COVID-19 BULLETIN

14 JULY 2020

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Compiled, Designed & Published by
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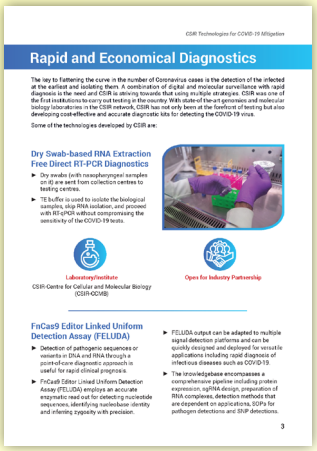
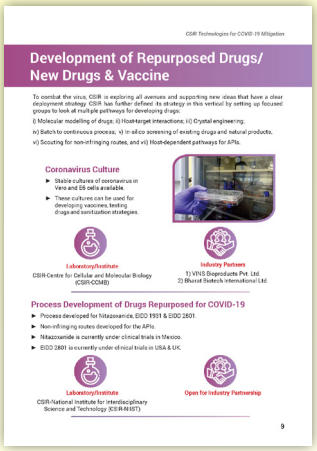
#CSIRFightsCovid19

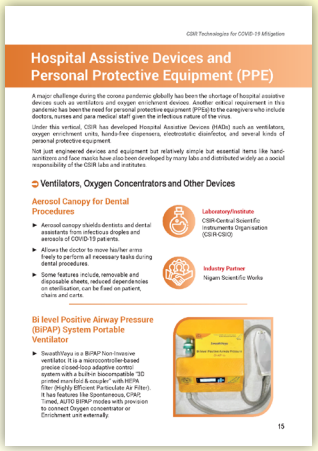
CSIR Brings out Compendium of Technologies for COVID-19 Mitigation

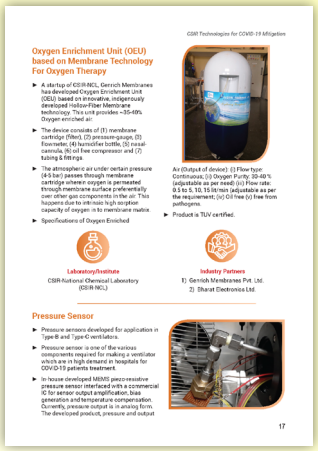
Ever since the Coronavirus pandemic broke out, the Council of Scientific and Industrial Research (CSIR) has mounted a strategic, well-coordinated and integrated approach towards mitigating the Coronavirus outbreak ranging from containing the spread of the virus by providing sanitisation and disinfection 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. CSIR has now brought out a compendium called *CSIR Technologies for COVID-19 Mitigation* encapsulating these efforts over the past almost hundred days.

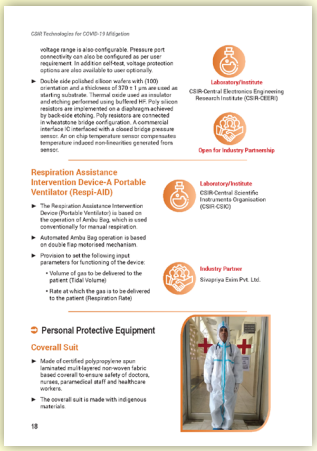
CSIR brought to bear its rich R&D knowledgebase by coming up with rapid testing technologies, cost-effective diagnostic kits, virus culture, genome sequencing and disease surveillance. Besides, its laboratories also came up with almost 100 technologies in as many days of the pandemic. Of these about 60 have been transferred to industries for large-scale manufacture and immediate supply. These ranged from ventilators to protective equipment, indigenous diagnostic kits to clinical trials of repurposed drugs,

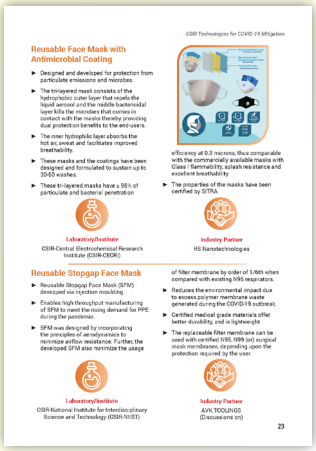


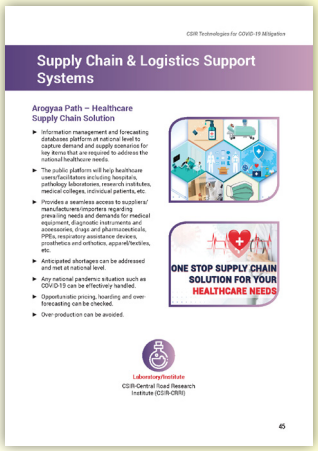


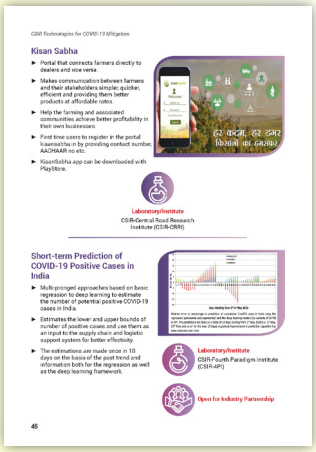


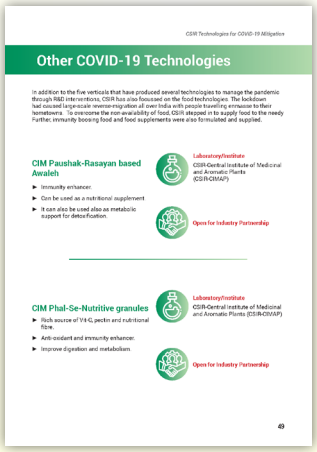












Source: *https://www.csir.res.in/csir-technologies-covid-19-mitigation*

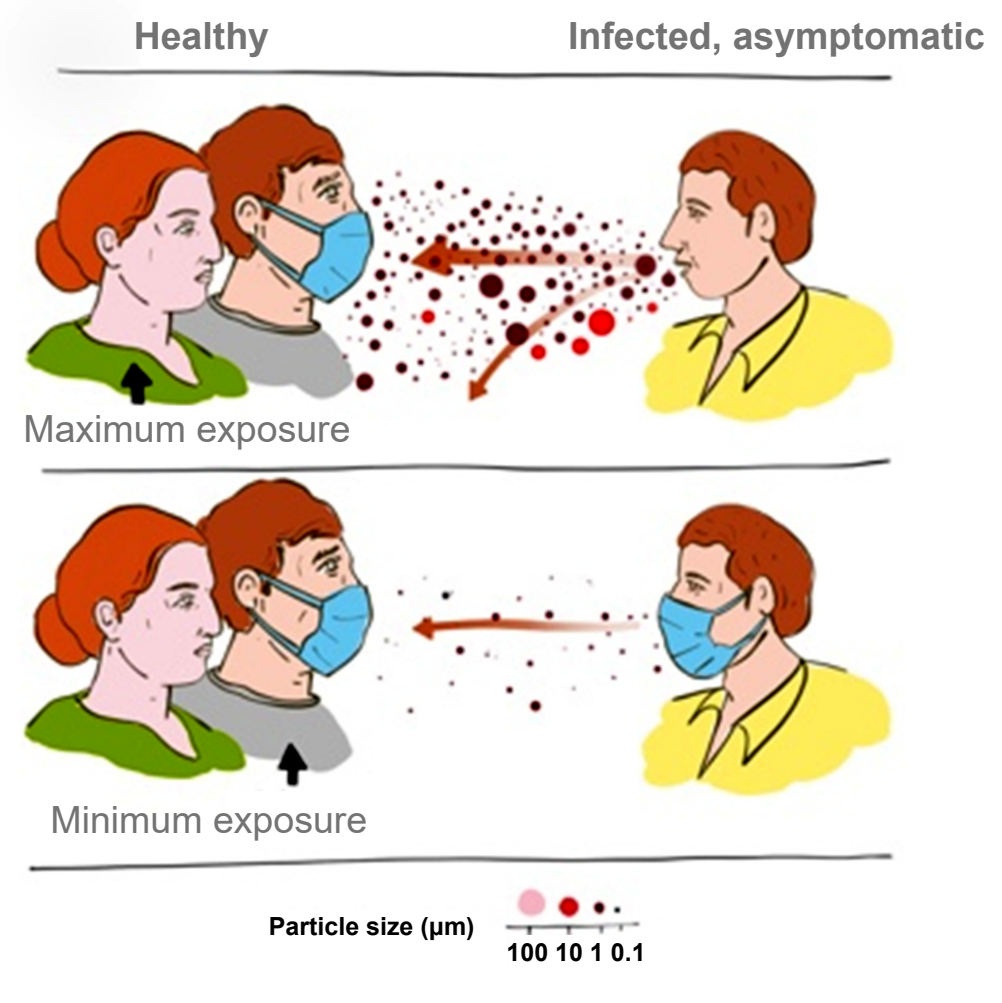
hand sanitizers and masks to disinfection machines and walkways.

With the lockdown effecting reverse migration, CSIR took upon itself to provide tons of nutritious and ready-to-eat immunity-boosting foods to the needy migrants in various parts of the country.

CSIR laboratories are also working on promoting rural employment through various schemes. With the lockdown disrupting normal supply chains throughout the country, CSIR launched the KisanSabha portal and App to support the farmers to get better prices for their produce. It is very heartening that the farming community has received the App very well.

Is SARS-CoV-2 Airborne?

Shekhar C. Mande
Director-General, CSIR
Secretary, DSIR



Among the recent important debates are concerns whether the transmission is airborne or not? It is now accepted that the route of infection is through the respiratory tract. It is believed that the infection can be acquired through inhalation, or even by touch through the mouth or nose, or possibly eyes.

The World Health Organization (WHO) has maintained that the primary spread of infection is through person-to-person contact. This position of the WHO is based on the presumption that when the infected person sneezes or coughs, large droplets are released, which can be inhaled by people in close proximity. The large droplets do not travel distances in air very far and quickly settle down, and hence maintaining at least 1 m distance from the infected individual would appear to avoid the risk of contact. The WHO typically refers this as people-to-people contact.

