer review.

Source: *N. Engl. J. Med.*; DOI: [10.1056/NEJMoa2026116](https://doi.org/10.1056/NEJMoa2026116); 2020

### ➔ Octogenarians also develop antibodies against COVID-19 infection



(Figure Courtesy: Preprint at medRxiv;  
DOI: 10.1101/2020.08.10.20171413; 2020)

According to a study on COVID-19 recovered individuals, the neutralizing antibodies for SARS-CoV-2 have been detected in octogenarians too. In a study performed at the Public Health England Hospital in London, UK, more than 500 residents and staff were tested. After five weeks, more than 80% of the residents were found to have developed antibodies in response to the virus, which included 82% of those over the age of 80. However, the team of researchers has cautioned that the potency of the antibodies to guard against re-infection is not clear at this point. The details of the study are published as preprint in medRxiv and are yet to be peer reviewed.

Source: Preprint at medRxiv; DOI: 10.1101/2020.08.10.20171413; 2020

### ➔ Phytochemicals as potential therapeutic agents against COVID-19 infection

Phytochemicals are potential molecules that are finding applications in drug industry. Researchers at the Guru Govind Singh Indraprastha University, Delhi have computationally analyzed several phytochemical compounds and found a few that are able to bind with the non-structural

protein 15 (Nsp 15) which is known to play a critical role in virulence of SARS-CoVs. These compounds are sarsasapogenin, ursonic acid, curcumin, ajmalicine, novobiocin, silymarin and arantoin, piperine, gingerol, rosmarinic acid, and alpha terpinyl acetate. These results indicate the need for *in vivo* and *in vitro* tests for further confirmation of the study. The details of the research have been published in the journal *Phytomedicine* after peer review.

Source: *Phytomedicine*; DOI: 10.1016/j.phymed.2020.153317; 2020

### ➔ Important to understand the availability of clean water and air during and after COVID-19 pandemic



Representative Image (Courtesy: canva.com)

Due to relatively long lasting lockdowns and other pandemic effects, the Sustainable Development Goals may be severely affected. The availability of clean air and water is already under stress worldwide due to several natural and human-induced triggers. In a collaborative effort, researchers of IIT-Kharagpur, IIT-Bombay and Vikram Sarabhai Space Center, Thiruvananthapuram have highlighted the need to understand, nurture and continue the investment in real priorities specifically clean water, air and climate change even in post-COVID times to achieve UN SDGs. It becomes more important since India has a major global share of the population. The study has been published in the *Journal of Earth System Science* after peer review.

Source: *J Earth Syst Sci*; DOI: 10.1007/s12040-020-01475-0; 2020

➡ Possibility of catching COVID-19 from the neighbor's toilet



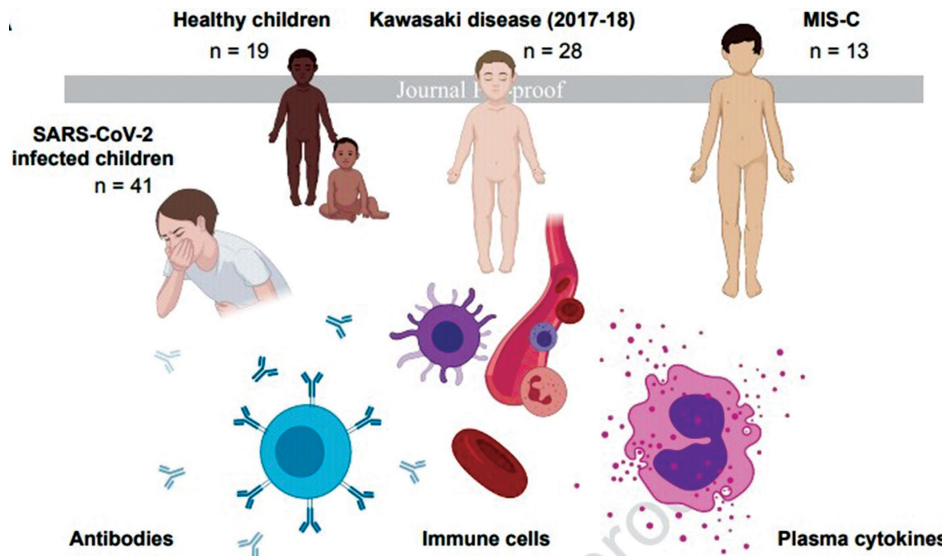
In wake of the 2003 SARS-CoV outbreak in Hong Kong, in which the virus spread through the pipes of an apartment, scientists are worried about the transmission of SARS-CoV-2 via toilets and drain odors containing aerosols with virus. After several studies confirmed the presence of the viral RNA of SARS-CoV-2 in fecal samples, the testing of waste-water and drainage has been suggested by scientists globally especially in highly affected areas. A few studies have also found abundant coronavirus RNA in hospital bathrooms and suggested that flushing the toilet can spread the viral particles far above the toilet seat.

Source: [Blog of Jocelyn Kaiser at Science Magazine](#); DOI:10.1126/science.abe6555 and [Environmental International](#); DOI: 10.1016/j.envint.2020.106039; 2020)

➡ Scientists explain the rare hyper-inflammatory syndrome in COVID-19 infected children

During the COVID-19 pandemic, paediatricians have discovered a new, life-threatening hyper-inflammatory syndrome resembling Kawasaki disease and named it Multisystem Inflammatory Syndrome in Children (MIS-C). Scientists of Karolinska Institute and Science and for Life Laboratory in Sweden and Tor Vergata University of Rome in Italy have formulized the immunological aspects of this rare condition. The researchers claim that the hyperinflammation and cytokine storm detected in children with MIS-C is different from that observed in adults. The common cold coronavirus related IgG antibodies are not found in the body of children who developed MIS-C with COVID-19. Several antibodies which attack the body's own proteins were also detected in these children. The researchers are also looking for genetic risk factors for developing MIS-C after COVID-19 infection. The details of the study are published in *Cell* after peer review.

