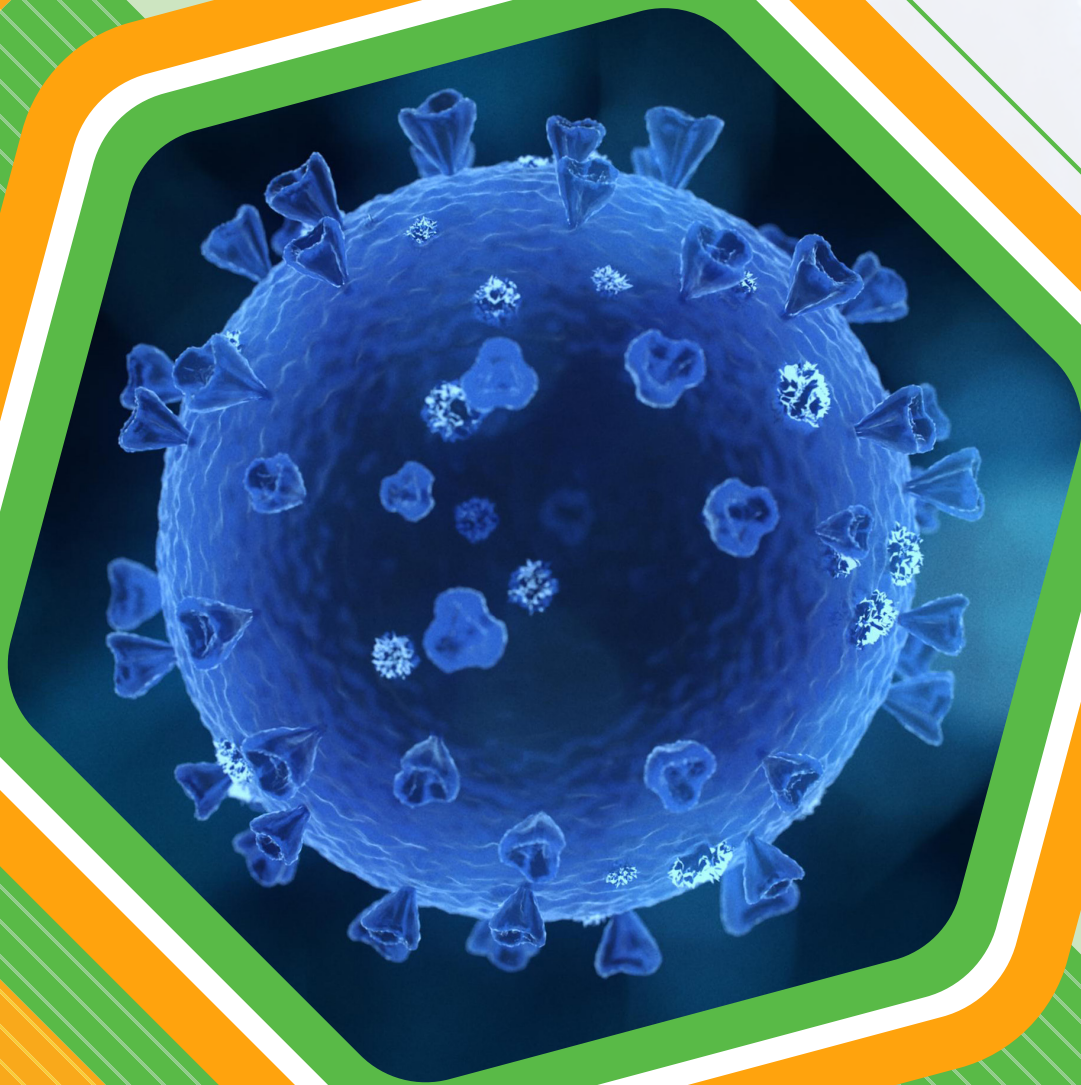


SCIENCE & TECHNOLOGY EFFORTS IN INDIA ON COVID-19



Compiled by
VIGYAN PRASAR
An Autonomous Organisation of
Department of Science & Technology,
Government of India

UPDATED WEEKLY
23rd July 2020



सत्यमेव जयते
FOREWORD

डॉ हर्ष वर्धन Dr Harsh Vardhan

स्वास्थ्य एवं परिवार कल्याण, विज्ञान और प्रौद्योगिकी
व पृथ्वी विज्ञान मंत्री, भारत सरकार

Union Minister for Health & Family Welfare,
Science & Technology and Earth Sciences
Government of India

सबका साथ, सबका विकास, सबका विश्वास
Sabka Saath, Sabka Vikas, Sabka Vishwas

The 2019 Novel Coronavirus (SARS-CoV-2) has spread rapidly throughout the world and has assumed the proportion of a Pandemic. Given the lack of an efficacious vaccine as well as non-availability of suitable chemotherapeutic interventions, mankind is experiencing an unprecedented existential crisis.

2. The Ministry of Science and Technology and the Ministry of Health & Family Welfare, with their various departments, are contributing in various ways towards the national R&D efforts for developing solutions to combat COVID-19. The Department of Science & Technology under the Ministry has launched a nationwide exercise to map and boost development of COVID-19 solutions with R&D, seed capital and scale-up support. All academic and research institutions are being reoriented to focus on the development of diagnostics, vaccines, antivirals, disease models and other R&D to enable a cure for this dreadful disease. Around 15 labs of Council of Scientific & Industrial Research (CSIR), under the Department of Scientific & Industrial Research, across the country are working in close partnership with major private sector Industries, PSUs, MSMEs and other Government departments to develop solutions for COVID-19. The Department of Biotechnology (DBT) under the Ministry has also formed a consortium to support the development of Medical equipment, Diagnostics, Therapeutics, Drugs and Vaccines to meet the Healthcare Challenges. Indian Council of Medical Research (ICMR), under the Ministry of Health & Family Welfare has already isolated the virus strain successfully, which is a first step towards vaccine research. Similarly, various other organizations under Ministry of Human Resource & Development, Ministry of Defence, Ministry of Chemicals & Fertilizers, etc. are also contributing substantively to our R&D efforts. The private sector has also come forward in a big way to supplement these efforts.

3. With a view to spreading awareness about the S&T efforts of the Government of India as well as private sector in finding solutions for COVID-19, Vigyan Prasar - an autonomous institution under Ministry of Science & Technology and engaged in large-scale science communication and popularization activities - has compiled all initiatives being undertaken in this field.

4. This document "Science & Technology Efforts on COVID-19 in India" shall serve as a ready-reckoner for policy makers, scientists, researchers, scholars and other stakeholders who might be interested in understanding and keeping themselves abreast with the latest S&T efforts being made to develop solutions to combat COVID-19.


(Dr. Harsh Vardhan)

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PREFACE

The COVID-19 pandemic has posed one of the biggest challenges to the entire humanity. In the wake of its outbreak, our lives have changed in ways we had never imagined before. All indications are leading to the conclusion that we all would have to learn to live with coronavirus, and there might be no early tapering off of the disease. This would require an adjustment to a NEW NORMAL of several aspects of our day-to-day life.

In these critical times, access to authentic information is of paramount importance. Vigyan Prasar (VP) has been covering the pandemic since the early days with the science communication perspective, ensuring that science and safety are the primary focus. VP is a national level organisation of the Department of Science and Technology, Government of India, engaged in science communication and popularisation. The principal objective of VP is to serve India's science popularisation agenda. This is achieved through several strategically important two-way, stakeholder-specific approaches to communicate about principles and practices of science and technology and implications for development and quality of life. Science popularisation therefore serves as a robust knowledge-led tool to fulfil various mutually reinforcing public policy objectives.

For the benefit of the stakeholders and target audience, we are preparing and publishing compilation of the most relevant initiatives and efforts by the Government of India through its various Science Ministries, Departments, and Funding organizations, in the shape of a weekly e-Newsletter. These organisations are all geared for combating the COVID-19 pandemic. These research-driven and technology-based interventions have been initiated on war footing to fight out the outburst of the pandemic. Government of India, through its various wings, like Science Ministries, Departments, and Funding organizations, has invited Calls for Proposals (CFPs) and Expression of Interest (EoIs) to enhance research and development-related activities to battle the pandemic out as well as making the nation self-reliant.

We hope this initiative of Vigyan Prasar shall be a handy guide to scientists, researchers, and scholars, especially those who are interested in knowing various aspects of COVID-19 and contributing to the coronavirus warfare and making the nation Atmanirbhar. Atmanirbhar Bharat, the vision of New India, will be fulfilled with aggressive implementation of the Make in India initiatives and when we would be wholeheartedly 'Vocal for Local'.

Vigyan Prasar
New Delhi

DR HARSH VARDHAN

Inaugurates COVID-19 Plasma Donation Campaign at AIIMS Delhi

19th July 2020, New Delhi

Dr Harsh Vardhan, Union Minister of Health and Family Welfare, today flagged off a Plasma Donation Campaign at AIIMS Delhi. The event was co-organized by Delhi Police where 26 police personnel who had recovered from COVID-19 volunteered to donate their blood plasma.

Expressing his gratitude to the Delhi Police for this initiative he said, "It is very sad that a dozen Delhi police personnel died due to Corona. In spite of these casualties, they are doing a great job deploying personnel to contain the spread, while the number of containment zones has jumped from 200 to 600."