When people sneeze or cough, they release droplets in the air. These droplets are typically 0.5-12 μm (1 μm is 1000th of a mm) in size[1]. The WHO categorizes the droplets as "respiratory droplets" if their size is 5-10 μm. Smaller than 5 μm droplets are categorized as "droplet nuclei". The reason for such categorization is important to understand in the perspective of how respiratory diseases are spread.

A sneeze can generate approximately 40,000 respiratory droplets, while cough or talking for 5 minutes can generate approximately 3000 droplet nuclei or smaller droplets[1]. When an infected individual exhales these droplets, they potentially have encapsulated within themselves respiratory pathogens such as *Mycobacterium tuberculosis* (the TB-causing bacterium), influenza virus, SARS-CoV-1, etc.

The larger droplets readily settle on surfaces, whereas smaller droplets or the droplet nuclei remain suspended in atmosphere for a longer duration. The larger droplets formed by an infected individual during coughing, sneezing, talking or singing therefore do not travel far. They settle down quickly. However, the smaller droplets can remain suspended in air for a considerable duration.

The earlier social distancing measures and other precautions suggested by WHO and others are based on the understanding that the SARS-CoV-2 transmission is mainly through larger droplets, which settle on surfaces. However, the evidence that normal speech can generate droplets nuclei, which could remain airborne for long period of time, raises concerns of viral transmission in confined spaces.

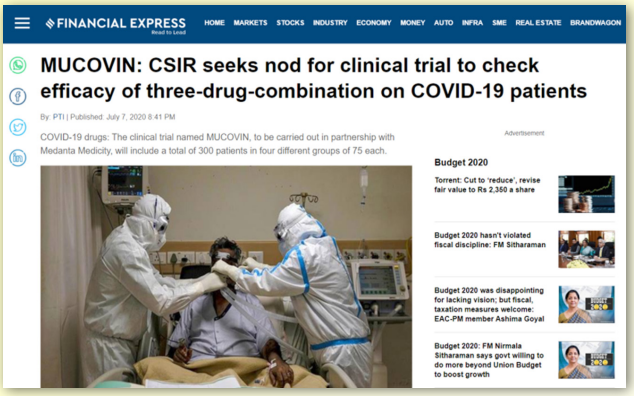
Considering that oral fluid has about a million copies of viruses per millimeter, the probability that a droplet of 10 μm size contains at least one virus particle is approximately 0.37%. This probability drops down to less than 0.01% for droplets of size less than 1 μm[2]. This means that in the estimated 3000 droplet nuclei exhaled by a person while talking for 5 minutes, approximately 10 will contain the encapsulated virus. The number of virion-encapsulated droplets generated during sneezing from an infected person is much larger, say, approximately 100. The droplets dehydrate very quickly in air, especially in the drier climates, making their size even smaller and thereby enhancing their probability to remain suspended in air longer.

With typical nasal breathing, the inhalation of droplets generated by an infected individual leads to their deposition in the respiratory tract, thereby putting the hitherto uninfected person at risk. In open spaces, the small-sized droplets get dissipated in air very quickly, and therefore concentration of virion-encapsulated droplets in the open is extremely low. Moreover, emerging evidence also suggests that the encapsulated virus in such droplets also gets inactivated by sunlight. However, the concentration of virion-encapsulated droplets is likely to be higher in places that are not well ventilated.

All these emerging evidences and arguments suggest that indeed airborne transmission of SARS-CoV-2 is a distinct possibility. So, how does one protect oneself from airborne infections? The answers are intuitively very straightforward – avoid large crowded gatherings, keep enclosed places like workplaces well ventilated, and most importantly, continue wearing masks even in enclosed spaces.

(Adapted from *Is SARS-CoV-2 Airborne?,* Shekhar C. Mande, https://urdip.res.in/covid19/publications.jsp)

CSIR to Undertake Clinical Trials of Combination Drugs & HDTs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MUCOVIN: CSIR seeks nod for clinical trial to check efficacy of three-drug-combination on COVID-19 patients

By: PTI | Published: July 7, 2020 8:41 PM

COVID-19 drugs: The clinical trial named MUCOVIN, to be carried out in partnership with Medanta Medicity, will include a total of 300 patients in four different groups of 75 each.

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Budget 2020: FM Nirmala Sitharaman says govt willing to do more beyond Union Budget to boost growth

CSIR, in association with Hyderabad-based Laxai Life Sciences Private Limited, has sought regulatory approval to undertake four-arm randomized controlled phase III clinical trial of combination drugs and host-directed therapies.

The clinical trial named MUCOVIN is to be carried out in partnership with Medanta Medicity in Delhi and will include a total of 300 patients in four groups of 75. The trials will be held over 17 to 21 days, including screening and treatment.

The study will seek to combine and repurpose antivirals and Host-Directed Therapies (HDTs) to address the disease-spread and pathology simultaneously. It is proposed to determine safety and efficacy of the three combination drugs — Favipiravir+Colchicine, Umifenovir+Colchicine and Nafamostat+5-aminolevulinic acid — and a control arm with the standard of care in COVID-19 patients.

This unique combinatorial strategy (antivirals and HDTs) with repurposed drugs having complementary, additive and synergistic role, has been adopted to increase therapeutic options for COVID-19 treatment and help patients recover faster.

The partner CSIR institutes in this important clinical trial are the CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad and CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu.

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CSIR-IGIB & IIT Alumni Council to Jointly Conduct Covid-19 Research

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News

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

Rajesh Kurup | Mumbai | Updated on July 08, 2020 | Published on July 08, 2020

The IIT Alumni Council has signed an agreement with CSIR Institute of Genomics and Integrative Biology (CSIR-IGIB) to jointly conduct Covid-19 research and patient data analysis.

The CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) has signed an agreement with the IIT Alumni Council to jointly conduct Covid-19 research and patient data analysis.

The joint research by CSIR-IGIB and IIT Alumni Council will focus on creating an ecosystem for COVID-19 diagnostics, therapeutics and preparedness. The ecosystem will enable a value chain with expertise, spanning digital health, Artificial Intelligence (AI), molecular diagnostics, next-generation sequencing, antibody harvesting, and production of monoclonal antibodies.

The partnership seeks to create a world-leading testing and treatment ecosystem in the country and global data leadership. This would enable open data access to every scientist and innovator in the world for the development of bleeding-edge testing and treatment solutions. The aim is also to set up the world's largest MegaLab in Mumbai for testing and India's largest MegaTx antibody facility for treatment based on biologics.

The Council has also handed over the world's largest imaging data of 8,500 patients from the National Sports Club of India Dome (NSCI Dome) in Mumbai to CSIR-IGIB. This data will soon be available in de-identified form, on an open data platform, which is being set up by IIT Alumni Council, CSIR-IGIB and Indian Council of Medical Research (ICMR) to help in the research to bring the pandemic under control.

CSIR-Summer Research Training Programme Gets Overwhelming Response

With academic schedules gone awry due to the lockdown triggered by the COVID-19 pandemic, the CSIR floated the CSIR-Summer Research Training Programme (CSIR-SRTP) 2020 to rope in its vast community of scientific and technical personnel to gainfully mentor and guide students online. The programme hosted by CSIR-North East Institute of Science & Technology (CSIR-NEIST), Jorhat has received overwhelming response from students throughout the country.

*A Nation-wide programme happening for the first time in the academic history of India, it received more than **16,000** applications from all across the country.*

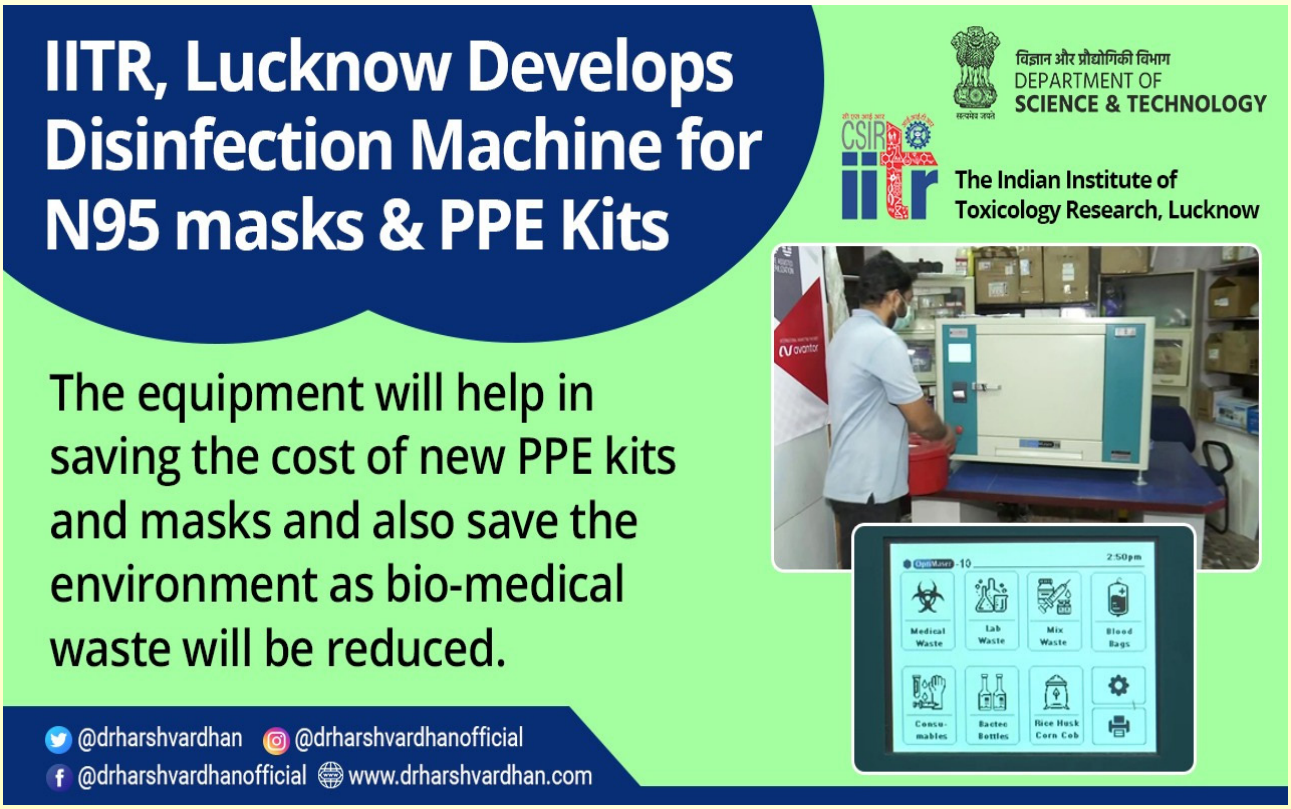
A nation-wide programme happening for the first time in the academic history of India, it received more than 16,000 applications from all across the country. The curtain raiser for the programme was attended by more than 3100 people online through MS Team and Facebook. It was inaugurated by Dr Shekhar C. Mande, Director General, CSIR.