Source: *Cell*, DOI: 10.1016/j.cell.2020.09.016; 2020



(Image courtesy: Consiglio et al., *Cell*, DOI: 10.1016/j.cell.2020.09.016; 2020)



## CORONA INNOVATIONS

### ➔ Repurposing Shipping Containers as ICU Pods

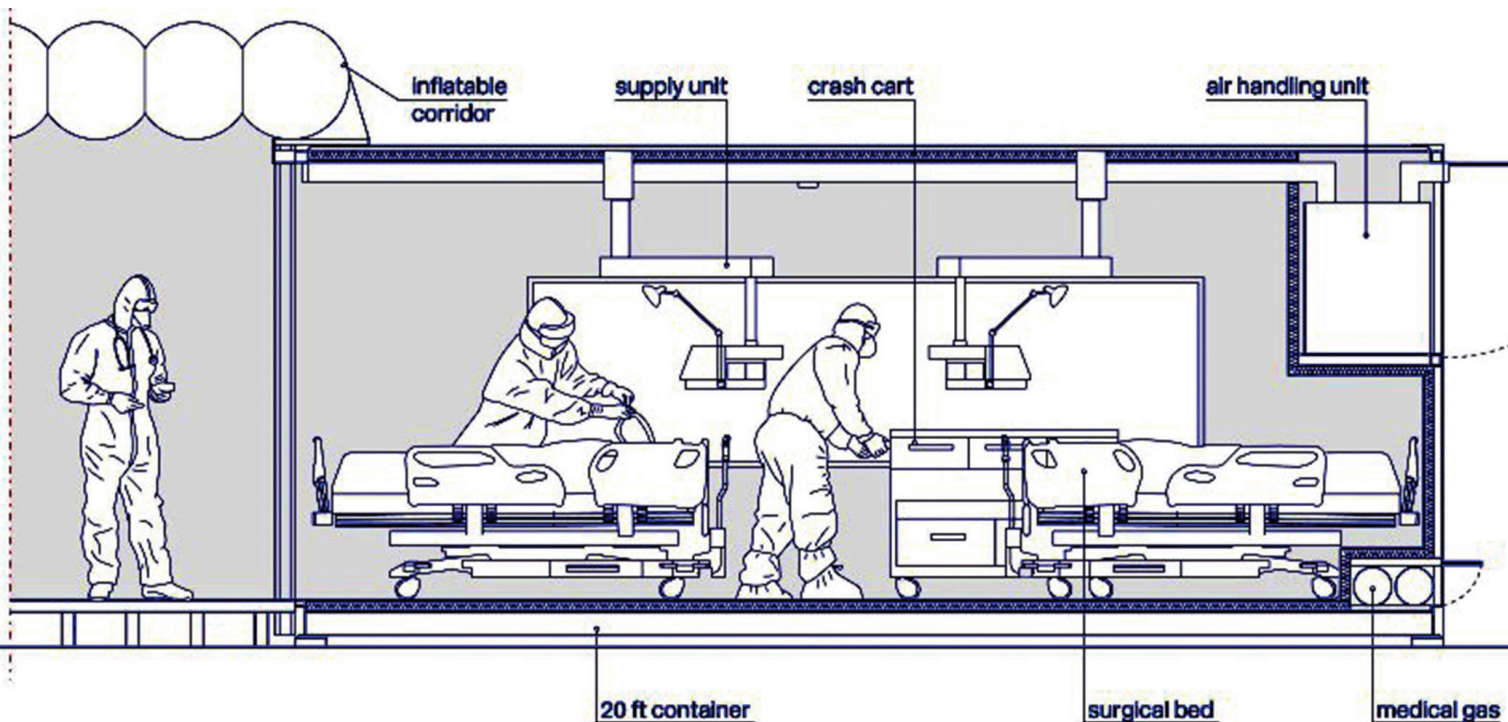


A project called CURA (Connected Units for Respiratory Ailments) repurposes shipping containers as ICU pods. The first container was deployed in Turin and later in hospitals across Italy, as well as in Europe and Latin America.

In this innovative technological strategy, empty containers are turned into mobile intensive care units (ICUs) with beds and all the essential equipment needed to keep desperately ill patients alive. The mobile ICUs are quick to build and ease the pressure on hospitals during the pandemic. Medical and epidemiology experts have already warned of the consequences in especially under-equipped regions like Africa.

Carlo Ratti Associati teamed up with the Massachusetts Institute of Technology to design the ICU module from shipping containers. They took advice from expert engineers and medical equipment suppliers. This novel initiative is supported by the World Economic Forum from COVID-19 Action Platform & Cities, Infrastructure & Urban Services Platform.

Source: <https://www.weforum.org>



➔ **Simoa Technology to detect & measure anti-coronavirus antibody**

Brigham and Women’s Hospital researchers have developed a sensitive and specific serology test using Quanterix’ ultra-sensitive Simoa platform for the detection and measurement of anti-coronavirus IgG, IgM, and IgA antibodies against four immunogenic viral proteins. The study indicates that Simoa assay can detect sero-conversion as soon as one day after symptom onset using less than a microliter of plasma.

The multiplex serological assay demonstrates the ability to detect antibodies against SARS-CoV-2 and identifies individuals who have been infected with the virus but are asymptomatic or have mild symptoms. Simoa assay has the potential to become a new standard by which researchers can conduct COVID-19 serological profiling. It is a valuable tool for answering important questions about the heterogeneity of clinical presentation seen in the ongoing pandemic.

Currently, nucleic acid based tests of nasopharyngeal swabs are the primary method used to detect COVID-19 infected

individuals. However, these tests can only diagnose the disease during a narrow window of active infection with an overall lower clinical sensitivity of 65-72%. Additional diagnostic methods, therefore, are needed to identify those who are or have been infected with the virus.

Source: <https://www.quanterix.com>

➔ **AI to fight against COVID-19**

Technology in the form of artificial intelligence (AI) has been a powerful tool in the search for COVID-19 treatments. AI has the potential to accelerate the process by reasoning across all available biomedical data and information in a systematic search for existing approved medicines.

