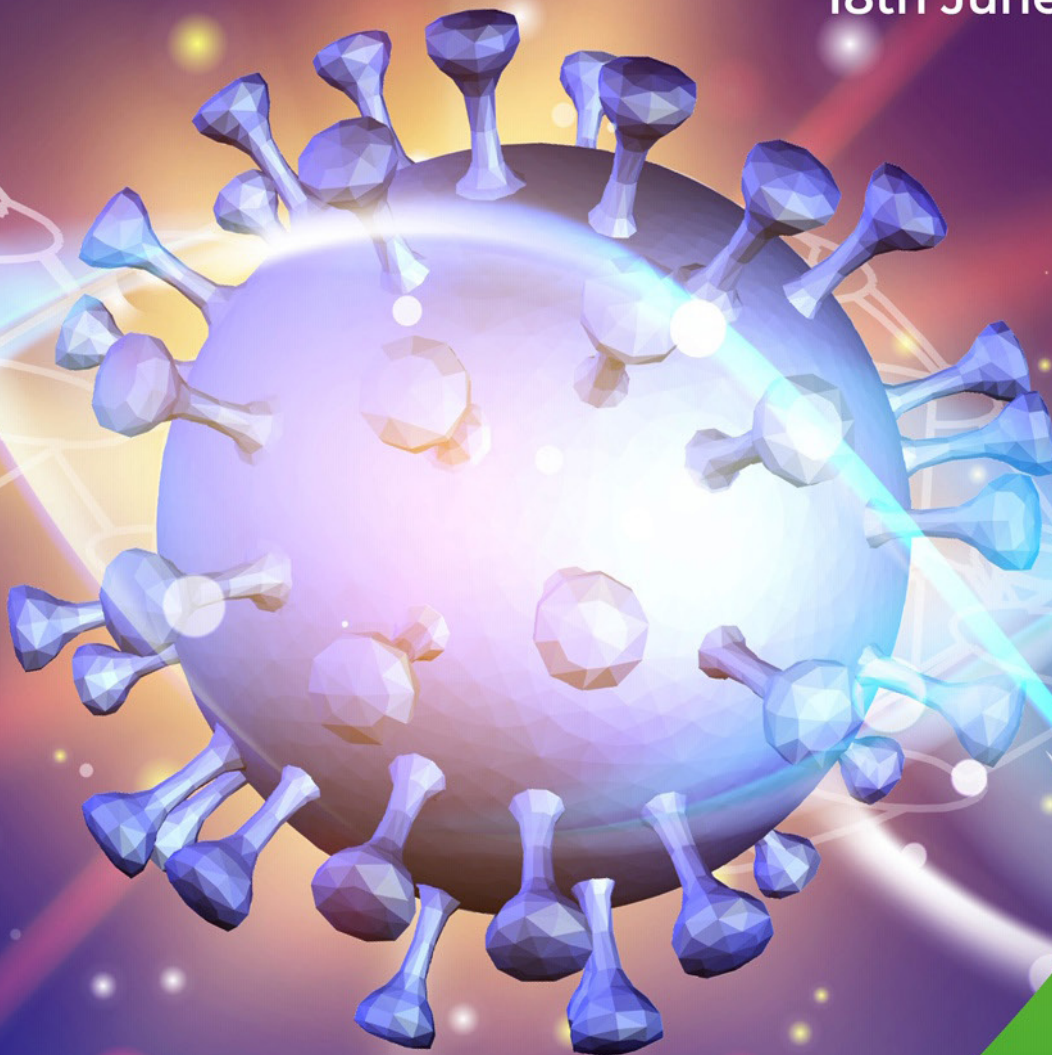


# SCIENCE & TECHNOLOGY EFFORTS IN INDIA ON **COVID-19**

UPDATED WEEKLY  
18th June 2020



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





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

**A**t the fag end of 2019, China informed the World Health Organization (WHO) regarding the occurrence of cases of pneumonia of an unknown cause in Wuhan City in Hubei province. On January 9, 2020, WHO issued a statement saying Chinese researchers have made the preliminary determination of the virus as a novel coronavirus. Since then, several lakhs of positive cases and more than one lakh deaths have been reported due to COVID-19 across the world. Lockdowns, curfews, sealing of hotspots of outbreak area, massive airport screenings, quarantines, and social distancing have become the norm across the globe.

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 and journalistic flavour, ensuring that science and safety are the primary focus. VP is a national level organization of the Department of Science and Technology, Government of India, engaged in science communication and popularization. The principal objective of VP is to serve India's science popularization 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 popularization therefore serves as a robust knowledge-led tool to fulfil various mutually reinforcing public policy objectives.

For the benefit of the stakeholders, we have prepared a compilation of the most relevant initiatives and efforts taken by the Government of India through its various Science Ministries, Departments, and Funding organizations. These organizations are geared for combating the epidemic of COVID-19. 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 (Eols) to enhance research and development-related activities to battle the pandemic out.

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 in whatever minuscule way and people at large.

Vigyan Prasar  
New Delhi



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# Dr Harsh Vardhan elected as Chair of Executive Board of WHO

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22<sup>nd</sup> May 2020, New Delhi

The Union Minister of Health & Family Welfare Dr Harsh Vardhan has been elected as Chair of the Executive Board of World Health Organization for the year 2020-21. This took place today during the 147th session of the Executive Board, in a meeting that was virtually held. He has replaced Dr Hiroki Nakatani of Japan.



Accepting the Chair of the Executive Board, Dr Harsh Vardhan paid tribute to the lakhs of people who have lost their lives due to the global COVID-19 pandemic. He requested all dignitaries present on the occasion to give a standing ovation to all the frontline health workers and other COVID Warriors by saluting their dignity, determination and dedication.

“I feel deeply honoured to have the trust and faith of all of you. India, and all my countrymen, too, feel privileged that this honour has been bestowed upon us,” he stated. Acknowledging that this is a great human tragedy and the next two decades may see many such challenges, he stated that “All these challenges demand a shared response, because these are shared threats requiring a shared responsibility to act.” He further added that “while this is the core philosophy of our alliance of member nations that comprise WHO; however, it needs a greater degree of shared idealism of nations.” He said that “The pandemic has made humanity acutely aware of the consequences of ignoring the strengthening and preparedness of our healthcare systems. In such times of global crisis, both risk management and mitigation would require further strengthening of global partnerships to re-energize interest and investment in global public health.”

Dr Harsh Vardhan also shared India’s experience of combating COVID-19. He noted that “We have a mortality of 3 per cent only. In a country of 1.35 billion, there are only 0.1 million cases of COVID-19. The recovery rate is above 40 per cent and the doubling rate is 13 days.”



As the new Chair of the Executive Board of WHO, Dr Harsh Vardhan underlined the need for higher commitments in respect of diseases that have plagued humankind for centuries, collaborations for supplementing each other by pooling of global resources, an aggressive roadmap to curtail deaths from diseases that can be eliminated, a fresh roadmap to address global shortages of medicines and vaccines and the need for reforms.



“I am sure that constant engagement with member states and other stakeholders will reinforce reforms and help accelerate progress towards achieving sustainable development goals and universal health coverage with the most productive, efficient and targeted utilization of resources. I will put myself to work to realise the collective vision of our organisation, to build the collective capacity of all our member nations and also build a heroic collective leadership,” he stated.


Dr Harsh Vardhan stated that WHO believes in the principle that the enjoyment of the highest attainable standard of health is one of the fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition. “We, therefore, commit to work with the Member States; the Organization and the global community of partners for the efficient, effective and responsive discharge of public health obligations,” he added.

Dr Harsh Vardhan, while taking charge as the Chair of the EB, also shared his thoughts on the future health scenario of the world. “I believe that health is central to economic performance and to enhancing human capabilities. However, public health policy must be based and guided on a proper understanding of nature. This is also the underlying principle of the Indian



traditional systems of medicine based on holistic health and wellness, which I have lived and experienced,” he said. He also outlined the policy of India towards ‘Universal Health for All’ through national flagships programmes such as Ayushman Bharat with its twin pillars of Health & Wellness centres (HWCs) and Pradhan Mantri Jan Arogya Yojana (PMJAY), being led by the dynamic and visionary Prime Minister Mr Narendra Modi.

Reminiscing about his long-standing association with WHO, he expressed his gratitude for the strong support of WHO in India’s fight against Polio. “If it had not been for the support and morale boosting by friends in WHO, I would not have achieved what I did. If, today, Polio stands eradicated from India, I must admit, it could never have been possible without the perseverance of WHO,” he stated.



Dr Harsh Vardhan has also been a member of several prestigious committees of WHO like Strategic Advisory Group of Experts (SAGE) and the Global Technical Consultative Group (TCG) on Polio Eradication. He has also served as an Advisor to the WHO.

The Executive Board of WHO is composed of 34 technically qualified members elected for three-year term. The main functions of the Board are to implement the decisions and policies of the Health Assembly and advise and facilitate its work.

This is another feather in the cap of Dr Harsh Vardhan's illustrious career. He earned his graduation and post-graduation in medicine from G.S.V.M. Medical College, Kanpur in 1979 and 1983, respectively. He has been associated with public service since 1993 when he was elected to the Delhi Legislative Assembly. He served his constituency continuously for five terms until he was elected to the 16th Lok Sabha in May, 2014 from Chandni Chowk constituency. From 1993 to 1998, he served as the Minister of Health, Education, Law & Justice & Legislative Affairs for the Govt. of NCT of Delhi. In 1994, as the Delhi Health Minister, he oversaw the successful implementation of the pilot project of the Pulse Polio Programme which involved the mass immunisation of 1.2 million children up to the age of 3 in Delhi, laying the groundwork for a Polio-free India in 2014. He has championed the passing and implementation of the Delhi Prohibition of Smoking and Non-Smokers Health Protection Act, 1997, which was later replicated by several States in the country.

Dr Harsh Vardhan has been the Union Health Minister in 2014 and later took over as the Union Minister Science & Technology and Earth Sciences. He was also Union Minister for Environment, Forest and Climate Change. He was re-elected to the 17<sup>th</sup> Lok Sabha and sworn in on May 30<sup>th</sup>, 2019 as Union Cabinet Minister and was given the portfolios of Health and Family Welfare; Science and Technology and Earth Sciences.



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# Digital Conference on **‘RE-START – Reboot the Economy through Science, Technology and Research Translations’, organised to celebrate the National Technology Day**

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11th May 2020, New Delhi

The Union Minister of Science & Technology, Earth Sciences and Health & Family Welfare, Dr. Harsh Vardhan said on 11 May, 2020 that India’s fight against Covid-19 is moving fast ahead strongly and steadily. He was addressing a Digital Conference, RE-START – ‘Reboot the Economy through Science, Technology and Research Translations’, organised to celebrate the National Technology Day. The Conference was organised by the Technology Development Board (TDB) a statutory body of the Department of Science & Technology (DST) and Confederation of Indian Industry (CII).



While applauding the Ministry of Science & Technology’s response to epidemics like COVID in the country, Dr. Harsh Vardhan emphasized that the S&T response reflects the collaborative spirit of the entire S&T ecosystem. “Indian Government, academia, scientists, start-ups, entrepreneurs and industry have been working relentlessly to find solutions to combat this pandemic. We must appreciate the efforts of our scientists, our entrepreneurs and our institutions working to find quick and deployable solutions for Covid-19. New discoveries, industry partnerships, and enhanced researches have thus been rapidly developed and adopted,” said the Minister.

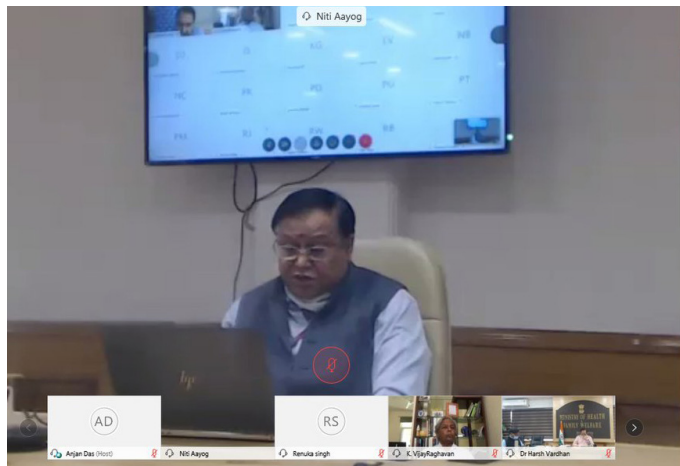


“Within a short period of time, the nation has been able to mobilize a number of researchers to develop new testing kits, protective equipment, respiratory devices, etc.,” he added.

The minister also apprised the audience about the ‘COVID-19 Task Force’ set up by the Government to map the COVID-19-related technology capabilities. “Our Government has vigorously

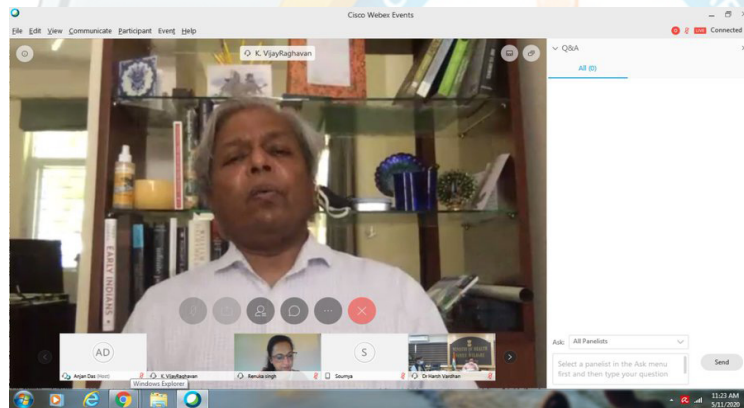
supported the 'Make in India' Programme. This has brought in scientific institutions and start-ups to develop the Covid-19 tests, masks, sanitizers, personal protective equipment (PPEs) and ventilators," he further added.

On the theme for the National Technology Day this year, Dr. Harsh Vardhan pointed out, "We need to mitigate the widespread economic impact and prepare for a stronger recovery using self-reliance as the new mantra. Thus, we look towards new opportunities to galvanize growth in the technological and industrial sector."



While delivering his special address, Dr. V K Saraswat, Member, NITI Aayog, pointed out the importance of new-age technologies and medical and manufacturing technologies in boosting the economy as the world adjusts to the new normal.

Principal Scientific Adviser to the Government of India, Professor K. Vijay Raghavan, pointed out how technology can change the way we live our lives and the way we do things in future, particularly so in the post-COVID era. He pointed out that this is an opportunity to gear up for the future that lies ahead, and a better-equipped R&D workforce and ecosystem will prepare India better for future challenges.




DST has stepped into its 50<sup>th</sup> year of existence. DST Secretary Professor Ashutosh Sharma thus underlined the significance of the National Technology Day in view of the challenges faced during these times of COVID-19. He further emphasized that the COVID-19 crisis had led R&D and technology

development to work in various modes. The private-public model has encouraged R&D to greater heights. Plausible translations, prototyping, start-ups, and Industry have seen immense growth. According to him, rebooting the economy requires new age technologies, appropriate national missions, programmes and schemes to get into quick action. He added that wherever readymade solutions are not available, research and development needs to be more profound, relevant, speedy, impactful and strongly connected to industry. The lessons learnt now would continue to assist us in addressing the overarching challenges of the future—sustainable development, climate change, industry 4.0, anti-microbial resistance, etc.

Dr. Saumya Swaminathan, Chief Scientist, World Health Organization, highlighted the steps taken internationally to combat the pandemic and the way forward. Dr. Swaminathan appreciated the way India has tackled the COVID-19 challenge.





DG, CII, Mr. Chandrajit Banerjee; President, CII, Mr. Vikram Kirloskar; and Dr Neeraj Sharma, Secretary, TDB were also among those participating in the inaugural session.

In this occasion, Dr. Harsh Vardhan also inaugurated a virtual exposition of companies whose technologies have been supported by TDB. Various organizations and companies showcased their products in the exposition through a digital B2B lounge.

The conference has hence brought together Scientists, Technocrats, Government officials, Diplomats, WHO officials and dignitaries from national and international Industry, Research Institutions and Academic Institutions on a single platform to share their insights on the role played by S&T in the global healthcare crisis and to find solutions to address the current challenge.

The Conference also had technical sessions on 'Medicines & Medical Technologies'; 'Advanced Materials – New Technology Horizons'; 'Advanced Manufacturing Technologies for Sustainable Future & Global Innovation' and 'Technology Alliance for Global Economic Leadership'.