The objective of the programme was to provide a scientifically stimulating platform to students stuck at home due to lockdown and expose them to scientific research and inculcate a scientific temperament. The salient features of the programme are popular lectures by eminent personalities, individual mentorship of each student (2 months full time), live demonstration of high-end equipment, instruments and experimental procedures, and lectures on fundamental, applied and translational research topics.

Medical Waste Disinfection Machine

CSIR-Indian Institute of Toxicological Research (CSIR-IITR) in a tie-up with a Lucknow based start-up has developed a microwave-based disinfection machine called 'Optimiser' which can make PPE kits and N95 masks reusable within 10 minutes. As many as 20 PPE kits and over 40 N95 masks can be disinfected in one go using the microwave technology within 10 min. A PPE kit and an N95 mask can be recycled and reused 20 times using the 'Optimiser' machine. Over 2,000 PPE kits can be disinfected in a day which will save the cost of the new safety gears.

The All India Institute of Medical Sciences (AIIMS) in Jodhpur and Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS) in Lucknow have validated the technology.

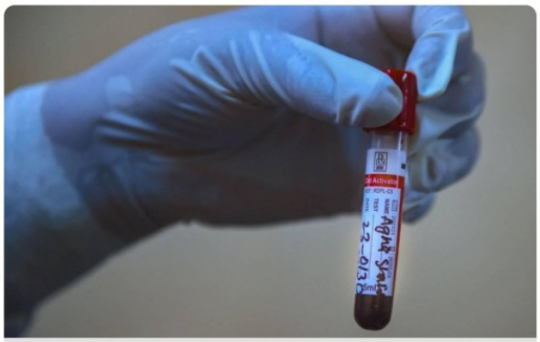


CSIR Media Coverage

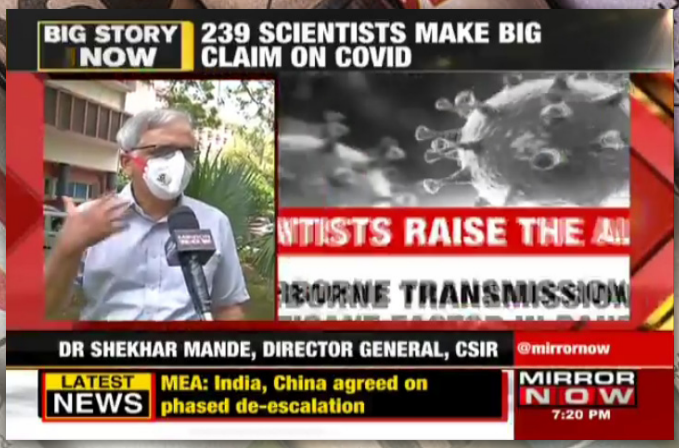
THE NEW INDIAN EXPRESS

CCMB's web app gives peek into one thousand plus coronavirus genomes

Express News Service | Published: 28th June 2020 08:55 AM



From Telangana, 193 virus genomes have been sequenced. (File Photo | PTI)



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Vaccine for COVID-19 can t be expected this year:CCMB director Mishra

Hyderabad, July 4 (PTI): A vaccine for COVID-19 cannot be expected before early next year as the process involves a lot of clinical trials and data testing, a top official of CSIR- CCMB said on Saturday, a day after ICMR said it aims to launch the world"s first COVID-19 vaccine by August 15. Rakesh K Mishra, Director of CSIR-Centre for Cellular and Molecular Biology, said the ICMR"s letter in this regard may be for internal consumption and aimed at putting pressure on hospitals to get ready for clinical human trials. "If everything goes absolutely really like a textbook plan, then we are talking about six to eight months to think of something that now we have a vaccine. Because you have to test in large numbers. It is not like a drug that if somebody is sick you give and see if it is

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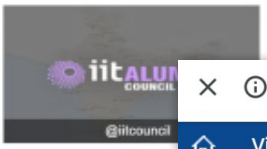
Jul 09, 2020, 8:19AM

IIT Alumni Council and CSIR-IGIB sign MoU for joint research on COVID-19 and patient data analysis

The IIT Alumni Council has signed an agreement with the CSIR Institute of Genomics and Integrative Biology (CSIR-IGIB) to jointly conduct research on COVID-19 and patient data analysis. It may be noted that the council is setting up the world's largest molecular diagnostic lab 'MegaLab Mumbai'.

According to a statement issued yesterday, the council handed over imaging data of over 8,500 patients, who were admitted at the COVID Care Facility at World's National Sports Club of India. IIT Alumni Council President Ravi Sharma has said that this partnership will not only create a world-leading testing and treatment ecosystem but also establish global data leadership. Late May, the Council had announced the launch of the world's largest virology lab testing centre with conducting one crore tests. The first phase, with a capacity to carry out 10 lakh tests, will be ready by the end

The IIT Alumni Council is the largest body of alumni, students and faculty from all the 23 Indian Institutes of Te partnering Technical Institutes of Excellence and was formed last year to carry out projects of social importanc



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THE HINDU

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

For representational purpose only. | Photo Credit: AP

V. Geetanath

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'Vaccine for COVID-19 can't be expected this year'

A vaccine for coronavirus cannot be expected before early next year, a top official of CSIR-CCMB said on Saturday, just a day after ICMR said it aims to launch the world's first vaccine by August 15.

Image Source : FILE

News Desk | New Delhi |
020 18:07 IST

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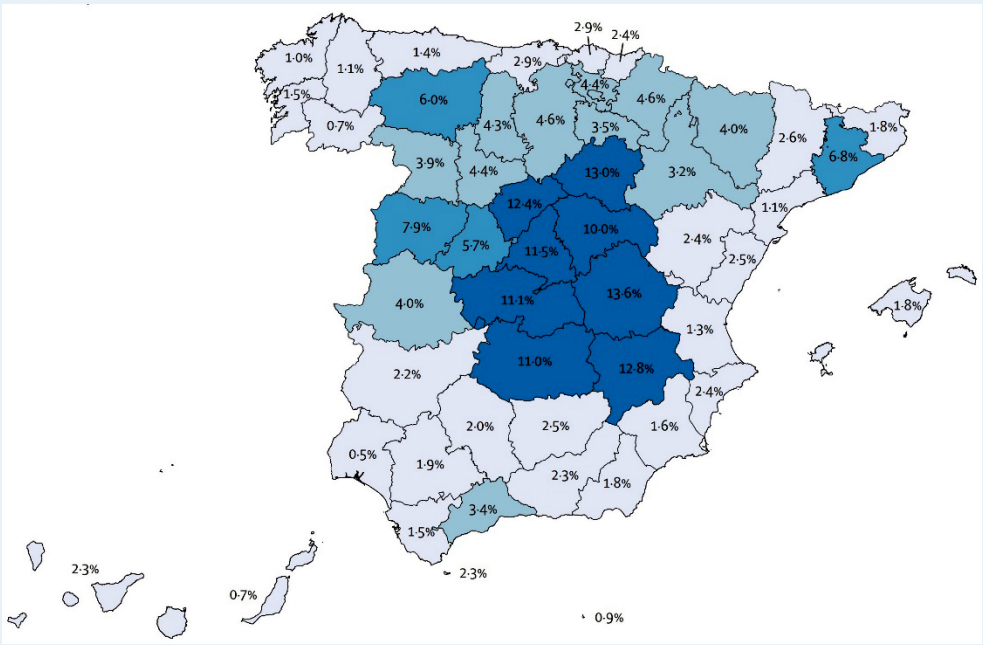
CORONA RESEARCH SNAPSHOT

A COVID-19 antibody study doubts the feasibility of herd immunity in case of SARS-CoV-2

Researchers at the Institute of Health Carlos-III in Madrid tested more than 61,000 individuals for SARS-CoV-2 antibodies from randomly selected households across Spain. SARS-CoV-2 antibodies are the fighter molecules released by the human immune system to fight against the SARS-CoV-2 viral attack. These defence molecules remain in the body of the infected person for a certain period of time and can be separated from the blood. The researchers performed a large scale SARS-CoV-2 antibody survey and analysed the data for the most hit areas and less hit areas. It is found that more than 10% individuals in capital areas such as Madrid tested positive and around 3% individuals in most of the coastal areas were found positive. The national average was around 5% for COVID-19 positive cases, detected through antibody tests performed for this study. However, approximately one-third of the infected population was asymptomatic. Spain is one of the hardest hit countries by the COVID-19 pandemic with a very high rate of mortality. These results suggest that herd immunity is like a mirage for many countries like India as 60-70% of the population needs to be infected for achieving herd immunity. The study is published in *The Lancet* after peer review.