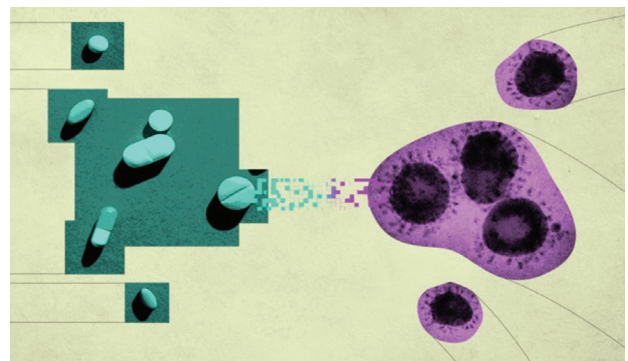
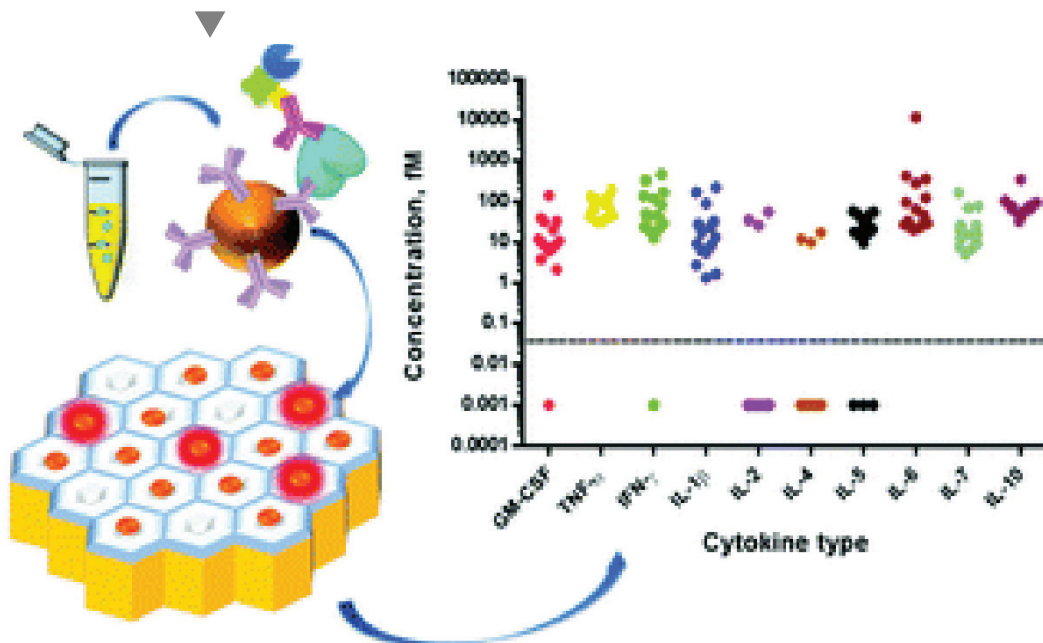


Photo Credit: Casey Chin; Getty Images



BenevolentAI uses AI systems to develop drugs that can fight the world's toughest diseases and is now providing support to the efforts to treat COVID-19. The company is now focusing on developing its product for infectious diseases. They are using their predictive capabilities to propose existing drugs that might be useful. Using a "knowledge graph" composed of chemical, biological and medical research and information, the company's AI machine learning models and algorithms can identify potential drug leads faster. While such systems will never replace scientists and clinicians, they can save both time and money.

Source: <https://www.weforum.org>

### ➡ Reusable antimicrobial mask that neutralizes coronavirus



A metal-oxide infused washable facemask effectively kills the novel coronavirus. This metal-oxide nanoparticle based and cotton-polyester facemask was launched by Sonovia Ltd. (Israel). The company performed tests of the anti-pathogen, anti-bacterial fabric used in its masks in accordance with international standards for determining anti-viral activity of textile products.

The almost-permanent, ultrasonic, fabric-finishing technology for mechanical impregnation of zinc oxide nanoparticles into textiles was developed at Bar-Ilan University. In the development of this fabric, 'cavitation' process is used for durability coating of individual textile fibers. This ensures that the fabric stays protective for longer periods and makes it reusable and washable. The fabric can also be used in textiles for hospitals, personal protective equipment and clothing.

Source: <https://www.hospimedica.com>

### Touchless self-check kiosk



The Indian Institute of Technology Guwahati (IIT Guwahati) in collaboration with Workspace Metal Solutions Pvt. Ltd, Udaipur, has come up with a touchless self-check kiosk capable of determining whether a person is suffering from fever, low blood pressure levels and, therefore, potentially has COVID-19 or any other viral or bacterial infection. The kiosk only takes about 30 seconds to check the individuals.

The fully automated touchless self-check kiosk has been designed as per the World Health Organisation (WHO) guidelines which instantly detects and records the syndromes associated with COVID-19 like body temperature and blood oxygen content and raises alarm in case it is beyond the limits. The Kiosk features UV-C disinfectant box which is capable of killing viruses/bacteria on surfaces of items like luggage, bags, keys, mobiles, wallets, etc.

Source: [India Science Wire](#)

### ➡➡ New AI diagnostics for lung diseases

IIT Kharagpur has developed an affordable AI and IoT based Diagnostic Device called SenFlex.T for Chronic Obstructive Pulmonary Diseases (COPD) which is a common chronic respiratory disease. COPD leads to many deaths and has especially become more acute during COVID-19 with enhanced comorbidity rates. SenFlex.T is a smart mask synced with an android monitoring app through Bluetooth that can continuously monitor breathing patterns, breathing rate, heart rate, oxygen saturation level in blood. The app is connected to a cloud computing server, where Artificial Intelligence (AI) has been implemented



