COVID-19 BULLETIN

21 JULY 2020

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

Compiled, Designed & Published by
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#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.

➲ CSIR to Conduct Study on Transmission of SARS-CoV-2 Virus

After the World Health Organisation (WHO) acknowledged the possibility that the novel coronavirus can remain in the air in crowded indoor spaces, where "short-range aerosol transmission cannot be ruled out", CSIR has announced it will conduct a study to ascertain the possibility of the spread of the virus through the air.

As part the study, air samples will be taken from two centres – the CSIR-Centre for Cellular & Molecular Biology (CSIR-CCMB) in Hyderabad and the CSIR-Institute of Microbial Technology (CSIR-IMTECH) in Chandigarh – to see if the presence of the virus can be detected or not. The study will take around 15 days to be completed

Dr Shekhar C. Mande, Director General of the Council of Scientific and Industrial Research (CSIR) explaining the rationale behind the spread of the virus in crowded and closed spaces, says that the smaller particles of the water droplets from an infected patient tend to stay in the air for some time. The larger particles of aerosol get settled easily on the surfaces but the finer particles can still remain in the air for some time and at a crowded place without proper ventilation, there is a potential threat of spread through the droplets.

A Safer, Cheaper & Faster SARS-CoV-2 Testing Method if Approved Can Scale Up Testing Capacity by Three Fold Immediately

Current methods of RT-qPCR testing are done in the form of swabs from samples received in Viral Transport Medium (VTM) followed by RNA extraction and RT-qPCR. CSIR-CCMB has generated a simplified protocol for this test where dry swabs are collected and directly used for RT-qPCR. This method has been established to have no loss of sensitivity and is on par with the current gold standard of testing.

Given this simplification, the method becomes safer as there is no liquid sample handling and leakage and fear of contamination for the persons handling the sample in BSL-3 facilities. It is also faster by about 5 hours as there is no RNA extraction and VTM containing tube handling. It is cheaper too as there is no RNA extraction and no VTM, correspondingly less manpower is needed.

In addition to this, the major bottleneck in testing today is the process of RNA extraction, because of time and manpower constraints. Removal of this step can improve the capacity of testing by about threefold, without any additional inputs.

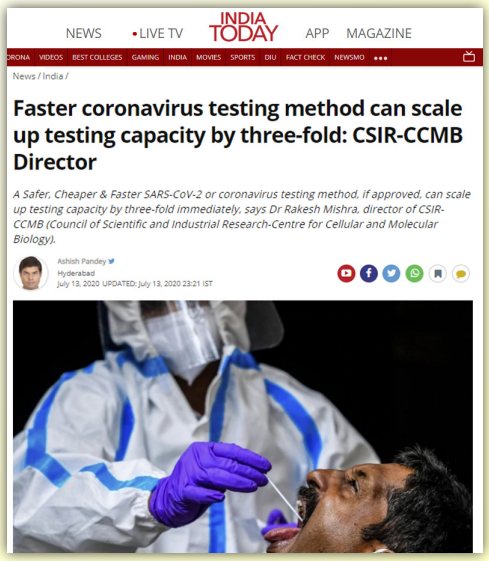
This method, Dry swab Direct RT-qPCR, is under consideration with ICMR and appropriate advisory is expected soon which will help in getting more tests done at much lower costs and give us a better chance at managing the pandemic.

Image by fernando zhiminaicela from Pixabay

Factor	Cost (Rs.)RT-qPCR (current method)	Cost (Rs.) CSIR-CCMB method	Saving (Rs.)	Comments
VTM	50	0	50	Range of cost is due to variation in cost of kits
RNA prep	350	0	350	
RT-PCR	700-1850	350	350-1500	
Cost/test	1100-2250	350	750-1900	
Tests/day (2 lakh)	**30 crore** (Average of 22-45 crore)	**7 crore**	**25 crore** (Average of 15-38 crore)	Difference at current cost of tests/day
Cost/ month	**900 crore**	**210 crore**	**690 crore**	Testing is key for next 6 months or so
For 6 months	5400 crore	1260 crore	4140 crore	
3x capacity (cost for 6 months)	**16200 crore** (other resources will be limiting factors)	**3780 crore**	**12420 crore**	3x capacity is possible in current set up if new method is used
Human resource	Impossible to make 3x capacity as it will need >3 fold more manpower	For 3x hike current manpower is enough	New method allows capacity increase	With current infra structure we can enhance testing by >3x.
Safety	Hazards of liquid sample handling	Dry swab	Much safer and easier	
Turnaround time	15-24 hours	5-6 hours	Easier and faster	

The table above shows what can be done to scale up quickly with no increase in manpower and cost.

- India is doing 2 lakh tests per day as more than that will require extra funds, setup of test labs and, more importantly trained manpower, which is not there. If our method is used, we can triple that capacity within (and less than) currently used resources (manpower, labs, and even the money).
- This means India can do more than 6 lakh tests per day which translates to more testing with cost-savings of Rs 75 crore per day as compared to the current status. Considering that we are expected to use these tests for the next six months, we estimate a financial gain of about Rs 12420 crores by this intervention.
- For the next 6 months with current situation we will be testing 2 lakh people per day at the total recurring cost of Rs. 5400 crore. Dry swab method will allow testing 6 lakhs per day with recurring cost of Rs. 3740 crores in six months.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News / India /

Faster coronavirus testing method can scale up testing capacity by three-fold: CSIR-CCMB Director

A Safer, Cheaper & Faster SARS-CoV-2 or coronavirus testing method, if approved, can scale up testing capacity by three-fold immediately, says Dr Rakesh Mishra, director of CSIR-CCMB (Council of Scientific and Industrial Research-Centre for Cellular and Molecular Biology).

Ashish Pandey
Hyderabad
July 13, 2020 UPDATED: July 13, 2020 23:21 IST

Our method does not need any new reagent, equipment or training. What it says is: do differently, in a simpler manner, and skip a few items and steps. This method is the need of the day and a quick approval would save valuable resources at this crucial time and tests can be made available without having to spend any extra effort/resources. We approached ICMR on 4 June 2020 and a response is still awaited. During this period this method has been tested and validated independently by CDFD, Hyderabad, Telangana and IISER, Berhampur, Odisha.

Source: https://urdip.res.in/covid19/blogs

Dr. Rakesh Mishra is the Director of CSIR-Centre for Cellular and Molecular Biology (CCMB) in Hyderabad, India.

➲ CMERI Durgapur Develops Thermal Scanner, Touch-less Faucet and Car Flusher

The CSIR-Central Mechanical Engineering Research Institute (CMERI), Durgapur has developed a unique "COVID Protection System (COPS)". The system includes Contactless Solar Based Intelligent Mask Automated Dispensing Unit cum Thermal Scanner (IntelliMAST), Touch-less Faucet (TouF) and 360-degree Car Flusher to effectively disinfect virus spread in workplaces.

COPS is a conglomeration of the following technologies:

1. **Solar Based Intelligent Mask Automated Dispensing Unit cum Thermal Scanner (IntelliMAST):** This is an intelligent surveillance kiosk that identifies the body temperature and whether an individual is wearing Face Mask or not through a customized Software Solution. Information about an employee not wearing a Face Mask is sent to the Administration for cashless delivery of the mask and later deduction of the price from the salary. The in-built Thermal Scanner detects probable rise in body temperature through forehead scanning and sends an audio visual alert to the Security Guards.

Facial Recognition based & ID Card based Attendance System will be incorporated into the system in the near future as a comprehensive solution for offices, industrial complexes as well as schools and college campuses.

2. **Touch-less Faucet (TouF): Effective** for households and office spaces, the system dispenses liquid soap and water from the same faucet with a time gap of 30 seconds, which is as per the latest Government guidelines. The faucet can be mounted on top of any wash basin and will be available in plug and play mode for very easy installation.

3. **360° Car Flusher:** The Car Flusher is a Sodium Hypochlorite Water Screen that uses a specialised nozzle design to ensure that the sanitizer-diffused water is evenly spread over and under car body/wheels with adequate water force and coverage. The architecture of the Car Flusher is based on a Water Channel Frame with appropriate number of specialised nozzles which can be customised and modified as per the specific requirements of organisation. The water channel frame and nozzle design have been optimized to ensure water efficiency and reduce water wastage.

➲ Technology for CSIR-NIIST's Air Sanitizer Transferred to Entrepreneur

The technology for an engineered system for disinfecting aerosols, developed by the CSIR-National Institute of Interdisciplinary Science & Technology (CSIR-NIIST), Thiruvananthapuram has been transferred to a private entrepreneur.

The unit absorbs aerosols from a distance and exposes it to a combination of germicidal UV radiations and filters and releases out clean and fresh air helping in controlling aerosol transmission. It is suitable for application in hospitals, clinics,

testing labs, office cabins, meeting rooms, etc. where aerosol mediated transmission of disease is very high. The low-cost system has a high efficiency, minimum infrastructure requirement for fabrication, and low power requirement.