**Website link:**

<https://dst.gov.in/india-well-poised-reboot-economy-through-st-dr-harsh-varadhan>

# DR. HARSH VARDHAN LAUNCHES 'AYUSH SANJIVANI' APP AND INTER-DISCIPLINARY STUDIES INVOLVING AYUSH INTERVENTIONS FOR COVID-19

7th May 2020, New Delhi

*"The alliance between technology stakeholders will help the traditional knowledge of AYUSH to reach a large global population."*

Dr. Harsh Vardhan, Union Health & Family Welfare Minister launched the 'AYUSH Sanjivani' App and two AYUSH-based studies related to COVID-19 situation on 7<sup>th</sup> May, 2020 in the presence of Shri Shripad Yesso Naik, MoS (I/c), AYUSH who participated through Video Conferencing from Goa.


Highlighting the importance of harnessing technology for COVID-19 response, the Union Health Minister said "The 'AYUSH Sanjivani' mobile app, which has been launched today, will help to generate data on acceptance and usage of AYUSH advocacies and measures among the population and its impact in prevention of COVID-19. It is developed by Ministry of AYUSH and MEITY and shall reach out to a target of 50 lakh people."

Dr. Harsh Vardhan stated that COVID-19 management has provided a potent platform for alliance between MoHFW, MoAYUSH and technology organisations such as CSIR, ICMR, and UGC to not only develop AYUSH interventions and solutions but also help in promoting AYUSH knowledge for the larger good of the global community. These organisations are joining hands today and



The graphic is a promotional poster for the 'AYUSH Sanjivani' app. At the top left is the logo of the Ministry of AYUSH, and at the top right is the 'myGov' logo. The central text reads: 'Expanding Horizons of Age-Old Traditional Knowledge of Ayurveda with AYUSH Sanjivani App'. Below this, a central image shows a smartphone displaying the app's interface. Surrounding the phone are four icons with corresponding text: 1. A green hexagon with a virus icon: 'To generate data on acceptance & usage of AYUSH measures & its impact on prevention of COVID-19'. 2. A blue hexagon with a person icon: 'Provide AYUSH advisories related to immunity boosting measures'. 3. A red hexagon with a person icon: 'Promote AYUSH knowledge for larger good of the global community'. 4. A purple hexagon with a person icon: 'To develop AYUSH interventions & solutions; to reach out to target of 50 lakh people'. At the bottom, there is a 'Download Now!' button with the Google Play logo and the date 'Dated: 9 May, 2020'. The background features a faint watermark of a person meditating and the text 'GATHERING & TRADITIONAL PRACTICES FOR CORONA PREVENTION & MEDICATION'.





are being supported and guided by ICMR and DCGI in propagating the wholesomeness and holistic health benefits of the age-old traditional medicinal knowledge of Ayurveda, he added. In addition to the App, Dr. Harsh Vardhan also launched two more scientific studies. One is the collaborative clinical research study on Ayurveda interventions as prophylaxis and as an add-on to standard care to COVID-19, which shall be a joint initiative of Ministry of AYUSH, MoHFW and the Ministry of Science & Technology through Council of Scientific & Industrial Research (CSIR) with technical support of ICMR. The Interdisciplinary Ayush R&D Task Force headed by Dr Bhushan Patvardhan, Vice Chairman, University Grant Commission (UGC) has formulated and designed clinical research protocols for prophylactic studies and add-on interventions in COVID-19 positive cases through thorough review and consultative process of experts of high repute from different organisations across the country for studying four different interventions, viz., Ashwagandha, Yashtimadhu, Guduchi Pippali and a poly herbal formulation (AYUSH-64). This includes the following two areas:

- a. Ashwagandha for the Prophylaxis against SARS-COV-2 in subjects with increased risk during the COVID-19 Pandemic: A comparison with Hydroxychloroquine in the healthcare providers and
- b. Effectiveness of Ayurveda Formulation as an adjunct to 'Standard of Care' for the Treatment of Mild to Moderate COVID-19: A Randomized, Open Label, Parallel Efficacy, Active Control, Multi-Centre Exploratory Drug Trial.

Dr. Harsh Vardhan also launched the population-based interventional studies on impact of AYUSH-based prophylactic interventions for prevention of COVID-19 infection in high risk population. The core objectives comprise of assessment of preventive potential of AYUSH interventions for COVID-19 and to assess the improvement in quality of life in high risk population. The study will be carried out through four Research Councils under Ministry of AYUSH and National Institutes in 25 states across the country and several State Governments covering approximately 5 lakh people. The outcome of the study is expected to pave a new horizon in understanding the preventive potential of AYUSH interventions during pandemics like COVID-19 through scientific evidence.

Elaborating on the import of these studies, Dr. Harsh Vardhan stated that these studies shall re-establish the importance of AYUSH pathies with the help of rigour of CSIR, ICMR and DCGI. "This is truly a momentous day. The technology alliance provides valuable opportunity for such knowledge-based solutions to continue to benefit us even after the COVID-19 pandemic has passed, by possible integration of AYUSH in the mainstream scientific efforts," he added. "Let us also understand that the modern pathies of medicine and science are not in competition with those of AYUSH, but they complement and strengthen each other in intrinsic ways," Dr Harsh Vardhan stated. "Under the leadership of our beloved Prime Minister, AYUSH advisories for enhancing immunity during COVID-19 pandemic have been acknowledged the world over," he said.

Shri Rajesh Bhushan, OSD/Secretary (HFW), Shri Vaidya Rajesh Kotecha, Secretary, AYUSH, Dr. Shekhar C. Mande, Director General, CSIR, Dr. V. G. Somani, Drugs Controller General of India, and other senior officers of MoHFW and AYUSH were also present at the launch event.

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# DST & ITS AUTONOMOUS INSTITUTIONS ELEVATED SCIENCE AND TECHNOLOGY IN INDIA TO INTERNATIONAL LEVELS

## — DR. HARSH VARDHAN

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3rd May 2020, New Delhi

Union Minister of Science & Technology, Health & Family Welfare and Earth Sciences, Dr. Harsh Vardhan today interacted with Heads of all Autonomous Institutions (AIs) and Subordinate offices of Department of Science & Technology (DST) via Video Conferencing on the occasion of 49<sup>th</sup> DST Foundation Day (3<sup>rd</sup> May, 2020) about their S&T initiatives, particularly in relation to their endeavours for combating the COVID-19 outbreak.



The Minister also launched “COVID KATHA”, a multimedia guide on COVID-19 on this occasion. As DST enters 50 years of serving the nation through Science & Technology, the Golden Jubilee Celebrations were also launched, initiating myriad activities in different parts of the country throughout the year.

Secretary (DST), Professor Ashutosh Sharma highlighted the major initiatives of DST, its vision for next five years and the steps DST is taking to identify and map technologies from R&D labs, academic institutions, start-ups, and MSMEs to fund nearly market-ready solutions for diagnostics, testing, healthcare delivery, and equipment and supplies to combat COVID-19.

Senior scientists and officials from National Science & Technology Entrepreneurship Development Board (NSTEDB), Science for Equity, Empowerment & Development (SEED) and from Statutory Bodies like Science and Engineering Research Board (SERB), Technology Development Board (TDB) and the Survey of India (SoI) spoke about the different initiatives being taken to tackle the outbreak. Similarly, Directors of Autonomous Institutions like the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) and Centre for Nano and Soft Matter Sciences (CeNS), Bengaluru, National Innovation Foundation (NIF), Ahmedabad and S. N.





Bose National Centre for Basic Sciences (SNBNCBS), Kolkata spoke about the preparations they have made to brace for the crisis.

During the interaction, Dr. Harsh Vardhan congratulated DST on the occasion of its 50<sup>th</sup> Foundation Day and said, “DST and its autonomous institutions have elevated Science & Technology in India to international levels and benefitted people across communities in myriad ways. DST provides the largest extramural research and development support in our country to strengthen national S&T capacity and capability through a competitive mode to scientists cutting across institutions and disciplines. DST’s efforts have helped India attaining 3<sup>rd</sup> position globally after China and US in terms of number of publications in science citation index journals.”

Praising the Indian scientists about their timely response in tackling COVID-19, he said, “Indian scientists have always risen to meet any challenge and this time also they have not disappointed the nation. We should remember that actions were needed with speed and scale at several fronts, which included: (i) Comprehensive mapping of our entire start-up ecosystem to identify and support relevant technology solutions ready for scaleup; (ii) Supporting industries and projects from academia and R&D labs working on modelling, properties of the virus and its impact, novel solutions, etc; (iii) Activation of relevant DST’s autonomous institutions in providing solutions. I am happy that our DST scientists achieved that despite the fact that we are running against time. Of particular mention here SCTIMST, Thiruvananthapuram which has already come up with over 10 effective products, several of which are of a breakthrough nature and are being commercialized rapidly.”

Dr. Harsh Vardhan said, “DST has contributed immensely to the S&T innovation space in our country over these 49 years. It has grown considerably with number of incubators and Start-Ups increasing significantly.” He highlighted some significant initiatives of DST and enumerated, “Schemes such as Augmenting Writing Skills through Articulating Research (AWSAR) launched to encourage young scientists to write popular science articles on their research pursuits; programme called National Initiative for Developing & Harnessing Innovations (NIDHI) to boost innovation and start-up activity, Million Minds Augmenting National Aspirations and Knowledge (MANAK) to encourage young students to think innovatively, a National Mission on Interdisciplinary Cyber-Physical Systems, new international S&T collaborations to connect with the best global science projects abroad such as participation in Thirty Meter Telescope Project; and India-Israel Industrial R&D and Technological Innovation Fund of USD 40 million have uplifted India’s science and technology efforts.”

Making a special mention about the National Mission on Quantum Technology and Application (NM-QTA) announced by the Finance Minister during budget this year at a cost of Rs. 8,000 Crores, Union Science & Technology Minister said, “Launch of NM-QTA is a leap into the future to promote and foster R&D in Quantum Technologies and related areas like quantum computing, quantum cryptography, quantum communication, quantum metrology and sensing, quantum enhanced imaging etc. I am sure DST will make the country proud by bringing the fruits of this cutting-edge technology for the benefit of common people.”

Concluding his remarks, Dr. Harsh Vardhan said, “The National policy on Scientific Social Responsibility which is being worked out by DST should be an embodiment of the principles of responsible innovation and social entrepreneurship which DST has imbibed over its 49-year journey. I am sure the document will inspire all the grantees of projects to reach out to stakeholders of Science and Society at large with all the tools, knowledge, manpower and infrastructure of S&T in the academia and R&D labs by choosing of one or more activities: scientific infrastructure sharing; mentoring/training of college/ university faculty; training on high end scientific skills and research; student internships; fostering research culture and many more.”

**Website link:**

<https://dst.gov.in/dst-its-autonomous-institutions-elevated-science-and-technology-india-international-levels-dr-harsh>

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# THE COUNTRY WILL BE SELF-RELIANT BY THE END OF MAY 2020 IN PRODUCING INDIGENOUS RAPID TEST AND RT-PCR DIAGNOSTIC KITS

## — DR. HARSH VARDHAN

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**“At least half a dozen candidate vaccines are being supported of which four are in an advance stage.”**

- Dr. Harsh Vardhan

28th April 2020, New Delhi

Union Minister of Science & Technology, Health & Family Welfare and Earth Sciences, Dr. Harsh Vardhan, reviewed through video-conferencing the various initiatives undertaken by the Department of Biotechnology (DBT) and its Autonomous Institutes (AIs) and Public Sector Undertakings (PSUs) – BIRAC and BIBCOLD to tackle the current COVID-19 crisis, especially with respect to progress made in indigenous development of vaccine, Rapid Test and RT-PCR diagnostic Kits.



Secretary, DBT, Dr. Renu Swarup informed that DBT has evolved a multi-pronged research strategy and action plan for immediate response as well as for long-term preparedness to tackle COVID-19. These multifaceted efforts include research towards development of candidate vaccines, therapeutics, and suitable animal models for COVID-19 as well as development of indigenous diagnostics and genomic studies on the host and pathogen. The DBT and its PSU,



Biotechnology Industry Research Assistance Council (BIRAC) has announced a COVID-19 Research Consortium Call to support diagnostics, vaccines, novel therapeutics, repurposing of drugs or any other intervention for control of COVID-19.

During interaction with DBT scientists, Union Minister was informed about various computational methods being





developed by DBT labs/AIs to predict potential antiviral drug molecules. In another strategy, surrogates of the virus are being developed representing one or more critical steps in virus lifecycle and inhibitors are being tested. Work is in progress to isolate neutralizing antibodies either from the patients recovered from COVID-19 or from human antibody libraries. Also, various AIs of DBT are

working on development of candidate vaccines which are at various stages of pre-clinical studies with an overall aim to demonstrate the proof of concept and immunogenicity and safety evaluation prior to clinical testing. At the moment, at least 9 of these studies are in early stages and one delivery and adjuvant system for improving the immunogenicity of candidate vaccine is at the advanced stage of development.

While discussing genetic sequencing, Dr. Harsh Vardhan said, "These genetic sequencing efforts remind me of Polio eradication movement 26 years back. Towards the fag end of the Polio movement, active surveillance of the country was done to find out the cases of acute flaccid paralysis. That time also, genetic sequencing was used to establish the travel history of polio virus which eventually helped in the eradication of polio."



After the presentation, Dr. Harsh Vardhan appreciated the work being done by scientists and their innovative ways of finding solutions to mitigate COVID-19. "The sincere efforts of DBT scientists will enable the country to be self-reliant in production of RT-PCR and Antibody test kits by the end of next month. This will make it possible to meet the target of conducting one lakh tests per day by the end of next month," he said. He also exhorted scientists working on developing new vaccines, new drugs

and medical equipment, to speed up their work. "Out of at least half a dozen candidates supported for vaccines, four are in an advanced stage and regulatory platform at one place has been constituted for speedy clearances," he said.



Dr. Harsh Vardhan also appreciated the BIRAC efforts in supporting over 150 start-up solutions of which over 20 are ready for deployment. He also released a hand sanitizer developed by another PSU of DBT, Bharat Immunologicals and Biologicals Corporation Ltd.(BIBCOL) which is engaged in manufacturing of various biological, pharmaceutical

and food products. It is currently manufacturing formulations of Vitamin C and Zinc tablets to contribute towards the solutions for COVID-19. "A contribution of Rupee One towards commercial sale of each single bottle of this Sanitizer will go to PM Cares Fund," Dr. Harsh Vardhan said.

Dr. Renu Swarup, Secretary, DBT, senior officials, Directors of DBT-AIs, Senior Scientists and senior officials from BIRAC and BIBCOL participated in the meeting.

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# DR. HARSH VARDHAN EXHORTS CSIR SCIENTISTS TO DEVELOP COVID-19 MITIGATION SOLUTIONS TO EFFECTIVELY COMBAT THE DISEASE

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**12th April 2020, New Delhi**

- Genetic sequencing was crucial in eradicating Polio; it will help in COVID-19 mitigation also, said Dr. Harsh Vardhan
- These are times of war, deliver solutions before war ends, not a routine research project, states Dr. Harsh Vardhan
- COVID-19 will give boost to country's resilience and self-reliance and enhance indigenous capacity in developing critical healthcare equipment

Today Dr. Harsh Vardhan, Union Minister for Science & Technology held a review with DG CSIR, Dr. Shekhar C. Mande and all the CSIR lab directors through video conference of the steps undertaken by CSIR and its constituent 38 labs towards mitigation of Corona Virus outbreak in the country.

DG CSIR Dr. Shekhar C. Mande informed that Core Strategy Group (CSG) has been set up in CSIR and the five verticals have been identified under which the COVID-19-related activities are being carried out. These include: Digital and Molecular Surveillance; Rapid and Economical Diagnostics; New Drugs / Repurposing of Drugs and associated production processes; Hospital Assistive Devices and PPEs; and Supply Chain and Logistics Support



*Dr Harsh Vardhan during video conferencing on research and developments initiatives on Covid-19 with the directors of CSIR labs*

Systems. Dr. Mande also mentioned that 15 CSIR labs are working in close partnership with major Industries, PSUs, MSMEs and other departments and ministries at the time of the crisis in the country.

After briefing of all the efforts being made by the CSIR labs in finding a solution for COVID-19, Dr. Harsh Vardhan informed them about the steps being taken by the Government of India in combating COVID-19.