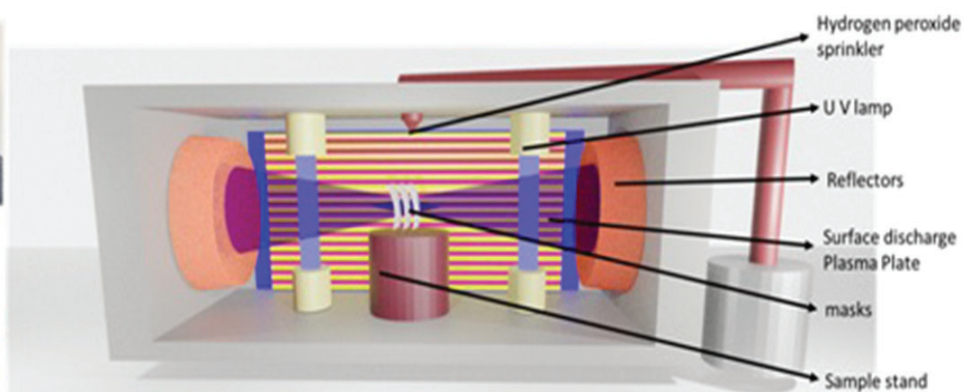
to predict the severity of COPD through Machine Learning (ML). The innovation has been reported in the international journal *ACS Applied Materials & Interfaces* (<https://pubs.acs.org/doi/full/10.1021/acsami.8b19051>).

Source: [kgpchronicle.iitkgp.ac.in](http://kgpchronicle.iitkgp.ac.in)

### ➡➡ POSCU — Portable sterilization unit

To facilitate multiple use of PPEs (Personal Protective Equipments), IIT Tirupati and IISER Tirupati have jointly developed the Portable Optical Cavity Sterilization Unit (POSCU) to decontaminate PPEs easily and rapidly. The portable sterilization unit uses a new technology called hybrid sterilization system to sterilize the PPEs, allowing them to be used multiple times. It can be used by health professionals and other COVID warriors for whom PPEs are essential and can prevent the generation of hazardous solid waste from PPEs. The team is currently optimizing the design parameters.

Source: [PIB](#)



## ➡ DIPCOVAN — antibody-based detection assay for COVID-19

DIPAS (Defence Institute of Physiology & Allied Sciences) has developed an antibody-based detection assay for sero-surveillance in association with Vanguard Diagnostics Pvt Ltd., Delhi. The test is for both spike as well as nucleocapsid proteins to cover a wide range of spectrum of disease. Test license has been obtained from DCGI and brand name “DIPCOVAN” has been registered. Approval for validation of kit by ICMR at NIV Pune is under process. After launching the kit manufacturing license will be obtained by the manufacturing company for mass production.

Source: [drdo.gov.in](http://drdo.gov.in)

## ➡ US9TM — Reusable Respirator Mask



IIT Hyderabad’s Centre for Healthcare Entrepreneurship (CFHE) has launched the reusable respirator mask namely US9™. The mask has been designed for the healthcare industry and its frontline workers by USafe, an incubatee of CfHE.

Source: [CfHE](https://www.cfhe.org/), [twitter](https://twitter.com/USafeHealth)

## ➡ Chitra AcryloSorb — Respiratory fluid solidification system



Disposal of respiratory secretions of patients suffering from highly contagious diseases such as COVID-19, Tuberculosis (TB) and influenza, poses a high risk of infection among healthcare workers. For the safe management of infected respiratory secretions, researchers at Sree Chitra Tirunal Institute for Medical Sciences and Technology have come up with a method for safe handling and disposal of respiratory secretions in hospitals for ICU patients or those with copious respiratory secretions treated in the wards. They have developed canister bags lined with super-absorbent material containing an effective disinfectant, named “AcryloSorb”. The canister bags can absorb 500 ml of secretions and solidify it immediately. In addition to that, the whole system will be decontaminated within no time because of the presence of disinfectant.

Source: [sctimst.ac.in](http://sctimst.ac.in)

## ➡ Engineered surfaces to detect, prevent coronavirus

Indian Institute of Technology (IIT), Guwahati, has developed methods to detect and prevent the novel coronavirus using bio-interface interactions between the virus and the surface spike protein.

"The interaction between the spike protein and contacting surfaces constitutes the key step of transmission of coronavirus. Thus, surface engineering, on one hand, shall facilitate a quick detection method and on the other hand, it would be a very secure method of protection against the virus, for example when applied on PPEs," Lalit M Pandey, associate professor, Department of Biosciences and Bioengineering, told PTI. The research has been published in reputed journals like *Materials Science and Engineering C*, *Applied Surface Science*, *Langmuir*, *J. Phys. Chem. C* and *ACS Biomaterials Science and Engineering*.

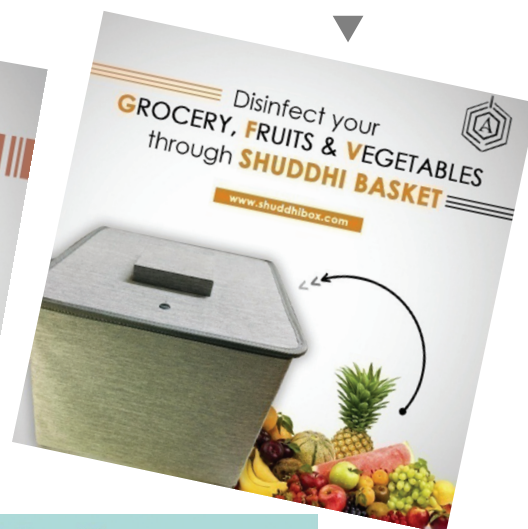
Source: PTI



### ➔ Shuddhi basket — disinfection device

Aristavault, an incubatee of Electropreneur Park (Electronic system design manufacturing incubation centre of Software Technology Parks of India (STPI), an autonomous society under MeitY has developed an indigenous UV-C home & office disinfection device, a sanitization box called Shuddhi Basket. The Shuddhi Basket can be used in the office to disinfect items like mobiles, files, etc. and home as well for groceries. The lightweight & foldable basket is easy to use and carry. The product was formally launched on 9 September 2020.