CSIR-NCL's Medical Grade Mask Enters Production

The technology for a superior face mask with better filtration efficiency than the available face masks in the market, developed by CSIR-National Chemical Laboratory (CSIR-NCL), Pune was transferred to a Pune-based company SETLAB. The company has now started production of the mask.

CSIR-NCL's patented bacterial nano-cellulose technology along with nano-coating was used in the mask. The cotton cloth coated in a solution of bacterial cellulose and nano-material completely prevents the penetration of bacterial growth. The Bacterial Filtration Efficiency (BFE) of CSIR-NCL mask is 99.9% and Particulate Filter Efficiency (PFE) is 92.63% PFE. This indicates a high restriction of hazardous particulates. The masks are made for easy breathability, are of medical grade and low flammability.

CSIR Media Coverage

CSIO develops goggles to prevent Covid-19 infection

Technology for healthcare workers involved in treating patients

VIJAY MOHAN

CHANDIGARH, JUNE 27

The Central Scientific Instruments Organisation (CSIO) has developed a technology for precision manufacturing of safety goggles for healthcare professionals involved in treating high viral load patients as in the case of the Covid-19 pandemic.

The present situation has brought out the need for effective personal protective equipment (PPE) to protect the healthcare service providers, patients and visitors from accidentally getting infected. The technology has been transferred to a private firm for its commercialisation and mass production.

According to scientists, the conjunctiva membrane, located inside the eyelid to lubricate the eyeballs, is the only exposed mucous membrane of the body. When the eyes are opened, the conjunctiva membrane is also exposed, making it an important, but often overlooked entrance for viruses. The protective eye wear is ergonomically designed to provide full cover and efficient sealing to the eye area from hazardous aerosols as well as other suspended particles.

A team of the CSIO scientists led by Dr Vinod Karar, chief scientist and head, Optical Devices and Systems, had taken up the design and development of the safety goggles in consultation with various industries and stakeholders.

These safety goggles are designed with a flexible frame to provide tighter sealing with the skin of the face and would cover the eyes and the surrounding areas and even accommodating for prescription eyeglasses. It consists of a sturdy polycarbonate lens and an adjustable elastic strap for ease of wearing.

"The goggles comply with ANSI/ISEA Z87.1-2010 standard with respect to see-through optical transmittance and can be used in varied environmental conditions without any fogging or fatigue," said Dr Neha Khatri, senior scientist and Principal Investigator, CSIO, associated with the project.

The team included Dr Vinod Karar, Dr Sanjeev Soni, Dr Amit L Sharma, Dr Mukesh Kumar and Vinod Mishra.

Dr Surender S Saini, head, business initiatives and project planning, said apart from healthcare professionals, the safety goggles could also be useful for the general public in crowded areas as well as in public transport.

PROTECTIVE EYE WEAR

- Safety goggles are designed with a flexible frame to provide tighter sealing with the skin of the face and would cover the eyes and the surrounding areas and even accommodating for prescription eyeglasses. It consists of a sturdy polycarbonate lens and an adjustable elastic strap for ease of wearing.
- Apart from healthcare professionals, the safety goggles could also be useful for the general public in crowded areas as well as in public transport.

Chandigarh Tribune: June 28, 2020

एनबीआरआइ में भी होंगे कोविड टेस्ट, लैब शुरू

ANI

South Asia's Leading Multimedia News Agency

CSIR Director General Dr Shekhar Mande in conversation with ANI.

Masks should be compulsory for all: CSIR DG after WHO confirms 'emerging evidence' of airborne COVID-19 spread

ANI | Updated: Jul 09, 2020 09:25 IST

New Delhi [India], July 9 (ANI): As the

The Indian EXPRESS

Favipiravir, Umifenovir drugs now in clinical trials to treat Covid-19

Along with Favipiravir are other drugs – ACQH, Umifenovir (Arbidol) and Mycobacterium W (anti-leprosy drug), which are now in clinical trials.

Written By Anuradha Mascarenhas | Pune |

Updated: June 19, 2020 9:26:36 pm

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News / India /

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NBRI's Covid testing lab inaugurated

Lucknow (PNS): Newly developed 'Advance Virology Lab', where Covid-19 testing facility has been established by National Botanical Research Institute, was inaugurated on Saturday by Chief Secretary RK Tiwari and KGMU Vice-Chancellor Dr MLB Bhatt.

NBRI director SK Barik said the facility has been developed under the guidelines MR, WHO and ry of Health and Pradesh," Barik said. He mentioned that as requested by the higher authorities of Uttar Pradesh, the NBRI DG took up the initiative of developing the testing facility in the wake of coronavirus pandemic. A team of scientists and researchers from CIMAP will also join the NBRI team for the testing of samples. CIMAP director PK Trivedi was also present on the occasion.

RK Tiwari congratulated

20:26 IIT Alumni Council, CSIR-IG... thehindubusinessline.com TWEET

BusinessLine

News

IIT Alumni Council, CSIR-IGIB to jointly conduct Covid-19 research, patient data analysis

Rajesh Kurup Updated on July 08, 2020

20:15 सुर्खियां संक्षेप राज्य जिला शहर भारत सितारा

CDRI को मिली एंटी वायरल ड्रग के क्लिनिकल ट्रायल की मंजूरी

Published :18 Jun 2020 , 10:55 pm IST

एक तरफ जहां कोविड-19 महामारी के खिलाफ पूरा विश्व जंग लड़ रहा है तो वहीं इससे बचाव के लिए भी वैश्विक स्तर पर वैक्सीन की खोज में हर छोटा बड़ा देश लगा हुआ है. भारत भी इस मुहिम में जी जान से लगा हुआ है. CSIR की प्रयोगशाला केंद्रीय औषधि अनुसंधान संस्थान को एक एंटी वायरल ड्रग के क्लिनिकल ट्रायल की मंजूरी मिली है.

लखनऊः सीएसआईआर की प्रयोगशाला केंद्रीय औषधि अनुसंधान संस्थान को एक एंटी वायरल ड्रग के क्लिनिकल ट्रायल की मंजूरी मिल चुकी है. यह ड्रग भारत में अब तक इस्तेमाल नहीं किया जाता है. ऐसे में इसके विभिन्न आयामों पर ईटीवी भारत ने सेंट्रल ड्रग रिसर्च इंस्टीट्यूट के डायरेक्टर प्रोफेसर तपस कुंडू से खास बातचीत की.

20:20 Coronavirus | CSIR-CCMB ... thehindu.com TWEET

THE HINDU

Coronavirus | CSIR-CCMB awaits ICMR approval to scale up COVID-19 testing three-fold with dry swabs

A woman reacts as a healthcare worker takes a swab from her to test for COVID-19 in Kolkata on July 10, 2020. | Photo Credit: REUTERS

V. Geetanath

HYDERABAD 14 JULY 2020 17:13 IST

UPDATED: 14 JULY 2020 18:52 IST

20:24

Masks Should Be Compulsory For All: CSIR Director General After WHO Confirms 'Emerging Evidence' Of Airborne COVID-19 Spread

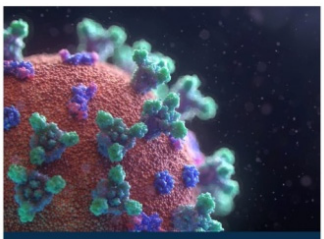
Dr Shekhar Mande, Director General at Council of Scientific and Industrial Research said that there is 'emerging evidence' in the world that when we speak, we emit aerosols - less than five microns in size which remain suspended in the air

Coronavirus Outbreak, News | ANI | July 09, 2020 7:44 PM | 0

CSIR Media Coverage

19 JUNE 2020 NEWS

CDRI gets approval for Phase III trial of Umifenovir to treat Covid-19



In this Phase III trial, CDRI will test the efficacy, safety and tolerability of Umifenovir in treating Covid-19. Credit: Fusion Medical Animation on Unsplash.