Dr Harsh Vardhan saluted the contribution of these volunteers by conferring certificates to 26 police constables. Of these, Shri Om Prakash was donating his plasma for the third time today. The Union Minister stated that these donations will have a long-lasting impact on other countrymen who will get inspired to donate their plasma. Every single donor counts in our journey towards victory over COVID-19 and we need more and more of these plasma warriors to help fight the pandemic till a definitive treatment or vaccine is developed, he added.



He acknowledged the huge potential of this strategy and the government's will to tap into it. He commented, "As of now convalescent plasma therapy has been approved for compassionate use with various plasma banks being set up to ensure round-the-clock availability. Despite the fact that India has one of the highest cure rates amongst COVID-19 patients, the plasma donations has yet to pick up. I am happy that AIIMS, New Delhi is organising this plasma donation campaign with the support of Delhi Police Corona Warriors."

Fondly remembering the contribution of Delhi Police as an integral part of the success of Pulse Polio campaign in 1994, Dr Harsh Vardhan stated that tens of thousands of police constables had joined the Abhiyaan and created a huge awareness drive. The 100 phone number was also dedicated for this cause, he reminisced.

Plasma from recovered COVID-19 patients contains protective antibodies to the novel SARS-CoV-2 virus. It can provide immunity to patients of COVID-19 when transfused. Considering its potential benefit, plasma therapy is provided to those patients who are not responding to conventional treatment. Anyone who has recovered from COVID-19 and has completed 28 days after the completion of treatment or home isolation and is between 18 to 60 years of age with a weight of more than 50 kg is eligible to donate their blood plasma. The Blood Bank will assess their eligibility for blood donation and check the level of COVID-19 protective antibody levels in their blood before they can donate. The blood of a survivor usually has a high concentration of such antibodies and when given to a susceptible person, these antibodies circulate in blood, reach tissues and neutralize the virus. The process of donation is completed in one to three hours and plasma can be collected on same day.

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The e-newsletter is being published on a regular basis by collating all the inputs received till the preceding day of the release.

The older issues of e-newsletter are available in the Archival Section at <https://vigyanprasar.gov.in/covid19-newsletters/>

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SCIENCE & TECHNOLOGY EFFORTS ON COVID-19
BY

OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

KISAN Mitr: An initiative to support farmers become Atmanirbhar

The Office of the Principal Scientific Adviser (PSA) to the Government of India has launched an initiative called Kisan Mitr. It is a seven-phase project aimed at supporting farmers to become Atmanirbhar (self-reliant).

PHASE I

The first phase focuses on creating a repository of agricultural technologies to catalyze modernization of farming and solve information asymmetry. The engagement stage of the platform independently helps young start-ups to showcase their agricultural technologies and easily engage with market demand.

After the recent outbreak of COVID-19 pandemic, reverse migration happened across the country, in which labours returned to their native villages. Through the Kisan Mitr digital platform, migrant youth can not only engage in farming but can also become agriculture-related entrepreneurs, helping their communities with modernization techniques.


The Kisan Mitr platform receives a catalogue of technologies supplied by institutions such as IIT, IISER, CSIR, ICAR, MSME, start-ups, and reputed Universities specializing in agriculture (Punjab, Tamil Nadu).

The demand is comprised of buyers from accelerators, agri-innovators, agri-incubators, industry, foundations, large FPO communities and Women Self Help Groups (SHG). A few examples are NABARD DDMs, TAFE, ITC, Coromandel, Tata Chemicals, Rallis, Nagarjuna, etc.

Examples of a few technologies on the platform include soil & water conservation technologies, farm ecosystem machinery services, clean energy-related technologies, logistics or supply chain technologies, storage and processing techniques, Mandi dashboards with real-time data, Drones on hire, etc.

The Kisan Mitr platform facilitates an engaging exchange between the supply and demand sides through chat, video meetings, rating system, and feedback forms. It also bridges the collaboration gap between the research institutes and the industry primarily via competitions in which difficult problems from the industry are posed as a challenge to the scientific community.

To solve the cold start problem, NASSCOM and NIAM organize weekly webinars and convene both the sides to the platform. DD Kisan is considering televising the agricultural technologies in order to increase visibility and adoption of modern farming techniques and technologies across the country.



The project has received support from various departments of the government as well as private sector organizations.

The other phases of the initiative will be covered in the subsequent editions of this newsletter.

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<https://farmer.indiancst.com/>

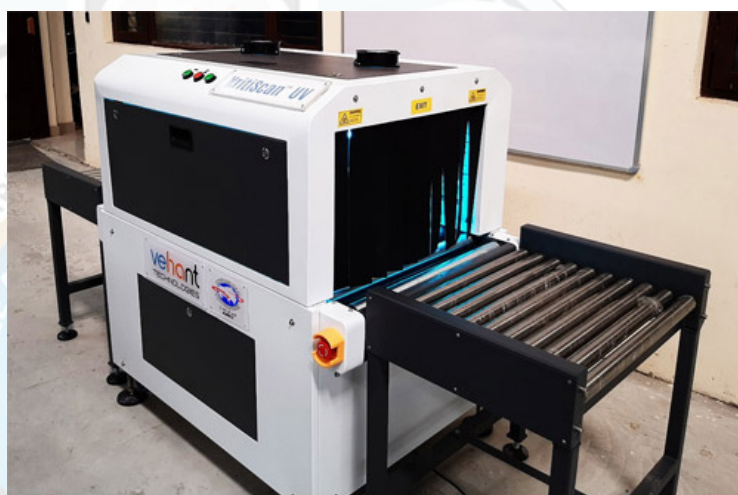
SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

ARCI & Vehant Technologies co-develop UV System for baggage scan disinfection to fight COVID-19

Both domestic and international travel has been a major reason for spread of the COVID-19 infection. Baggage, an inevitable part of travel, involves handling by multiple people and can be contact points for spread of the virus and should be disinfected quickly each time they change hands. With increase in the passenger traffic at airports, railway stations and commercial establishments during the



post-lockdown period, there is an immediate necessity for a rapid system for the baggage disinfection within few seconds to effectively fight against COVID-19.

In order to control spread of infection through baggage, International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, an autonomous R&D Centre of Department of Science and Technology (DST), Govt. of India and Vehant Technologies, Noida have co-developed KritiScan® UV Baggage Disinfection System.

This advanced baggage disinfecting system has a specially designed motorized conveyor to guide the baggage into the disinfection tunnel, which uses UVC light (254 nm) with appropriate irradiance to inactivate microbes and viruses. The UV-C lamps used in the system are well shielded and hence pose no harm to staff or passengers in the vicinity of the system. However, any human intervention is strongly advised against when the UVC sources are on.

Website link:

<https://dst.gov.in/arci-vehant-technologies-co-develop-uv-system-baggage-scan-disinfection-fight-covid-19>

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT-ILS establishes in-vitro culture facility for coronavirus

The DBT's Bhubaneswar-based Institute of Life Sciences (ILS) has established an in-vitro culture facility for coronavirus. The cultures are from patient sources using vero cells. Seventeen virus cultures have been established from swab samples with varying virus loads. Dr Soma Chattopadhyay and Dr Gulam Syed at the Institute are taking the lead in establishing and maintaining these culture units. This measure will be of great importance for COVID-related research in the country. In addition, it will aid the industry for appropriate testing and validation of various antiviral products thereby contributing to diagnostics, pathological intervention, as well as management of the disease.



This facility is in addition to a biorepository facility at ILS, which is aimed at collecting and storing clinical samples for furthering research and development related to coronavirus. ILS is the fourth lab to set up such an in-vitro culture facility in India.

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Website link:

https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_02S_20July2020.pdf

<https://www.ils.res.in/>

DBT-NIBMG helps beef up COVID-19 Diagnostics facilities in West Bengal

The DBT's Kolkata-based National Institute of Biomedical Genomics (DBT-NIBMG) has extended its support to the Institute of Post Graduate Medical Education & Research (IPGMER) and its associated Seth Sukhlal Karnani Memorial (SSKM) Hospital in the city to beef up COVID-19 diagnostics facilities in the state.

DBT-NIBMG deputed a team of volunteers in the SDLD and VRDL laboratories of IPGMER where they were involved in



hands-on viral RNA isolation and real-time PCR. They worked at COVID-19 testing labs at IPGMER for a few weeks for continuous periods of 5-6 hours every day wearing PPE kits. They assisted in performing COVID-19 tests and also trained the in-house staff at the hospital. To date, they have processed more than 2,500 patient samples. In addition to the IPGMER and SSKM Hospital, volunteers from DBT-NIBMG are visiting other district hospitals in West Bengal to help set up COVID-19 testing labs.