Dr. Harsh Vardhan exhorted CSIR scientists and said, "India has high expectations from its scientific community and I am sure that the community will rise to the occasion and deliver in this time of need". He appreciated that CSIR Labs were also participating in testing of swab samples of COVID patients and some of them have started doing genetic sequencing of the virus with a target of doing 500 sequencing in coming weeks. Dr. Harsh Vardhan said, "Genetic sequencing is very crucial in identifying the host response as well as identifying population vulnerability to the disease." He said, "These genetic sequencing efforts remind me of Polio eradication movement 26 years back. Towards the fag end of the Polio movement, active surveillance of the country was done to find out the cases of acute flaccid paralysis. That time also, genetic sequencing was used to establish the travel history of polio virus which eventually helped in the eradication of polio."

He also appreciated CSIR for partnering with MSMEs, Major industries, PSUs working on RT-PCR machines. He said, "Plasma-based therapy is very much needed at this hour. For this, we need to motivate the patients who have recovered from the COVID-19 to donate blood."

He also appreciated the work done by CSIR-NAL with BHEL and BEL on Ventilators, Oxygen Enrichment Devices and 3-D printed face shields, face masks, gowns and other protective equipment. "All these things will help us in next few weeks," he said.

Dr. Harsh Vardhan, however, cautioned CSIR scientists to develop COVID-19 mitigation solutions keeping fixed timeframe in mind. "These are times of war, CSIR scientists should work to deliver solutions before war ends, they should not treat it as a routine research project". He said, "COVID-19 has also come as a blessing in disguise as it will give boost to country's resilience and self-reliance and enhance indigenous capacity in developing critical healthcare equipment." He also appreciated the collaboration being done by the CSIR scientists using Video Conferencing tools and reiterated the scientists that while doing research they should continue observing social distancing and lockdown because till such time vaccine is developed by scientists to combat COVID-19, these two remain the most potent form of social vaccine.

Dr. Shekhar C. Mande, DG, CSIR, Dr. Anurag Agrawal, Director, Institute of Genomics and Integrative Biology (CSIR-IGIB) and Dr. Nakul Parashar, Director, Vigyan Prasas were present in the review meeting with the Union Minister. Directors of remaining 38 CSIR labs attended the meeting through Video Conference.



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# COVID INDIA SEVA TO PROVIDE SOLUTIONS TO COVID-19-RELATED QUERIES

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Union Minister of Health & Family Welfare, Science & Technology, and Earth Sciences, Dr. Harsh Vardhan launched an interactive platform, COVID INDIA SEVA, on 21 April 2020. The initiative is aimed at providing real-time solutions to COVID-19-related queries. People can post their questions to the COVID INDIA SEVA twitter handle for getting swift replies from the team of trained experts. This initiative is aimed at enabling transparent e-governance delivery at large scale, especially in crises, like the ongoing outbreak of COVID-19 pandemic.

Dr. Harsh Vardhan, in a tweet, said that through this platform, trained experts would be able to share authoritative public health information swiftly at scale, helping to build a direct channel for communication with citizens. Commenting on the launch of the social handle, he said that Twitter has proved to be an essential service for both the government and citizens to interact and exchange information, especially in times of need.

The responses by the experts will be available for everyone and users will not be required to share any personal details or health records on this account.



**Website link:**

<https://twitter.com/drharshvardhan/status/1252529868899708930?s=20>

<http://newsonair.com/Main-News-Details.aspx?id=386270>

<https://www.businesstoday.in/latest/trends/what-is-covid-india-seva-an-explainer/story/401619.html>

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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 TO DEAL WITH COVID-19  
BY

# OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

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## **Industry Engagement facilitated by the Office of the Principal Scientific Adviser**

With the country facing an unprecedented crisis due to the coronavirus pandemic, the premier technical institutes have completely re-oriented their research ecosystem to develop solutions for the myriad issues that are coming up. This Herculean effort that lacks a parallel in modern history demands not only a significant commitment in terms of manpower and infrastructure but also a sizeable financial outlay. The industry has stepped up to do its part and help the country overcome this crisis by funding and collaborating on research projects with academia.

## **IIT Madras partners with Infosys for blockchain-based tracker technology for human-to-human transmission of contagious disease and renovation of healthcare infrastructure**

The COVID-19 outbreak has revealed starkly the inadequacy of healthcare infrastructure in the U.S., Italy, China, U.K. and other countries to handle such crises. This is an alarm signal for India also to renovate and overhaul its overall healthcare management system so that it is flexible and robust while delivering quality. Towards this a solution is being developed by IIT Madras in collaboration with the IT Firm Infosys - called 'BlockTrack' – which can play a vital role. This project envisages a solution leveraging Blockchain, Internet of Things (IoT) and AI/ML (Artificial Intelligence/Machine learning) and could be disruptively beneficial.

The project seeks to build an infrastructure for single-point records, interoperability and track unwanted or new contagious diseases spreading in the population. The Blockchain-based solution seeks to maintain tamper-proof record of movements of target persons and interoperability among health organizations. These records track pre-identified contagious disease carriers and help health organizations to work in synchronization with each other, across geographies.

### **The following are the key points of 'BlockTrack':**

- Unique patient records for identification without duplication of data;
- Interoperability across platforms and geographies;
- Supply chain management using tamper-proof Blockchain technologies; and
- Tracking movement and gathering information around proximity (especially during the outbreak of new diseases).

## **IIT Jodhpur develops innovative face shield and sterilisation system for N95 masks**

In the unprecedented COVID-19 crisis, CII has significantly contributed in building collaborations wherever possible between companies and academic institutions. In partnership with ACMA,

SIAM, IMTMA and SIDM, CII formed a network of companies for augmenting the inventory of ventilators through manufacturing by utilising their resources such as plant and machinery and highly skilled manpower to mass-manufacture ventilators or through import. Parallely, with the support of the PSA's office, a consortium of innovative COVID-19 technologies, offered by industry and start-ups incubated by national research laboratories, government agencies and academic institutions, was also formed to make technologies available for industry partnerships. In its efforts towards developing technologies against COVID-19, IIT Jodhpur has developed an innovative face shield, which is now available in the market as a commercial product of M/s Iscon Surgicals Ltd, Jodhpur, and a few thousand units have been manufactured and already sold. Besides this, the Institute has also developed an advanced photocatalytic oxidation sterilization system based on UV-light and metal oxide nanoparticles catalyst to treat N95 filtering facemask respirators for reuse. The technology - the knowhow of the sterilisation system - has been transferred to seven firms namely M/s Iscon Surgicals Pvt Ltd, Jodhpur, Rajasthan; M/s Kamtech Associates Pvt Ltd, Jaipur, Rajasthan; M/s Chempharm Industries India Pvt Ltd, Sonipat, Haryana; M/s. Parappadi Technologies (P) LTD, Trivandrum, Kerala; M/s Johri Digital Healthcare Ltd, Jodhpur; Mai Bharat Society, Jaipur; and M/s Zintex Blue Ocean Pvt Ltd, Jaipur in May 2020. These firms are in the process of the development of these products.

### **IIT Madras gets support from Fluor India and Capgemini for mass production of COVID-19 testing kits**

Fluor Daniel India Private Limited (Fluor India) has been providing comprehensive EPC services since 1995, combining global strength with local expertise. The Fluor Delhi office along with Capgemini, a global leader in consulting, technology services and digital transformation, funded the development and mass production of COVID-19 testing kits through an initiative of the Health Technology Incubator of the Indian Institute of Technology, Madras.

### **IISc builds Mobile Diagnostic Lab for COVID-19, supported by Toyota Kirloskar Motors, Tata Motors and SBI Foundation**

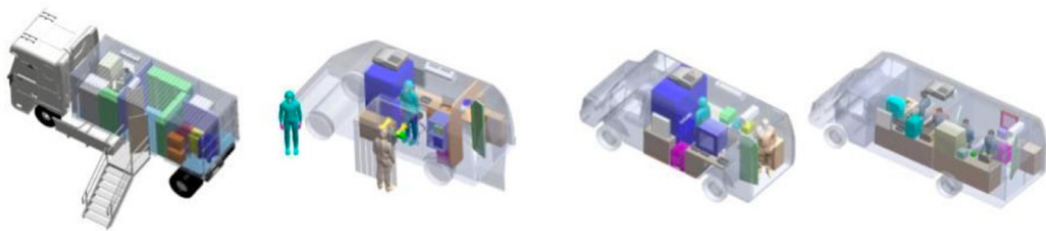
Studies from across the world have highlighted the effectiveness of large-scale testing in managing the spread of new COVID-19 cases as well as reducing mortality, especially with early detection of asymptomatic cases. As the pandemic spreads to the interior parts of the country that do not have access to advanced molecular diagnostic test capabilities, there is an urgent need to build and deploy safe and accurate testing capabilities at various locations.



Towards this goal of scaling up testing capabilities to reach remote areas and reducing turnaround times from sample collection to test results from 1-3 days, this project is working on building a mobile diagnostic laboratory. An ambulance and two vans were donated for this purpose by Toyota Kirloskar Motors and Tata Motors. Through a grant from the SBI Foundation and with the identification of suitable partners for redesign, the interiors of these vehicles are being equipped with instrumentation required to convert them into mobile labs. After multiple iterations of the lab designs, workflows, SOPs and protocol with inputs from several experts within IISc and outside, the final version of the designs and protocol are approved by ICMR.



## Mobile Diagnostic Lab Facility - ICMR Approved Lab Designs



<b><u>Nodal Hub</u></b>	<b><u>Sample prep Lab</u></b>	<b><u>Sample Processing Lab</u></b>	<b><u>Sample Testing Lab</u></b>
<ul style="list-style-type: none"> <li>• 20ft. container/bus</li> <li>• Storage of controls, PPEs</li> <li>• Biowaste handling</li> <li>• Preloading of PCR Reagents, Controls</li> <li>• Continued operations of satellite labs for 1 week</li> </ul>	<ul style="list-style-type: none"> <li>• Tata /Force van</li> <li>• Collection through separate booth</li> <li>• Aliquoting of samples</li> <li>• Virus Inactivation</li> <li>• Needs to be in separate BSL-2 environment</li> </ul>	<ul style="list-style-type: none"> <li>• Tata/Force Van</li> <li>• BSL-2 environment</li> <li>• RNA extraction &amp; isolation</li> <li>• 100 samples/shift/van</li> <li>• 300 samples/shift/van with automated instrument</li> </ul>	<ul style="list-style-type: none"> <li>• Force T2 van</li> <li>• Interiors modified for lab</li> <li>• RT-PCR based test</li> <li>• Analysis and reporting</li> <li>• 160 samples/shift/instrument</li> </ul>

3

Soon after the successful deployment of the first unit in Karnataka, the project aims to scale the solution within and beyond the state by engaging with central and state governments, NGOs and other partners.

### **NCBS & JNCASR working on epidemiological modelling**

Mukund Thattai, Sandeep Krishna, and Madan Rao of the National Centre for Biological Sciences- Tata Institute of Fundamental Research (NCBS-TIFR), in collaboration with Srikanth Sastry of Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), are working on mathematical models of the COVID-19 spread, including agent-based models and course-gained epidemiological models. These will be matched to national level quantitative data on COVID-19 spread to provide recommendations on outbreak suppressions.

In addition, a team led by Upinder Bhalla and Sanjay Sane of NCBS is also working on an olfactory test for anosmia, which can identify clusters of potential COVID-19 and high-risk individuals.

The global pandemic COVID-19 has reached unprecedented international spread and cases are still being reported. Institutes with cutting-edge capabilities like NCBS and inStem will have a significant impact in responding to this crisis. The capacity of these institutes to contribute to the national response has been possible by donors who share their vision and want to work towards a common goal. Partners, such as Punjab National Bank (PNB), the Azim Premji Foundation, Standard Chartered Global Business Service, and the Nuclear Power Corporation of India Limited (NPCIL) are among those whose objectives of success include the well-being and health of the greater populace.

Please connect with Dr Sapna Poti ([sapnapoti@ia.iitm.ac.in](mailto:sapnapoti@ia.iitm.ac.in)) for further information on any of the industry engagement with S&T organisations.

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

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### **Kerala start-up ties up with SCTIMST to launch IoT-based used mask disposal smart bin & UV light-based disinfection device to beat COVID-19**

VST Mobility Solutions, a start-up headquartered at Cochin, has launched an automated mask disposal machine as part of its efforts to develop products helping to combat the COVID-19. The disposal device, named BIN-19, has used technology developed by the Sree Chitra Tirunal Institute for Medical Sciences and Technology (SCTIMST), Thiruvananthapuram, an institute of national importance under DST, Government of India. It was formally launched by Ernakulam District Collector S. Suhas by installing a unit at his office, the administrative headquarters of the district.

The Internet of Things (IoT)-based BIN-19 is used for collecting and disinfecting used facemask. The device has been subjected to a series of successful microbiological tests by Sree Chitra Lab. Sree Chitra is one of the testing agencies for UV-based devices in the country as per the guidelines of the Indian Council of Medical Research (ICMR).



**Website link:**

<https://dst.gov.in/kerala-start-ties-sctimst-launch-iot-based-used-mask-disposal-smart-bin-uv-light-based-disinfection>

### **Public & expert consultation Town Hall Meet for STIP 2020 launched**

STIP 2020 Town Hall Meet, the Track-I public & expert consultation process for the formulation of Science, Technology and Innovation Policy (STIP) 2020 was launched by the Principal Scientific Adviser to the Government of India Professor K VijayRaghavan and Secretary, DST Professor Ashutosh Sharma on June 12, 2020.



While inaugurating STIP 2020 Town Hall Meet, Prof K VijayRaghavan said that COVID-19 has shown us that it is critical to invest in science with missions focusing on critical areas like Change and Sustainability, Environment and Biodiversity and Information. “India is one of the few postcolonial countries that have invested in the development of Science and Technology,” he added.

He pointed out the necessity to make science and knowledge accessible freely for everybody across languages and other existing barriers. He said that the consequence of the policy should be to reach out to as many people as possible and for that translation of science is extremely important so that people can think independently in their own language and access knowledge and resources.

The Track I consultation process involves an extensive public and expert consultations through Science Policy Forum, a dedicated platform for soliciting inputs from larger public and expert pool, to make the formulation of STIP 2020 decentralized, bottom-up, and inclusive.

The engagements in Track I will include public dialogue series with thought leaders and policy scholars, a thematic panel discussion with public engagement, targeted survey instruments, print media articles and channels for written inputs, community podcasts for last-mile connectivity.

**Website link:**

<https://dst.gov.in/public-expert-consultation-town-hall-meet-stip-2020-launched>

### **DST Secretary interacts with STIP 2020 Secretariat team**

Professor Ashutosh Sharma, Secretary, DST, interacted with STIP 2020 Secretariat comprising policy fellows, DST officials, and PSA officials, involved in the STIP 2020 formulation process. He highlighted the importance of tapping into think tanks for their recommendations, reflection of interconnectedness between knowledge generation and knowledge consumption systems and linkages between different sectors and emerging areas like AI, in the policy formation process.

“Several existing knowledge pools like TIFAC, policy research centres, industry bodies like CII, FICCI have already studied and thought about many of the issues related to science policy, and we can invite well-considered recommendations from them. Besides, much as science covers several sectors which have been covered in the 21 thematic groups, there are linkages between the different sectors, the new and emerging areas of science like Artificial Intelligence, machine learning, quantum computing, and the traditional sectors. Also, there is a lot of interconnectedness between knowledge generation and knowledge consumption systems in the policy. These should be integrated in the policy,” Professor Sharma said during the interactive sessions.

He encouraged the young policy fellows who would play a crucial part in the policy formation process and added that their energy and enthusiasm combined with the wisdom of the seniors would make the process a successful decentralized and inclusive one.

**Website link:**

<https://dst.gov.in/dst-secretary-interacts-stip-2020-secretariat-team>





- In the moderate stage, it will help in the shifting of the patients to a nearby isolation ward and be supported by the doctor over the telepresence platform.
- For those with severe symptoms or patients with epidemiological risks, it will support in shifting them to hospital under specialists' care.

COVID-19 patients at home who are under care from Ubiqare will get:

- Extension of care of Pulmonologist/Physician and interactive clinical telepresence;
- Regular monitoring by IoT-enabled medical devices with cloud-based analytics on EHR;
- Analytics-assisted Triage and tele-consultation by Ubiqare Doctor/Pulmonologist/Physician;
- Sample collection or interventions by the last-mile clinical network/healthcare workers.

The subscription for this health solution ranges from Rs. 15,000 to Rs 20,000 per month.