Sign up here for GlobalData's free bi-weekly Covid-19 report on the latest information your industry needs to

कारगर होगी कोरोना को हराने में देसी उमीफेनोविर

जासं, लखनऊ : राजधानी स्थित केंद्रीय औषधि अनुसंधान संस्थान (सीडीआरआइ) के वैज्ञानिकों के शोध प्रयासों से कोविड-19 के खिलाफ जारी जंग के बीच देश को जल्द बड़ी राहत मिलने वाली है। संस्थान रिकॉर्ड समय में चीन और रूस में प्रचलित वायरल की उमीफेनोविर दवा के निर्माण की सस्ती व देसी टेक्नोलॉजी बाजार में सितंबर तक उतार देगा। यह दवा कोरोना वायरस की रोकथाम और उसके उपचार के लिए सुरक्षित तथा असरदार होने के साथ ही बेहद सस्ती है। माना जा रहा है कि इस गोली की कीमत लगभग 10 रुपये के आसपास होगी।

संस्थान के निदेशक डॉ. तपस कुंडू इस उपलब्धि से बेहद उत्साहित हैं। उन्होंने बताया कि चूंकि चीन और रूस में दवा पहले से प्रचलित है। इसलिए भारत में सीधे फेज-3 के क्लीनिकल ट्रायल जुलाई से शुरू कर दिए जाएंगे। इसके लिए केजीएमयू, डॉ.राम मनोहर लोहिया संस्थान एवं एरा मेडिकल कॉलेज को चुना गया है। दवा निर्माण व विपणन के लिए संस्थान ने विकसित

दवा की खासियत

यह दवा मानव कोशिकाओं में कोरोना वायरस के प्रवेश को रोकने के साथ कोविड-19 के खिलाफ प्रतिरक्षा प्रणाली (इम्यून सिस्टम) को सक्रिय करने में अत्यंत कारगर है। संस्थान ने प्रभावी दवा की खोज के लिए अन्य रोगों में प्रयोग किए जा रहे 130 मॉलिक्यूलों को चिह्नित किया। इनमें से 30 मॉलिक्यूल प्रभावी पाए गए और इनमें से कोविड-19 के खिलाफ उमीफेनोविर सबसे अधिक असरदार मिली। इस दवा का उपयोग इन्फ्लूएंजा के इलाज के लिए रूस और चीन में मुख्य रूप से किया जाता है। वहां भी यह कोविड-19 में बेहद [illegible] गई थी। इसके बाद [illegible] उमीफेनोविर की देसी

THE HINDU

Coronavirus | Hyderabad-based pharma firm ties up with CSIR to take up COVID-related drug trials

For representational purpose only. | Photo Credit: AP

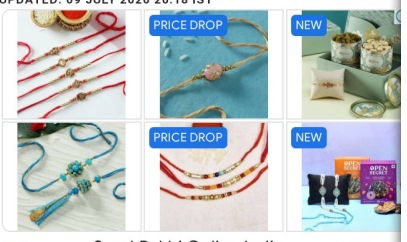
V. Geetanath

THE HINDU

48 acres allotted to CSIR-CCMB research centre

Special Correspondent

HYDERABAD 09 JULY 2020 20:18 IST
UPDATED: 09 JULY 2020 20:18 IST



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Orders issued delineating the land at Bommaipa of Bhongir mandal

CSIR-Centre for Cellular and Molecular Biology (CCMB)'s long-awaited dream of having its own dedicated innovation centre to expand its research activities is on the verge of coming true with the government issuing orders delineating

20:19 78%
News › India

Airborne or not: CSIR to conduct study on transmission of Covid-19

Ayushman Kumar | Correspondent
Updated Jul 15, 2020 | 21:49 IST

After WHO formally acknowledged the possibility of Covid spread in closed air space, CSIR in India is set to conduct a study to ascertain if the transmission is possible via droplets from one place to another.

Representational Image

08:10 72%
Home >>News

Masks Should Be Compulsory For All: CSIR Director General After WHO Confirms 'Emerging Evidence' Of Airborne COVID-19 Spread

Dr Shekhar Mande, Director General at Council of Scientific and Industrial Research said that there is 'emerging evidence' in the world that when we speak, we emit aerosols - less than five microns in size which remain suspended in the air

Coronavirus Outbreak, News | ANI | July 09, 2020 7:44 PM | 0

Social distancing along with wearing masks, still remains to be the biggest tools of precautions against coronavirus: Dr Shekhar Mande

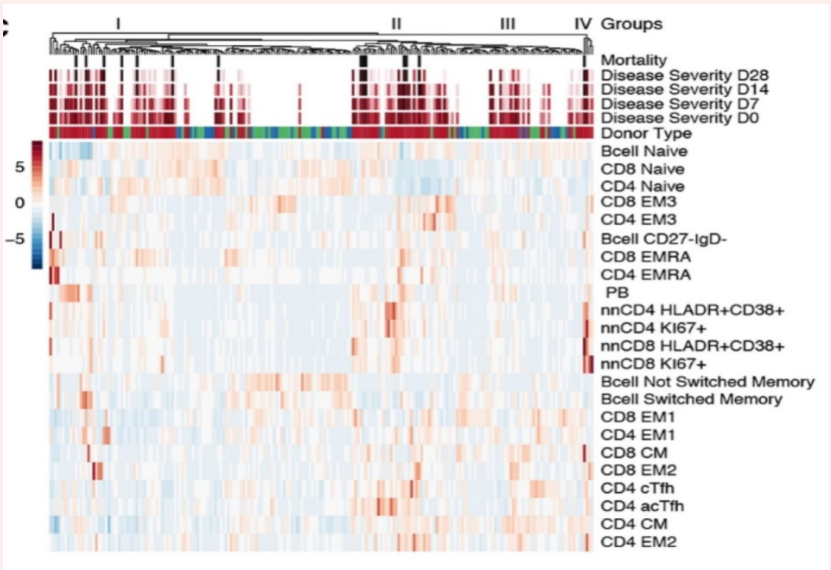
CORONA RESEARCH SNAPSHOT

Distinct immunotypes are linked to severity of infection or improved health in COVID-19 patients

Details of exact mechanisms with which our immune system responds to the COVID-19 infection in different individuals are poorly known to scientists. Varying observations regarding immune response in patients of COVID-19 are being reported on an almost daily basis. Presence of antibodies in severe COVID-19 ICU patients also raised questions why patients with antibody response are unable to control the disease? In a rigorous deep immune profiling study, evidence has been found that three immunotypes are responsible for the hospitalized patients' poor clinical trajectories or improved health. T-cell and B-cell response in the COVID-19 infected patients is poorly understood yet.

Scientists at the University of Pennsylvania, USA and their collaborators have analysed samples of 125 COVID-19 patients and compared them with healthy individuals using high dimensional cytometry and deep immune profiling. In this detailed study, integration analysis of approximately 200 immune and 50 clinical features revealed the activation of T-cells and B-cells in a proportion of patients. A group of patients had shown T-cell activation as characteristics of acute viral infection. Plasmablast responses with more than three times of circulating B-cells has also been shown. The scientists are suggesting that the understanding of these immunotypes may lead to design of new therapies and vaccine candidates to fight against COVID-19. The study is published in *Science* after peer review.

Source: *Science;* DOI: 10.1126/science.abc8511; 2020



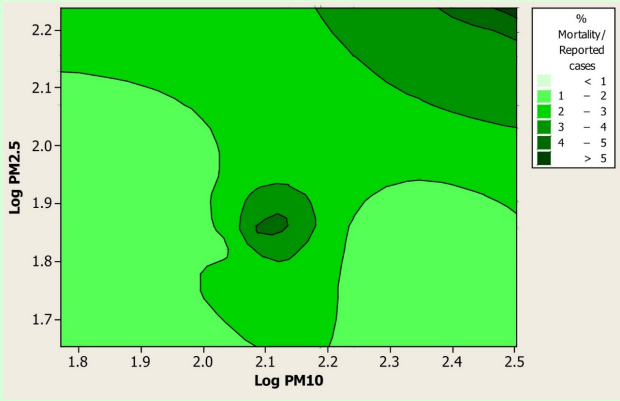
Heatmap of indicated immune parameters by row, donor type, disease severity, and mortality indicated across top

(Courtesy: Mathew *et al. Science; 2020*)

Air pollution poses increased risk of COVID-19 infection in Asian cities

Air pollution has been shown to be a prominent cause for several respiratory complications in human. The particulate matter suspended in the air can also act as a platform for SARS-CoV-2 particles to settle on. Thus, air pollution can pose a higher risk in the case of COVID-19 airborne transmission too. Scientists at the CSIR-National Environmental Engineering Research Institute (NEERI), Nagpur have estimated an increased risk of COVID-19 transmission due to air pollution by establishing the linkage between mortality rates in infected cases and air pollution levels (especially particulate matter with less than 2.5 microns size and 10 micron size) in Asian cities. The researchers analysed data related to nine Asian cities including Delhi (India), Hebei (China), Lahore (Pakistan) and Jakarta (Indonesia). The analysis of the data suggests a positive correlation between the past exposures of high level PM 2.5 and high mortality rates in different cities. The study is published in *Environment, Development and Sustainability* (Springer) journal after peer review.