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Website link:

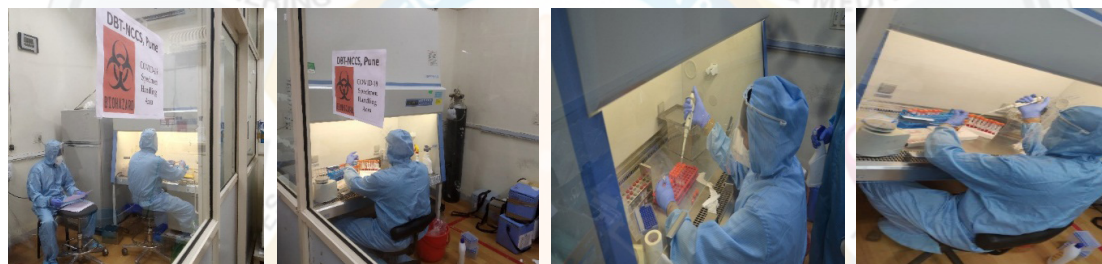
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01S_20July2020.pdf

<https://www.nibmg.ac.in/>

<http://dbtindia.gov.in/covid/dbt-initiatives-0>

DBT's NCCS tests over 10000 samples for COVID-19 in 10 weeks

The DBT's Pune-based institute, the National Centre for Cell Science (NCCS) began testing samples for SARS-CoV-2 on 25th April, 2020 to facilitate the ongoing COVID-19 surveillance. Speeding up efforts further, DBT-NCCS tested 5000 more samples in just a month, and crossed a major milestone by completing over 10000 tests in 10 weeks. This was made possible only by the tireless, diligent and persistent efforts of several scientists and technical and other staff, who have been working long hours, seven days a week.




COVID-19 tests being performed at NCCS facility

It was approved as a diagnostics facility by the DBT, the Indian Council of Medical Research (ICMR) and the Maharashtra State Government. Extensive and speedy preparations were made by this government research institution, including repurposing some of its laboratories to serve as a testing centre, procurement of supplies like PPE and kits, formulating and validating a standard operating procedure (SOP), getting technical and scientific staff trained at ICMR-NIV for COVID-related biosafety measures and sample testing, registering the facility with the appropriate authorities, and conducting mock testing.

Initially, fewer samples were sent to this Centre from within the Pune district of Maharashtra. However, with Maharashtra being the worst affected state in India, a large number of samples are required to be tested every day. Therefore, the Centre experienced a surge in the numbers of samples received in early May and started receiving many samples from other districts of Maharashtra as well. Undaunted by this task, the team at the Centre accelerated and doubled its efforts, frequently testing over 200 samples per day. Within less than a month and a half, this centre tested its first 5000 samples.

Furthermore, NCCS has also provided guidance and assistance to other research organizations, such as IISER-Pune and ARI to set up COVID-19 testing facilities on their respective campuses. A short video shared on the NCCS social media and website offers a glimpse into the activities of the diagnostics team. Updates are also posted on the website and social media of DBT-NCCS, to keep the public abreast of the activities of this testing centre.



The timely and much-needed support provided by ICMR-NIV, the Armed Forces Medical College, the B. J. Medical college in Pune, and the Directorate of Medical Education and Research in Mumbai have been invaluable in successfully initiating and implementing the activities at NCCS. The financial requirements were primarily met through the intramural funds of NCCS from the Government of India and partially supported by Lupin Ltd and Gennova Biopharmaceuticals Ltd. The Director of NCCS, Dr Manoj Kumar Bhat, is thankful to the scientific staff, technical staff and their families for their constant support in NCCS's contribution towards this national cause.

Contact Info: Jyoti Rao, jyoti@nccs.res.in

Website link:

https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01B_20July2020.pdf

https://twitter.com/DBT_NCCS_Pune/status/1280840051736248320

https://www.facebook.com/pg/DBT-National-Centre-for-Cell-Science-509782325747597/photos/?tab=album&album_id=3213425358716600

<https://www.nccs.res.in/index.php/Events/Covid>

<https://youtu.be/ICgBoPiZNu4>

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

Airborne transmission of COVID-19 possible, wear masks in enclosed spaces: CSIR

Amid recent acknowledgement from the World Health Organisation (WHO) over emerging evidence of airborne spread of the novel coronavirus, the head of India's premier R&D body has said that airborne transmission of SARS-CoV-2 is indeed a "distinct possibility" and suggested wearing masks even in "enclosed" spaces.

Director General of the CSIR, Dr Shekhar C. Mande sought to bring clarity on the issue in his blog post referring to findings of various studies and said, "All these emerging evidences and arguments suggest that indeed airborne transmission of SARS-CoV-2 is a distinct possibility."



Elaborating on how one can keep oneself safe in such a scenario, Mande wrote: "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."

Website Link:

<https://www.csir.res.in/slider/airborne-transmission-covid-possible-wear-masks-enclosed-spaces-csir>

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

CSIR-Centre for Cellular and Molecular Biology (CCMB) has asserted that the current testing capacity of two lakh tests a day across the country can be quickly scaled to six lakh tests a day by collecting dry swabs from patients for safer, cheaper and faster COVID-19 testing.

"This method has been validated and tested by two other institutions - Centre for DNA Fingerprinting and Diagnostics (CDFD) here and Indian Institute of Science Education & Research (IISER), Berhampur, Odisha. We had approached the Indian Council of Medical Research (ICMR) for approval in June first week and an appropriate advisory is expected soon which will help in getting more tests done at much lower costs giving us a better chance at managing the pandemic," said Director of CCMB, Rakesh Mishra.

He also said that a shift towards dry swab testing will immediately entail a saving of up to ₹ 75 crore a day! He explained that the 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.

Instead of this, scientists of CSIR-CCMB have 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," he affirmed.

Dry swabs will also enable the collection and transport process to be simpler and safer as there is no liquid sample handling and leakage and fear of contamination for the persons handling the sample in highly secure BSL-3 lab facilities. "It is also faster by about five hours as there is no RNA extraction and VTM containing tube handling. Further, it is cheaper too as there is no RNA extraction and no VTM, correspondingly less manpower is needed", said Dr Mishra.

Website Link:

<https://ur dip.res.in/covid19/>

कार्यस्थलों के लिए आर्टिफिशियल इंटेलिजेंस आधारित नई कोविड-सुरक्षा यूनिट

कोविड-19 के संक्रमण से बचाव के लिए शोधकर्ता विभिन्न युक्तियां खोजने में जुटे हुए हैं। दुर्गापुर स्थित सेंट्रल मेकैनिकल इंजीनियरिंग रिसर्च इंस्टीट्यूट (सीएमईआरआई) के शोधकर्ताओं ने इस दिशा में काम करते हुए नया 'कोविड प्रोटेक्शन सिस्टम' (कॉप्स) ईजाद किया है जो कार्यस्थलों पर कोविड-19 का संक्रमण रोकने में उपयोगी हो सकता है।

कॉप्स सिस्टम में संपर्क रहित सोलर ऑटोमेटेड मास्क डिस्पेंसिंग यूनिट और थर्मल स्कैनर (इंटेलिमास्ट) लगा है। आर्टिफिशियल इंटेलिजेंस और इंटरनेट ऑफ थिंग्स पर आधारित यह सिस्टम स्वचालित कामकाज में मददगार हो सकता है। सीएमईआरआई द्वारा जारी एक बयान में बताया गया है कि यह तकनीक व्यावसायिक हस्तांतरण के लिए तैयार है। निकट भविष्य में सीएमईआरआई की योजना एक डिजिटल एंट्री मैनेजमेंट सिस्टम विकसित करने की है।



सोलर इंटेलिमास्ट एक इंटेलिजेंट सर्विलांस किओस्क है जो शरीर का तापमान बताने के साथ-साथ यह भी पता लगा लेता है कि उसके सामने से होकर गुजरने वाले व्यक्ति ने मास्क पहना है या फिर नहीं। इसके जरिये मास्क न पहनने वाले कर्मचारियों की सूचना प्रशासन तक पहुँच जाती है। कर्मचारी स्कैनर पर चिप युक्त परिचय पत्र दिखाकर डिस्पेंसर से मास्क प्राप्त कर सकते हैं, जिसका मूल्य उनकी सैलेरी से काट लिया जाता है। यह प्रणाली बड़े संस्थानों में कर्मचारियों द्वारा सुरक्षा मानकों का पालन सुनिश्चित करने में मददगार हो सकती है।

सीएमईआरआई के निदेशक प्रोफेसर हरीश हिरानी ने कहा है कि "महामारी की मौजूदा स्थिति को देखते हुए कॉप्स सिस्टम कार्यस्थलों के लिए गेमचेंजर साबित हो सकता है। हेल्थकेयर कर्मचारियों की तरह विभिन्न संस्थानों में अग्रिम पंक्ति में तैनात सुरक्षाकर्मियों पर भी संक्रमित लोगों एवं वस्तुओं के संपर्क में आकर कोविड-19 से ग्रस्त होने का खतरा अधिक होता है।"

चेहरे की पहचान और परिचय पत्र आधारित उपस्थिति प्रणाली निकट भविष्य में इस सिस्टम में शामिल की जा सकती है। इस तरह से कार्यालयों, औद्योगिक इकाइयों, स्कूलों एवं कॉलेजों को अपनी तरह की यह संपूर्ण प्रणाली मिल सकती है।

Website Link:

<https://vignanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-I-17-July-20.pdf>

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR) AND MINISTRY OF HEALTH & FAMILY WELFARE (MOHFW)

AIIMS New Delhi's "e-ICU" video consultation programme gains traction

In order to strengthen the Government of India's efforts to reduce COVID-19 mortality, AIIMS New Delhi has started a video-consultation programme with ICU doctors across the country called e-ICU on 8th July, 2020. The programme aims at holding case-management discussions among doctors who are at the frontline in treating COVID-19 patients in hospitals and COVID-19 facilities around the country. Physicians who manage COVID-19 patients including those in the ICUs can raise queries, present their experience and share knowledge with other physicians and experts from AIIMS, New Delhi on this video platform.