Source: Aristavault, Twitter



## #IndiaFightsCorona

### How to handle self isolation?

- Keep yourself busy
- Engage yourself in productive work
- Be physically active
- Distract yourself from negative emotions
- Eat well and drink plenty of fluids



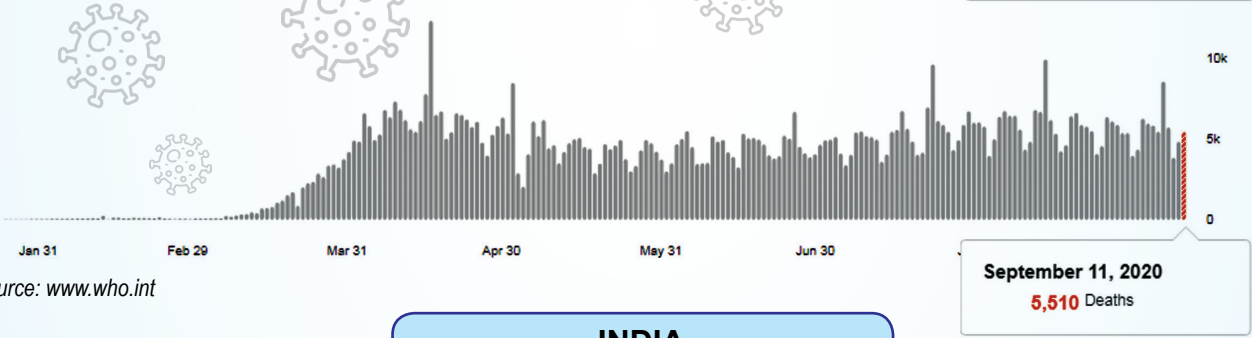
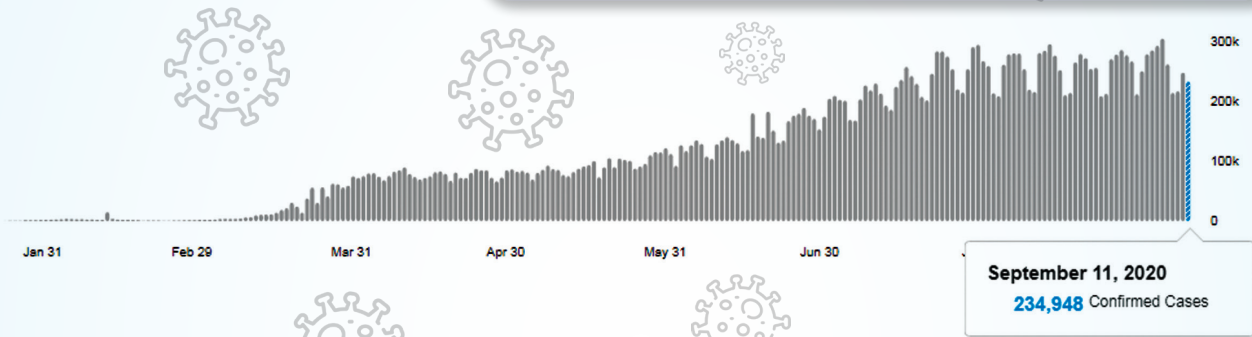
 @COVIDNewsByMIB

# COVID-19 Dashboard

## Global COVID-19 Cases and Deaths

(Data as of 11 September 2020)

	<b>Worldwide</b>
<b>Total Confirmed Cases</b>	<b>27,973,127</b>
<b>Total Death</b>	<b>905,426</b>



Source: www.who.int

### INDIA (Data as of 11 September 2020)

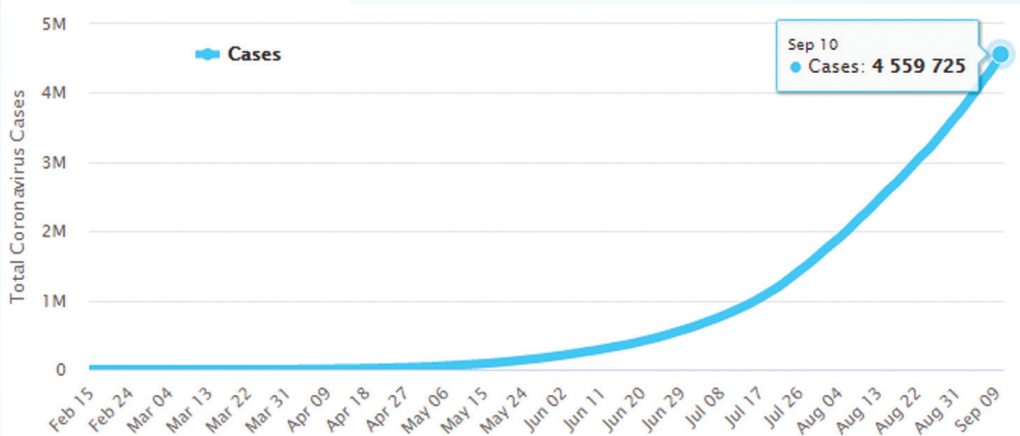
<b>TOTAL SAMPLES TESTED UP TO SEPTEMBER 11, 2020</b> 5,40,97,975			
<b>SAMPLES TESTED ON SEPTEMBER 11, 2020</b> 11,63,542			
<b>Total Cases</b> <b>45,62,414</b> 96551 ↑	<b>Active (20.68%)</b> <b>9,43,480</b> 24462 ↑	<b>Discharged (77.65%)</b> <b>35,42,663</b> 70880 ↑	<b>Deaths (1.67%)</b> <b>76,271</b> 1209 ↑

Source: www.mygov.in

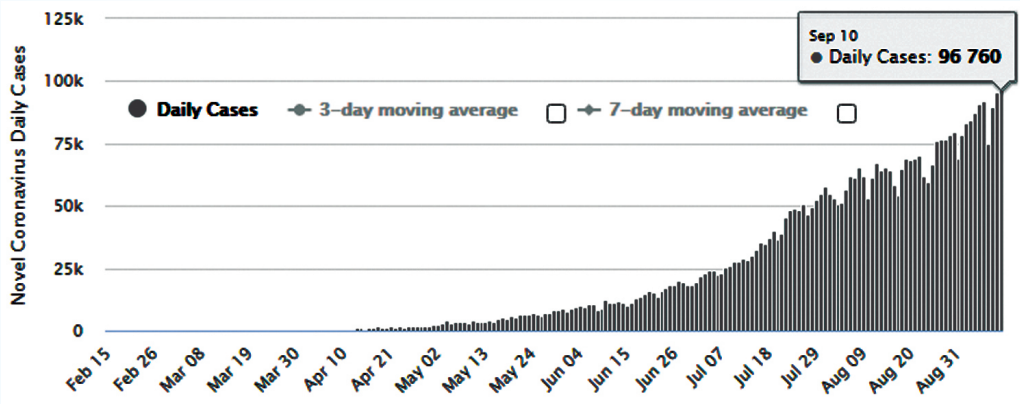
**Graph INDIA**

(Data as of 11 September 2020)