Source: Bherwani *et al.*; *Environment, Development and Sustainability;* DOI: 0.1007/s10668-020-00878-9



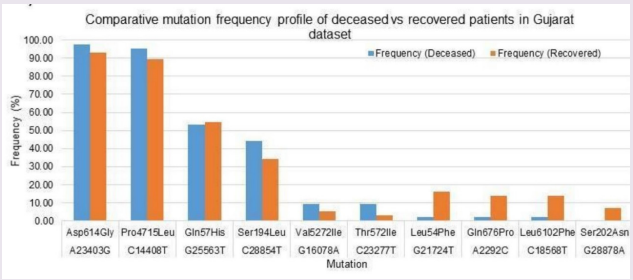
Contour plot for the percentage of mortality per unit reported cases with respect to PM2.5 and PM10

(Courtesy: Source: Bherwani *et al.; Environment, Development and Sustainability;* 2020)

Researchers analyse SARS-CoV-2 variants in Gujarat to understand disease epidemiology

Scientists at the Gujarat Biotechnology Research Institute (GBRC), DST in Gandhinagar have sequenced and analysed the variants of SARS-CoV-2 virus in Gujarat. The researchers have found 361 SARS-CoV-2 genomes from across Gujarat only. These virus variants were analysed from diseased and recovered patients to understand the pathogenesis of COVID-19. The genome C28854T was found to be significantly associated with the death of patients, which is the deleterious mutation in nucleocaspid (N) genes. The other dangerous gene is G25563T which has a prominent role in viral pathogenesis in patients. Genome sequencing also tells us about the evolution history of the virus. The study is published as preprint in *bioRxiv* and is still under peer review.

Source: Preprint at *bioRxiv*; 2020; DOI:10.1101/2020.07.10.197095



(Courtesy: Joshi *et al.* preprint at *bioRxiv*; 2020; DOI:10.1101/2020.07.10.197095)

More real-time waste management data is needed to fight against COVID-19 pandemic

Lockdowns have restructured waste generation. Several industries that used to generate a huge amount of waste are now closed or running with limited production. The COVID-19 pandemic has increased medical waste several times with masks and gloves being widely used by people as a daily routine. The type of waste that used to be generated by the industries and institutions has been highly restructured during this pandemic. This can't be correctly known without systematic modelling of waste management data in the individual countries and worldwide. Dr. C. Naughton from University of California, USA has published a perspective article in the journal *Resources, Conservation and Recycling* (Elsevier) to draw attention towards this grave issue. He pointed out that cities like New York, Arizona, Ohio and South Carolina have experienced increases in recycling at their facilities up to 45% in comparison to last year. New York, which is one of the hardest hit by COVID-19, has increased municipal solid waste of 3.3% and organic waste increases up to 13.3%. Online purchasing caused a very high increase in packaging waste globally. It is important to act fast to reduce the waste material globally and for that it needs real time waste management data modelling and systematic planning.

Source: *Resources, Conservation and Recycling* (Elsevier) DOI: 10.1016/j.resconrec.2020.105050

Antibodies developed against SARS-CoV-2 vanish within weeks after infection

(Photo Courtesy: iStock images)

According to one of the most comprehensive studies performed yet, the key antibodies which neutralize the viral infection fall to low levels within a few weeks of COVID-19 infection. Researchers of King's College, London monitored the concentration of neutralizing antibodies against SARS-CoV-2 in 65 infected people for up to 94 days. They found that in most people antibody levels began to fall about a month after symptoms appeared. These findings are raising questions about the durability of vaccines designed to promote the production of neutralizing antibodies. The study is published as preprint in *medRxiv*, which is yet to be peer reviewed.

Source: Preprint at *medRxiv*; http://doi.org/d3s2; 2020

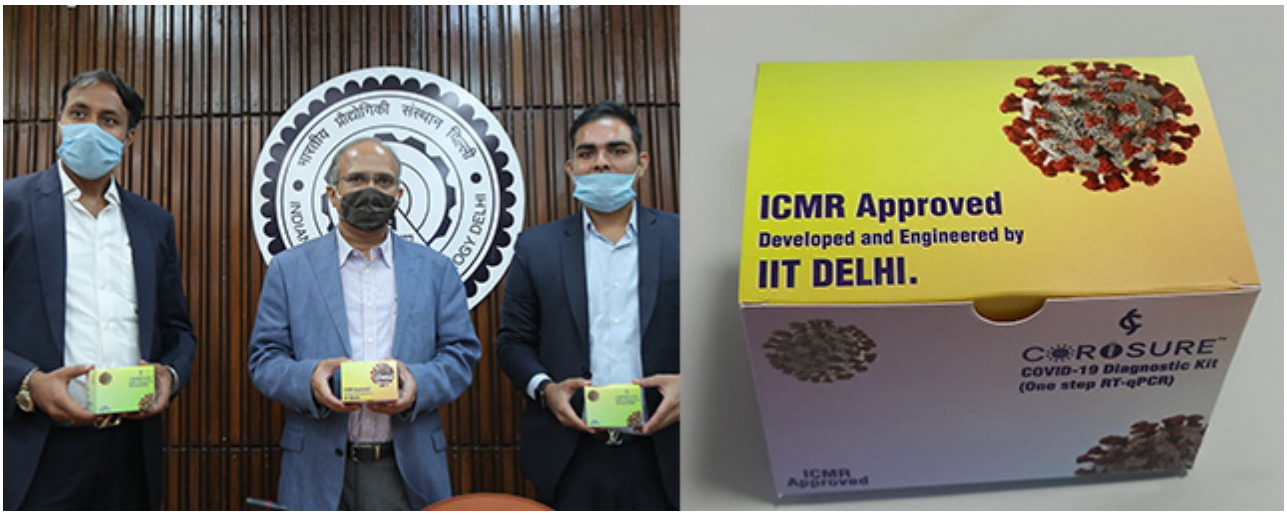
Positive trial results give hope for a vaccine candidate

(Image Credit: iStockphoto.com)

According to preliminary data from phase I safety trials, the leading vaccine candidate being co-developed by Moderna in Cambridge-USA generated an immune response against SARS-CoV-2 but caused a few mild side effects. This vaccine candidate consists of RNA instructions that prompt human cells to make the virus's spike protein, generating an immune response in humans. After the vaccine injections, all participants produced antibodies capable of recognizing the SARS-CoV-2 virus and neutralizing antibodies which can block infection. Phase III trial for testing the vaccine on 30,000 participants will start in July which will test whether the vaccine can prevent COVID-19. The details of the studies have been published in the *New England Journal of Medicine*.

Source: *N. Engl. J. Med.*; DOI: http://doi.org/d3tt; 2020

CORONA INNOVATIONS



COROSURE — World's Most Affordable COVID-19 Diagnostic Kit

IIT-Delhi has developed the world's most affordable RT-PCR based COVID-19 diagnostic kit called Corosure which has been approved by the ICMR and DCGI. The Corosure Kit has been developed indigenously and is much cheaper than other kits. The probe-free diagnostic kit has been manufactured by Delhi NCR-based Newtech Medical Devices.

Source: https://home.iitd.ac.in/news-diagnostic-kit.php

Molecular probes used in COVID-19 test kits

VNIR Biotechnologies Private Limited, a spinoff by Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) has launched an indigenous fluorescence probe and Polymerase Chain Reaction (PCR) mix for Reverse Transcription-Polymerase Chain Reaction (RT-PCR) detection for use as molecular probes in COVID-19 test kits.

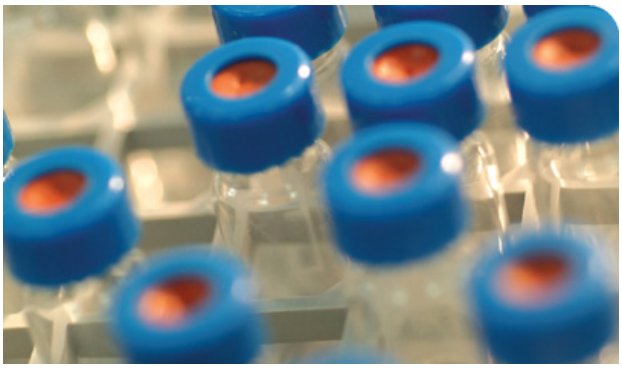
Source: PIB

SHUDH — UV Sanitizing Device

IIT-Kanpur has come up with a Smartphone operated handy ultraviolet disinfection sanitizing product called "SHUDH" which has six UV lights of 15 Watts each that can be individually monitored from a distance. The device is capable of disinfecting a 10x10 square feet room within 15 minutes.

Source: ddnews.gov

"Itolizumab" Receives DCGI Nod



Biocon's breakthrough drug Itolizumab has received DCGI (Drugs Controller General of India's) approval for its use in moderate to severe COVID-19 patients. Itolizumab is the first novel biologic therapy to be approved anywhere in the world for treating patients with moderate to severe COVID-19 complications. Biocon has repurposed Itolizumab, an anti-CD6 IgG1 monoclonal antibody launched in India in 2013 as ALZUMAb® for treating chronic plaque psoriasis, for the treatment of CRS in moderate to severe ARDS patients due to COVID-19.