The primary objective of these discussions is to reduce mortality from COVID-19 by learning from shared experience and strengthening best practices among hospitals with 1000 beds including isolation beds, oxygen-supported and ICU beds. Four sessions have been held till date covering 43 institutions [Mumbai (10), Goa (3), Delhi (3), Gujarat (3), Telangana (2), Assam (5), Karnataka (1), Bihar (1), Andhra Pradesh (1), Kerala (1), and Tamil Nadu (13)].

Each of these sessions conducted through Video Conference span over 1.5 to 2 hours. The discussions have covered the entire range of issues related to management of COVID-19 patients. Some of the important issues that have been stressed upon are the need for rational use of 'Investigational Therapies' like Remdesivir, convalescent plasma and Tocilizumab. The treating teams have discussed the current indications and possible harm due to their indiscriminate use and the need to limit social media pressure-based prescriptions.

The use of proning, high flow oxygen, non-invasive ventilation and ventilator settings for advanced disease have also been a common discussion point. The role of various testing strategies in diagnosing COVID-19 has also been an important topic of shared learning.

Issues such as the need for repeat testing, admission and discharge criteria, management of post-discharge symptoms, and return to work have been addressed.

Some of the other common concerns have been the methods of communication with patients, screening of healthcare workers, managing new-onset diabetes, uncommon presentations such as stroke, diarrhoea and myocardial infarction etc. The team from AIIMS, New Delhi was able to act as a bridge for new knowledge from one group to the other at each VC, apart from advising from its own experience and the extensive literature reviews done by the domain experts.

The “e-ICU’ video consultation programme in the coming weeks would cover ICU doctors from smaller healthcare facilities (i.e., those having 500 beds or more) across the country.

Website link:

<https://pib.gov.in/PressReleaseDetailm.aspx?PRID=1639872>

List of IgG ELISA/CLIA kits for COVID-19 validated by ICMR-identified validation centre

Serosurveys are performed to understand the proportion of population exposed to infection including asymptomatic individuals. Depending upon the level of seroprevalence of infection, matching public health interventions can be implemented for prevention and control of the disease.

Survey in high risk or vulnerable populations (healthcare workers, frontline workers, immunocompromised individuals, individuals in containment zones etc.) helps to know who has been infected in the past and has now recovered.

List of IgG ELISA/CLIA kits for COVID-19 are

1. Zydus Cadila Healthcare Ltd., Ahmedabad (Gujarat), India: COVID Kavach IgG ELISA;
2. Euroimmun US Inc., USA: Euroimmun Anti-SARS-COV-2 IgG ELISA;
3. Calbiotech Inc., USA: Erbalisa COVID-19 IgG ELISA;
4. YHLO iFlash, China: SARS-CoV-2 IgG CLIA;
5. Karwa Enterprises Pvt. Ltd, Delhi, India: KAVACH Karwa SARS-COV 2 IgG ELISA;
6. Voxtur Bio Ltd., (Mumbai), India: VOXEL Anti-SARS COV-2 IgG Antibody detection kit COVID KAVACH

ICMR has transferred COVID Kavach IgG ELISA technology to below mentioned pharma companies: Zydus Cadila Healthcare Ltd; Meril Diagnostics Pvt. Ltd; Voxtur Bio Ltd.; Trivitron Healthcare Pvt. Ltd; J. Mitra & Co. Pvt Ltd; Karwa Enterprises Pvt Ltd; and Avecon Healthcare Pvt Ltd.

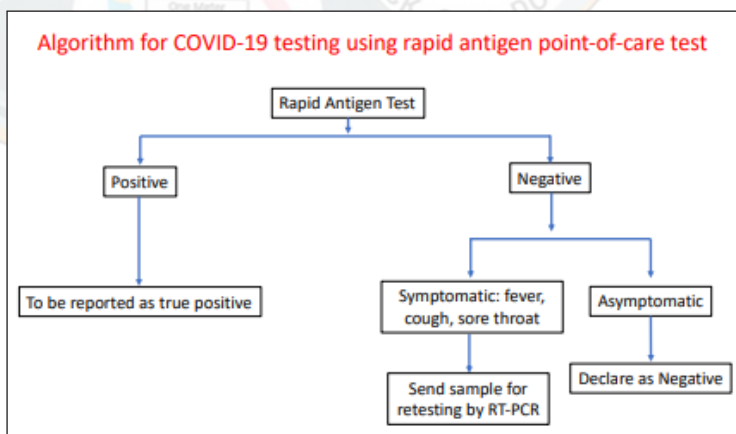
Website link:


https://www.icmr.gov.in/pdf/covid/kits/ELISA_CLIA_Kits_List_16072020.pdf

Advisory on district-wise login credentials for rapid antigen testing for COVID-19

ICMR has invited researchers/entrepreneurs to come up with testing kits, which are accurate and useful. Efforts are being made to validate such kits and make multiple options available for use. With the use of antigen tests, more and more tests are being carried out. It is absolutely necessary that all such testing data is uploaded on

the ICMR database and all positive cases are brought to the attention of district/municipal authorities for isolation/quarantine/treatment, as the case may be. It is expected that to





provide safe healthcare services, all Government hospitals/labs as well as all private NABH/ NABL hospitals/labs may initiate antigen testing and also apply for obtaining login credentials for data entry into the ICMR portal.

ICMR has been receiving multiple requests from various public sector units, small private/ government facilities, temples, etc. for initiating this testing.

In an effort to facilitate and further liberalize testing, ICMR has generated five common login credentials for each district of your State/UT, which may be shared with all Government and private facilities selected for antigen testing. A nodal person from respective State/UT can also be nominated who could contact the ICMR team for obtaining login credentials.

Website link:

https://www.icmr.gov.in/pdf/covid/labs/District_wise_Rapid_antigen_testing.pdf

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

DRDO develops evaporating fogger for sanitization to fight against COVID-19

An evaporator-type fogging device has been developed by Defense Institute of Physiology & Allied Science (DIPAS) for sanitization of work spaces and associated accessories. The fogger can be used with any type of chemical suitable for particular disinfection purpose.

The systems consist of a small chemical reservoir (CR), suction mechanism, evaporation mechanism and a blower. The size of the reservoir is optimized to avoid wastage of chemical. The main stock of the disinfection fluid remains in a separate chemical chamber (CC) which is air tight and does not allow reaction with air. From this chamber the fluid goes to the reservoir below the evaporator from where the suction mechanism picks it for evaporation. Electronic sensor and solenoid valve maintain the required level in the reservoir.



As soon as the system stops, the supply is automatically cut off. The timer starts and stops the blower according to the pre-set values displayed on a digital timer provided on the front side. The complete system and chemical chamber are made up of stainless steel to avoid any corrosion.

The capacity of chemical reservoir is 500 ml. A separate air-tight chemical chamber for additional disinfection fluid has been provided that has 4-liters capacity. The system can be easily handled/transported.

With this machine an enclosure of about 1000 cubic ft would require fogging time of around 8 minutes with dwelling time of 60 minutes. The fogging time can be calculated depending upon the size of the room, and the dwelling time will remain same. The operation can be easily handled as per SOP.



Website link:

<https://drdo.gov.in/personnel-vehicle-area-sanitization-equipment>

Germiklean - Dry Heat Sanitization System developed by DRDO to combat Coronavirus

In the COVID-19 pandemic situation, prevention through sanitization is most effective way to remain safe. Keeping this in mind, a dry heat sanitization system named Germiklean has been developed to sanitize uniforms, canes, polycarbonate shields, files, papers, metals, ceramic items etc. Germiklean is a dry heat-based system which uses hot air at 70°C for 10-minute cycle to sanitize items placed inside.

The systems consist of a mild steel powder-coated box having a working chamber made up of stainless steel (Grade 304) and a heating chamber.

The heating chamber consists of a heating element, timer, sensor cum controller and a blower to maintain the required temperature inside the working chamber for the sanitization of items. Forced convection system is used for proper mixing of heat and it maintains uniform temperature inside the working chamber. Measures have been taken to ensure zero heat loss e.g. insulating material is filled in the gap between the inner chamber and outer body, double-walled door filled with glass wool, and synthetic gasket fitment on the door.

The system has modular design and the dimensions can be changed depending upon the requirement. The Germiklean in picture depicts Poly urethane-insulated MS chamber with 304 grade and Stainless Steel internal chamber of dimensions (W x D x H) 1875 mm x 850 mm x 1600 mm. It has got air handling unit (AHU) with heating system for maximum temperature of 100°C and working temperature of 70°C. It has provision of 24 hangers in 3 fixtures inside the chamber with in-built door lights.

Website link:

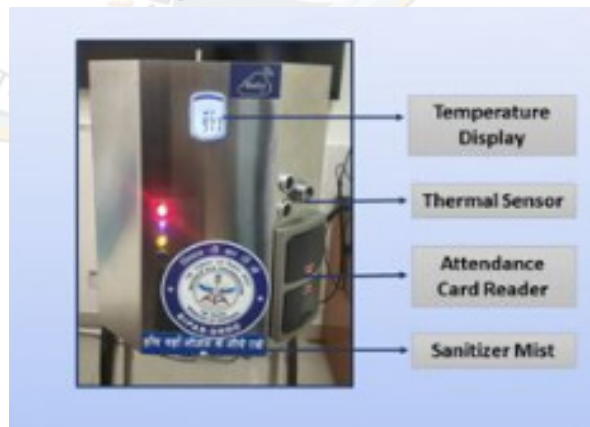
<https://drdo.gov.in/personnel-vehicle-area-sanitization-equipment>




DRDO develops Sanitizer With Attendance Gear & Temperature Monitoring (SWAGATAM)

A system has been developed by Defense Institute of Physiology & Allied Science (DIPAS) for non-contact card-based attendance and temperature monitoring along with sanitizer dispenser, simultaneously covering every aspect of safety against COVID-19.