Contact info: Dr. Shirshendu Mukherjee (mdpmubmgf@birac.nic.in); Dr. Hafsa Ahmad (nbm9@birac.nic.in); Ms. Ginny Bansal (pmubmgf6@birac.nic.in)

**Website link:**

[https://vigyanprasar.gov.in/wp-content/uploads/vigyan\\_samachar\\_dbt\\_03S\\_15June2020.pdf](https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_03S_15June2020.pdf)

## SOP for testing COVID-19 samples at DBT-CDFD

The DBT's Hyderabad -based Centre for DNA Fingerprinting and Diagnostics (CDFD) has drawn up a detailed standard operating procedures (SOP) for the COVID-19 testing facility set up at its campus.

The institute is getting Naso-Pharyngeal swab samples from government hospitals from all the districts across the State of Telangana in south India. The document provides the detailed protocol to be followed to test them for COVID-19.



*Centre for DNA Fingerprinting and Diagnostics (CDFD)*

The SOP has been made based on inputs from different recommendations by the World Health Organisation (WHO), United State's Centers for Disease Control and Prevention (CDC) and the handbook prepared by the office of the Principal Scientific Advisor to the Government of India for COVID-19 testing in research laboratories.

The document covers all aspects beginning from how the security guard of the Institute must receive the vehicle carrying samples at the entrance of the building to how the samples will be analysed and a report will be sent to the office of the district medical and health officer of the district from where the specific sample had come. It also gives clear protocol for how the biohazardous waste produced in the process should be handled and disposed of, how to sanitise the work and how to protect those engaged in the analysis from getting exposed to the virus.

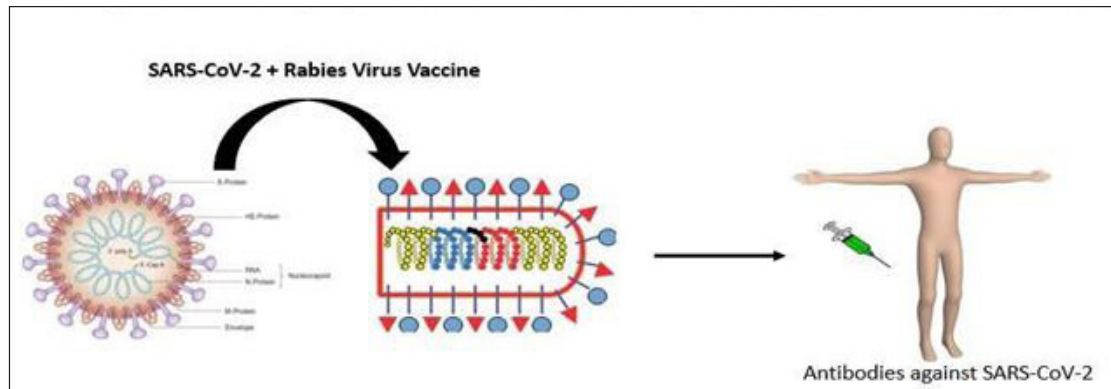
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[https://vigyanprasar.gov.in/wp-content/uploads/vigyan\\_samachar\\_dbt\\_04S\\_15June2020.pdf](https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_04S_15June2020.pdf)

<http://www.cdfd.org.in/>

## DBT's National Pharma Mission to fund a COVID-19 vaccine project

The current 2019 Novel Coronavirus (2019-nCoV or SARS-CoV-2) pandemic is unprecedented; the global response is drawing on the lessons learned from other disease outbreaks in the past. In the setting of a public health emergency, the development of a vaccine must balance manufacturing speed and technical feasibility with clinical safety and immunogenicity trial outcomes. Ultimately, the manufacturing must be scalable and the delivery simple to reach the maximum number of people in the shortest possible period.



*Long-term immunity against COVID-19 and Rabies by an established vaccine platform*

Considering all these requirements, Bharat Biotech International Ltd (BBIL), Hyderabad, and Thomas Jefferson University, USA have signed an agreement to develop a COVID-19 vaccine based on an inactivated Rabies virus platform. The DBT's National Biopharma Mission will provide funding for the joint project under the DBT- BIRAC COVID-19 Research Consortia Initiative.

Thomas Jefferson University has developed a Rhabdovirus-based vector that contains the S1 fragment of SARS-CoV-2 / COVID-19 spike glycoprotein. The recombinant rabies virus harbouring SARS-CoV-2 S1 fragment will be further inactivated using beta-propiolactone.

The use of a Rhabdovirus vector for producing a vaccine is not new. It has been successfully used for many human vaccines. For instance, chemically inactivated Rabies Virus (RABV) vaccines are quite safe and are administered very widely to humans. The codon-optimized foreign genes in general, introduced between RABV N and P genes, have been found to be highly expressed and stable. The same platform is being used to develop several vaccines against epidemic and pandemic causing viruses like Ebola virus, Nipah virus, and other coronaviruses like SARS, MERS-CoV, etc. The rabies vaccine has decades of safe use across diverse populations. A proof of concept was demonstrated by protecting animal models based on challenge studies with the related MERS-CoV in two mouse models and alpacas (camelid). Long-term protection is expected since the RABV vaccine often provides life-long protection.

Bharat Biotech International Ltd (BBIL), which is the world's largest Rabies vaccine manufacturer, will take up complete development and commercialization of the vaccine into world markets. It will be involved in a full-fledged, end-to-end development of the COVID-19 vaccine candidate from laboratory scale work to full-scale GMP Manufacturing, pre-clinical evaluation of the safety of the vaccine and comprehensive clinical trials from Phase I to Phase 3, to achieve commercial licensure. Its vaccine facility has already received a project grant under BIRAC/DBT Scheme from the Government of India for this vaccine.



BBIL has so far commercialized 16 vaccines and has market authorization in over 65 countries. It is the major supplier of the Rotavirus (ROTAVAC®) and Oral polio vaccines (BIOPOLIO®) to India's and World's Expanded Program of Immunization (EPI). Globally, its products are registered in 33 countries and the products are being supplied to more than 115 countries. It has a track record of low-priced vaccines at a high supply.

**Websitelink:**

[https://vigyanprasar.gov.in/wp-content/uploads/vigyan\\_samachar\\_dbt\\_02S\\_15June2020.pdf](https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_02S_15June2020.pdf)

<https://birac.nic.in/>

**DBT-IBSD augments COVID-19 testing facilities in Manipur and Mizoram**

The DBT's Institute of Bioresources and Sustainable Development (DBT-IBSD) has its head office in Imphal and has centres in Shillong, Gangtok, and Aizawl. It has been taking steps to help boost the capacity of the various States in the north eastern region of the country to meet the challenges posed by the COVID-19 pandemic that is sweeping across the world.

It recently provided assistance in Manipur and Mizoram under the guidance of its Director, Prof. Pulok Kumar Mukherjee. In Manipur, it extended a helping hand to the COVID-19 testing centres at Jawaharlal Nehru Institute of Medical Sciences (JNIMS) and Regional Institute of Medical Sciences (RIMS) at Imphal to cope with a shortage of trained manpower. One Scientist Fellow, one Post-Doctoral Fellow and one research scholar under the guidance of Dr. Nanaocha Sharma, Scientist-E has been helping in JNIMS, while one Research Associate and one Senior Research Fellow under the guidance of Dr. Indira Devi, Scientist-D has been helping in RIMS.

This is in addition to an earlier initiative, where DBT-IBSD had lent one RT-PCR and one RNA Extraction equipment to RIMS and one RT-PCR to JNIMS. Besides, it has distributed hand sanitizers, masks, face shields and drinking water to frontline workers and different quarantine centres located in Imphal west district and also involved in different other activities.

In Mizoram, the Institute has provided one Real Time (RT) PCR equipment to Zoram Medical College in Aizawl. The equipment, along with consumables, was flown to the Mizoram capital from Imphal in a helicopter arranged by the Mizoram Government. The equipment has been lent at the request of the Government of Mizoram and the Zoram Medical College. The consignment was handed over to the Department of Science and Technology, Mizoram

**New RT-PCR equipment reaches Aizawl**

To procure the new equipment, Planning Secretary Dr C. Vanlalrangsanga, MISTIC Executive Committee Chairman made an appeal to an autonomous body under the Central Government's Department of Biotechnology, Institute of Bioresources & Sustainable Development (IBSD), Imphal. The matter was also pursued by Health Minister Dr R Lalhangliana, Health Secretary H. Lalengmawia and Zoram Medical College officials.

Ruling Mizo National Front (MNF) legislator and state health and family welfare board vice chairman Dr. ZR Thiansanga on June 3 said that the government will soon issue an order making mandatory of nasopharyngeal swab (sample) test for all stranded people, who returned to the state from containment zones and hotspot areas.

He said that decision was made following 12 people, whose Rapid Antibody Test results showed non-reactive, have tested positive for novel coronavirus according to their nasopharyngeal swabs examination in Real-time Polymerase Chain Reaction (RT-PCR) machines.

"Samples of all the stranded people from containment zones, who are yet to return and have already reached Mizoram would be tested at laboratories. Those currently placed under quarantine will also be tested," he said.

He said that the government will procure a few more RT-PCR machines to increase testing ratio.

**OUR REPORTERS**  
**AIZAWL, JUNE 5**  
 New RT PCR (Reverse Transcription Polymerase Chain Reaction) Equipment RT-PCR

Quant Studio™ 5 and necessary testing tools reached Aizawl on Friday. The equipment was booked by the joint initiatives of the Mizoram

**CONTD. ON P3**

sent-scientist-to-cope-up-covid-testing-facilities

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updated 12:50 PM UTC, Jun 2, 2020

Headlines: Maharashtra, Gujarat: IT Newskumbal, June 2: The Cytone 'Ns

**IBSD SENT SCIENTIST TO COPE UP COVID TESTING FACILITIES**

June 2, 2020 Written by Gurn Artham Naicha 0 comments

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IT News  
Imphal, June 2:

Institute of Bioresources and Sustainable Development (IBSD), Takyelpat has been supporting the COVID testing facilities at RIMS and JNIMS by sending various scientists and researchers to cope up with the shortage of trained manpower.

A statement by the Senior Administrative Officer of IBSD, Imphal said that the institute has been working to support the testing facilities at RIMS and JNIMS under the guidance of its Director, Prof. Pulok Kumar Mukherjee, with available resources and expertise.

One Scientist fellow, one post doctoral fellow and one research scholar under the guidance of Dr. Indra Devi, Scientist-D has been helping to VRDL and MDRU of RIMS Imphal. The statement also added that the IBSD, Imphal have already lent one RT-PCR and RNA Extraction equipment to RIMS, Imphal to reduce the testing load at their center. Another RT-PCR was also lent to JNIMS testing center earlier the statement said.

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TODAY - Wednesday, Jun 03, 2020

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**Deputation of manpower from IBSD, Imphal to COVID-19 Testing Centres**

Imphal, 02nd June 2020

In order to augment the COVID-19 testing capacity at Manipur, the Institute of Bioresources and Sustainable Development (IBSD), Takyelpat have working to support the COVID testing facilities at RIMS and JNIMS.

IBSD under the guidance of its Director, Prof. Pulok Kumar Mukherjee has been working in different ways in the fight against the pandemic Coronavirus with the resources and expertise available.

To cope up with the shortage of trained manpower, as suggested by the authorities, recently several scientists and researchers of the institute are working hand in hand to the COVID-19 testing Centres at JNIMS and RIMS.

One Scientist Fellow, one Post-Doctoral Fellow and one research scholar under the guidance of Dr. Nanaocha Sharma, Scientist-E has been helping at the JNIMS's VRDL; while one Research Associate and Senior Research Fellow under the guidance of Dr. Indra Devi, Scientist-D has been helping to VRDL and MDRU of RIMS, Imphal.

IBSD, Imphal already lent one RT-PCR and RNA Extraction equipment to RIMS, Imphal to reduce the testing load at their testing centre. Another RT-PCR was also lent to JNIMS's testing Centre earlier.

It may be mentioned that IBSD with the leadership of Prof. Pulok Kumar Mukherjee has been joining with all its efforts to fight against the pandemic Coronavirus with the resources and expertise available with the institute since the announcement of national lockdown 1.0.

IBSD had also distributed its own hand sanitisers, masks, face shields and drinking water to front liners and different quarantine centres located in Imphal west district and also involved in different other activities.

Senior Administrative Officer  
Institute Of Bioresources & Sustainable Development (IBSD)  
Department Of Biotechnology, Government Of India  
Takyelpat, Imphal — 795001, Manipur (India)  
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\* This Press Release was sent to e-pao.net by Atom Samarendra Singh ( Junior Assistant (Admin.) IBSD, Imphal ) who can be contacted at [asamarendra\(AT\)yahoo\(DOT\)com](mailto:asamarendra(AT)yahoo(DOT)com)  
This Press Release was posted on 03 June 2020

Government, by scientists and staff of the Aizawl centre of the IBSD. RT-PCR is one of the best methods for detecting, tracking and studying the novel coronavirus.

Chief Minister of Mizoram, Mr. Zoramthanga expressed his gratitude to Union Minister for Science and Technology, Dr Harsh Vardhan, DBT Secretary, Dr Renu Swarup, DBT-IBSD Director and DBT-IBSD team in a series of tweets. Among other things, the Institute had also earlier lent one RT-PCR machine to the Government of Meghalaya in April 2020 for the testing facility at Tura.

Contact info: Prof. Pulok Kumar Mukherjee; Director, DBT-IBSD; Email: [director.ibsd@nic.in](mailto:director.ibsd@nic.in)

**Website link:**

[https://vigyanprasar.gov.in/wp-content/uploads/vigyan\\_samachar\\_dbt\\_01S\\_15June2020.pdf](https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_01S_15June2020.pdf)

[www.ibsd.gov.in](http://www.ibsd.gov.in)

**Dealing with the unknown during and beyond the pandemic – Webinar to bring together experts on mental health**

For the eighth in the series of webinars COVID-19 Ask the Experts, DBT's Translational Health Science and Technology Institute (THSTI), DBT-Wellcome Trust India Alliance, IAVI and Nature India brought together mental health experts to address issues related to mental health during and after the COVID-19 pandemic. Experts are of opinion that fear, worry, and stress are normal responses to perceived or real threats, more so during times when one is faced with imponderables such as COVID-19 and it is normal to be scared, worried or stressed in a pandemic.



Alongside the fear of contracting the virus, everyone faced significant changes in a country-wide lockdown. People's movement was restricted to help contain and reduce the spread of the virus. Working from home, temporary unemployment, online classes, and lack of physical contact with family members, friends, and colleagues have become the new realities. The impact of the pandemic and the lockdown

on the most vulnerable groups has been deep and far-reaching. More than ever before, it has, therefore, become important that we look after our mental as well as our physical health.

The webinar has broadly covered the following topics:

- De-constructing fear, worry and stress during a pandemic;
- Dealing with uncertainty and the new 'normal';
- Stay home - only easy to hashtag?;
- Impact of the crisis on the mental health of vulnerable groups, frontline health workers and journalists;
- Mental health of those living with COVID-19 – patients and caregivers;
- How has COVID changed mental health care? What would it look like post-COVID?;
- Definition of a support group now that we have to “socially” distance and
- Role of technology in mental health care: opportunities and risks
- Role of the government in mobilising support and resources for mental health care during and after the pandemic and
- Mental health research – dealing with redefined research priorities, setbacks and related opportunities due to COVID-19.

Contact Info: Dr. Siuli Mitra ([smitra@thsti.res.in](mailto:smitra@thsti.res.in))

**Website link:**

<https://www.indiaalliance.org/news/446>

<https://thsti.res.in/>

**DBT-NCCS crosses its first landmark with over 5000 samples tested for COVID-19**

With growing COVID-19 cases, the DBT's National Centre for Cell Science (NCCS), Pune, has started receiving huge number of COVID-19 samples from Pune and other districts of Maharashtra. Undaunted by this task, the team at DBT-NCCS accelerated and doubled its testing efforts and are now testing about two hundred samples per day. Within less than one and a half month of having started sample testing, this centre has crossed its first landmark by testing over 5000 samples. This has been possible only with the help of the tireless and diligent efforts of several scientists and technical and other staff who have been working long hours and seven days a week. A short video shared on the NCCS social media and website offers a glimpse into the activities of the diagnostics team.





DBT-NCCS crosses its first landmark by testing over 5000 samples for COVID-19

NCCS began testing samples for SARS-CoV-2 at the end of April 2020 to facilitate the ongoing COVID-19 surveillance. The Institute has repurposed some of the laboratories to serve as a testing centre, with extensive and speedy preparations made soon after it was approved as a diagnostics facility by the DBT, the Indian Council of Medical Research (ICMR) and the Maharashtra State Government. 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.