(Source: *The Lancet; DOI:* http://doi.org/gg332t)



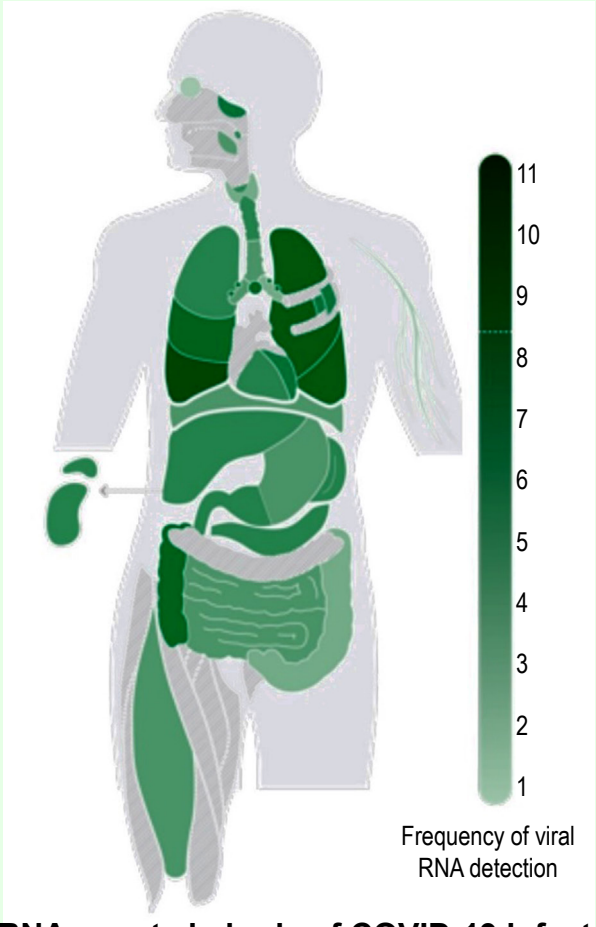
Detailed map for detected SARS-CoV-2 antibodies in Spain

(Courtesy: M. Pollán *et al*. *Lancet*; 2020)

Autopsy studies of COVID-19 infected dead-bodies suggest immune system may be more responsible for death rather than the virus itself

Several studies are coming up related to several organs affected by COVID-19 infection. Researchers worldwide are trying hard to understand the mechanism by which SARS-CoV-2 affects the different organs of the human body. Several studies have suggested that the human immune system may have a contribution in organ-damage observed in the severely infected COVID-19 patients. Prof. David Dorward and his team at University of Edinburgh, UK conducted the detailed mapping studies on 11 dead bodies along with sites of inflammation and injury. They have taken images of 37 anatomical sites present in the human body including lungs and analysed these for levels of viral hotspots and inflammation. They found that some tissues overcame the viral infection but were not inflamed, whereas other tissues were damaged but did not contain high levels of novel coronavirus. Scientists were correlating the inflammation in tissues with the level of viral loadings, previously. These findings are contrary to the previous perception that only the virus is damaging the tissues. Scientists claim that it may be the immune system of the human body too which may have a role in organ-damage in the case of severe COVID-19 infection. There studies are under peer review currently.

(Source: Preprint at *medRxiv;* http://doi.org/d27t)



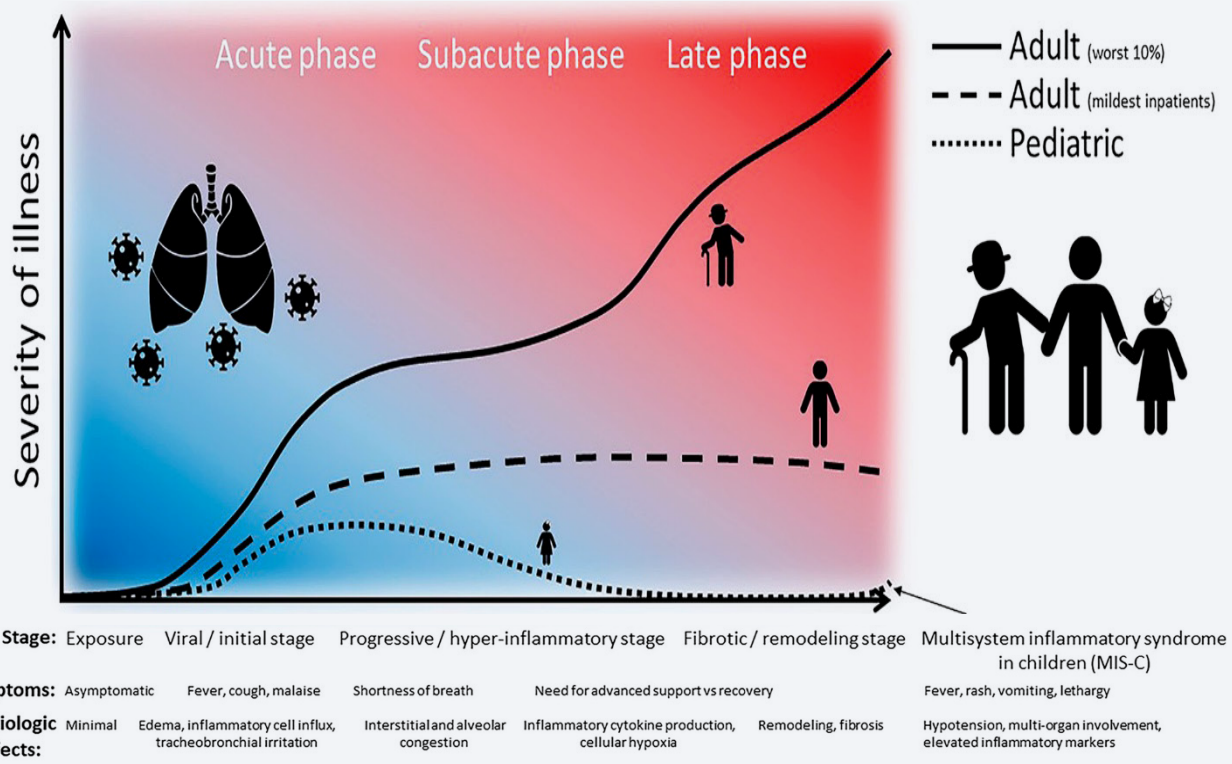
Map of viral RNA counts in body of COVID-19 infected individual

(Courtesy: D. A. Dorward *et al.*; 2020)

Lung physiology and immune function in children could be the reason for their protection from severe COVID-19

According to paediatric physicians of Baylor College of Medicine and University of Texas Health Science Centre Houston-USA, the different lung physiology and immune function in children may be the reason for less severity of COVID-19 infection. ACE2 receptors are the key proteins for entering in human cells used by SARS-CoV-2. It has been found that ACE2 receptors are less in numbers in lungs of children than adults, naturally. In addition to that, it was observed that the immune system of children responds to different viruses differently than adults. These differences include different mechanisms, such as retention of T-cells in children which are to fight inflammation. The lung tissues in children have higher concentration of regular T-cells which protect them during COVID-19 infection. The individuals having higher number of T-cells also have higher levels of 'Interleukin 10' (IL-10) which is a kind of anti-inflammatory cytokine. The findings are published in the journal *American Journal of Physiology-Lung Cellular and Molecular Physiology after peer review.*

(Source: American Journal of Physiology-Lung Cellular and Molecular Physiology; DOI: 10.1152/ajplung.00183.2020)



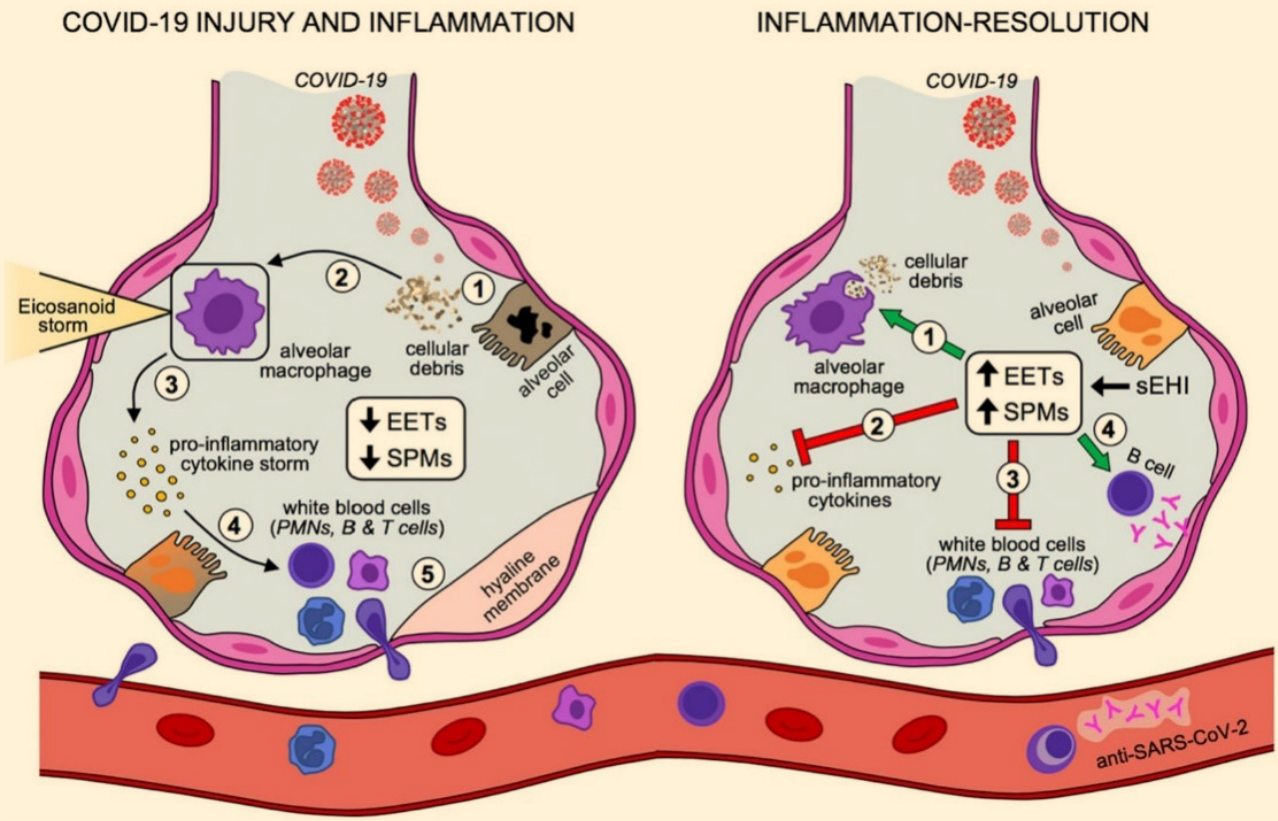
Differences in clinical condition in children and adults with SARS-CoV-2 infection