The System has in-built card reader which is connected to the server via GSM & GPRS. An ultrasonic sensor sends out high frequency sound waves (about 40 KHz) in the direction of detection and receives the reflection from nearby objects and gives distance reading by processing the echo time.





Once, a person punches the card, his/her card number, current date and time of arrival/exit along with temperature details (96°F to 107.6°F) will be saved on the server. Up to 40000 records can be stored in the device itself.

This data can be accessed from the server with the help of API/Interface and thus can be used for Employee Attendance System accordingly. The system has been tested and found easy to use, stable in performance, and user friendly. The temperature can be recorded from a distance 2 cm to 4 cm. The sanitizer can be used from a distance of 2 cm to 20 cm.

Website link:

<https://drdo.gov.in/miscellaneous>

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

SCIENTIFIC AND ACADEMIC INSTITUTIONS

Union HRD Minister launches world's most affordable COVID-19 diagnostic kit, Corosure, developed by IIT Delhi

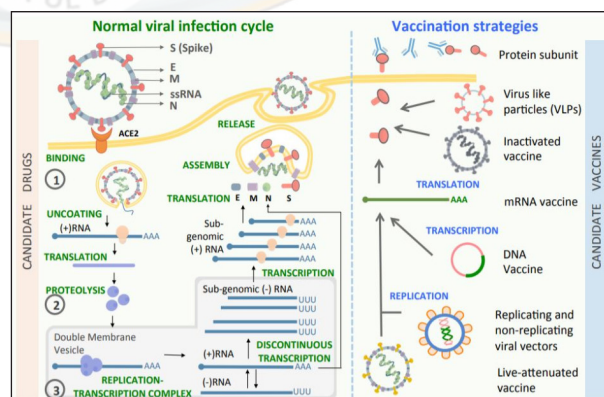
Union Human Resource Development Minister, Shri Ramesh Pokhriyal 'Nishank' e-launched the world's most affordable RT-PCR-based COVID-19 diagnostic kit developed by IIT Delhi and approved by the ICMR and DCGI in New Delhi. COVID-19 Diagnostic Kit is a step towards Prime Minister Shri Narendra Modi's vision of a self-reliant India. The country requires cheap and reliable testing for the country which can help to control the pandemic. The Corosure Kit has been developed indigenously and is much cheaper than other kits. This affordable detection kit will help the country amid the ongoing crisis. This kit will now be available for use by the authorised testing labs with this launch and will significantly bring down the cost of COVID-19 RT-PCR testing.



Website Link:
<https://home.iitd.ac.in/news-diagnostic-kit.php>

IISER Tirupati reviews “Global efforts on vaccines for COVID-19” in the Topical Collection on COVID-19: Disease Biology & Intervention issue of the Journal of Biosciences

COVID-19 is an emerging infectious disease that has turned into a pandemic. It spreads through droplet transmission of the new coronavirus SARS-CoV-2. It is an RNA virus displaying a spike protein as the major surface protein with significant sequence similarity to SARS-CoV which causes severe acute respiratory syndrome. The receptor binding domain of the spike protein interacts with the human angiotensin



converting enzyme 2 and is considered as the antigenic determinant for stimulating an immune response. While multiple candidate vaccines are currently under different stages of development, there are no known therapeutic interventions at the moment. A review paper by Raju Mukherjee, Department of Biology, Indian Institute of Science Education and Research (IISER) Tirupati, has been published that describes the key genetic features which are being considered for generating vaccine candidates by employing innovative technologies. It also highlights the global efforts being undertaken to deliver vaccines for COVID-19 through unprecedented international cooperation and future challenges post development.

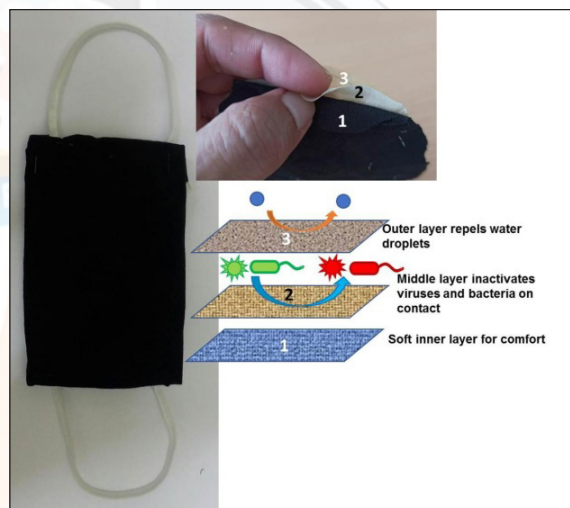
Website Link:

<http://www.iisertirupati.ac.in/research/researchhigh/>

http://www.iisertirupati.ac.in/events/Raju_Mukherjee_article.pdf

IISc makes virucidal composite fabric for PPE

Indian Institute of Science (IISc), Bengaluru, made a fabric for PPE named Virucidal composite fabric. Since there is no vaccine currently available for the COVID-19 pandemic, protection is the only prevention. Personal protective equipment (PPE) such as facemasks, gloves and surgical/lab coats are very important in the context of virus containment for healthcare workers during pandemics. Current antiviral masks available in the market are either expensive or are inefficient in reducing viral transmission. Due to high demand for PPE worldwide, the supply of quality PPE is limited. There is a need to rapidly manufacture affordable multi-layered masks with antiviral and antibacterial properties for protecting healthcare workers and other high-risk groups.



A combination of three layers consisting of polyester and cotton fabrics is used to construct a 3-ply facemask to contain common viruses such as the influenza virus as well as SARS-CoV-2. The three-layered mask consists of modified polyester, where a nanofibrous polymer membrane was deposited that renders the first layer highly hydrophobic. The first layer resists the entrance of any liquid drops containing the virus particles due to its hydrophobicity.

Contact Info: sbose@iisc.ac.in, kchatterjee@iisc.ac.in

Website Link:

<https://covid19.iisc.ac.in/virucidal-composite-fabric-for-ppe/>

IISc develops analytical tool for direct numerical simulation of 'cough/sneeze flows' to understand transmission dynamics of COVID-19 infections

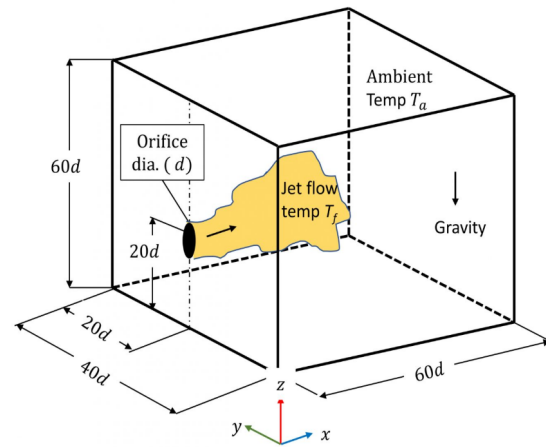
The transmission dynamics of highly-contagious respiratory diseases like COVID-19 (through coughing/sneezing) is an open problem in the epidemiological studies of such diseases. The primary cause of COVID-19 infections is believed to be droplet transmission from an infected person to a susceptible neighbour. WHO has recommended maintaining a distance of 1-2m from an infected person to minimize transmission to a neighbour. However, recent studies

suggest that this could be an under-estimation and that the pathogen is likely to get transported over much longer distances, especially through sneezing. Thus, a better understanding of the transmission dynamics of the COVID-19 infection is the need of the hour.

Indian Institute of Science (IISc) Bengaluru has developed an analytical tool for direct numerical simulation of 'cough/sneeze flows' to understand transmission dynamics of COVID-19 infections. The objective of the present work is to develop a direct numerical simulation (DNS) code for studying 'cough/sneeze flows' by a suitable combination of available DNS codes and to generate useful data and physical understanding on these flows.