**Website link:**

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

<https://youtu.be/ICgBoPiZNu4>

**Learn how game theory can be applied in understanding pandemics**

A weekly 'Data Science' webinar series was organized by "Manav - The Human Atlas Initiative", a collaborative project between DBT's National Centre for Cell Science (NCCS), IISER-Pune and Persistent Systems was held on 11<sup>th</sup> June, 2020. The session on game theory was conducted by Dr M.V. Krishnasastry, Senior Scientist at the DBT-NCCS. The webinar was open to all and free. This gave science enthusiasts a glimpse into how game theory can be applied in real-life situations such as the current pandemic.



This weekly webinar series was initiated to meaningfully engage students and other science enthusiasts in an interactive educative experience during the lockdown and help increase scientific awareness about how data science is used as a tool in health sciences and biology in general. It was kick-started at the end of April with a webinar on "R0: How scientists quantify the intensity of an outbreak". This was followed by webinars on diverse topics, including "Data Science Approaches for Genomics and Pandemics"; "Biomedical NLP at Scale: Automated inference of Biological Networks"; "The Future Research Scientist in the Age of AI and Big



Data”; and “When and Where to Divide to Conquer: Personalized Medicine using Systems and Machine-based Biology Approaches”.

This series has been hugely successful having attracted well over a thousand registrations, mainly from students. The ‘Manav’ initiative, exemplary of a public-private partnership, is funded by the DBT, Government of India, and co-funded by Persistent Systems. It aimed to annotate the extensive data from the scientific literature related to the human body and to initiate steps towards creating a virtual human atlas eventually. The project will help students across India to learn how to comprehend and extract relevant information from scientific literature using a digital annotation tool. Students and researchers interested in participating can learn more from the project’s website (<https://manav.gov.in/>) and social media (Twitter: Manav Human Atlas & Facebook: MANAV Human Atlas).

Crucial decisions, such as those required to protect the whole population in a pandemic, can be tricky and not the easiest for authorities to make. This is so because what may be best for the population as a whole may not necessarily be the best thing for individuals and vice versa. The game theory, which is typically used in economics, could help address this dilemma.

Contact info: Jyoti Rao (jyoti@nccs.res.in)

**Website link:**

<http://shorturl.at/pqwQ7>

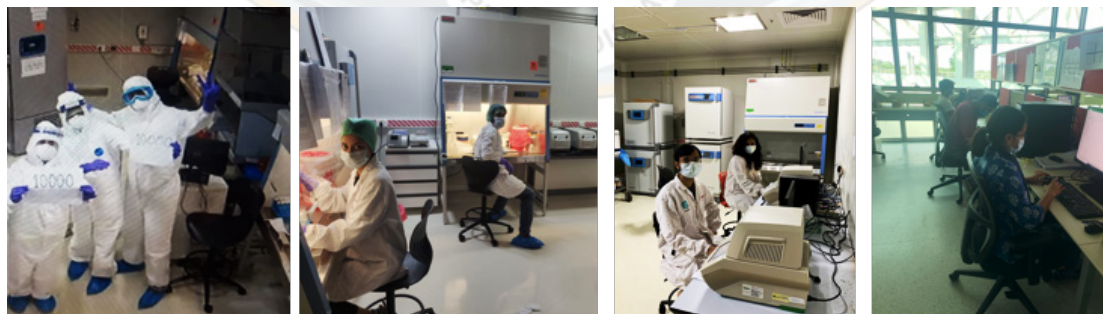
<https://manav.gov.in/>

### **Outreach: COVID-19 effort on testing at DBT’s inStem has reached a milestone**

The DBT’s Institute for Stem Cell Science & Regenerative Medicine (InStem), Bengaluru has recently reached a milestone of 10,000 samples testing (May 29, 2020) since Day 1 of testing (i.e., April 13, 2020), with 500+ samples arriving from districts in Northern Karnataka and Bangalore itself. The level of commitment and support from the campus community has been outstanding especially the faculty members, young researchers, and technical and administrative staff who have volunteered for this work.

The institute has done extensive testing for COVID-19. Since state healthcare systems are severely overburdened, many research institutions have stepped in to fill this gap by offering available infrastructure, skilled researchers, and resources.

Contact info: Amrita Tripathy (tripathy@instem.res.in)



*SARS-CoV-2 testing pipeline at the testing laboratory of Bangalore Life Science Cluster*

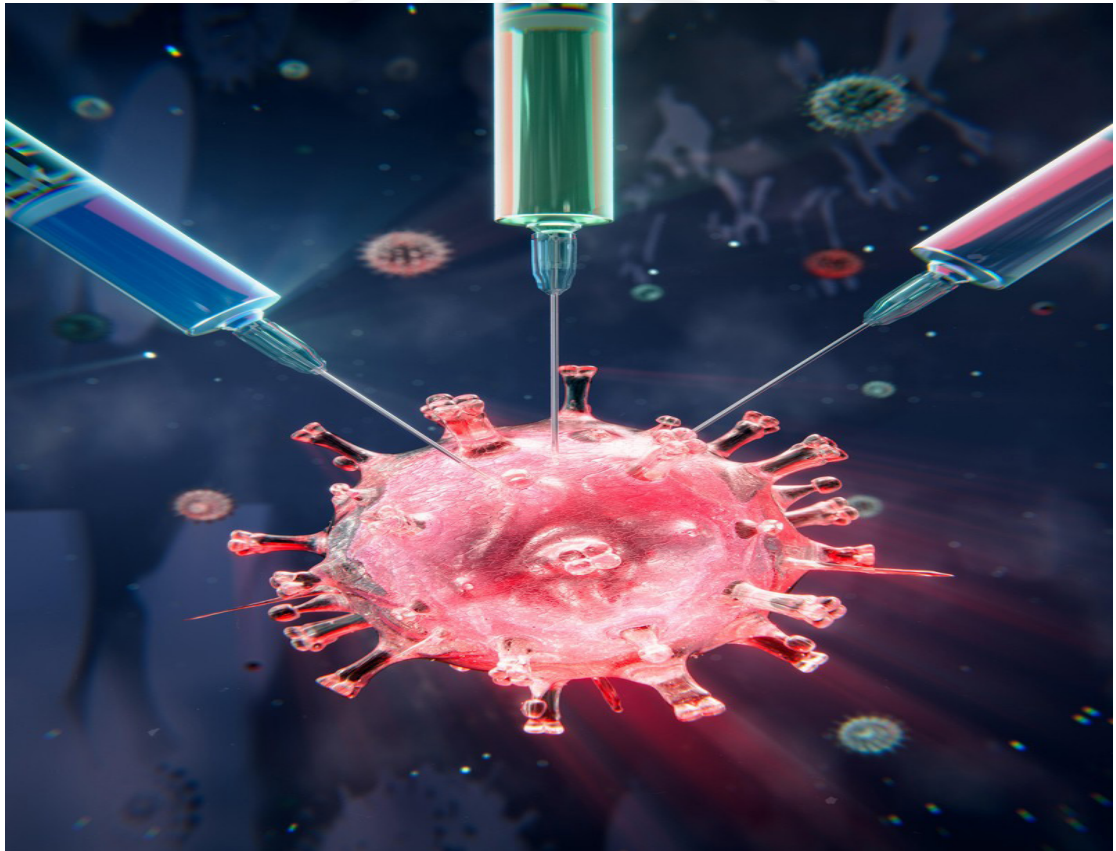
**Website link:**

<https://instem.res.in/>

## Antiviral activity testing against SARS-CoV-2

To meet the growing need for the *in vitro* and *in vivo* antiviral assays for the new drug candidates/ test substance (TS), Regional Centre for Biotechnology (RCB) and Translational Health Science and Technology Institute (THSTI) have jointly decided to provide these tests. RCB will be providing *in vitro* antiviral test at non-cytotoxic concentration and THSTI will be providing *In vivo* assay for test substance showing the *in vitro* antiviral activity. SARS-CoV-2 cultures have been set up in the BSL-3 facility and are ready to help with the *in vitro* anti-viral assay for drugs/herbal extracts/formulations in the cell culture model at a non-cytotoxic concentration of the TS.

Contact Info: Dr Deepika Bhaskar (deepika.bhaskar@rcb.res.in)



**Website link:**

<https://www.rcb.res.in/upload/SARS-CoV2%20Antiviral%20activity%20testing.pdf>



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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

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### Researchers develop low-cost novel coronavirus test

The Indian Council of Medical Research (ICMR) has recommended only reverse transcription-Quantitative polymerase chain reaction (RT-qPCR) test for novel coronavirus testing. Researchers at the Centre for Cellular and Molecular Biology (CCMB) have developed a new low-cost and low-tech test for SARS-CoV-2 testing. This test is known as reverse transcription nested PCR (RT-nPCR) test.

This test does not require RT-qPCR. The RT-nPCR developed by the CCMB research team has shown comparable performance to the standard RT-qPCR test. The nested PCR approach does not depend on RT-qPCR but uses standard RT-PCR as part of an endpoint assay.

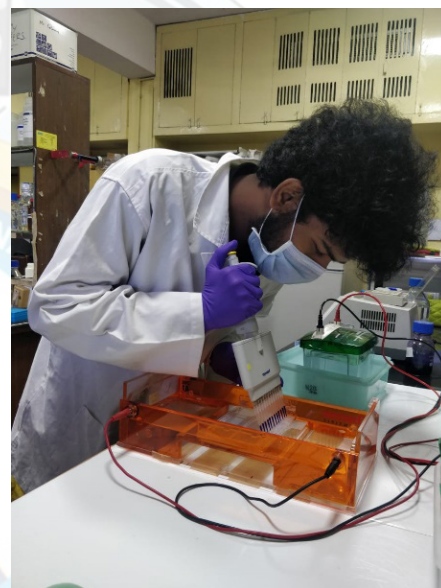
In the course of comparing the results of both tests, researchers found that the standard RT-qPCR test can have low detection efficiency (less than 50%) in a real testing scenario, which may be due to low viral representation in many samples. This finding brought home the importance of monitoring detection efficiency directly in test environments.

“We developed and tested an RT-nPCR protocol comprising a multiplex primary RT-PCR for amplification of four SARS-CoV-2 amplicons and a control human amplicon followed by a secondary nested PCR for individual amplicons. We also examined the use of RT-nPCR in pooled testing and in direct amplification without RNA isolation,” said Dr Rakesh Mishra, Director, CCMB.

**Website Link:**

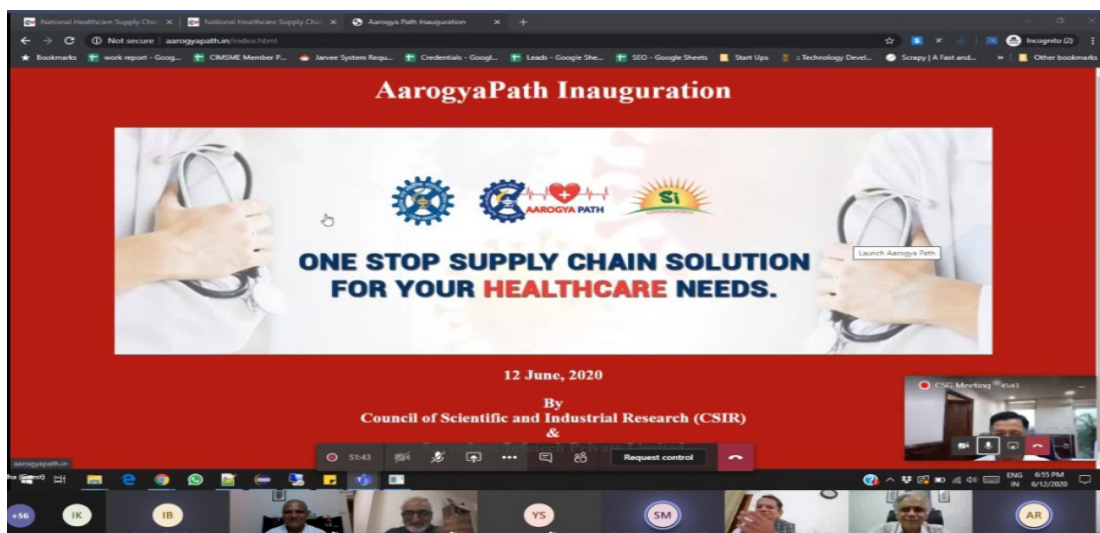
<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-10-June-20.pdf>

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



### CSIR launches ‘AarogyaPath’, a portal to strengthen healthcare supply chain

CSIR has launched AarogyaPath, a web-based solution for the healthcare supply chain, which provides real-time availability of critical supplies. AarogyaPath would serve manufacturers, suppliers, and customers through the web portal <https://www.aarogyapath.in>.



The COVID-19 pandemic has posed a situation of national health emergency, leading to severe disruption in the supply chain. In particular, the ability to produce and deliver the critical items was compromised due to a variety of reasons. This integrated public platform, named AarogyaPath, has been developed with the vision of “*providing a path which leads one on a journey towards Aarogya (healthy life)*” to address the challenges related to the supply of essential healthcare goods.

This platform provides a single-point source for key healthcare goods, which could help customers in tackling a number of routinely experienced issues. The issues include dependence on limited suppliers, time-consuming processes to identify good quality products, limited access to suppliers who can supply standardized products at reasonable prices within desired timelines, lack of awareness about the latest product launches, etc.

This portal was launched by Rajesh Bhushan, Officer on Special Duty, Ministry of Health and Family Welfare, in the presence of DG-CSIR, Dr Shekhar C. Mande. Sudhir Garg, Joint Secretary, Ministry of MSME and Dr Vijay Chauthiwale, Pharma Sector Expert, were guests of honour at this event.

**Weblink:**

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-13-June-20.pdf>

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

### **CSIR-IICT webinar educates students on drug discovery, safety gear for COVID-19**

Students had an engaging session on the current scenario on drug discovery and safety protocols for containing COVID-19 through a webinar organized by the CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad. Addressing the students, Dr S. Chandrasekhar, Director, CSIR-IICT, said the scientists stood strong in the period of lockdown to find solutions for combating the new virus that affected the world. The IICT scientists too worked continuously to ensure a speedy solution in the form of drugs and protection gear that can reach the society at affordable prices.



Scientists from the institute discussed drug discovery, repurposing of drugs, sanitizers, masks, face shields and other equipment to combat COVID-19 during this webinar. Dr Chandrasekhar said the masks and face shields developed at the Institute are game changers for the common person. Elaborating on drug discovery, Dr Chandrasekhar said the time taken for any drug to come to the market is about 8 to 12 years and can cost approximately Rs. 10,000 crore. This process involves many steps right from identifying a molecule to trials and permissions. Utmost importance while developing a drug is given to safety and toxicity of the drug. He advised students to maintain social distance and follow self-hygiene to defeat the spread of the virus.

**Weblink:**

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-3-15-June-20.pdf>  
<https://www.iictindia.org/>

### **CSIR-NEERI to teach sanitization techniques to homeless and migrants**

The National Environmental Engineering Research Institute (CSIR-NEERI) has joined hands with the District Legal Services Authority (DLSA), Nagpur, and non-governmental organizations (NGOs) to impart training to homeless and migrant labourers staying in Nagpur.

A meeting in this regard was held recently at NEERI in the presence of Justice Abhijeet Deshmukh, Secretary, DLSA, and Dr Rakesh Kumar, Director, NEERI. During the discussion, the participants emphasized that before the schools, colleges, hotels, etc. are reopened, all these institutions should be properly sanitized, as many schools, especially government and zilla parishad schools, have been used to quarantine COVID-19 suspects and shelter migrant workers.

Dr Suvha Lama, Scientist, CSIR-NEERI, explained on how to clean and disinfect the workplaces. Dr Shilpa Kumari, Scientist, CSIR-NEERI, informed that the institution had already imparted training to various NGOs on preparing reusable masks according to WHO guidelines. She also demonstrated various systems and devices by which disinfection can be done. Dr Pratap Reddy Maddigapu, Project Scientist at the institution, stated that a disinfection device based on Ultraviolet (UV)-C technology can be used to disinfect used masks, used hand gloves, papers, documents, files, etc. Homeless and migrant labourers, after giving them proper training, can be engaged in such disinfection activities for their livelihood, he added.