(Courtesy: *Lingappan et al.; American Journal of Physiology-Lung Cellular and Molecular Physiology;* 2020)

Novel approach to limit organ-damage in severe COVID-19 patients

In cases of severe COVID-19 infection, numerous deaths are being reported because of organ damage. The organ damage occurs many times due to cytokine storm which is a type of immune reaction of the human body against the viral attack. It has been found that the viral attack provokes inflammatory overreaction in the tracks of human body causing organ-damage. Researchers are in the race to find ways to stop this inflammatory overreaction by the immune system in the case of SARS-CoV-2 attack. A team of scientists at Beth Israel Deaconess Medical Centre and Brigham & Women's Hospital-Israel have proposed a novel approach to limit the organ damage by limiting the cytokine storm induced inflammatory response in severe COVID-19 patients. These cytokines are important to kill the viruses but the cytokines also damage the infected lung cells. This damage to lung cells triggers additional inflammation in tissues and thus the effects of the cytokine storm go out of control. Previous studies have shown that the inflammation can be mitigated by naturally occurring molecules called 'Resolvins', which are already under trial against many inflammatory diseases. Scientists are suggesting that these molecules can be of use against severe COVID-19 infection induced inflammation in organs. This research work is published in the journal C*ancer and Metastasis Reviews* after peer review.

(Source: *Cancer and Metastasis Reviews*; DOI: 10.1007/s10555-020-09889-4)



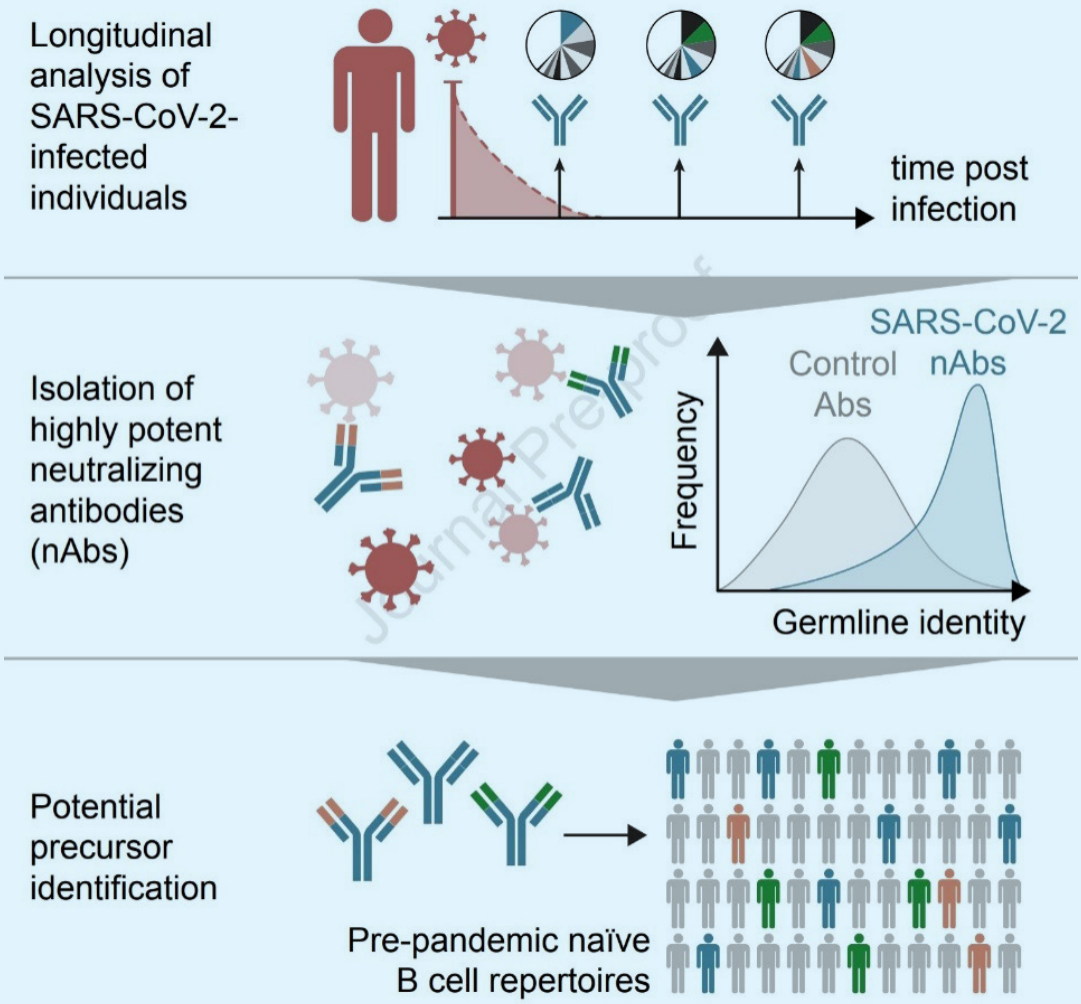
Mechanism proposed for mitigating inflammation due to severe COVID-19 infection

(Courtesy: Panigrahy *et al. Cancer and Metastasis Reviews*, 2020; 39 (2): 337)

Neutralizing antibodies are reconstructed in laboratory to fight against COVID-19

Neutralizing antibodies are molecules that fight against the viral intruders in the human body. These antibodies have great potential in prevention and treatment of COVID-19 infection. Scientists at the Cologne University Hospital and German Centre for Infection Research have been isolating potent antibodies from COVID-19 infected people, characterizing these antibodies and analysing their response in treatment. The researchers have examined more than 4000 SARS-CoV-2 specific B-cells on a single cell level and have tried to decode their immune response to COVID-19 infection. The scientists reconstructed 255 antibodies in their lab, which were further examined for their ability to neutralize SARS-CoV-2. Finally, 28 neutralizing potent antibodies were shortlisted. It is expected that these molecules shall enter in to clinical trials later this year. The findings are published in the journal *Cell* after peer review.

(Source: *Cell*; DOI: 10.1016/j.cell.2020.06.044)



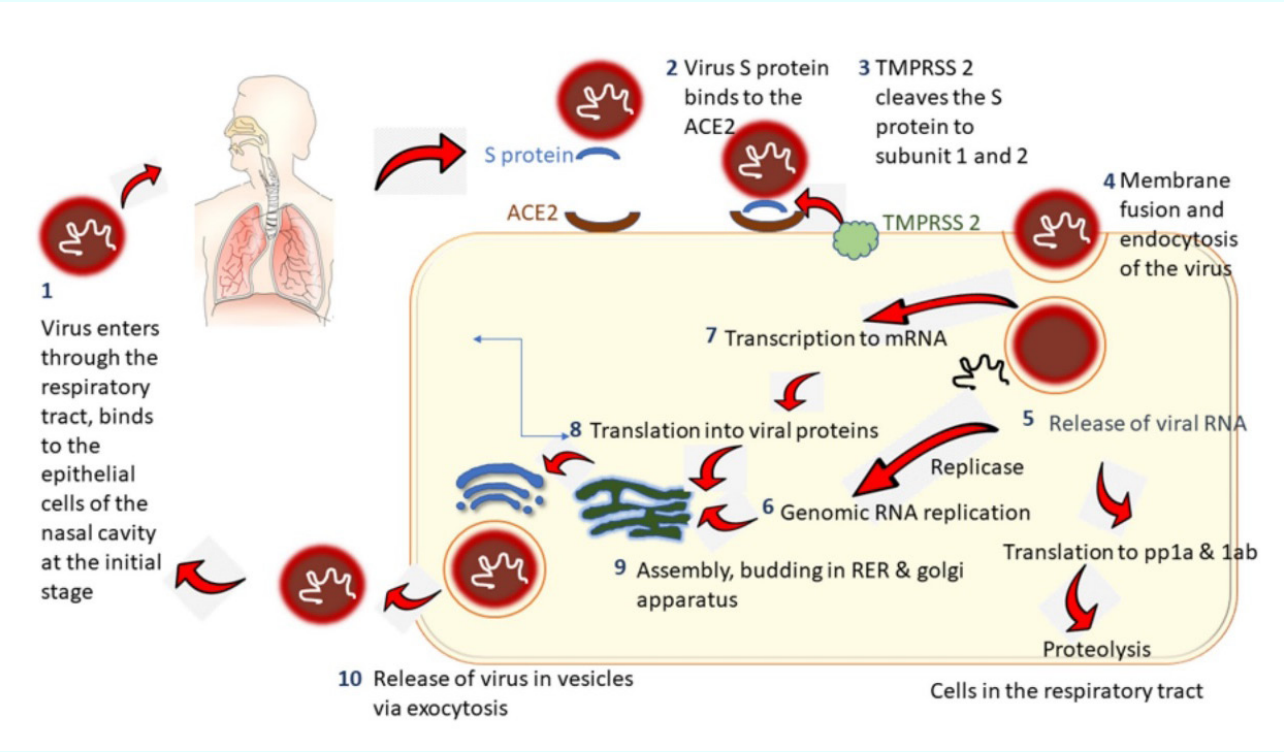
Flow-chart for isolation, modification and identification of potent neutralizing antibodies.

(Courtesy: Kreer *et al.* Cell; 2020)

Experiments suggest that SARS-CoV-2 damages the endocrine system

The endocrine system is a collection of glands that produce hormones which regulate growth, development, tissue function, sexual function, reproduction, sleep, mood and metabolism including other body functions. A recent review in *Journal of Endocrine Society* published by researchers of different institutes of Sri Lanka and Oxford University, UK suggests that SARS-CoV-2 can damage the endocrine system. The authors have observed that the SARS viruses bind with ACE2 receptors to enter in to the human cells. These viruses also use ACE2 receptors to enter into the endocrine cells to infect them.