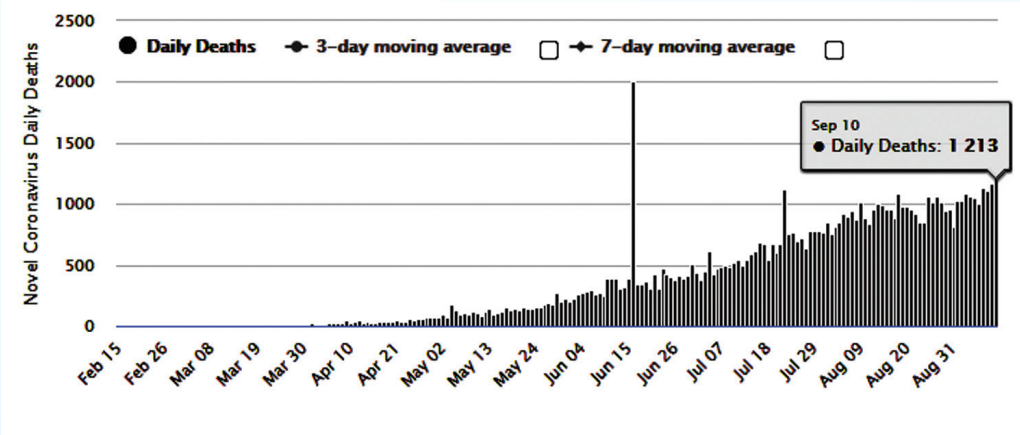
**Total Cases in India**



**Daily New Cases in India**



**Daily New Deaths in India**

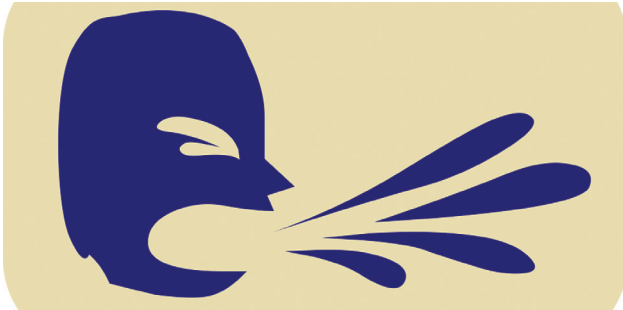


Source: www.worldometers.info



## CORONA Q&A

### Is a single specific physical distance enough in all situations?



According to a study (doi: <https://doi.org/10.1136/bmj.m3223>) published in *BMJ*, Nicholas R Jones and colleagues argue, “Rigid safe distancing rules are an oversimplification based on outdated science and experiences of past viruses.” The study says that the physics of respiratory emissions is overlooked where different size droplets are trapped and the breathed out soggy and hot turbulent gas cloud that keeps them concentrated as it carries them over metres matter. And after the cloud slows sufficiently, ventilation, specific patterns of airflow and type of activity become important. Viral load of the emitter, duration of exposure, and susceptibility of an individual to infection are also important.

The study suggested that “instead of single, fixed physical distance rules, we propose graded recommendations that better reflect the multiple factors that combine to determine risk. This would provide greater protection in the highest risk settings but also greater freedom in lower-risk settings, potentially enabling a return towards normality in some aspects of social and economic life.”

### How does saliva test for COVID-19 work?



Faced with an ongoing lack of protective equipment and testing supplies, medical professionals have been seeking alternatives to accurately diagnose cases of COVID-19. Supplies of nasopharyngeal swabs were some of the first testing materials to run low in mid-March, prompting a pivot to nasal swabs. More recently, saliva-based testing has come forward as an attractive, low-cost alternative.

The first spit tests are already being sold to consumers, with more poised to apply for emergency use authorization from the US Food and Drug Administration soon. While saliva can be a crude sample for diagnosing disease using traditional PCR, it pairs well with a cheap PCR alternative known as loop-mediated isothermal amplification (LAMP), previously used to detect outbreaks of Zika and Ebola in resource-poor countries. Propelled by a global pandemic, researchers in the US and the UK are now modifying LAMP and assessing its utility as a diagnostic tool for COVID-19.

Saliva-based testing also offers an improvement over the standard nasopharyngeal swab because people can collect their own samples with minimal discomfort, simply spit into a sterile tube and mail it to a lab for processing. Universities

and clinicians alike are now planning to incorporate saliva-based sampling into their workflow for diagnosing COVID-19.

Despite the ease of sampling, saliva is not without its challenges. For PCR, the virus's RNA must first be reverse transcribed into DNA. Besides, saliva contains enzymes that chew up nucleic acids and inhibitors that interfere with the DNA amplification process used to detect the virus. As a result, saliva must often be purified before the DNA can be amplified. While quantitative reverse transcription PCR remains the most-used method to diagnose COVID-19 regardless of how the sample is collected. Several projects have already begun processing samples using LAMP. The pilot study in England, for example, is using its own LAMP protocol, and researchers at Beaumont Health, Michigan's largest healthcare system, have also announced a new LAMP test for processing saliva samples.

[www.the-scientist.com](http://www.the-scientist.com)

### Can singing softly reduce COVID-19 risk?



*Credit: Wigmore Hall*

Sing softly and don't shout to reduce the risk of COVID-19 spread, new research suggests, offering a ray of hope for musicians who have been restricted from performing in public. Music makers have

been hit hard by the coronavirus pandemic, with singing, as well as playing of woodwind and brass instruments deemed to be a potential high risk for spreading the disease, a concern fuelled by outbreaks in choirs. Prof. Jonathan Reid, a professor of physical chemistry at the University of Bristol and a co-author of the research said, "It is not about the vocalization, whether it's singing or speaking, it is about the volume. Just by singing a little bit more softly you really reduce the risk."