Website Link:

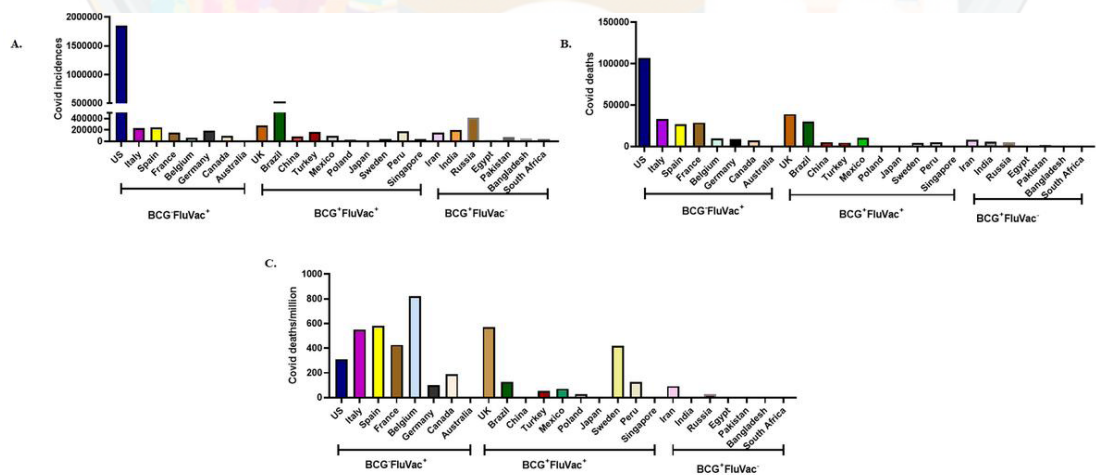
<https://covid19.iisc.ac.in/direct-numerical-simulation-of-cough-sneeze-flows-to-understand-transmission-dynamics-of-covid-19-infections/>



IISc studies protective roles of flu infections and BCG vaccination in lowering COVID-19 mortality

Countries, such as the USA, Italy, France and Spain which have flu vaccination, but not BCG vaccination, showed maximum number of COVID-19 deaths. It appears that high numbers of flu infections are protective and can decrease the number of COVID-19 deaths. Importantly, countries with high flu cases and BCG vaccination, such as India, Egypt and South Africa, showed relatively lower COVID-19 deaths, reinforcing the protective roles of BCG vaccination.

Notably, these general trends are statistically significant for COVID-19 deaths but not COVID-19 incidences. The study is being carried out at Indian Institute of Science (IISc), Bengaluru. The implications of results are discussed with respect to the roles of microbial infections in the respiratory tract, vaccinations and other factors in lowering COVID-19 deaths.



Contact Info: Dipankar Nandi; nanidi@iisc.ac.in

Website Link:

<https://covid19.iisc.ac.in/protective-roles-of-flu-infections-and-bcg-vaccination-in-lowering-covid-19-mortality-preprint-study/>

SCIENCE OUTREACH & POPULARISATION EFFORTS

Since the outbreak of COVID-19 pandemic, the Ministry has supported numerous research projects and technology interventions through its various Departments, Autonomous Organisations, Professional Bodies, Statutory Bodies, and Laboratories. In the expedition of science outreach and popularisation, a number of knowledge and information products have been generated and released.

Efforts from Ministries, Departments & Scientific Organisations

NISCAIR publishes a special edition of 'Science Diplomacy' on COVID-19

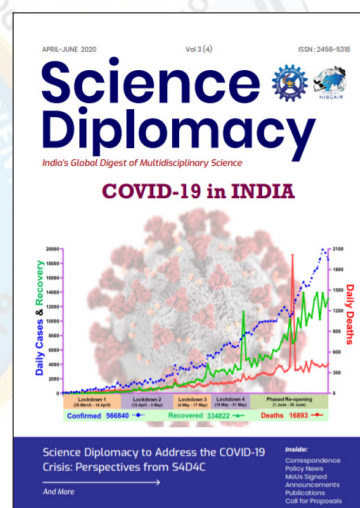
National Institute of Science Communication and Information Resources (CSIR-NISCAIR) published a special edition of 'Science Diplomacy' on COVID-19 in India in Apr-Jun 2020, Vol. 3(4). 'Science Diplomacy' is among the first endeavours to bring highlights of Indian scientific achievements in foreign languages. It helps in identifying priority areas for collaboration and involvement of stakeholders in policy-making and strategic engagements, including scientists, academicians, senior diplomats, science counsellors and experts.

In the current edition, perspectives from S4D4C have been covered along with the correspondence with scientists across the globe sharing their stories on COVID-19 global reverberations. S4D4C – the full project title 'Using Science for/in Diplomacy for Addressing Global Challenges' – is a European project, co-funded by the European Commission under the Horizon 2020 programme.

Contact Info: director@niscair.res.in, monicajaggi@niscair.res.in

Website Link:

<https://www.niscair.res.in/includes/images/sciencediplomacy/Science-Diplomacy-April-June-2020.pdf>



Government of India releases advisories to address mental health issues among pregnant women amidst COVID-19

Government of India is taking all necessary steps to ensure that we are prepared well to face the challenge and threat posed by the COVID-19 pandemic. The most important factor in preventing the spread of this virus locally is to empower the citizens with the right information and taking precautions as per the advisories being issued by Ministry of Health & Family Welfare.

In its series of advisories, on 12th July 2020, Government of India released infographics, both in Hindi & English, containing advisories to address mental health issues among pregnant women amidst COVID-19, during perinatal period.

Addressing Mental Health Issues among Pregnant Women Amidst COVID-19

Symptoms of Psychological distress during Perinatal period

- Lack of sleep because of anxiety, easily annoyed or irritable
- Focusing excessively on social media messages about COVID-19
- Getting anxious about infection control procedures in family members
- Excessive worrying about missing work
- Feeling sad/angry because of isolation, not being able to meet family & friends
- Feeling nervous, anxious, or on edge; Trouble relaxing

Dated: 12 July, 2020

Addressing Mental Health Issues among Pregnant Women Amidst COVID-19

Self Care Guide for Pregnant Women (1/2)

- Remember that mental health is as important as physical health for adequate growth & development of your baby
- Minimize watching, reading or listening to news about COVID-19 that causes you to feel anxious or distressed
- Anxiety about the COVID-19 infection is normal at this time of pandemic and lockdown
- Seek information only from trusted sources so that you can take practical steps to prepare your plans
- Find opportunities to amplify positive & hopeful stories. e.g. Stories of women who have had babies, persons who recovered from COVID-19

Dated: 12 July, 2020

Addressing Mental Health Issues among Pregnant Women Amidst COVID-19

Self Care Guide for Pregnant Women (2/2)

- Practice hand hygiene techniques frequently at home, ask your doctor regarding sanitation practices at home
- Maintain an adequate diet, including green vegetables, protein, & carbohydrates
- If you are concerned about pregnancy, contact your ASHA or ANM or obstetrician over the phone
- If you are nearing your delivery, then keep your "Mother Card", emergency ambulance number ready
- Follow the instructions provided by your doctor regarding hospital visits. In case you have to visit, try not to touch any surface in the hospital

Dated: 12 July, 2020

Website Link:

<https://transformingindia.mygov.in/covid-19/?type=en§or=#scrolltothis>

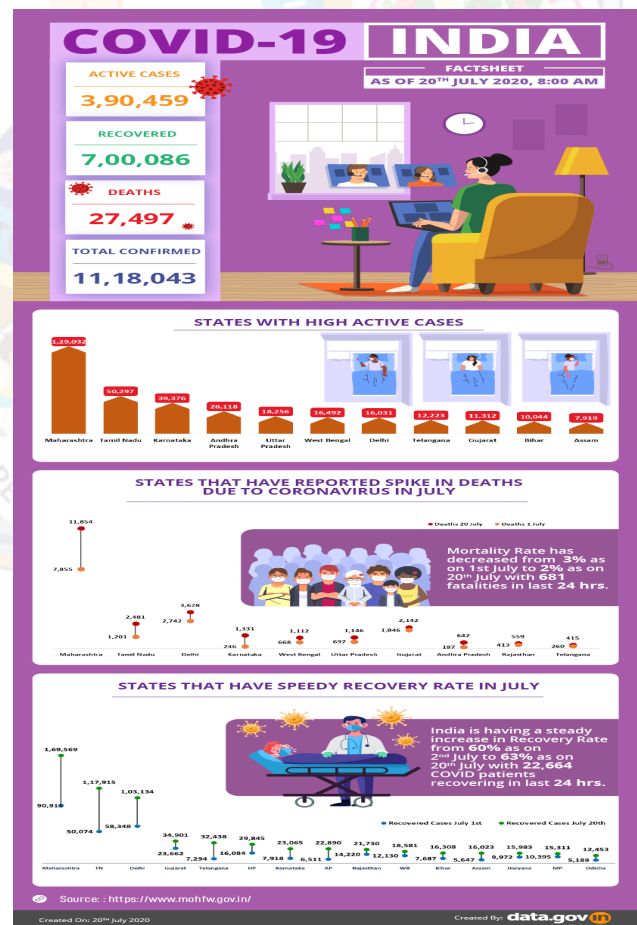
Government of India presents regular COVID-19 India factsheet

India's coronavirus cases have crossed 11-lakhs mark and now, as on 20th July 2020, 8:00 AM, stands at 11,18,043 cases out of which 7,00,086 have recovered. Government of India, through its Open Government Data (OGD) Platform <https://data.gov.in/> has taken the initiative to present the regular factsheet related to COVID-19.

The OGD platform is aimed at supporting Open Data initiative of Government of India. The portal is used by various Ministries, Departments, and their organizations, to publish datasets, documents, services, tools and applications collected by them for public use. It intends to increase transparency in the functioning of Government and also opens avenues for many more innovative uses of Government Data to give different perspective.

Website Link:

<https://community.data.gov.in/covid-19-india-factsheet-as-on-20th-july-2020-800-am/>



Press Information Bureau releases daily bulletin on COVID-19

Press Information Bureau (PIB), Government of India releases a daily bulletin on COVID-19. The bulletin contains Press Releases concerning COVID-19, issued in last 24 hours, inputs from PIB field offices and fact checks undertaken by PIB.