DLSA and NGOs pointed out that various government and private organizations will henceforth seek routine and standard environmental sanitization procedures, where CSIR-NEERI could play a major role in bringing out a policy document. CSIR-NEERI could also be instrumental in imparting sanitization training to homeless and migrant labourers for providing them employment opportunities.

**Weblink:**

<https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-2-15-June-20.pdf>  
<https://www.neeri.res.in/>

### **Air sanitiser from NIIST to disinfect aerosols**

The National Institute for Interdisciplinary Science and Technology (CSIR-NIIST) has developed a low-cost air sanitiser which could prove ideal for enclosed public spaces such as hospitals, given the COVID-19 scenario. The system 'disinfects' aerosols, the fine particles suspended in air. It exposes them to a combination of antimicrobial filters and germicidal UVC radiation and releases clean air.

Many infectious diseases of bacterial, fungal and viral origin are transmitted through aerosols, which are minute (micron size) respiratory droplets that reach air when people cough, sneeze or even talk. “Direct inhalation can take these aerosols deep into the lungs or aerosols can get deposited on surfaces leading to a source of contact transmission. Studies related to COVID-19 have further reported that coronavirus can stay active in aerosols up to three hours (depending on surrounding conditions) and on surfaces up to several days,” the institute said in a statement.

The air sanitiser was developed by a team led by Krishnakumar B., Principal Scientist, NIIST. The team tested the unit with aerosols spiked with known bacterial cultures of Staph aureus and E. coli and found a significant reduction in bacterial cell count in the exhaust air.

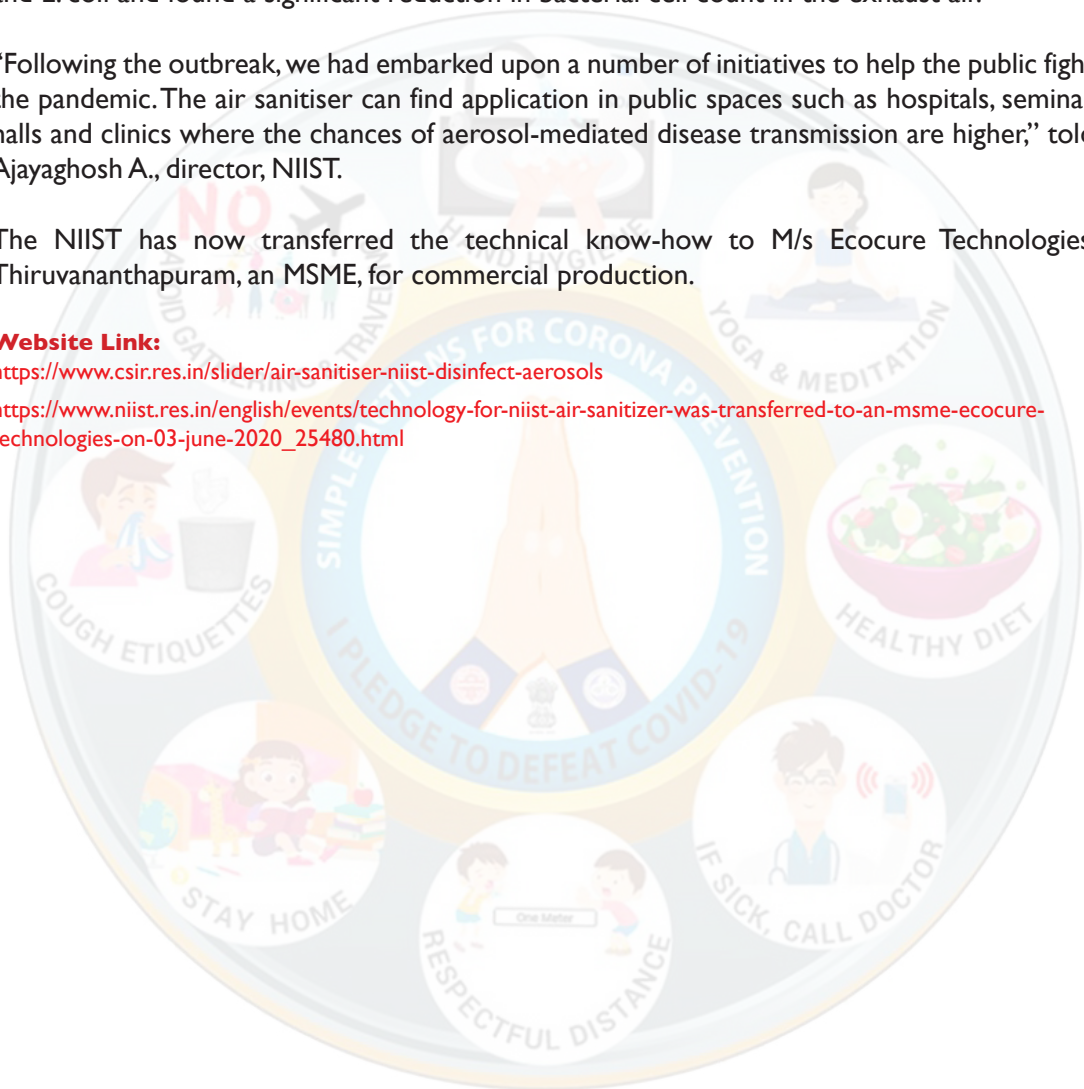
“Following the outbreak, we had embarked upon a number of initiatives to help the public fight the pandemic. The air sanitiser can find application in public spaces such as hospitals, seminar halls and clinics where the chances of aerosol-mediated disease transmission are higher,” told Ajayaghosh A., director, NIIST.

The NIIST has now transferred the technical know-how to M/s Ecocure Technologies, Thiruvananthapuram, an MSME, for commercial production.

**Website Link:**

<https://www.csir.res.in/slider/air-sanitiser-niist-disinfect-aerosols>

[https://www.niist.res.in/english/events/technology-for-niist-air-sanitizer-was-transferred-to-an-msme-ecocure-technologies-on-03-june-2020\\_25480.html](https://www.niist.res.in/english/events/technology-for-niist-air-sanitizer-was-transferred-to-an-msme-ecocure-technologies-on-03-june-2020_25480.html)





# SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

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

### Ministry of Health releases revised version of clinical management protocol for COVID-19

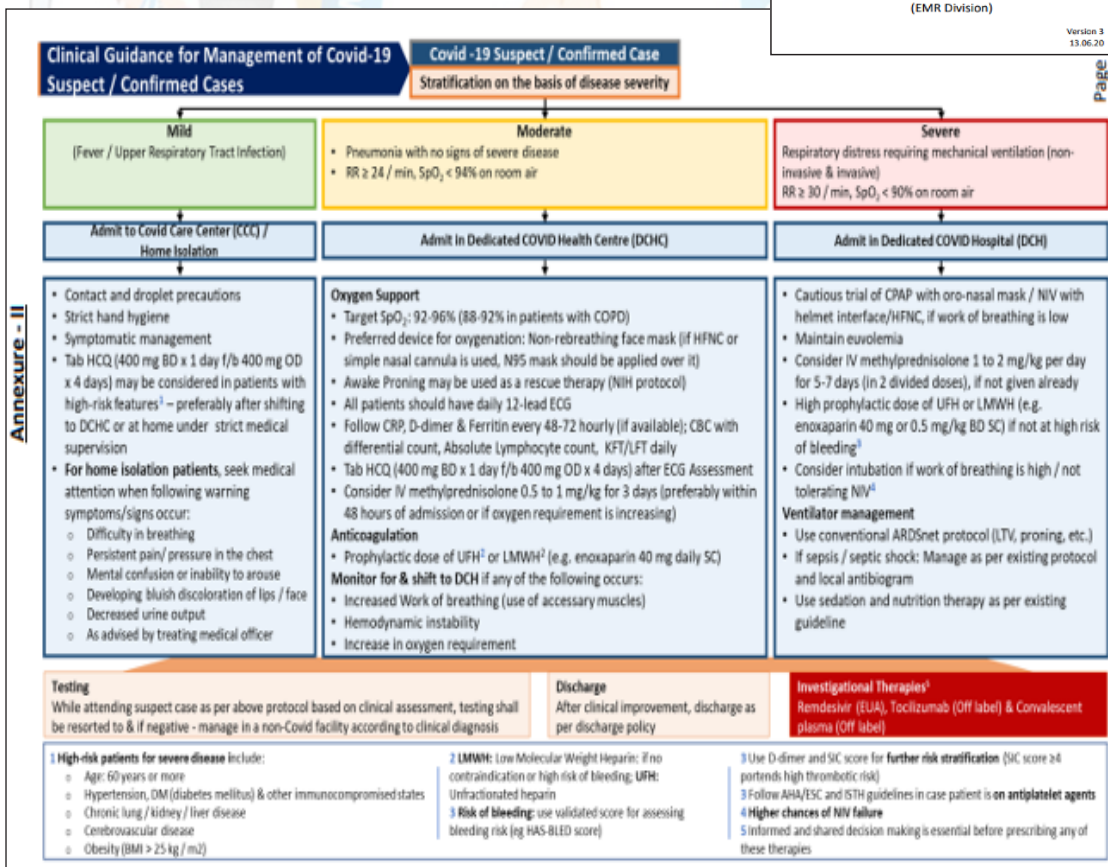
Ministry of Health & Family Welfare (MoHFW), on 13<sup>th</sup> June 2020, released revised version of clinical management protocol for COVID-19. The protocol deliberates upon detailed clinical features, case definitions, risk factors, and management of mild, moderate and severe cases.



#### CLINICAL MANAGEMENT PROTOCOL: COVID-19

Government of India  
Ministry of Health and Family Welfare  
Directorate General of Health Services  
(EMR Division)

Version 3  
13.06.20



#### Website Link:

<https://www.mohfw.gov.in/pdf/ClinicalManagementProtocolforCOVID19.pdf>

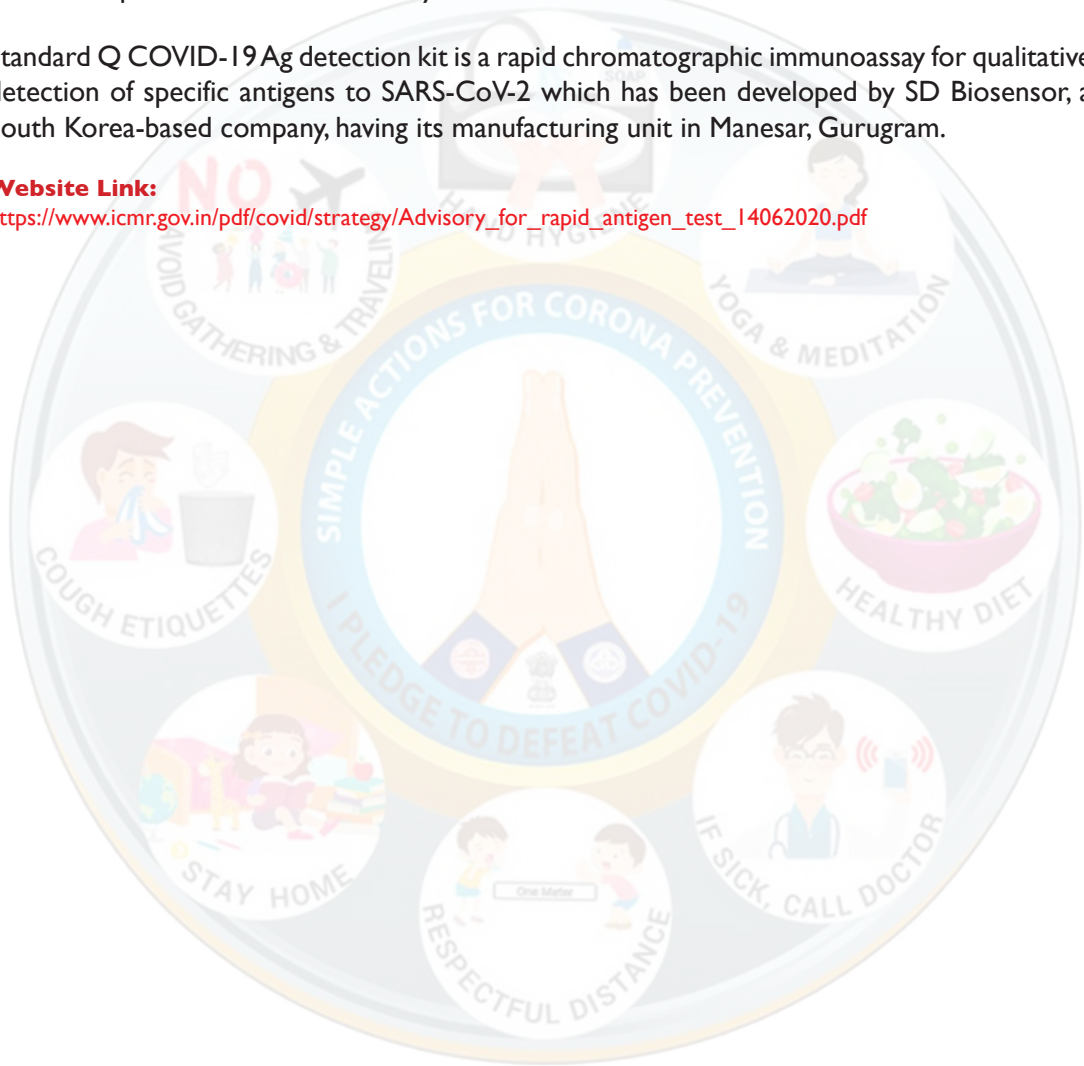
## Advisory on use of Rapid Antigen Detection Test for COVID-19

ICMR recommends the use of Standard Q COVID-19 Ag detection assay as a point-of-care diagnostic assay for testing. There are no reliable antigen detection tests available worldwide, which could be used as rapid point-of-care tests for quick detection of COVID-19 positive patients. Such tests would help in proper implementation of the Government strategy to test, track and treat. Such tests will also help in allaying the anxiety and fear of healthcare workers and aid in better clinical management of the patients. In view of this, an independent two-site evaluation of the only available or standalone antigen detection assay: Standard Q COVID-19 Ag detection kit, was conducted with an aim to evaluate its sensitivity, specificity and feasibility of use as a point-of-care test for early detection of SARS-CoV-2.

Standard Q COVID-19 Ag detection kit is a rapid chromatographic immunoassay for qualitative detection of specific antigens to SARS-CoV-2 which has been developed by SD Biosensor, a South Korea-based company, having its manufacturing unit in Manesar, Gurugram.

**Website Link:**

[https://www.icmr.gov.in/pdf/covid/strategy/Advisory\\_for\\_rapid\\_antigen\\_test\\_14062020.pdf](https://www.icmr.gov.in/pdf/covid/strategy/Advisory_for_rapid_antigen_test_14062020.pdf)





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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

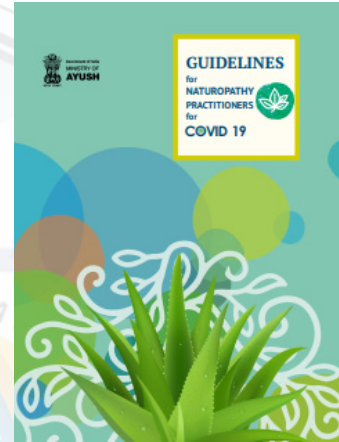
BY

# MINISTRY OF AYUSH

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### Ministry of AYUSH releases guidelines for naturopathy practitioners for COVID-19

The guideline document released by Ministry of AYUSH is for naturopathy practitioners to impart yoga therapy, naturopathy treatment modalities, nutrition, diet and lifestyle approaches to improve immunity in our population. Research has shown that there is a heterogeneity in susceptibility to infections during a flu epidemic. Psychological stress, fitness and physical activity, nutrition, sleep, comorbid conditions and lifestyle play a vital role in shaping this immune response. Naturopathy is a system of lifestyle medicine that works in modulating these factors and improves the body's innate healing properties that is immunity.



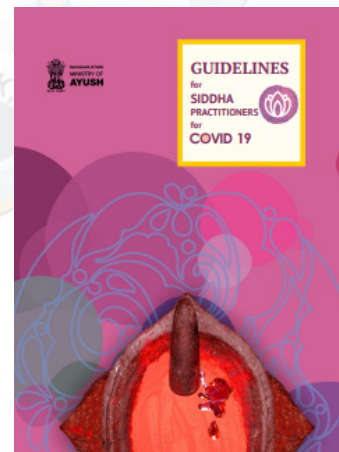
The guidelines may be useful in this current scenario when we are facing a COVID-19 pandemic. Since elderly population, children and those with comorbid conditions are vulnerable to this infection, naturopathy interventions can be used as an adjunct preventive management. The impending anxiety and stress of isolation due to COVID-19 and lockdown can down regulate immune responses and lower defence that can lead them to contract this infection and increase its severity.