Source: Biocon, Press Release

'MediCab' — foldable hospital unit

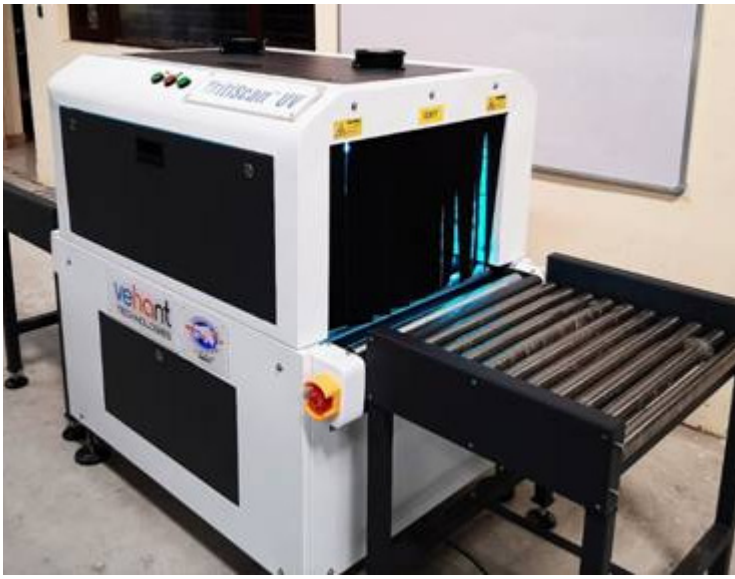
IIT-Madras has developed a portable hospital unit called 'MediCab', which can be installed anywhere within two hours by just four people. 'MediCab' which was launched in the Wayanad district in Kerala, is a decentralized approach to detect, screen, identify, isolate and treat COVID-19 patients in their local communities through these portable microstructures.

Source: The Print

KritiScan® UV baggage disinfection system

To control the spread of infection through baggage, the International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad and Vehant Technologies, Noida have co-developed KritiScan® UV Baggage Disinfection System. The compact UVC conveyor system can efficiently disinfect the baggage passing through the conveyor within a few seconds and is suitable for use in airports, railway and bus stations, hotels, commercial and private establishments for rapid disinfection of baggage.

Source: PIB



Remote support in COVID-19 ICU

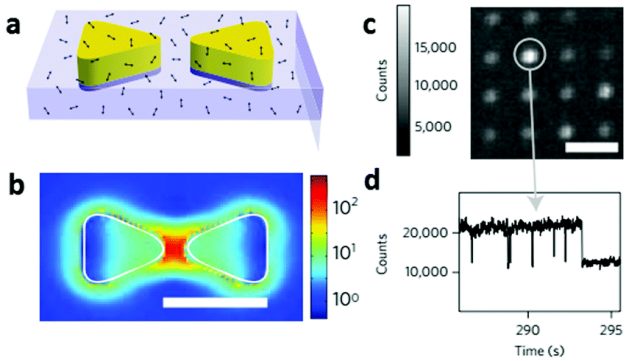
H3D-VisionAir has developed 3D-microscope glasses that offer surgeons head-worn augmented reality by combining 3D-multispectral cameras along with advanced computer analytics and near-eye displays. The technology consists of a headset with a built-in camera that enables somebody else to see what you see and give advice, as well as show data. It works through a wearable PC with a wi-fi link. In the times of coronavirus pandemic, it promises to be a great tool for remote education in 2D or 3D.

The researchers have also developed a similar product named monocular AR headset. This has a camera that works with a smartphone app. This is called a smart-eye technology and it could offer remote support for doctors and nursing staff in ICUs during the COVID-19 crisis. Medical staff could wear the headset with a built-in camera, capture video stream in ICU and contact a medical specialist through a smartphone so that the specialist can give ICU staff advice from his/her office or home.

Source: https://www.computerworld.com

Detecting Coronavirus in the air

As per the WHO report, aerosols may contain the coronavirus. The diameter of this virus ranges from 60 nm to 140 nm. With conventional optical techniques, observation of this size range is not possible due to the spatial resolution limit imposed by diffraction. But recent breakthroughs in high-resolution imaging enable resolving fine optical details beyond this limit and emerging optical nanoscopy techniques could be significant in the battle against COVID-19. They may enable quick and accurate COVID-19 diagnostics.



The ATTRACT project TEFPLASNOM focuses on the innovative technique called Augmenting Tip-enhanced Fluorescence Nanoscopy (TEF). This is a technique that exploits the interaction of light and a nano-sized tip to provide resolutions at the scale of the tip's apex. Combining TEF with scattering-type scanning near-field optical microscopy and tip-enhanced Raman spectroscopy helps in real-time detection and identification of the novel coronavirus. These techniques are very specific and able to extract morphological and physico-chemical features in seconds. The resolving power of these nanoscopy techniques, potentially capable of subnanometer resolutions, could also help examine important properties of the SARS-CoV-2 that are not well understood.

Source: https://attract-eu.com

Detecting SARS-CoV-2 in five minutes

Abbott, a global healthcare leader, has received emergency use authorization (EUA) from the U.S. Food and Drug Administration (FDA) for the fastest available molecular point-of-care test for the detection of novel coronavirus (SARS-CoV-2). This testing technology delivers positive results in as little as 5 minutes and negative results in 13 minutes.

The test will run on the company's ID NOW™ platform. It will provide rapid results in a wide range of healthcare settings such as physicians' offices, urgent care clinics and hospital emergency departments. The ID NOW platform is small, portable, lightweight (6.6 pounds) and uses molecular technology, which is valued by clinicians and the scientific community for its high scale of accuracy. ID NOW is already the most widely available molecular point-of-care testing platform in the U.S. today.

Source: https://www.abbott.com

Tool to support in-vitro intestinal research during COVID-19

UK-based iPSC (induced pluripotent stem cells) Disease Modelling Company DefiniGEN has identified iPSC-derived intestinal organoids that could be used to help structure in vitro (in a lab) studies of the biology of SARS-CoV-2 infection across cohorts of multiple patients.

SARS-CoV-2 primarily targets the respiratory system. Studies have shown that it also infects and multiplies within the intestinal epithelium. IPSC-derived organoids exhibit characteristics that closely mimic the in vivo (in the body of an organism) intestinal epithelium, making them a valuable surrogate model for studying the virus. DefiniGENiPSC-derived intestinal organoids display a polarized epithelium and harbor a mixture of cell types normally present in the primary intestinal epithelium barrier in vivo, including goblet cells, Paneth cells, LRG5+ stem cells, enterocytes and enteroendocrine cells. The organoids polarise, form crypt structures and grow villi at the apical surface and are shown to secrete mucus in a similar manner to primary human gut tissue.

DefiniGEN's differentiation platform is optimized to enable successful generation of intestinal organoids from a diverse range of patients. Patient skin fibroblasts or PBMCs can first be reprogrammed to iPSC and then differentiated to produce mature intestinal organoids which carry the original patient genetics and so manifest a gut model specific to that donor.

Source: https://www.clinlabint.com

COVID-19

What is the difference between isolation and quarantine?

Isolation and quarantine help protect the public by preventing exposure to people who have or may have a **contagious disease.**

- **Isolation** separates sick people with a contagious disease from people who are not sick.
- **Quarantine** separates and restricts the movement of people who were exposed to a contagious disease to see if they become sick.

ISOLATION

Isolation is for people who are already sick.

Isolation separates and restricts the movement of sick people so they can't spread disease to healthy people.

Isolation is a routine procedure in hospitals and healthcare facilities.

Isolation is usually voluntary, but in a public health emergency, officials have the authority to isolate people who are sick.

QUARANTINE

Quarantine is for people who are not sick, but may have been exposed.

Quarantined people may or may not become sick.

Quarantined people may stay at home or another location so they don't spread disease to healthy people.

If you are quarantined and you become ill, you can seek medical treatment from a healthcare provider.

Quarantine can be voluntary, but in a public health emergency, officials have the authority to quarantine people who have been exposed to an infectious disease.

dhec Healthy People. Healthy Communities.

Visit scdhec.gov/COVID19 for more information.

CR-012593 3/20

Ministry of Health & Family Welfare
Government of India

fssai | Eat Right India सही भोजन, बेहतर जीवन. | Help us to help you

Once you reach home after shopping, follow these steps:

1.  Leave your shoes outside before entering the house.
2.  Keep shopping bags in an isolated or segregated place.
3.  Wash your hands with soap and clean potable water. If possible, keep a sanitizer or soap and water at the entrance.
4.  Change clothes on reaching home. Put the used clothes for washing in a separate bin.
5.  Afterwards, remove the food from the shopping bags and keep it away.
6.  Do not store/leave food outside of the house, in cars or garages as it could lead to food safety issues like temperature abuse and pest exposure.
7.  Sanitize/disinfect food packages by wiping them with an alcohol based solution or soap and clean water/
8.  Clean the sink and platform where the food items are washed. Do not let the drip fall on the floor, else wipe it immediately.