In a study that has yet to be peer-reviewed, the team reports how they asked 25 professional singers to breathe, speak, cough and sing into funnels. They then measured the mass of tiny droplets suspended in the air, known as aerosols, which were produced. The experiments were set up in an orthopaedic operating theatre, a setting chosen for its lack of background aerosols.

While one route by which COVID-19 spreads is via big droplets, largely produced when someone coughs and which fall to the ground within a couple of metres, Reid said aerosols were another possible route, noting such tiny droplets can linger in the air longer.

The team found the results of their study varied across participants, however at the lowest volume singing and speaking generated a similar mass of aerosols as breathing. While singing generates a slightly higher mass of aerosols than speaking, at least when loud, the difference is very small compared with the effect of volume.

However the research has limitations, it only measured aerosols produced by one individual at a time, while it did not look at how much virus was contained in the aerosol or the actual infection risk posed by the levels of aerosol produced.

[www.theguardian.com](http://www.theguardian.com)

## Does Coronavirus spread more indoors at low humidity?



Source: [www.analyticalscience.wiley.com](http://www.analyticalscience.wiley.com)

Airborne transmission of the coronavirus SARS-CoV-2 via aerosol particles in indoor environment seems to be strongly influenced by relative humidity. This is the conclusion drawn by researchers from the Leibniz Institute for Tropospheric Research (TROPOS) in Leipzig and the CSIR National Physical Laboratory in New Delhi from the analysis of 10 most relevant international studies on the subject published in the scientific journal *Aerosol and Air Quality Research*.

The researchers found that air humidity influences the spread of corona viruses indoors in three different ways: (a) the behaviour of microorganisms within the virus droplets, (b) the survival or inactivation of the virus on the surfaces, and (c) the role of dry indoor air in the airborne transmission of viruses. Although low humidity causes the droplets containing viruses to dry out more quickly, the survivability of the viruses still seems to remain high. The team concludes that if the relative humidity of indoor air is below 40 percent, the particles emitted by infected people absorb less water, remain lighter, fly further through the room and are more likely to be inhaled by healthy people. In addition, dry air also makes the

mucous membranes in our noses dry and more permeable to viruses. Therefore, more attention should be paid to indoor air to prevent future outbreaks of viral disease. The moisture content of indoor air is an important aspect but not the only one. Fresh air from outside can also reduce the risk of transmission.

[www.sciencedaily.com](http://www.sciencedaily.com)

## Why COVID-19 is more deadly in people with obesity, even if they're young?



Credit: Gustavo Basso/Nurphoto/Getty Images

Since the pandemic began, dozens of studies have reported that many of the sickest COVID-19 patients have been people with obesity. In recent weeks, that link has come into sharper focus as large new population studies have cemented the association and demonstrated that even people who are merely overweight are at higher risk. People with obesity are more likely than normal-weight people to have other diseases that are independent risk factors for severe COVID-19, including heart disease, lung disease, and diabetes. They are also prone to metabolic syndrome, in which blood sugar levels, fat levels, or both are unhealthy and blood pressure may be high. A recent study from Tulane University of 287 hospitalized COVID-19 patients found that metabolic syndrome itself substantially increased the risks of ICU admission, ventilation, and death.

The physical pathologies that render people with obesity vulnerable to severe COVID-19 begin with mechanics: Fat in the abdomen pushes up on the diaphragm, causing that large muscle, which lies below the chest cavity, to impinge on the lungs and restrict airflow. This reduced lung volume leads to collapse of airways in the lower lobes of the lungs, where more blood arrives for oxygenation than in the upper lobes. If you are already starting with this mismatch, you are going to get worse faster from COVID-19.

Other issues compound these mechanical problems. For starters, the blood of people with obesity has an increased tendency to clot, an especially grave risk during an infection that, when severe, independently peppers the small vessels of the lungs with clots. In healthy people the endothelial cells that line the blood vessels are normally saying to the surrounding blood, they don't clot. According to the experts signaling is being changed by COVID because the virus injures endothelial cells, which respond to the insult by activating the coagulation system.

Immunity also weakens in people with obesity, in part because fat cells infiltrate the organs where immune cells are produced and stored, such as the spleen, bone marrow, and thymus. Beyond an impaired response to infections, people with obesity also suffer from chronic, low-grade inflammation. Fat cells secrete several inflammation-triggering chemical messengers called cytokines, and more come from immune cells called macrophages that sweep in to clean up dead and dying fat cells. Those effects may compound the runaway cytokine activity that characterizes severe COVID-19.

[www.sciencemag.org](http://www.sciencemag.org)

### Can people catch COVID-19 from fecal matter?

A number of studies have reported finding RNA from SARS-CoV-2 in fecal samples from COVID-19 patients. Some of those patients also had diarrhea, suggesting the virus had infected their intestinal tracts; the RNA could also come from swallowing saliva or respiratory tract fluids containing the virus. Such fecal samples inspired wastewater testing currently being used to watch for incipient COVID-19 outbreaks in cities around the world and at some U.S. universities.

Some studies have also found abundant coronavirus RNA in hospital bathrooms, and one modeling study suggested that flushing a toilet can spew viral particles far above the seat. A person could therefore be exposed to SARS-CoV-2 by breathing aerosolized fecal matter, or by ingesting the virus after touching a contaminated surface.

A key point often glossed over, scientists say, is the limited evidence that viral RNA in stool comes from live, infectious viruses—not just leftover material from “dead” or destroyed viruses. Only a few labs have reported culturing live virus from COVID-19 patient stool samples, which is challenging to do. One team has suggested that intestinal fluid neutralizes the virus. The U.S. Centers for Disease Control and Prevention says “it is unclear” whether virus in feces can cause COVID-19 and concludes the risk of spreading the virus this way is “low.” To date, there are no documented cases clearly indicating infection via fecal matter.