**Website link:**

<https://www.AYUSH.gov.in/docs/naturopathy-guidelines.pdf>

### Guidelines for Siddha practitioners released by Ministry of AYUSH to combat COVID-19

In the Siddha system, Epidemics/Pandemics are mentioned as 'Uzhi Noi' or 'Kothari Noi.' In general, they are classified under "KollaiNoikal" (Communicable Diseases) which most commonly occur at the time of "Ayana Santhi" months (end a month of Uthara Ayanam & Thatchana Ayanam) and fall on Adi and Margazhi month in Tamil Calendar. It is believed that in those days, the immunity of human beings will be low based on Mukkutram Theory.



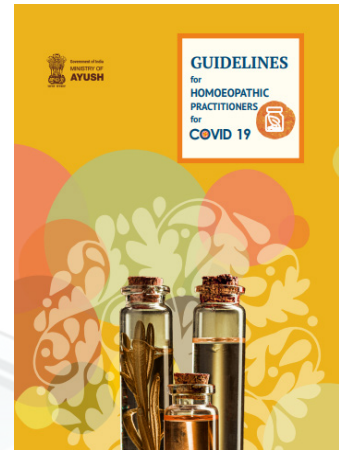
In Siddha System, the diseases are raised based on the derangement of Mukkutram. Usually, Thottru Noigal (communicable diseases), associated with Aiya kutram (Respiratory-related illness), gets affected due to its Sthiram gunam (stability factor). In Guru Naadiquoted, Thottru Noigal is generally caused by Kirumi (Pathogens). The symptoms are due to Noiyanan vanmai (immunity of an individual); if it is good, he/she will not be affected. So, the medicines are used to neutralize the Aiya kutram.

**Website link:**

<https://www.AYUSH.gov.in/docs/siddha-guidelines.pdf>

## Guidelines for homoeopathic practitioners for COVID-19 released by Ministry of AYUSH

In case of epidemics or pandemics, first approach is to follow preventive measures and educate people about general measures and to provide interventions that will keep their immunity enhanced. Homeopathy therefore recommends issuing of public notice for Genus epidemics identified by the designated experts for immunity enhancement and practitioners may suggest the same to the people and as per the Advisory issued by Ministry of AYUSH.



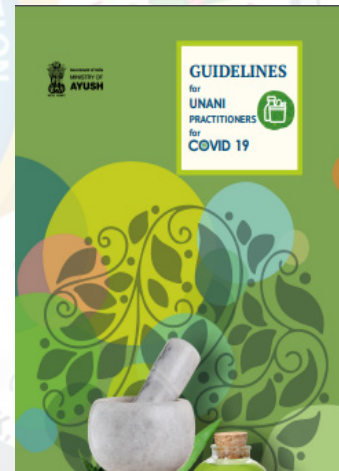
Second approach is to provide homoeopathic symptomatic mitigation to affected persons. Homoeopathic medicines are also useful in the treatment of communicable diseases like influenza-like illness, dengue, acute encephalitis syndrome etc. Several studies are also published which show the immune modulatory potential of homoeopathic medicines in preclinical studies. These medicines can be prescribed in an integrated manner or standalone depending on the severity on a case to case.

**Website link:**

<https://www.AYUSH.gov.in/docs/homeopathy-guidelines.pdf>

## Ministry of AYUSH releases guidelines for Unani practitioners for COVID-19

Unani scholars have prescribed several single drugs as well as compound formulations for the prevention and treatment of infectious diseases in general. They have emphasized more on the use of certain drugs which are known to improve host immunity during the outbreak of epidemics, endemics and pandemics. Ismail Jurjani (1041-1136 CE) mentioned that use of Tiryqaq during epidemics strengthens the heart and keeps the body faculties strong. Single and compound Unani drugs may prove to be beneficial and can be used under the supervision of qualified Unani physicians for possible immune-boosting/symptomatic relief in upper respiratory tract infections.



As per Unani classical wisdom, improving immunity with immune boosters is one of the key approaches for prevention of disease and maintenance of health. Therefore, a strategy to enhance immunity and provide symptomatic relief in upper respiratory tract infection is advocated in these guidelines for qualified Unani medicine practitioners.

**Website link:**

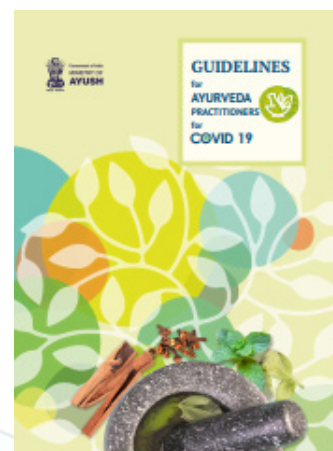
<https://www.AYUSH.gov.in/docs/unani-guidelines.pdf>

## Guidelines for Ayurveda practitioners for COVID-19 released by Ministry of AYUSH

The COVID-19 pandemic is defining the global health crisis of our time and it has transpired to be the greatest challenge we have faced since the Second World War. The number of deaths and incidence of infection are rising at an alarming rate throughout the world. The situation has materialized to be much more than a health crisis with a potential to create



devastating situations at social, economic and political levels. Till date, no effective management to address this infection has been discerned and attempts are being made to integrate a few traditional interventions along with standard treatment protocols for COVID-19. It has further been observed that there is a paucity of empirical evidence to guide appropriate management of the disease. Collecting data and comparing outcomes are being recommended globally. In view of this, it is very essential to develop guidelines for practitioners to generate evidence-based data at prevention, promotion and therapeutic levels.



The medicines recommended in the guidelines are based on Essential Drugs List, Standard Treatment Guidelines, Ayurvedic Pharmacopoeia of India, Ministry of AYUSH (Government of India) along with considerations from other recommendations issued by various health authorities across India. The practicing Vaidya has to have his/her own discretion in selecting medicines based on the stage of the disease, symptom complex and availability of the drugs in their locality. Use of mask, hand sanitization, social/physical distancing to break the chain, healthy nutritious diet and measures of improving immunity and all other general healthcare measures are to be advised as per the guidelines issued by health authorities from time to time.

**Website link:**

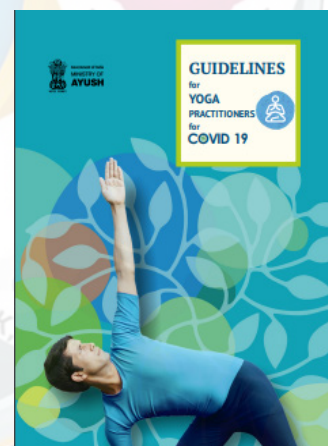
<https://www.AYUSH.gov.in/docs/ayurveda.pdf>

## **Guidelines for Yoga practitioners for COVID-19 released by Ministry of AYUSH**

Yoga may play significant role in the psycho-social care and rehabilitation of COVID-19 patients in quarantine and isolation. They are particularly useful in allaying their fears and anxiety.

The guidelines are for yoga professionals (Certified Yoga teachers/instructors and therapists etc.) to teach a safe set of yoga practices based on available scientific evidences, to novices in all walks of society as a service to humanity during this pandemic of COVID-19. This is complimentary to all measures that have been adopted. Yoga-based lifestyle modules which can be used for different sections of the society in the present scenario are presented with the following objectives:

1. To improve general immunity among the population;
2. Rehabilitation of vulnerable populations (children, elderly and those with comorbid conditions such as diabetes and hypertension) and to those patients in isolation/quarantine with or without mild symptoms; and
3. To add-on yoga-based interventions and meditation practices for COVID-19 cases in isolation and hospitalization for psychosocial care.



**Website link:**

<https://www.AYUSH.gov.in/docs/yoga-guidelines.pdf>

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

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### Automatic mist-based sanitizer dispensing unit

Indigenous device for touch-free disinfection of hands is developed to deliver sanitizer mist as long as hand(s) are kept below the delivery nozzle. A single fluid nozzle with low flow rate is used to generate aerated mist, which provides full coverage to both hands with few ml quantity of sanitizer.



The quick response of the sensor not only ensures timely delivery of the sanitizer mist but also reduces the wastage to almost zero. More than 1000 persons can sanitize their hands in one refill.

Two variants of 2- and 5-litre capacity have been developed and tested. Industrial partner has been identified for mass production and the tentative cost of the equipment (5 litre) is Rs. 5000 per unit.

**Website link:**

<https://drdo.gov.in/automatic-hand-sanitizer-dispensing-unit>

### Single Outlet Automated Resuscitator (SOAR)

An Assistive Breathing Device is developed called Single Outlet Automated Resuscitator (SOAR) based on the device developed for Indian Army for use in NBC containment environment. The device is tested in various user trials and can provide respiratory support to COVID-19 patients in the hospital, in transit or patients at home.



The system works with the blower/turbine as the source of the breathing air. It is a standalone system which can run on AC/DC/external battery and also by direct pneumatic supply.

**Website link:**

<https://drdo.gov.in/hospital-aids>



## Personnel disinfection enclosure (fog based)

A sanitization enclosure called PerSan comprising of a chamber and a fog generator has been developed.

The chamber is made from skeleton of steel pipes coated with epoxy or acrylic paint/powder or of UPVC pipes. The structure is covered except the openings for entry and exit portions, using polythene film of 200-240 $\mu$ m, those normally used in poly-houses. The two openings, for entry and exit, are closed with either strip curtains or shower curtains.

The assembly of the chamber is such that the base of the chamber is 1m x 1m and the height is 7 ft. The design enables assembly of the chamber in few hours. It is equipped with two fog generators of capacity of about 3L/hr or single fog generator of capacity 5-6L/hr. The fog generator is an ultrasonic transducer-based humidifier that generates fog of 1 to 5  $\mu$ m aerosols.



The system has important features, like, in-built reservoir tank for storage, solenoid valve with liquid level sensor for replenishment of the liquid in fog generation tank from the reservoir tank, IR (proximity) sensor in the power supply circuit of the fog generator, time selector for setting of time for fog generation from 15s to 1 minute, etc. The fog generation tank dimensions has been optimised to produce maximum fog. It uses more than 95% indigenous components.

### Website link:

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

## FOGG sanitizer – Disinfection of room/chamber

A fogg sanitizer in which disinfection will be done with Hydrogen Peroxide ( $H_2O_2$ ) in a low-pressure, low temperature, nontoxic process has been developed. It uses vaporized  $H_2O_2$  to reduce the level of infectious agents.  $H_2O_2$  is strong oxidant and can be used as potent broad-spectrum germicide. It belongs to the category of High-Level Disinfection (HLD). Disinfectants of this level kill all vegetative microorganisms, mycobacteria, lipid and nonlipid viruses, fungal spores, and some bacterial spores. It is safer than chlorine.

The rooms/closed chambers may be disinfected as per the validated protocol.

### Website link:

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

## MEDIDOOT – Medical Trolley

Medidoot medical trolley is designed to supply critical items – food, cloth and medicine to the patients infected with contagious like the present SARS-CoV-2 in the isolated wards, thereby reducing the exposure of doctors and other healthcare staff to the infected area/patients.

The trolley is remotely operated by a trained person to carry medical supplies to the designated patient in a remote location. It has closed enclosures to prevent cross contamination of the supplies and should be able to open only by the operator remotely. There is a provision of two-way audio visual interaction between the patients and the medical team through the screen and microphone running either on Wi-Fi or standalone cellular network. It has the capability to sense obstacles and stop automatically in order to take care of the operational errors.



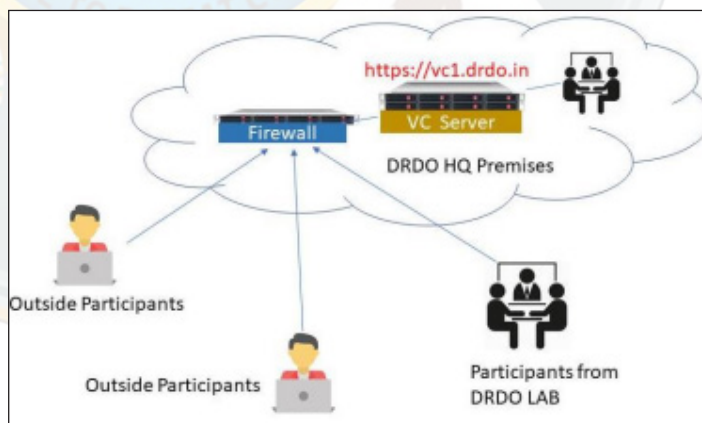
The trolley is provided with an alarm to alert the patients when it reaches the destination. It has in-built short circuit protection mechanism for patient safety. Pilot light is provided to alert the people that the device is in operation and a battery charge level indicator is provided in the interface console. The trolley can be easily sanitized (Dry/Wet) post operation without removal of any of the components and hot swapping of the battery is possible for continuous operation of the trolley.

**Website link:**

<https://drdo.gov.in/sites/default/files/inline-files/Medidoot.pdf>

### **SAMMUKH - DRDO video conferencing solution on internet**

The video conferencing (VC) facility is provided for DRDO community to meet the requirement of uninterrupted working. This VC facility has been setup in DRDO premises and is named as SAMMUKH. The Sammukh VC server is placed at DRDO HQ running on Ubuntu (ver 18.04) and hosted on secured domain name as <https://vc1.drdo.in>. The server is physically protected.



It is based on WebRTC video-conference and uses modern XMPP communication server for high performance audio-video conferencing. Reverse Proxy Nginx is configured for Authentication and Videobridge, i.e., an SFU server manages all conference media streams.

The VC Traffic is under control and do not go outside DRDO. Three-tier independent Access control/authentication have been provided, which are Website Access, VC Room Creation and



Room Entry Password. A firewall is implemented to protect the system from cyber-attacks. Other security and encryption features have also been used to make it safe.

The gives HD quality video, lossless audio, supports more than 100 participants, provides private meeting rooms, screen share option and chat box for the participants. The controls (Mike, Speaker, and Video) have been provided in user friendly manner.

Security assessment of Sammukh has been done by SAG, DRDO with complete Source Code Analysis and independent VA/PT has been carried out by Advisor Cyber. Detailed SOP has also been issued by DRDO.

**Website link:**

<https://drdo.gov.in/sites/default/files/inline-files/Sammukh.pdf>

### **Drone-based surveillance system**

An unmanned aerial vehicle (Drone) has been configured for surveillance of COVID-19 hotspots and containment zones to ensure strict compliance of lockdown guidelines in densely populated areas, where streets are too narrow for motorised patrolling and police personnel are susceptible to infection in case of manual patrolling. The system has been developed in collaboration with an industrial partner from Greater Noida.



The size of the drone is 2.5 ft x 2.5 ft and the weight is less than 3kg. It can be remotely operated through a hand-held tablet. It can fly up to 60 m and has a range of 3 km with the capability of way point navigation. It is equipped with a public announcement system and an onboard video camera for recording and broadcasting real-time video feed to the control room. The controlling software of the drone has built-in artificial intelligence tools for decision-making. The UAV automatically returns to its home location in case of any communication failure.

The system has been demonstrated to the Chandigarh Police in the containment zone of Bapu Dham Colony, which has become a major hotspot of COVID-19 positive cases in Chandigarh. The system can act as a force multiplier for the law enforcement agencies, who have been a frontline warrior in this battle against the global pandemic.

**Website link:**

<https://drdo.gov.in/sites/default/files/inline-files/Drone%20Based%20Surveillance%20System.pdf>

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# SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

## MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY (MeitY)

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### Joint statement from founding members of GPAI on leveraging AI towards COVID-19 mitigation

India, Australia, Canada, France, Germany, Italy, Japan, Mexico, New Zealand, the Republic of Korea, Singapore, Slovenia, the United Kingdom, the United States of America, and the European Union have come together to create the Global Partnership on Artificial Intelligence (GPAI or Gee-Pay). GPAI aims to support the responsible and human-centric development and use of AI in a manner consistent with human rights, fundamental freedoms, and their shared democratic values, as elaborated in the OECD Recommendation on AI. To this end, GPAI also look forward to working with other interested countries and partners.

GPAI is an international and multi-stakeholder initiative to guide the responsible development and use of AI, grounded in human rights, inclusion, diversity, innovation, and economic growth. In order to achieve this goal, the initiative will look to bridge the gap between theory and practice on AI by supporting cutting-edge research and applied activities on AI-related priorities.