Website Link:

<https://pib.gov.in/PressReleasePage.aspx?PRID=1640261>



- Total recoveries leap up to 7.2 lakh; 24,491 COVID-19 patients recovered during the last 24 hours.
- National Recovery Rate Improves to 62.72%.
- Case Fatality continues to dip further to 2.43%.
- 19 States/UTs conducting more than 140 tests/day/million, as advised by WHO
- Over 3.3 lakh samples tested in last 24 hours.
- Presently, there are 4,02,529 active cases in the country.
- Sero-prevalence study shows that on an average, across Delhi, prevalence of IgG antibodies is 23.48 %; Large number of infected persons remain asymptomatic.
- HRD Ministry launches MANODARPAN to provide psychosocial support to students for their Mental Health and Well-being.

Indian Railways creates Post COVID Coach to ensure safer journey

Indian Railways has taken numerous steps and measures to prevent the spread of COVID-19 virus infection. Sustaining the ruthless fight against COVID-19, Indian Railways' production unit, Rail Coach Factory, Kapurthala, has developed a Post COVID Coach to fight COVID-19. It has design improvements in the coach like handsfree amenities, copper-coated handrails & latches, plasma air purification and titanium di-oxide coating for COVID-free passenger journey.



Railways Ensuring Safer Journey Rail Coach Factory, Kapurthala Designed Post COVID Coach to fight COVID-19



Provision of hands-free amenities like foot-operated water tap & soap dispenser, foot-operated flush valve, etc.



Coach equipped with copper-coated handrails & latches as copper degrades the virus landed on it within a few hours



Provision of plasma air equipment in AC duct to sterilize air & surfaces inside the AC coach



Titanium di-oxide coating on washbasins, lavatory, berths, glass window, floor, virtually every surface that comes in human contact

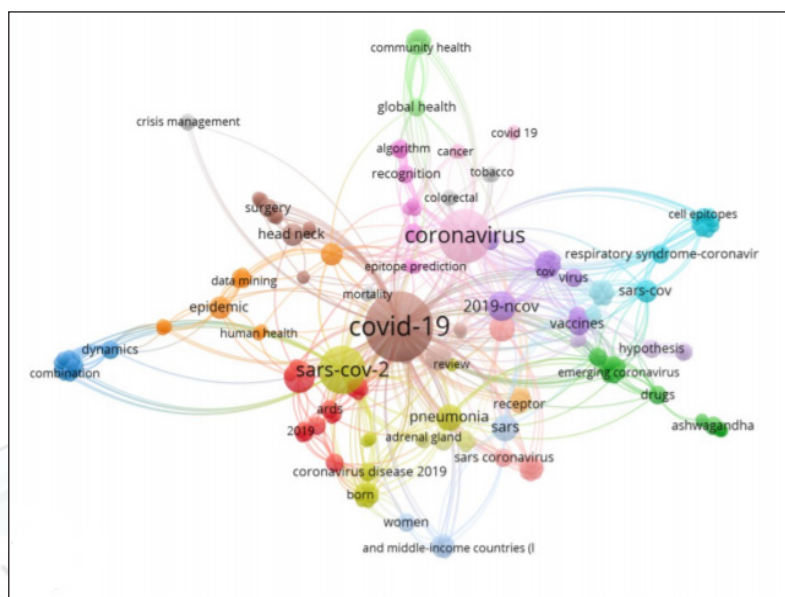
Website Link:

<https://pib.gov.in/PressReleaseDetail.aspx?PRID=1639661>

Directorate of Education of Delhi Government does a quantitative analysis of COVID-19 research in India

Directorate of Education, Government of National Capital Territory (NCT) of Delhi, has done a quantitative analysis of COVID-19 research in India. The study has been published in June 2020 edition of Indian Journal of Biochemistry & Biophysics, Vol. 57.

In this paper, the author attempts to identify the coverage of publication on SARS-CoV-2 (COVID-19) in different academic databases. Analysis of Indian publications in Dimension has been carried out to identify the authors, institutions, keywords, and journals. Dimension indexes from 742 Indian publications with 196 citations as on 11th May 2020. All India Institute of Medical Sciences (AIIMS) is the most productive organization with 65 publications. Preprint servers such as MedRxiv and BiorXiv are the leading databases where Indian authors have made available their research output.



Keyword network of COVID-19 publications (Sources:WOS)

Contact Info: Manohar Pathak, manoharpathak@gmail.com

Website Link:

<http://nopr.niscair.res.in/handle/123456789/54461>

Bureau of Indian Standards makes special provisions for making COVID-19-related PPE

To promote the supply of quality Personal Protective Equipment (PPE) during the ongoing COVID-19 pandemic, Bureau of Indian Standards (BIS) has permitted relaxation in its norms of having in-house testing facilities for filter half masks, surgical masks and eye protectors.

This has been done to enable more manufacturers to be brought in the ambit of BIS product certification scheme, which will in turn result in greater quantity of BIS-certified PPEs being made available to the users. However, for such manufacturers, testing of samples for conformity to the specified requirements is being done in laboratories of BIS licensees who have in-house testing facilities or in BIS recognized or empanelled private/government labs.



Website Link:

<https://bis.gov.in/index.php/relaxations-for-covid-19/>

Indian Standards ensuring safety and performance in COVID-19

The global pandemic of COVID-19 has deeply impacted all around. The Government and community at large are facing numerous challenges to quickly respond to and manage the situation. Some of the Indian Standards on PPEs and medical equipment are critical in ensuring their safety and performance in use. BIS has identified 14 of these key standards on PPEs, Infrared thermal readers and scanners, and ventilators, for which more details are provided at its website.

Website Link:

<https://www.bsbedge.com/IndianStandardsonCovid19>

KVIC contributes to Atmanirbhar Bharat by making low-cost, eco-friendly khadi masks





Masks are one of the most desired requisite in today's world impacted with COVID-19 pandemic for day-to-day usage. On call of the nation, khadi artisans retrained themselves to stitch khadi masks, an exquisite product made of handcrafted fine khadi fabric. These masks are skin friendly and come at zero cost to the environment. Khadi and Village Industries Commission (KVIC), Ministry of Micro, Small and Medium Enterprises (MSME), appeals the general public to breathe with khadi masks, promote Make-in-India to empower artisans and help make them become 'Atmanirbhar'.



KHADI MASKS IN MAKING

Taking Immense **CARE**
On What you **WEAR**

Because, a **MASK**
is your personality-an expression of
hygiene & consciousness

 <p>Khadi Silk Mask (Non Printed) Code : 10001 Price : ₹ 100 / Piece</p> <p>View More</p>	 <p>Khadi Cotton Mask Code : 10002 Price : ₹ 30 / Piece</p> <p>View More</p>	 <p>Khadi Silk Mask (Printed) Code : 10003 Price : ₹ 100 / Piece</p> <p>View More</p>	 <p>Khadi Cotton Mask Code : 10004 Price : ₹ 30 / Piece</p> <p>View More</p>
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Website Link:

<https://www.kviconline.gov.in/khadimask/index.jsp>

AICTE facilitates funding support for institutions offering a COVID-19-related tech solution

With reference to COVID-19 pandemic, All India Council for Technical Education (AICTE) requests those Institutions which are having Start-up/Industry (if any) and offering a Tech Solution (for the pandemic) to write directly to the Department of Science and Technology (DST) with all the details.

Contact Info: neerajs@nic.in; anigupta@nic.in

Website link

<https://www.aicte-india.org/sites/default/files/DST.pdf>

DPIIT releases a compendium of critical care equipment for COVID-19

Department for Promotion of Industry and Internal Trade (DPIIT) has released a compendium of critical care equipment as solutions for COVID-19. These technologies are provided by various start-ups and supported by COVID-19 TASKFORCE.



Website Link:

https://www.startupindia.gov.in/content/dam/invest-india/Templates/public/covid_resource_section/listicles/Covid%20Startup%20Solutions_critical%20care%20equipment.pdf

CSIR-NISCAIR brings out weekly e-Newsletter on COVID-19

National Institute of Science Communication and Information Resources (CSIR-NISCAIR) brings out a newsletter dedicated for the COVID-19 outbreak. The newsletter covers stories and information on various aspects, like research, technology and innovation efforts to fight the pandemic out and related awareness and sensitisation information. The latest edition dated 21st July 2020 has been published.