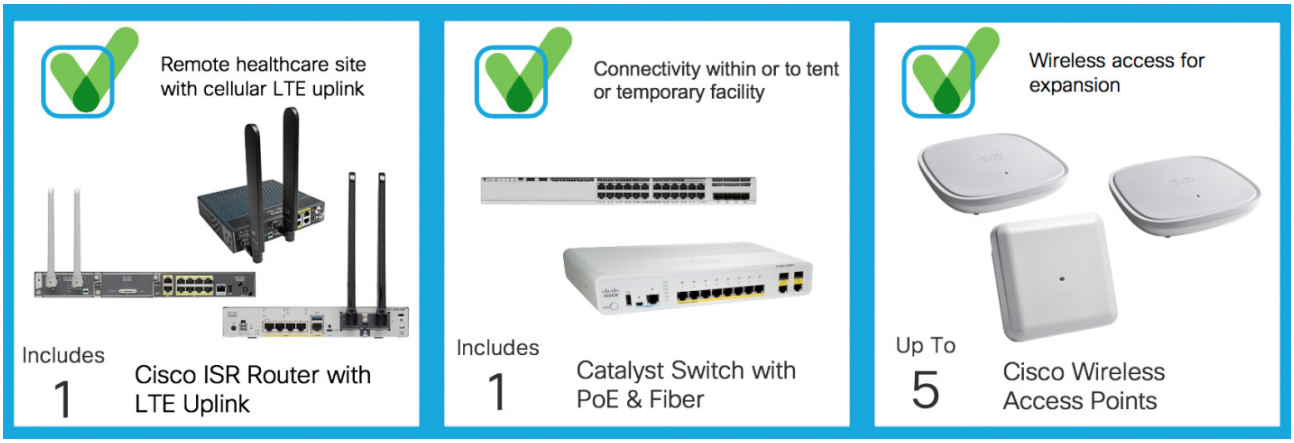
(Source: *Journal of the Endocrine Society*, 2020; DOI: 10.1210/jendso/bvaa082)



Pathogenesis of the novel coronavirus

(Courtesy: Somasundaram*et al.*; *Journal of Endocrine Society*, 2020)

CORONA INNOVATIONS



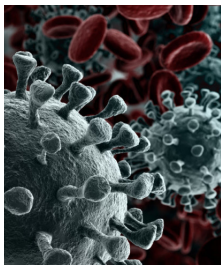
No-cost Wireless Networking Equipment to Connect Healthcare System

Hospitals around the world are setting up temporary COVID-19 treatment and testing facilities. Often these facilities need networking technology as well as equipment to keep doctors and other medical staff productive and informed and to enable patients to communicate.

The IT company Cisco has set up two technological innovations to help the healthcare system rapidly in order to obtain networking equipment at no cost. These two innovations are 'Cisco Pandemic Equipment Brokerage' and 'Cisco Healthcare Rapid Response Network Bundle'. Cisco has networking engineers on call to provide design and configuration support for technology practitioners as they work to keep the people safe. The brokerage innovation is designed to match companies looking to donate unused wireless equipment with healthcare facilities that may need it. If you have equipment you would like to donate to healthcare organisations during this pandemic by filling out a Donor Form. Healthcare organizations that need equipment can fill out the Request Form to indicate what they need. Cisco will connect the organizations and function as a bridge.

Source: https://blogs.cisco.com

Online tools for tracking COVID outbreak



In UK, Bio Nano Consulting has developed advanced online Covid-19 outbreak tracking and epidemic simulation tools for mapping, modelling and managing the coronavirus pandemic. This tool will be functional in the UK as well as around the world. The first such tool is available at www.CORONA19.uk. It shows the cumulative number of confirmed coronavirus cases for the 32 London suburbs. The status of rest of the UK can be observed on a separate tab.

The tracking software shows recent changes in the cumulative number of confirmed cases and reveals the key changes in virus spread.

The second online tracking tool is available at www.covidsim.org which shows the epidemic trajectory and healthcare demand simulations. It is based on epidemiological modelling algorithms and is developed in conjunction with Imperial College, London. This tool enables government healthcare officials, media persons and researchers from low and middle income countries to deploy advanced epidemiological prediction tools. The web-based tool informs economic and political decisions concerning intervention or restriction strategies and related resource allocation.

Both the coronavirus tracking software and online pandemic management tools have been designed to help government healthcare officials, strategic planners and academic researchers to model, plan, prepare for and manage outbreaks more effectively.

Source: https://sciencebusiness.net

Photonic biosensors detect Coronavirus

The ATTRACT project "BioPIC" has developed a biosensor chip technology to combat the COVID pandemic. This may lead to major advances in point-of-care applications, food diagnostics and environmental monitoring through the rapid and precise analysis of various substances. This photonic biosensor technology is proving to be promising in detecting the coronavirus.

The biosensor chip technology enables simultaneous digital analysis of various substances and physical parameters. The results of this digital analysis are reliable and verified. Also this operation is very cost-effective and it takes only a few minutes. In addition, the biosensor technology is miniaturised, mobile and effective. All these features of this technology are superior to the detection techniques currently available.

Source: https://attract-eu.com

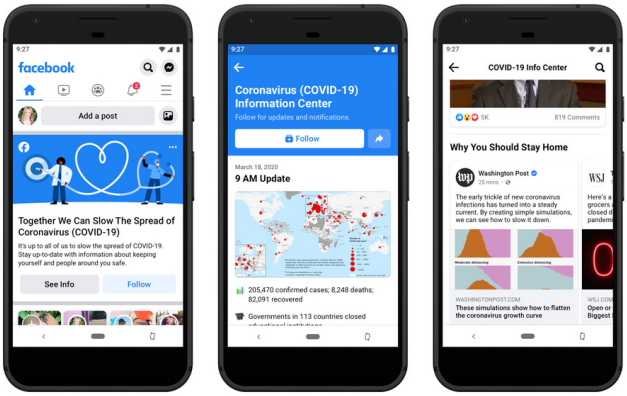
DESREM™ — Mylan's generic version of Remdesivir

Image credit: Flickr

Hertfordshire, England and Pittsburgh and Bangalore, India, Mylan N.V. announced that the Drug Controller General of India (DCGI) has approved its remdesivir 100 mg/vial for restricted emergency use in India as part of the DCGI's accelerated approval process to address urgent, unmet needs amid the evolving coronavirus 2019 (COVID-19) pandemic. The drug is approved for the treatment of suspected or laboratory-confirmed incidences of COVID-19 in adults and children hospitalised with severe presentations of the disease. The drug will be launched under the brand name DESREM™ in India.

Source: Press Release (http://newsroom.mylan.com/press-releases)

Facebook also serves to control COVID-19



Carnegie Mellon University in collaboration with Facebook is working to combat the COVID pandemic by using technology. In this technological initiative, the data of those Facebook users are being evaluated who have COVID-19-related symptoms. This global data of COVID patients is very useful for medical governance and research. This data has the potential to be extremely valuable for forecasts because a spike in symptomatic infections might be indicative of a spike in hospitalizations to come.

Such focused data of COVID affected people from across the world can uniquely help researchers and health authorities to get the information they need to respond to the outbreak and start planning for the recovery.

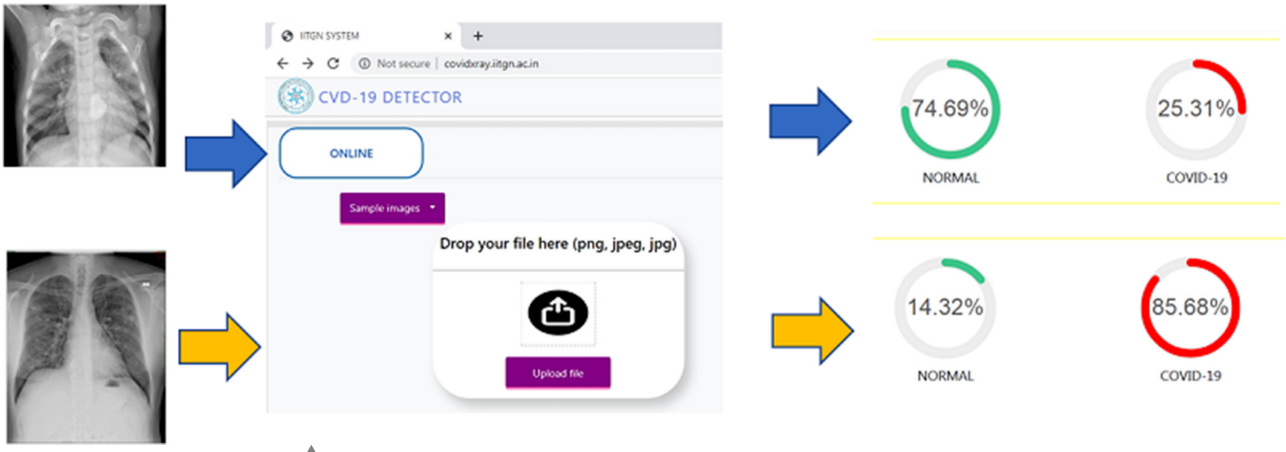
Source: https://www.cmu.edu

"Compact XL — Lab in a Box" to automate molecular diagnostics

Pune-based molecular diagnostics company, Mylab Discovery Solutions has launched 'Compact XL' – India's first machine to automate the manual processes of molecular diagnostic tests such as RT-PCR tests for COVID-19. Compact XL is a compact bench-top machine that will automate lab processes from sample handling to preparing RT-PCR ready tubes. It is a cartridge-based machine and can test multiple samples at the same time. It can be used for a wide range of RNA/DNA-based tests including COVID-19 RT-PCR tests. The machine can take input of various sample types such as plasma, tissue, sputum and swab.