To know more, visit : - **www.fssai.gov.in/cms/coronavirus.php**

#IndiaFightsCorona #COVID19 #HelpUsToHelpYou

सत्यमेव जयते
MINISTRY OF HEALTH & FAMILY WELFARE
GOVERNMENT OF INDIA

National Institute of Mental Health and Neuro Sciences
(Institute of National Importance)

Taking care of Mental Health of Children during COVID-19

The outbreak of COVID -19 and its consequences can make children anxious and stressed. Take care of their mental health with these simple strategies.

PROVIDE ASSURANCE WHENEVER NEEDED

It is important to reassure your children. Listen to their concerns and try answering their queries related to the outbreak. Spend quality time with them and give them the attention they need. Reading them stories to put them to sleep will make them feel loved.

KEEP THEM IN CONTACT WITH THEIR FRIENDS

Physical distancing from friends can be a cause of distress for the children. Encourage them to talk to their friends, cousins and loved ones by calling them up or through video calls. You can also involve your children and their friends in some fun activities which they can do together by staying connected virtually.

MANAGE YOUR CHILD'S ANXIETY

It is normal for your child to become anxious at this time. Look out for the emotional cues in your child and talk to them regarding the same. Avoid being judgemental when they express their feelings. Do not avoid their questions related to COVID or speak to them harshly. This can increase their fear and anxiety. Instead, make them understand that things will be better if we take proper care. Remember that this is a new situation for your children and do not get irritated with them,

GIVE THEM CLEAR INFORMATION

It is not advisable to provide children with a lot of reports and news related to the outbreak. However it is important to give them correct information as to what is happening around the world. Give them proper facts in a way that they can understand so that they do not remain confused, as this may increase their anxiety. You can make the explanations creative through pictures and drawings.

ENGAGE THEM IN INDOOR ACTIVITIES

During this time, children may get easily bored. Involve them in indoor games to cut down the boredom. You can also make their learning fun by giving them puzzles to solve and teaching them crafts. Encourage them to pick up a hobby. Involve the children in some stretching exercises, yoga or dancing which they will enjoy. You can also involve them in doing simple household activities to keep them engaged

MAKE A ROUTINE OF LEARING AT HOME

At this time, schools are closed, however this should not stop the children from learning. Ensure that they have a regular habit of studying by giving them small assignments related to their lessons. Check the assignments to understand their progress

Above all, take good care of your children's health. Ensure that they practise hand washing and cover their mouth and nose with bent elbow when they cough or sneeze. Watch out for any symptoms of COVID-19 and reach out to the doctor if necessary. Have a plan in advance in case your child falls sick. Ensure that the children eat healthy food and get good sleep and rest.

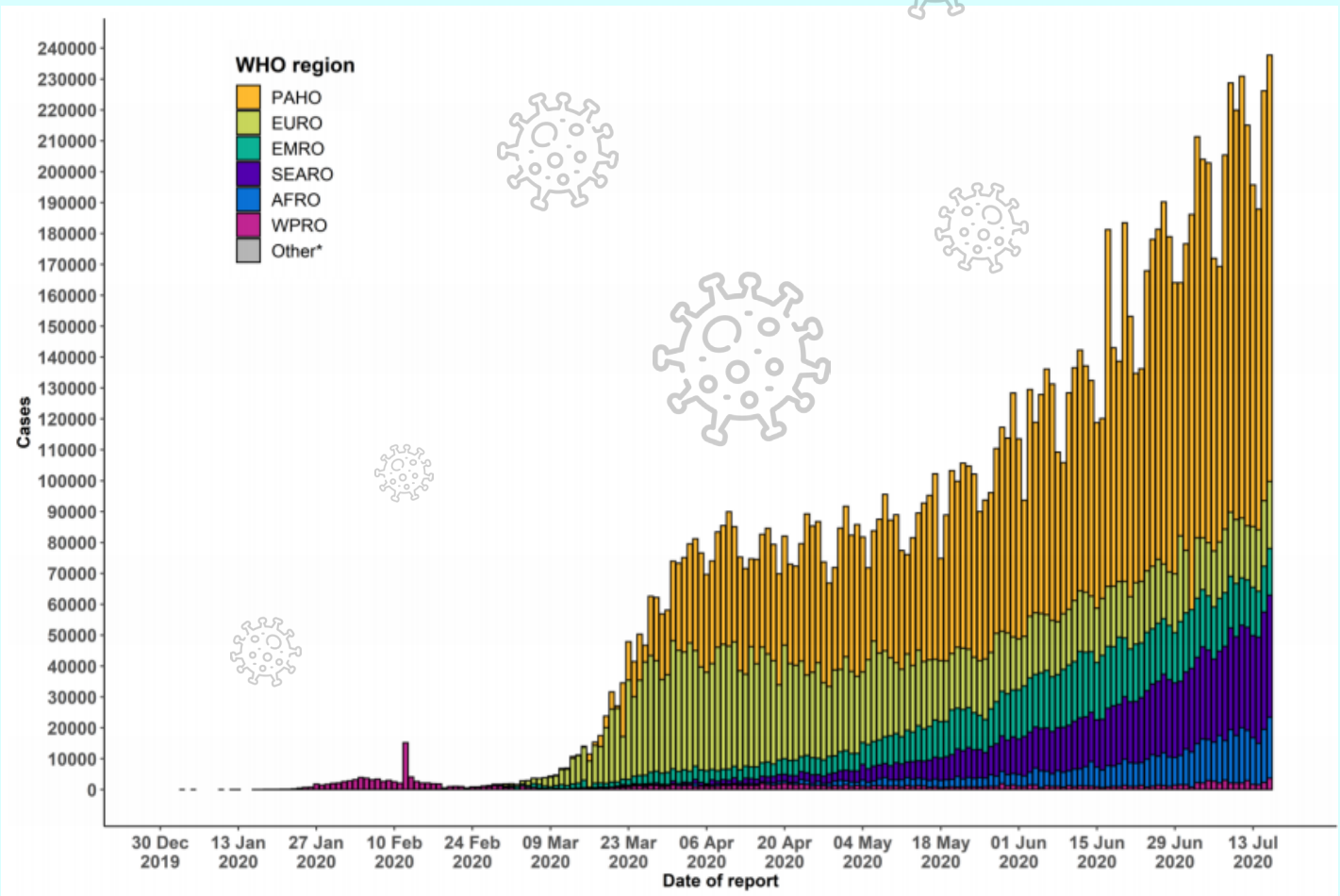
IN CASE YOU NEED ANY HELP
Please contact COVID -19 Psycho social toll free helpline at 080-46110007
or consult your doctor or a mental health professional

COVID-19 Dashboard

Global COVID-19 Cases and Deaths

(Data as of 17 July 2020)

	Worldwide
Total Confirmed Cases	59361613
New Cases	237743
Total Death	585727
Total New Death	5682



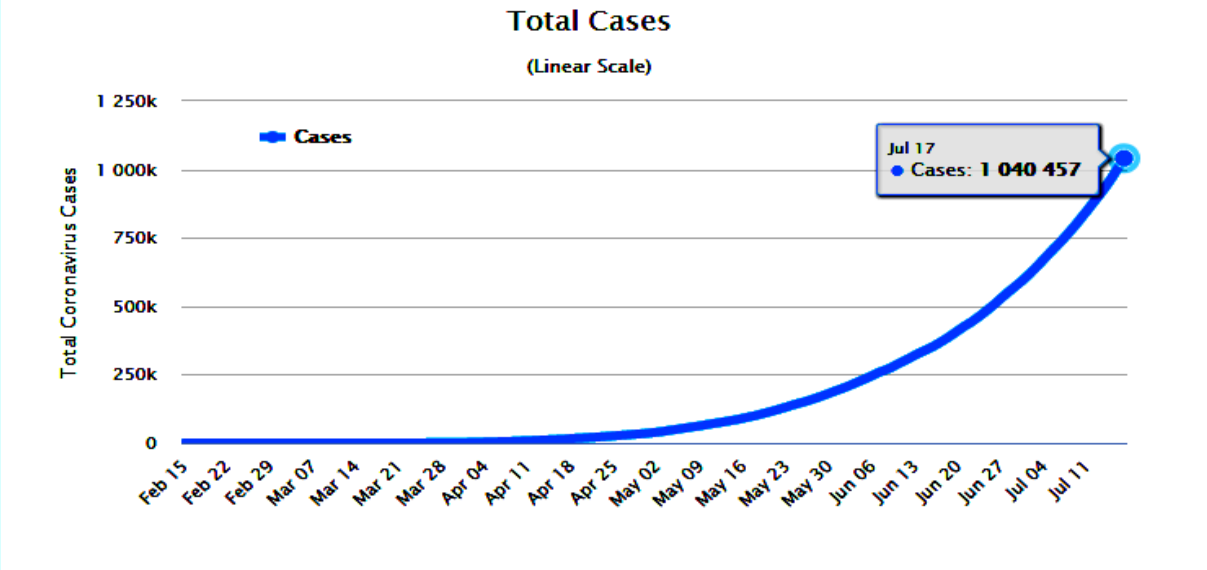
Graph
INDIA

(Data as of 18 July 2020)