Website Link:

<https://www.niscair.res.in/covidbulletin/view/12>

<https://www.niscair.res.in/covidbulletin>

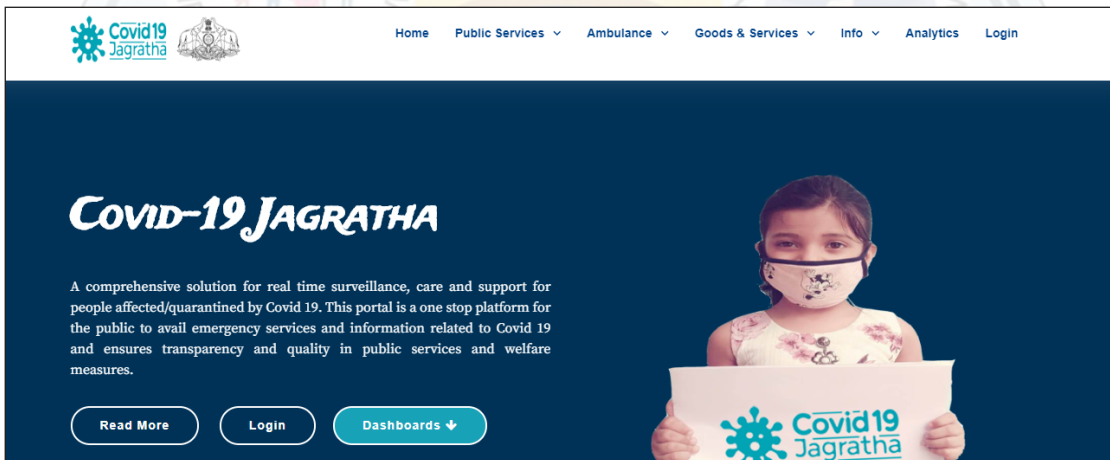


COVID-19 JAGRATHA: One-stop platform for people in Kerala who seek to avail emergency services and coronavirus-related information

COVID-19 Jagratha is a comprehensive solution for effective daily reporting/monitoring of the quarantine and health status of the people under surveillance by Field Health Workers like PHN/JHI/Asha (Ward RRT) and provision of health service through teleconsultation and referral by Medical Officers based on the reports available in the system.

The portal is designed for disseminating information related to COVID-19 for public and provisions for accessing emergency services for public. This platform can be used to generate simplified daily report on welfare measures initiated by the District Administration for public who are provided with support during lockdown, like support to elderly people, migrant labourers, and Public Distribution System.

This is also a one-stop platform for the public to avail emergency services and information related to COVID-19 and ensures transparency and quality in public service and welfare measures. This information and management solution is conceptualized and designed by District Administration Kozhikode engaging District NIC and IT Mission Teams.



Website link:

<https://covid19jagratha.kerala.nic.in/>

IIT Palakkad special Edition on COVID-19 initiatives: Heroes In The War Against COVID-19

When COVID-19 was starting to engulf our nation, IIT Palakkad has been testing out ways to help the community, policymakers, and fellow researchers. The initiatives included both actual device implementations to data-backed case study explorations/visualisations. A team of faculty and staff, both on campus and



outside, has been set up for the same. The entire initiative is headed by Dr S Kanmani Subbu, appointed as Nodal Officer, coordinating the various activities and forming the interface with the collaborating industries for creating the products.

All the efforts (initiatives, projects, case studies) taken by the Institute and an update on the latest developments, such as Preparation and Distribution of Hand Sanitizer, Making reusable Respiratory Masks, Portable Emergency Ventilator, Foot-operated Hands-free Sanitizer Dispenser, Pulse Plethysmograph Instrument for Continuous Monitoring of blood pulse, heart rate and oxygen saturation of patients in ICUs, Affordable Rapid Testing Kits, Models and analysis making use of Machine Learning, Panchayat Level Vulnerability Map, Lung Ultrasound Imaging for Monitoring COVID-19 patients, Pool Testing Strategies, Crowd Sensing and Localization and others.

Website link:

https://iitpkd.ac.in/sites/default/files/2020-05/TFS_SpecialEdition_on_Covid19Initiatives.pdf

Efforts from Vigyan Prasar

India Science Channel

India Science is an Internet-based Over-The-Top (OTT) Science TV channel. It is an initiative of the Department of Science and Technology (DST), Government of India, implemented and managed by Vigyan Prasar (VP), an autonomous organisation of the Department of Science and Technology. This 24x7 video platform is dedicated to science and technology knowledge dissemination, with a strong commitment to spreading scientific awareness, especially with Indian perspectives, ethos and cultural milieu. The initiative is supported by the National Council of Science and Technology Communication (NCSTC), DST.

Science and Technology are the main driving forces of the nation and fundamental to progress and growth. So, the advantages of science and technology must reach all sections of society through popular media of communication. India's large Internet user base of 500 million is split between 305 million urban Indians and 195 million rural Indians, all of whom need to be reached with



authentic science and technology content. And to do so, the Internet is fast becoming the most accessible and preferred media for content delivery.

Since the occurrence of COVID-19, India Science has been working tirelessly to connect with the people, in the form of regular bulletins, documentaries, interviews, bytes and live sessions of scientists, doctors, experts, science administrators and policymakers. The following is a brief of the information products produced by India Science.

1. Weekly COVID-19 video bulletin: Produced in both Hindi and English language weekly basis from 7 July 2020, COVID-19 bulletin apprises the audience about the latest development happening in S&T in India that are helping in managing and overcoming the challenges thrown up by the pandemic. Vigyan Prasar has produced daily COVID-19 Bulletin during 11 April to 06 July 2020.
2. COVID-19 Explained - Short films to explain important research finding related to COVID-19 in layman's lingo produced every week. The subjects chosen for this short film caters to the curiosity of common man related to COVID-19.
3. Facebook live sessions on interviews of various stakeholders and media with DST Secretary.

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<https://www.indiascience.in/>

India Science, Technology and Innovation (ISTI) Web Portal

The India Science, Technology and Innovation Portal (ISTI) is a one-stop window for information about developments in India on science, technology and innovation. The portal focuses on bringing all stakeholders and Indian STI activities on a single online platform; helping efficient utilisation of resources; highlighting functioning of scientific organisations, laboratories and institutions; aggregating information on science funding, fellowship & award opportunities spanning from school to faculty level; pooling together conferences, seminars and events; and

The screenshot shows the ISTI web portal interface. At the top, there is a header with the ISTI logo and navigation links: "Webinar", "About", "Announcements", "Connect", and "Register". Below the header is a search bar and a menu with categories: "RESEARCH", "FUNDING", "ORGANISATIONS", "SCHEMES", "SCHOLARSHIPS", "INNOVATIONS", "TECHNOLOGIES", and "COVID-19: THE PANDEMIC". The main content area features a large banner for "India presents white paper for Make in India post-CoVID-19" with a video player. Below this is a section titled "COVID-19 Updates" for "Week 29: July 13 - 19, 2020". This section contains three articles with corresponding images: "Government releases white paper on focused interventions for Make in India, post-COVID-19", "CSIR comes up with a compendium on technologies for COVID-19 mitigation", and "FSSAI issues food hygiene, safety and nutrition guidelines for consumers to prevent the spread of COVID-19". The footer includes social media handles for Facebook (@ISTIportal) and Twitter (@ISTIportal), and the website URL: www.indiascienceandtechnology.gov.in.

projecting science in India with its major achievements. The ISTI web portal has been developed by VigyanPrasar, an autonomous organisation of the Department of Science and Technology (DST).

In the critical times of outbreak of COVID-19 pandemic, the web portal serves as a one-stop online information guide to bring together

a collection of resources in response to the COVID-19. These resources are generated by efforts made by numerous initiatives and schemes taken up by several Departments and Ministries of Government of India. These are being implemented by public-supported research institutions in India. The content presented here relies on the best available scientific understanding of the disease and its transmission.

The web portal provides all information related to COVID-19, its presentation of symptoms, transmission modes and mechanisms, and various models of protection of individuals, healthcare professionals & prevention from spreading to the community. The reasons, usefulness and impact of social distancing have been communicated in an easy-to-understand manner.

The Research and Development efforts made at Ministry level and various funding organisations are enumerated here on as-and-when-available basis. The innumerable infographics have been provided here are sourced from various organisations for efficient delivery of the information and targeting the common people as the largest stakeholder. The frequently asked questions and myth busters are also answered here.

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Website link:

<http://indiascienceandtechnology.gov.in/covid-19-the-pandemic>

Weekly Publication of e-Newsletter on COVID-19

For the benefit of its stakeholders and target audience, Vigyan Prasar is bringing out a weekly e-Newsletter on the most relevant initiatives and efforts taken by Government of India through its various Science Ministries, Departments, and Funding Organisations. These organisations are continuously striving for combating the outbreak of COVID-19. These research-driven and technology-based interventions have been initiated on war footing to fight out the outburst of the pandemic.

The e-Newsletter aims to be a handy guide to scientists, researchers, and scholars, especially those who are interested in knowing various aspects of COVID-19 and contributing to the coronavirus warfare and making the nation Atmanirbhar.

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Website link:

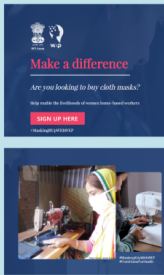
<https://vigyanprasar.gov.in/covid19-newsletters/>

Masking up with Women Entrepreneurship Platform: NITI Aayog's flagship initiative

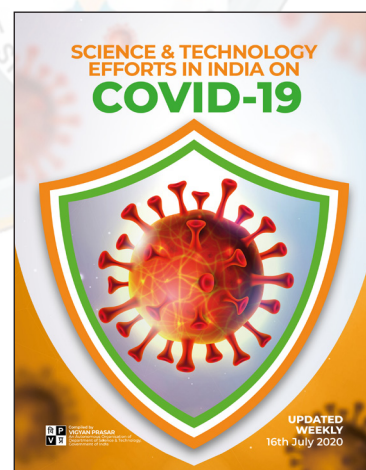
Empowers women home-based workers from grassroots & not-for-profit organisations as well as small businesses

Facilitates connections with potential buyers for sale and funding support

Facilitates connections to raw material suppliers



[http://www.indiascienceandtechnology.gov.in/](https://www.indiascienceandtechnology.gov.in/)





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