Source: https://mylabdiscoverysolutions.com/mylab-launches-compact-xl-lab-in-a-box/

Image credit: Twitter



AI-based tool to detect COVID-19

Indian Institute of Technology (IIT), Gandhinagar, has developed an artificial intelligence-based deep learning tool for detection of COVID-19 from chest X-ray images. The tool can be used for quick preliminary diagnosis before the medical test. During these days of pandemic and limited authorised testing facilities, COVID-19 diagnosis is a challenging task. The new tool can cater to a large population and can essentially mitigate the burden on medical infrastructure by aiding testing and diagnosis with preliminary results. The tool has simple machine learning architecture and has been trained using deep learning algorithms and datasets of pooled X-ray images.

Source: https://news.iitgn.ac.in/

"Chakr DeCoV" — Decontaminates N95 masks

IIT Delhi incubated cleantech startup Chakr Innovation has launched 'Chakr DeCoV' to decontaminate N95 masks. 'Chakr DeCoV' is an ozone-based decontamination device enabling safe reuse of N95 masks and serving as a sustainable solution to fight COVID-19. The device is capable of inactivating SARS-CoV-2 virus. It kills the majority of bacteria as tested at IIT Delhi. The safe and reliable system has been designed for hospitals with an automated cycle ensuring easy identification and traceability. Designed in the shape of a cabinet, Chakr DeCoV is built with an innovative decontamination mechanism, which utilises the high penetrability of Ozone gas for cleaning the pores of the N95 mask, ensuring complete decontamination of its intricate layers.

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

Nano-coated filter for healthcare workers

The Indian Institute of Technology Madras has developed a nano-coated filter media which not only has applications in healthcare but also in defence and other places where air filtration of submicron particles is needed. This nano-coated filter media has been fabricated by a nylon-based polymer coating on cellulose paper and was developed through the electrospinning process. The coating properties are optimised for efficient removal of sub-micron sized dust particles in the air.

Source: DD News

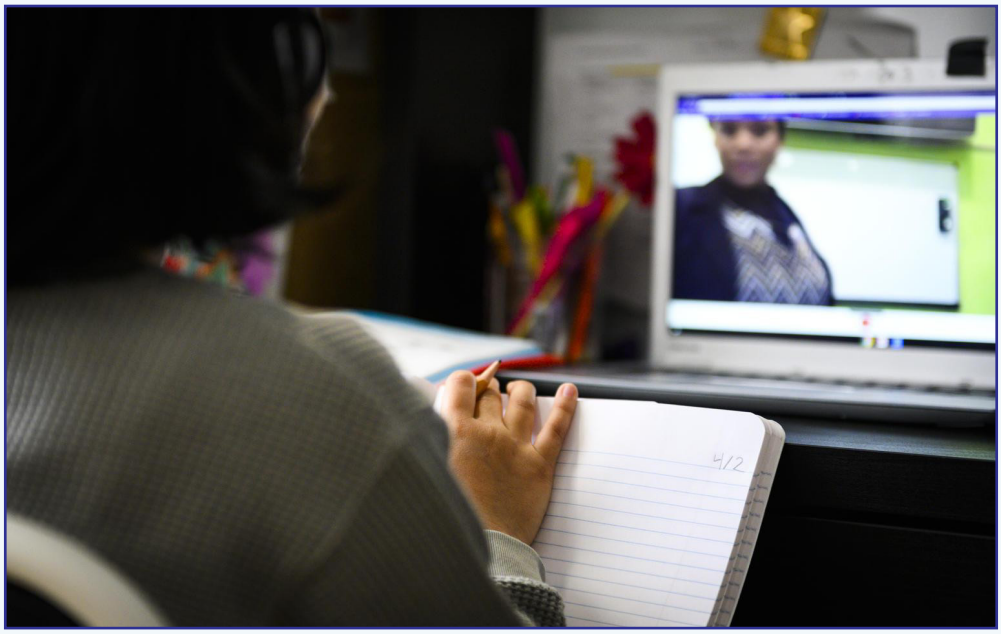
"Medi-Sarathi' and "AI-powered Trolley"

To reduce the contact of frontline healthcare workers with infected patients and areas, the Indian Institute of Technology, Ropar, has designed and developed indigenously two state-of-the-art low-cost autonomous vehicles, "Medi-Sarathi' and "AI-Powered Trolley" in association with PGIMER, Chandigarh. "We were brainstorming about multiple affordable options to ensure better safety for our COVID-19 team in addition to SOPs being followed. That's how 'Medi-Sarathi' and 'AI-Powered Trolley' came into being. These are special, affordable and customized solutions for our local needs which have already been rigorously tested at PGIMER's labs before being launched," says Prof. G.D. Puri, Dean (Academics) & Head, Deptt. of Anesthesia & Intensive Care, PGIMER.

Source: timesofindia.indiatimes.com

How to keep your child safe online while stuck at home during the COVID-19 outbreak

5 ways to help keep your child's online experiences positive and safe



1. Keep them safe with open communication

Have an honest dialogue with your children about who they communicate with and how. Make sure they understand the value of kind and supportive interactions and that mean, discriminatory or inappropriate contact is never acceptable. If your children experience any of these, encourage them to tell you or a trusted adult immediately. Be alert if your child appears to be upset or secretive with online activities or if they are experiencing cyberbullying. Work with your child to establish rules on how, when and where devices can be used.

2. Use technology to protect them

Check that your child's device is running the latest software and antivirus programs, and that privacy settings are on. Keep webcams covered when not in use. For younger children, tools such as parental controls, including safe search, can help keep online experiences positive. Be cautious of free online educational resources. Your child should never have to provide a photo or their full name to use these resources. Remember to check the privacy settings to minimize data collection. Help your child learn to keep personal information private, especially from strangers.

3. Spend time with them online

Create opportunities for your child to have safe and positive online interactions with friends, family and you. Connecting with others is more important than ever at the moment and this can be an excellent opportunity for you to model kindness and empathy in your "virtual interactions". Help your child recognize and avoid misinformation and age-inappropriate content that may increase anxiety about the

COVID-19 virus. Many digital resources from credible organizations like UNICEF and the World Health Organization are available for you and your child to learn about the virus together. Spend time with your child to identify age appropriate apps, games and other online entertainment.

4. Encourage healthy online habits

Promote and monitor good behavior online and on video calls. Encourage your children to be kind and respectful to classmates, to be mindful of what clothes they wear and to avoid joining video calls from a bedroom. Familiarize yourself with school policies and helplines to report cyberbullying or inappropriate online content. As children spend more time online, they can be exposed to more advertising that may promote unhealthy foods, gender stereotypes or age-inappropriate material. Help them recognize online ads and use the opportunity to explore together what is wrong with some of the negative messaging you see.

5. Let them have fun and express themselves

Spending time at home can be a great opportunity for your children to use their voices online to share their views and support those in need during this crisis. Encourage your child to take advantage of digital tools that get them up and moving, like online exercise videos for kids and video games that require physical movement. Remember to balance online recreation with offline activities, including time outside, if possible.

Source: unicef.org

Ministry of Health & Family Welfare
Government of India

Help us to help you

NOVEL CORONAVIRUS DISEASE (COVID-19)

COVID APPROPRIATE BEHAVIOURS

Maintain distance of 6 feet (2 Gaj)

Wash hands frequently and thoroughly with soap and water

Wear home-made reusable face-cover/mask at all times

Avoid touching eyes, nose and mouth

Use tissues/handkerchief while coughing or sneezing and dispose used tissues into closed bin/wash handkerchief

Badalkar Apna Vyavahar, Karein Corona Par Vaar

For information related to COVID-19
Call the State helpline numbers or Ministry of Health and Family Welfare, Government of India's 24x7 helpline number
1075 (Toll Free), Email at ncov2019@gov.in , ncov2019@gmail.com

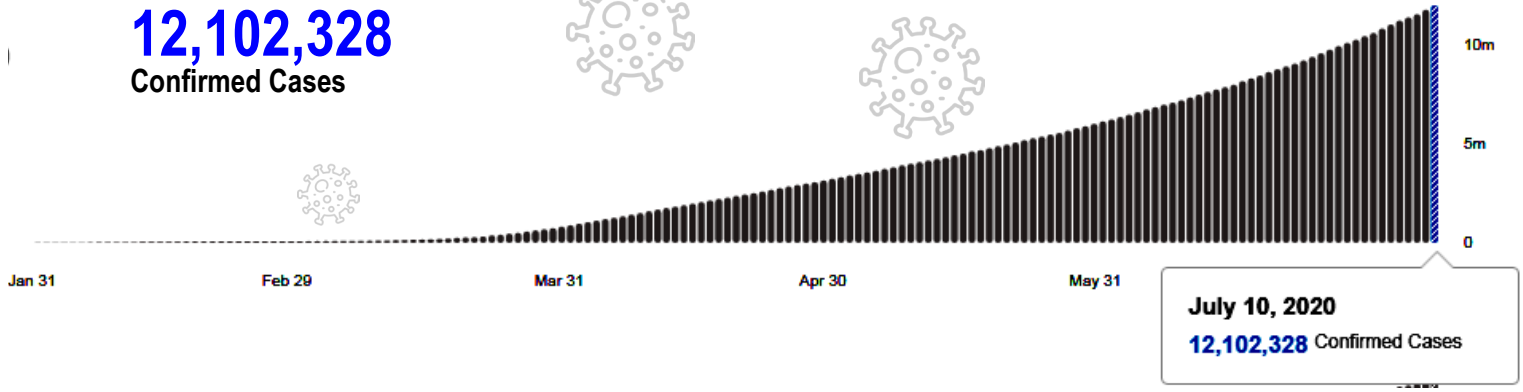
mohfw.gov.in @MoHFWIndia @MoHFW_INDIA mohfwindia @mohfwindia