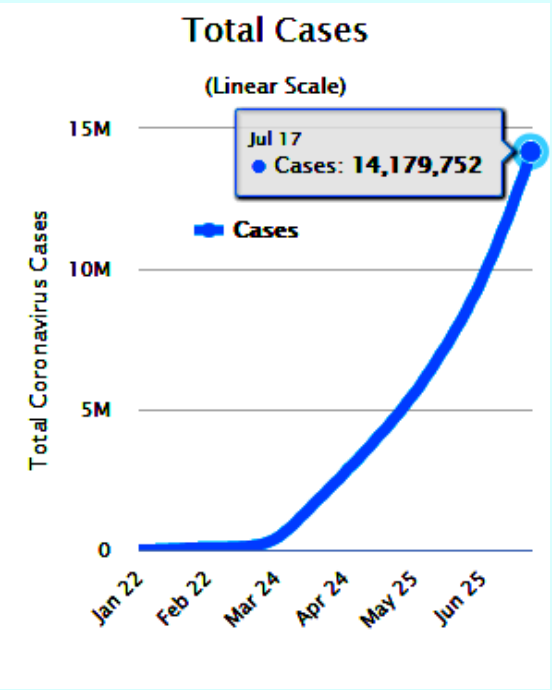
3,58,692	6,53,750	26,273	1
Active Cases	Cured / Discharged	Deaths	Migrated

Source: www.mygov.in

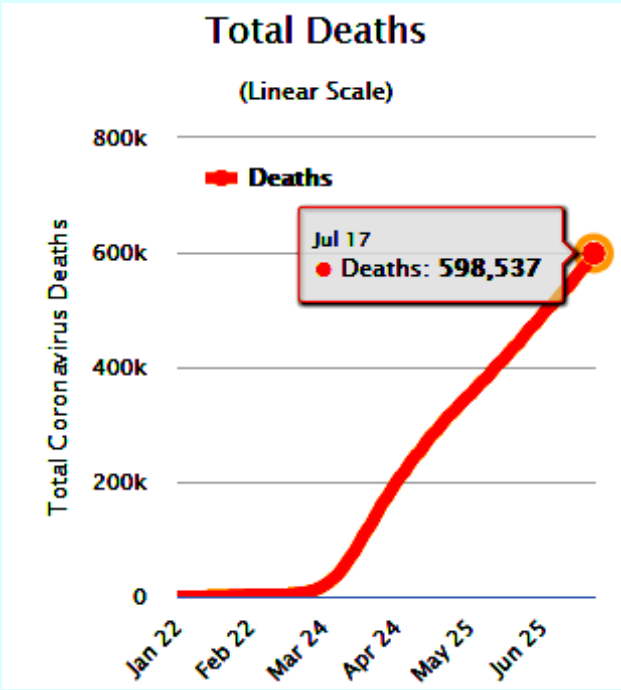
Total New Cases in India



Daily New Cases



Daily New Deaths



CORONA Q&A

Can a COVID-19 recovered patient get infected again?

Yes. According to recent findings published in *Nature Medicine* journal, it has been observed that re-infection of COVID-19 can occur after 2-3 months of the previous infection. Till now, there was a belief that people once recovered from COVID-19 would become immune for their life, but new studies are suggesting otherwise. When an individual gets infected with COVID-19, the immune system develops immune proteins to fight against the virus. These immune proteins are called antibodies. It has been found that the number of antibodies in recovered patients starts decreasing after 2-3 months of the COVID-19 infection. It leaves the individual vulnerable to reinfection after a certain period.

(Source: *Nature Medicine*; June 2020)

Who are COVID-19 super-spreaders?

Although there is no defined specific number of infections an individual must cause to be called a super-spreader, in general, COVID-19 super-spreaders are those contagious individuals who can cause infections to at least two or three individuals. Researchers are trying to define the exact number. Several new studies are showing that COVID-19 infection follows the '*80:20 Pareto Principle*' (Named after Italian Economist Vilfredo Pareto). As per the *80:20 Pareto Principle,* 80% of the new COVID-19 infections are caused by fewer than 20% of the carriers. There have been a number of cases where the infected person takes good care and doesn't infect anyone else. On the other hand, there are spreaders who spread the disease aggressively. A few days back in a wedding, the infected groom transmitted COVID-19 to 96 other individuals, becoming a super-spreader.

Can change in weather affect the spread of COVID-19 infection?

Ever since the COVID-19 pandemic broke out, there have been many assumptions related to its potency and survival in changing weather and temperature. During the initial period of infection, it was believed that its effect would be reduced in summers with increasing temperature, however, all these assumptions became baseless with time as the deadly virus has been spreading all over rapidly. Harvard University researchers assembled one of the largest datasets integrating COVID-19 infections and weather and found a negative association between temperature, humidity and transmission of the virus (https://doi.org/10.1101/2020.05.05.20092627).

Is there a possibility of a resurgence of COVID-19 in the winter season?

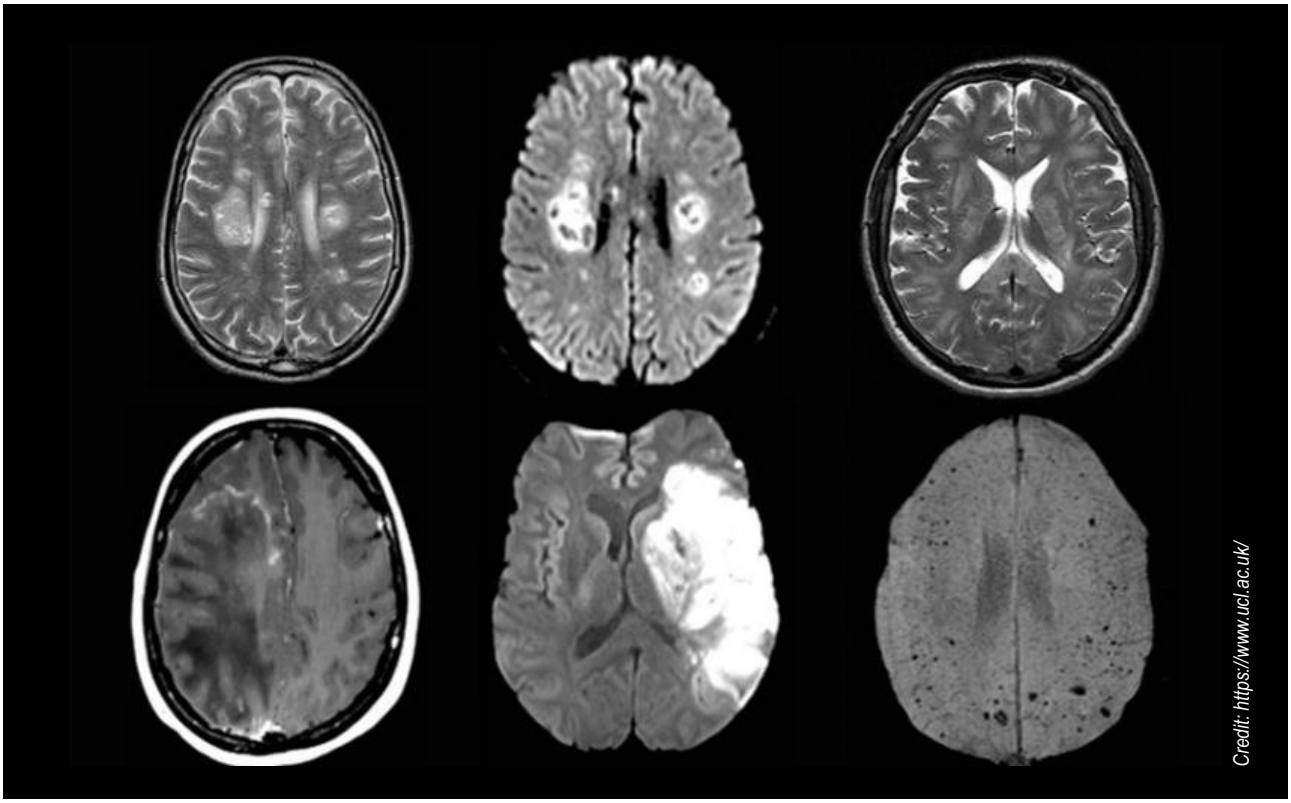
A study (https://doi.org/10.1016/j.puhe.2020.05.065) conducted by researchers from the Banaras Hindu University and Central University of Rajasthan found that there can be an increased spread of COVID-19 infection in winters. To understand the link between environmental temperature and COVID-19 cases, the average temperature and various COVID-19 cases from different countries were collected, compared and analyzed. The study concluded that the number of coronavirus cases was comparatively higher in colder countries than in warmer countries thereby concluding that cold environment may be an additional risk factor for COVID-19 cases.