But researchers say the risk should not be ignored. Many animal coronaviruses can be spread through feces, “so it isn't a stretch to believe it might be possible with SARS-CoV-2,” says epidemiologist Susan Amirian of Rice University.

# COVID-19 MYTH BUSTERS

## MYTH

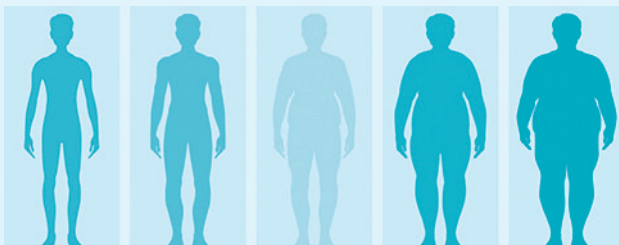
**COVID-19 doesn't cause long-term damage**



**Floor fans are safe**



**Covid-19 does not discriminate by body weight**



## FACT

It can be a long road to recovery, and scientists are just beginning to research the lingering effects. Fatigue, shortness of breath, persistent loss of sense of smell, and damage to the heart, lungs, kidneys, and brain are just a few symptoms on a long and wide-ranging list of the lingering effects of COVID-19. Recently, researchers launched a study that hopes to determine who is at highest risk and whether treatment in the acute phase of illness could relieve the long-term consequences.

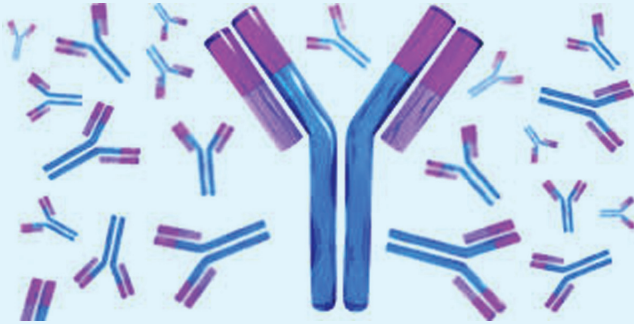
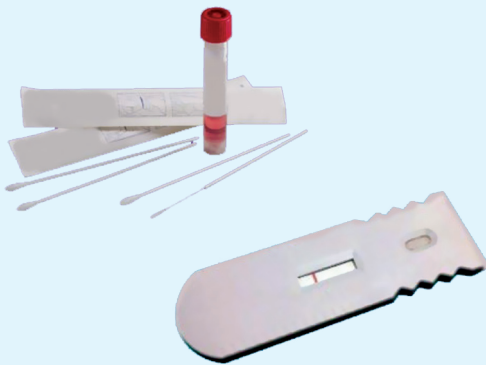
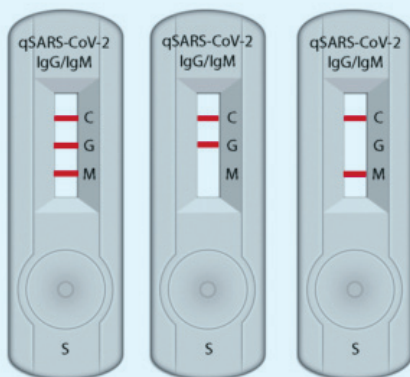
[www.projecthope.org](http://www.projecthope.org)

No, large floor fans create a focused blast that pushes air and the virus a long way. A number of studies show you can get infected at a good distance because of those large fans. Besides closed areas these fans are also common in outdoor restaurants and other venues where people gather.

[www.health.ucdavis.edu](http://www.health.ucdavis.edu)

No, the fact that researchers have been pointing to body size as a risk factor for weeks now, even in the absence of much evidence, is a clear example of how weight stigma gets enacted in science. It's been made to seem like common sense: Larger-bodied people are at higher risk from this pandemic. Those who are overweight really need to be careful.

[www.wired.com](http://www.wired.com)

**MYTH** ❌**Antibodies equal immunity****Rapid antibody tests on blood are a good alternative to diagnose COVID-19****If I test positive for IgG (Immunoglobulin G) antibodies, I am now immune to COVID-19****FACT** ✅

The short answer to this myth is that we have no evidence that antibodies will make people immune or offer any protection. Most experts agree that after the initial infection people will have some degree of immunity for some amount of time. But we do not know that for sure and even if it is true we do not know how much protection it will grant or for how long. It could be minor protection for a few weeks or major protection for a few years.

[www.orthospinenews.com](http://www.orthospinenews.com)

The rapid tests on blood cannot be used for diagnosis of an active COVID-19 infection. These rapid blood tests look for antibodies the body may have developed while fighting COVID-19. A positive test most likely means that the individual has already had the infection in past and has recovered from the virus. The test remains positive for a very long time even after full recovery. Similarly, if someone is sick and COVID-19 is suspected, the antibody test may still be negative.

[www.swachhindia.ndtv.com](http://www.swachhindia.ndtv.com)

A positive Immunoglobulin G (IgG) antibody test only means you have already had COVID-19 infection and have recovered from it even if the infection was asymptomatic. There is not enough scientific research to know if these antibodies offer long term immunity to protect you from getting COVID again. In fact, there have already been a few cases of reinfection reported. So, even if you test positive for these antibodies, continue following all the precautions as if you could get the infection again.

[www.swachhindia.ndtv.com](http://www.swachhindia.ndtv.com)


**MYTH** ❌

**COVID-19 antigen test is better than PCR (Polymerise Chain Reaction) testing**

**FACT** ✅

Both of these are viral tests done on the throat swab. The COVID antigen test can be used in areas where resources for Polymerise Chain Reaction are unavailable or when it is very urgent. The pros of these tests are the rapidity, lower cost and its specificity. Therefore, if it tests somebody positive with COVID-19, no PCR confirmation is needed. The cons are that it gives many false-negative results. So those who test negative should ideally be then tested with the RT-PCR (Real Time Polymerise Chain Reaction).

[www.swachhindia.ndtv.com](http://www.swachhindia.ndtv.com)

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