COVID-19 Dashboard

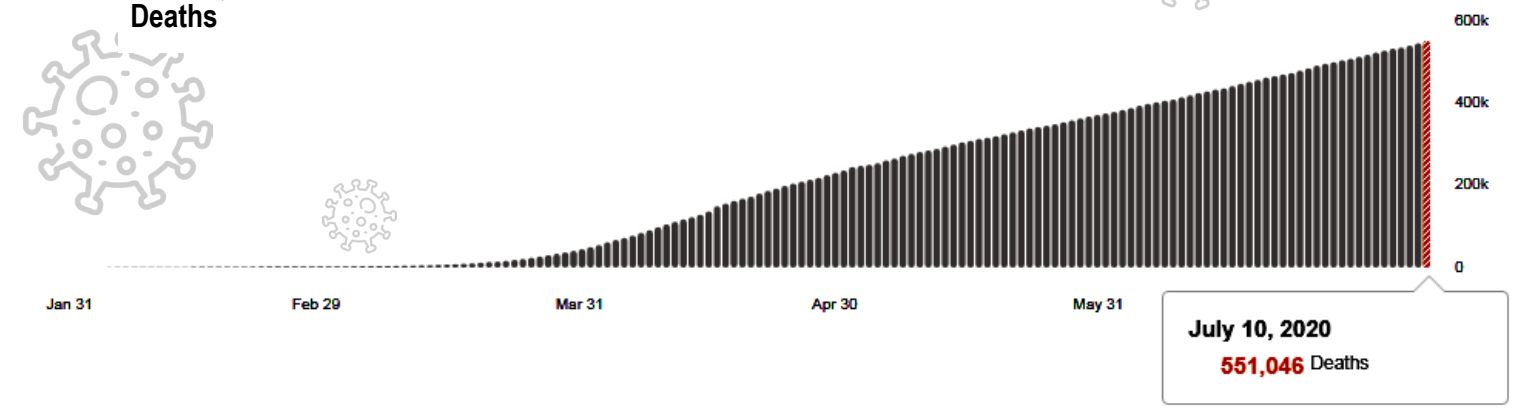
Global COVID-19 Cases and Deaths

(Data as of 10 July 2020)

12,102,328
Confirmed Cases



551,046
Deaths



INDIA

(Data as of 11 July 2020)

283407	515385	22123	1
Active Cases	Cured / Discharged	Deaths	Migrated

Source: www.mygov.in

CORONA Q&A

Why the novel coronavirus cannot be transmitted by mosquito bites?

Malaria is a common but life threatening disease caused by Anopheles mosquito bite. These mosquitoes carry the Plasmodium parasite and when this mosquito bites you, the parasites are released into your blood stream.

There has been no evidence to support the claim that the novel coronavirus could be transmitted through mosquitoes. This virus basically is a respiratory virus. It primarily spreads via respiratory droplet emissions generated by coughing or sneezing of the infected person. This virus is transmitted through discharge from the nose or droplets of saliva. Hence WHO has advised social distancing to avoid close contact with anyone who is coughing or sneezing.

When will a vaccine for COVID-19 come up?

Till date, there is no vaccine and anti-viral medicine for COVID-19 but there are several independent efforts going on to make the vaccine for COVID-19. However, it takes many years to develop a vaccine for a virus. It will take less time to make a vaccine for COVID-19 because the scientists have already sequenced its genome. Generally, a vaccine is first tested in laboratories to confirm its action against virus and proof-of-concept. The next challenge is to make this highly pure vaccine in large quantities for market availability. After production, the final product is also tested on different animals and then humans. Currently, since this is an emergency situation, a COVID-19 vaccine may be directly tested on humans without prior testing in animals. It may take more than one year to complete the clinical trials and achieve the market production of the vaccine. However, there is no guarantee that a vaccine under test will work and show prevention of COVID-19 till final tests. Therefore, scientists keep a pipeline of different vaccine candidates for tests.

Image created by Russell Tate. Submitted for United Nations Global Call Out To Creatives - help stop the spread of COVID-19.

When does the community transmission happen in a country?

Community transmission happens when the infected number of people becomes so large that the source of the virus becomes untraceable. It is also called the phase 3 of the virus transmission. The stage of community transmission in society can be confirmed by thorough testing of patients who are showing the symptoms of COVID-19 but do not have any known travel history or exposure to the COVID-19 patients.

When should someone be cautious in case of losing the sense of smell?

According to a study performed by the researchers of King's College London, the loss of smell and taste might be linked to COVID-19 infection. In this study, nearly 60% of the patients reported losing the sense

of smell and taste in case of COVID-19 infection. However, around 18% didn't lose the sense of smell and taste. However, some patients only reported losing the sense of taste and smell.

In an interview to news agency Reuters Dr. Tim Spector a King's College professor who led the study said, "When combined with other symptoms, people with loss of smell and taste appear to be three times more likely to have contracted COVID-19 according to our data, and should therefore self-isolate for seven days to reduce the spread of the disease."

Since, majority of the patients are exhibiting the loss of smell and taste, it is important to notice the other COVID-19 symptoms combined with loss of smell and taste as a possible indication of COVID-19 infection and the person should go for COVID-19 testing.

When will the COVID-19 pandemic end?

To bring the COVID-19 pandemic to an end, an effective vaccine is needed. There are a number of rigorous efforts going on in the direction of making a COVID-19 vaccine. Researchers are hopeful to make a COVID-19 vaccine in one and a half year.

How Isolation is different from Quarantine?

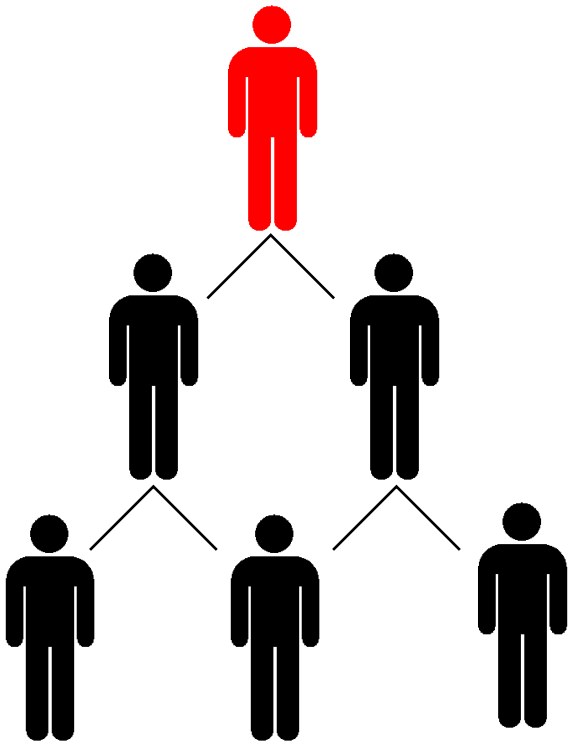
Image Credit: CDC

Quarantine and *Isolation* are being interchangeably used to refer to separating people in various ways due to the spread of a disease. Isolation and quarantine help protect the public by preventing exposure to people who have or may have a contagious disease. But for doctors, public health officials, and other professionals, there is an important distinction between *quarantine* and *isolation*. 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.

Why is it so hard to stop people from touching their faces frequently?

People wipe their eyes, scratch their noses, bite their nails and twirl their mustaches. People touch their faces more when they are anxious, embarrassed, or stressed, but also when they aren't feeling anything at all. Studies show that students, office workers, medical personnel, and people on trains touch their faces between nine and 23 times per hour, on average. Face-touching provides immediate relief eventually making it a habitual response that resists change. The first step in reducing face-touching is becoming aware of it. Self-monitoring is more effective when people create a physical record. You can create a log where you briefly describe each instance of face-touching. If you are aware of the behavior you want to change, you can replace it with a competing response that opposes the muscle movements needed to touch your face.

What is "Patient Zero"?



Patient zero is described as the first human who gets infected with the virus in an outbreak. Developments in genetic analysis have made it possible to follow back the lineage of the infection by investigating those it has infected.

Researchers can pinpoint people who may have been the primary individuals to begin spreading the infection thus triggering the episode. Distinguishing who these individuals are can help address vital inquiries regarding how, when and why it began. These would then be able to assist to protect more individuals from getting sickness now or in future epidemics.

FACT CHECK

COVID-19 MYTH BUSTERS

MYTH ✗

FACT ✓

Virus gets worse during rain

Weather conditions and Coronavirus are not linked; only proper infection control measures have any impact on the control or spread of this virus.

www.passporthealthusa.com

Every case of fever and coughing is the result of coronavirus

No, when someone has a fever and respiratory symptoms, chances are that it is something much more common like the upper and respiratory illnesses that you usually get rather than a 2019-nCoV infection.

www.medicalnewstoday.com

A vaccine for COVID-19 is available

No, there is currently no vaccine available to protect against COVID-19. Several vaccine trials are underway in different countries worldwide, but experts say they are many months away from being ready for widespread use.

www.hopkinsmedicine.org

Taking ibuprofen while infected with COVID-19 will make the condition worse

There is currently no evidence of patients with negative effects from using ibuprofen while infected with COVID-19. The World Health Organization says it is consulting with physicians treating the patients.

www.hackensackmeridianhealth.org

MYTH ✗

FACT ✓

Children are only contagious if they show symptoms

It is a scary thought, but you can still have and spread coronavirus even if you don't have symptoms. No matter who or what you touch, if you wash your hands before you touch your face, you probably won't catch it. The risk of catching coronavirus is lower for kids who are at their home and not exposed to other kids at school or daycare.

www.hopkinsallchildrens.org

Wear gloves when touching common surfaces like elevator buttons and subway poles

Not really, wearing gloves is "probably not effective" in preventing the spread of the virus, Dr. Esper said, "because then what are you doing with them? Eventually, the gloves themselves become contaminated." Most gloves have minute holes, Dr. Meissner said. "Just simple hand washing with soap and water is the most time-tested and the most effective intervention."

www.nytimes.com

Eating frozen foods such as ice-cream spreads the Coronavirus

No, there is no scientific evidence that hygienically made frozen foods and ice-cream spreads the Coronavirus.

www.timesnownews.com

Content in this bulletin has been compiled from various sources, and wherever available, due credit has been given to the original source.