Can coronavirus infection lead to serious brain disorders?

COVID-19 patients are experiencing a variety of neurological effects ranging in severity from confusion to loss of taste and smell to severe strokes. British-based neurologists have warned about serious brain damages and published the details of more than forty COVID-19 patients from the UK in the journal *Brain* (https://doi.org/10.1093/brain/awaa240). The team investigated the symptoms of the COVID-19 patients and found that many patients with inflammation were diagnosed with Acute Disseminated Encephalomyelitis (ADEM), which is a rare immune-mediated inflammation affecting the brain and spinal cord. According to the study, “SARS-CoV-2 infection is associated with a wide spectrum of neurological syndromes affecting the whole neuraxis, including the cerebral vasculature and, in some cases, responding to immunotherapies. The high incidence of acute disseminated encephalomyelitis, particularly with the haemorrhagic change, is striking.”

As per the official statement (https://www.ucl.ac.uk/news/2020/jul/delirium-rare-brain-inflammation-and-stroke-linked-covid-19) on UCL website, joint first author Dr Rachel Brown (UCL Queen Square Institute of Neurology and UCL Infection & Immunity) said, "Our study advances understanding of the different ways in which COVID-19 can affect the brain, which will be paramount in the collective effort to support and manage patients in their treatment and recovery.”

In an article titled “Opinion: How Coronavirus Affects the Brain” (https://www.ucl.ac.uk/news/2020/jul/opinion-how-coronavirus-affects-brain), Associate Professor Dr Michael Zandi (UCL Queen Square Institute of Neurology) described the following four main effects of COVID-19 on the brain:



- A confused state (known as delirium or encephalopathy), sometimes with psychosis and memory disturbance.
- Inflammation of the brain (known as encephalitis). This includes a form showing inflammatory lesions – acute disseminated encephalomyelitis (ADEM) – together with the effects of low oxygen in the brain.
- Blood clots, leading to stroke (including in younger patients).
- Potential damage to the nerves in the body, causing pain and numbness (for example in the form of post-infectious Guillain-Barré syndrome, in which your body's immune system attacks your nerves).

What are the main ways of airborne transmission of viruses?

There are basically three ways of transmission – one is fomite transmission, when someone infected touches a surface and leaves the virus behind. This can be handled with hand hygiene.

The other two types are droplet transmission and aerosol transmission. Droplet transmission occurs when people talk to each other and larger drops that contain the virus travel from one person to the other. These viruses because of their size don't stay up in the air for long periods or distances. Aerosol transmission occurs when tiny droplets of the virus remain airborne after someone with the virus talks, breathes or coughs, and the droplets stay up in the air for longer periods of distances.

In COVID-19, the majority of the droplets are large and do not stay in the air for long or travel far. But in certain unusual situations, especially if we are dealing with a "superspreader," some of the droplets may be small and may be able to stay in the air for longer periods and travel longer distances.

#Healthy@Home

Surface Cleaning

There is much to learn about the novel coronavirus (SARS-CoV-2) that causes coronavirus disease 2019 (COVID-19). Based on what is currently known about COVID-19, spread from person-to-person of this virus happens most frequently among close contacts (within about 6 feet). This type of transmission occurs via respiratory droplets. On the other hand, transmission of novel coronavirus to persons from surfaces contaminated with the virus has not been documented. Recent studies indicate that people who are infected but do not have symptoms likely also play a role in the spread of COVID-19.

Transmission of coronavirus occurs much more commonly through respiratory droplets than through objects and surfaces like doorknobs, countertops, keyboards, toys, etc. Current evidence suggests that SARS-CoV-2 may remain viable for hours to days on surfaces made from a variety of materials. Cleaning of visibly dirty surfaces followed by disinfection is a best practice measure for prevention of COVID-19 and other viral respiratory illnesses in households and community settings.

For Hard (Non-porous) Surfaces

- Wear disposable gloves when cleaning and disinfecting surfaces. Gloves should be discarded after each cleaning. If reusable gloves are used, those gloves should be dedicated for cleaning and disinfection of surfaces for COVID-19 and should not be used for other purposes. Consult the manufacturer's instructions for cleaning and disinfection products used. Clean hands immediately after gloves are removed.
- If surfaces are dirty, they should be cleaned using a detergent or soap and water prior to disinfection.

- For disinfection, household disinfectants should be effective.
- Additionally, diluted household bleach solutions (at least 1000ppm sodium hypochlorite, or concentration of 5%–6%) can be used if appropriate for the surface. Follow manufacturer's instructions for application, ensuring a contact time of at least 1 minute, and allowing proper ventilation during and after application.
- Check to ensure the product is not past its expiration date. Never mix household bleach with ammonia or any other cleanser. Unexpired household bleach will be effective against coronaviruses when properly diluted.
- Bleach solutions will be effective for disinfection up to 24 hours. Prepare a bleach solution by mixing- 5 tablespoons (1/3rd cup) bleach per gallon of room temperature water or 4 teaspoons bleach per quart of room temperature water.

For Soft (Porous) Surfaces

- For soft surfaces such as carpeted floor, rugs, and drapes, clean the surface using soap and water or with cleaners appropriate for use on these surfaces.
- Launder items (if possible) according to the manufacturer's instructions. Use the warmest appropriate water setting and dry items completely.
- Disinfect with household disinfectants. Vacuum as usual.

For Electronics

- Consider putting a wipeable cover on electronics.
- Follow manufacturer's instructions for cleaning and disinfecting.
- If no guidance, use alcohol-based wipes or sprays containing at least 70% alcohol. Dry surface thoroughly.

www.cdc.gov

FACT CHECK

COVID-19 MYTH BUSTERS

MYTH ✗

FACT ✓

You can avoid wearing PPE if you need to do something very quick

It doesn't matter how quick you can get done with a specific task. You must always wear your PPE as long as you work in a hazardous area where your health and safety are at risk. Accidents happen all the time and don't have a time limit. It only takes a second for something to go wrong and an accident to occur.

www.support.ce-check.eu

You'll get coronavirus automatically from someone released from quarantine

You won't get COVID-19 automatically from someone who's just been released from quarantine, because that person didn't develop COVID-19. People who've been exposed to coronavirus but haven't developed COVID-19 may be placed in a 14-day quarantine. It's the longest amount of time it takes for someone to develop COVID-19 after being exposed to it. If someone's released from quarantine, it means they didn't develop COVID-19 during quarantine, so they're not considered a risk for spreading coronavirus.

www.adventhealth.com

You should wash your fruits and vegetables in water that is mixed with bleach, soap or vinegar

None of these ideas are scientifically proven methods of removing coronavirus from produce. Bleach in particular is dangerous to use for washing food – even in a highly diluted solution also you should not wash fruits or vegetables with detergents or soap. These products could be ingested and could cause mild stomach irritation with nausea, vomiting, diarrhea or abdominal pain.

www.coronavirus.uwhealth.org

MYTH ✗

You're immune now if your antibody test is positive

FACT ✓

If you tested positive for antibodies, it means you may have already had COVID-19 and recovered from it. Whew, it's all over, right?! Not necessarily. According to the CDC, there isn't enough research yet to know if you're immune to the virus once you've already had it. There's a chance you could get infected again. While you may have already had the virus, you'll still need to behave as if you could get it again. Continue to carefully follow your local official's guidelines, including social distancing or staying at home. Frequently wash your hands and be cautious about touching surfaces while in public.

www.eatthis.com

Cases are increasing because testing is increasing

At one point, the idea that COVID-19 case numbers were high because of an increase in testing made intuitive sense, especially in the early stages of the pandemic when people showing up for tests were overwhelmingly showing symptoms of possible infection. More testing meant health officials were aware of more illnesses that would have otherwise gone under the radar. And testing predominately sick and symptomatic people can result in an overestimate of its virulence.

www.eatthis.com

An infected mother cannot breastfeed

According to the WHO, a mother can breastfeed her child and this is because breast milk provides all the protection against any illnesses and powers up the baby's immune system.

www.medlife.com

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