In collaboration with partners and international organizations, GPAI will bring together leading experts from industry, civil society, governments, and academia to collaborate across four Working Group themes: 1) Responsible AI; 2) Data Governance; 3) The Future of Work; and 4) Innovation & Commercialization. Critically, in the short-term, GPAI's experts will also investigate how AI can be leveraged to better respond to and recover from COVID-19.

GPAI will be supported by a Secretariat, to be hosted by the OECD in Paris, as well as by two Centres of Expertise – one each in Montréal and Paris. The relationship with the OECD will bring strong synergies between GPAI's scientific and technical work and the international AI policy leadership provided by the OECD, strengthening the evidence base for policy aimed at responsible AI. The Centres will provide administrative and research support for the practical projects undertaken or assessed by Working Group experts from various sectors and disciplines. The Centres will also plan the annual GPAI Multi-stakeholder Experts Group Plenary, the first of which will be hosted by Canada in December 2020.



**Website link:**

[https://meity.gov.in/writereaddata/files/Joint\\_Statement\\_on\\_Launch\\_GPAI.pdf](https://meity.gov.in/writereaddata/files/Joint_Statement_on_Launch_GPAI.pdf)



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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

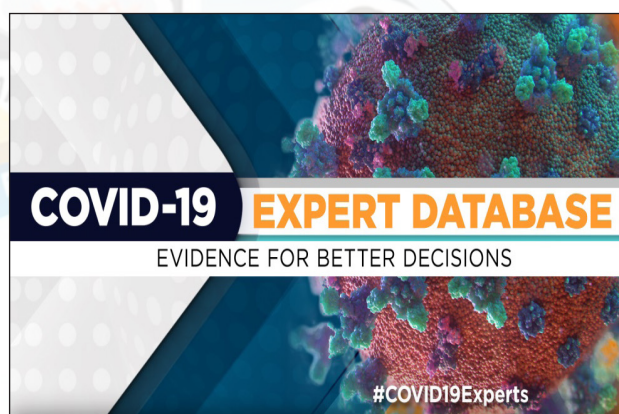
BY

# OTHER SCIENTIFIC AND ACADEMIC INSTITUTIONS

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### Expert database for research on COVID-19 pandemic from the Science Academies of India

The three Science Academies of India - National Academy of Sciences, India (NASI), Indian Academy of Sciences (IASc) and Indian National Science Academy (INSA) - have jointly drawn on a list of experts/scientists/fellows of the academies, who have volunteered to participate and assist with planning/decision/research addressing the challenges posed by COVID-19. They will be willing to participate, review and assist with any of the programmes in the domains of their expertise.



The lists of scientists are from the following areas of expertise:

- Basic Science
- Data Analytics and Modelling
- Therapeutics and Repurposing of Medicines
- Design and manufacture of Protective Gear
- Rapid manufacture of test kits
- Rapid manufacture of instruments including ventilators
- Rapid validation of drug

Contact info: AcademiesExperts@gmail.com

**Website Link:**

[http://insaindia.res.in/scroll\\_news\\_pdf/experts.pdf](http://insaindia.res.in/scroll_news_pdf/experts.pdf)

### IISc successfully completes prototyping of PRAANA ventilator

Indian Institute of Science (IISc) successfully completes the prototyping of an indigenously developed ICU-grade ventilator. Built using a custom designed pneumatic system controlled by a microprocessor; it uses proprietary



algorithms and techniques to blend air and oxygen in the desired ratio. It also has fine-grained control of patient-side respiratory parameters such as respiration rate, inspiration to expiration ratio,  $\text{FiO}_2$ , and PEEP. It supports both invasive and non-invasive ventilation. The ventilator uses only components made in India or easily available in the domestic supply chains. The team took about 35 days to go from the drawing board to a proof-of-concept system and then a working prototype in another two weeks.

**Website Link:**

<https://www.iisc.ac.in/events/iisc-team-successfully-completes-prototyping-of-praana-ventilator/>

## **NIT Jalandhar develops herbal hand sanitiser to fight COVID-19 outbreak**

In order to promote hand hygiene and minimise the transmission risk of the COVID-19 virus among the individuals, National Institute of Technology (NIT) Jalandhar in collaboration with Bharat Herbals, Jalandhar developed a low-cost herbal hand sanitizer and has more than 70% alcohol. The sanitizer is found to be effective in destroying Coronaviruses.

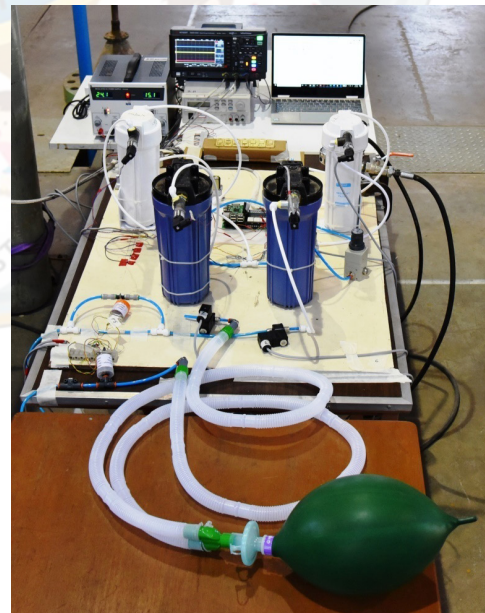


**Website Link:**

[https://www.nitj.ac.in/index.php/nitj\\_cinfo/pages/377](https://www.nitj.ac.in/index.php/nitj_cinfo/pages/377)

## **IISc building indigenous ventilator prototype for COVID-19 patients**

A ventilator can be a life-saver for patients whose lungs are damaged by the COVID-19 infection. But India, like all other countries grappling with this pandemic, is likely to face a large shortage of ventilators. Manufacturers are unable to source key components such as sensors and flow controllers from abroad due to the current disruptions in global supply chains. To address this shortage, Indian Institute of Science (IISc) is currently building a prototype of an electro-mechanical ventilator from scratch, using only components found or made in India, based on guidelines issued by the UK Medicines and Healthcare products Regulatory Agency. It is expected to be ready within the next couple of weeks.



Contact Info: [news@iisc.ac.in](mailto:news@iisc.ac.in); [pro@iisc.ac.in](mailto:pro@iisc.ac.in)

**Website Link:**

<https://www.iisc.ac.in/events/iisc-team-building-indigenous-ventilator-prototype-for-covid-19-patients/>



## Single-piece Full Body PPE Cover (Marshall) developed at NIT Jalandhar to fight COVID-19 outbreak

National Institute of Technology (NIT) Jalandhar has designed and developed a Single-piece full body PPE cover (Marshall). The designed PPE is single-piece full body cover from head to toes with proper ventilation without direct exposure to viral particles suspended in the environment (air, water, soil). The mask and screen are pre-installed as the part of the cover. The PPE is chained from back while the front, which is exposed mainly to infected person, is completely covered. For proper ventilation, pores are kept at suitable places. The lower side of cover which goes up to toes is installed with anti-slip soles to provide friction while walking or running. A patent has been filed and the inventor with possible collaboration is working on improving the quality of the design and product for wider applications. The material is washable and can be sterilized with standard methods before packaging and application. It takes lesser time and effort to wear and to respond on quick notice. Presently, the developed cover has a low manufacturing cost (Rs. 500) for common application (Level-1) and can be replaced with standard materials for specific applications (Level 2-4).



### Website Link:

[https://www.nitj.ac.in/index.php/nitj\\_cinfo/pages/379](https://www.nitj.ac.in/index.php/nitj_cinfo/pages/379)

## NIT Jalandhar develops a novel technology to curb the airborne transmission of SARS-CoV-2

As COVID-19 continues to ravage the global populations, the world is singularly focused on finding ways to battle the novel coronavirus. The premier institutes of the country are trying hard to develop novel disinfection and decontamination technologies to fight the spread of COVID-19. Dr B R Ambedkar National Institute of Technology (NIT), Jalandhar developed a novel technology for chemical-free sanitisation of the indoor air to combat the spread of COVID-19 through airborne transmission in enclosed spaces such as offices, lifts, shops, restaurants, classrooms, hospitals, airplane cabins, healthcare facilities, ICUs, isolation and quarantine centres, etc.



The technology has been transferred to M/s Hi-Safe Electronics Corporation for commercial production of chemical-free indoor air sanitizer. The technology was invented by Dr Jatinder Kumar Ratan, Associate Professor, Department of Chemical Engineering, and patent for the same has already been filed along with Dr KS Nagla of Instrumentation department.

Contact Info: [kumarj@nitj.ac.in](mailto:kumarj@nitj.ac.in); [naglaks@nitj.ac.in](mailto:naglaks@nitj.ac.in)

### Website Link:

[https://www.nitj.ac.in/index.php/nitj\\_cinfo/pages/412](https://www.nitj.ac.in/index.php/nitj_cinfo/pages/412)

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## SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

# PRIVATE SECTOR ENTERPRISES

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### **Kwality Healthcare from Thane manufacturing safety products for healthcare**

Thane-based Kwality Healthcare is a distinguished organisation of this domain, engaged in manufacturing and supplying a finest assortment of safety products. A wide range of products are available to the patrons in multifarious specifications and sizes. Moreover, they present customized range to the clients, that is accredited for its notable attributes such as longer service life, light weight, easy to dispose and comfortable.

Although the company is manufacturing a number of products since long but they boost up their products to combat COVID-19 like, disposable surgical and bouffant cap, surgical facemask, respiratory mask, cup mask, pocket mask, hand gloves, disposable non-woven shoe cover, etc. The products have longer service life, are light-weight, easy to dispose and comfortable.



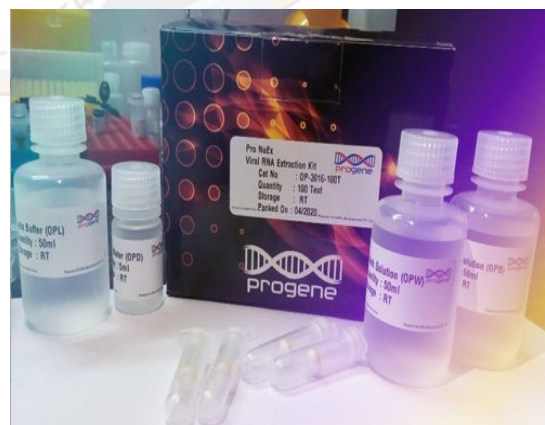
**Website link:**

<https://www.kwalityhealthcare.co.in/>

### **Pro NuEx–Mini Prep Viral RNA Extraction Kit developed by OPRL Bio Sciences**

OPRL Bio Sciences Pvt. Ltd. (Formerly ORANGE) from Chennai is an organization that manufactures biotech instruments, both standard and customised products, teaching kits, research kits, biochemical buffers, plasmid and DNA, Markers (DNA & protein), etc.

It has developed an extraction kit for isolation of viral RNA from cell-free fluids such as Plasma, Nasopharyngeal swab, Serum, Oropharyngeal swab, Sputum, BAL in Viral Transport Medium and other body fluids for COVID-19 detection.





This kit carries out efficient extraction of viral RNA from wide range of viral strains. The sample is first lysed under the highly denaturing conditions provided by Buffer (OPLB) to inactivate RNases and ensure isolation of intact viral RNA. When Carrier RNA is added to precipitation step, it improves the binding of viral RNA to the Miniprep Spin Column, especially in the case of low-titer samples, and limits possible degradation of the viral RNA due to any residual RNase activity.

**Website link:**

<https://www.orangeindia.co.in/corona-kit.html>

## **AURA Biotech manufacturing PCR Aura Pure Quick COVID-19 Viral RNA Isolation Kit**

AURA Biotechnologies Private Limited is a Chennai-based Pharmaceutical and Biotechnology Research organization involved in developing innovative technologies to expedite the R & D process and lessen the drug and diagnostic development cost. AURA's quick COVID-19 viral RNA isolation kit is used for the isolation of VIRAL RNA from Nasal/throat swab collected in Viral Transfer Medium (VTM). This kit has been designed using magnetic nano-bead-based technology validated by ICMR-NIV, Pune. AURA Pure beads are built with high magnetic power with large surface for the maximum load of viral RNA. The simple protocol comes with a magnetic separator for 12 tubes format.



**Website link:**

<http://www.aurabiotech.com/#>

## **Alcham Diagnostic launches VTM With ICMR approval to combat COVID-19**

Alcham Diagnostics is a Coimbatore-based manufacturing and exporting company of clinical and research disposable products. These medical disposable products are highly appreciated for its high quality and are widely recognised by medical and research institutions.

They develops Viral Transport Medium (VTM) consisting of Flocked Nylon Swabs/Cotton Swabs, modified Hank's BSS and a buffer to maintain the pH ( $\text{pH } 7.3 \pm 0.2$ ) of medium. VTM includes protein for stabilisation and antimicrobial agents to suppress bacterial and fungal contamination without harming viruses, chlamydiae and mycoplasmas. It helps store samples for long periods by preserving viruses when stored frozen with the presence of a cryoprotectant and must be stored at 10 to 30 degree until usage of the product.

**Website link:**

<https://www.bioproindia.com/covid-19.html>



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# SCIENCE OUTREACH & POPULARISATION EFFORTS

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Since the eruption 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 Science Ministries, Departments & Scientific Organisations

### Government of India invites to share your ideas & suggestions to help fight COVID-19 pandemic

Government of India is taking all necessary steps to ensure that every Indian is prepared well to face the challenge and threat posed by the growing pandemic of novel Coronavirus. The most important factor in preventing the spread of the 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 order to involve the community in the fight against the virus, MyGov has called for participation by inviting citizens to share their ideas and suggestions to help fight Coronavirus. These can include innovative and best practices regarding hygiene, handwashing, social distancing and preventing spread of rumours and being prepared rather than panicking, and at the same time, keeping calm and staying vigilant.

Last Date for Participation: 30<sup>th</sup> June 2020

**Prepare, Don't Panic!**

Give your ideas & suggestions  
to help fight **#CoronaVirus**



**Website link:**

[https://www.mygov.in/group-issue/share-your-ideas-suggestions-help-fight-coronavirus/?utm\\_source=webcampaign&group\\_issue&285571](https://www.mygov.in/group-issue/share-your-ideas-suggestions-help-fight-coronavirus/?utm_source=webcampaign&group_issue&285571)

### The Ayush Sanjivani Quiz aims to analyse impact of immunity boosting advisories

The Ayush Sanjivani mobile app is a notable effort in the field of public health research in India. It aims to study the impact of AYUSH-based practices in improving the health of the



general public. The AYUSH Ministry advisories on immunity boosting came at the difficult time of the COVID-19 pandemic and are believed to have helped millions of people to ward off health problems in these difficult days. The Ayush Sanjivani has posed a set of questions which aims to assess the impact of the said advisories in the prevention of COVID-19.

Participation in this quiz will help you understand the AYUSH systems of healthcare in general and the Ayush Sanjivani app in particular.

Quiz End Date: 21<sup>st</sup> June 2020

**Website Link:**

<https://quiz.mygov.in/quiz/the-ayush-sanjivani-quiz/>

**Kids, Vaayu & Corona: PGIMER-Chandigarh and Panjab University produce an Educative Comic Series for COVID Awareness**

COVID-19 has created a nightmare for most of the people around the world. For kids, it really becomes incomprehensible to understand the related talks, advisories and other scientific information. To overcome the challenge, Postgraduate Institute of Medical Education and Research (PGIMER, Chandigarh) and Panjab University (PU), have created an educative comic series titled 'Kids, Vaayu & Corona' for children to make them aware about the threats of Coronavirus and ways to remain safe by taking simple precautionary steps for prevention and control of spread of the infection. Continuing with the trend, third part of the comic series aims to engage children at home and explore their creative potential.



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**Website Link:**

<https://www.care4cleanair.com/media>

[https://6c7e24ae-fb40-4331-a67d-c876b179abc8.filesusr.com/ugd/bce95d\\_4fdfac85ea104cd993aa3e5a468fd4b2.pdf](https://6c7e24ae-fb40-4331-a67d-c876b179abc8.filesusr.com/ugd/bce95d_4fdfac85ea104cd993aa3e5a468fd4b2.pdf)

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

National Institute of Science Communication and Information Resources (CSIR-NISCAIR) brings out newsletter dedicated for the COVID-19 outbreak. The newsletter covers stories and information on various aspects, like research, technology and innovation efforts to fight out the pandemic and related awareness and sensitisation information.

### Website Link:

<https://www.niscair.res.in/covidbulletin/view/7>

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



## 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 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 the 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.



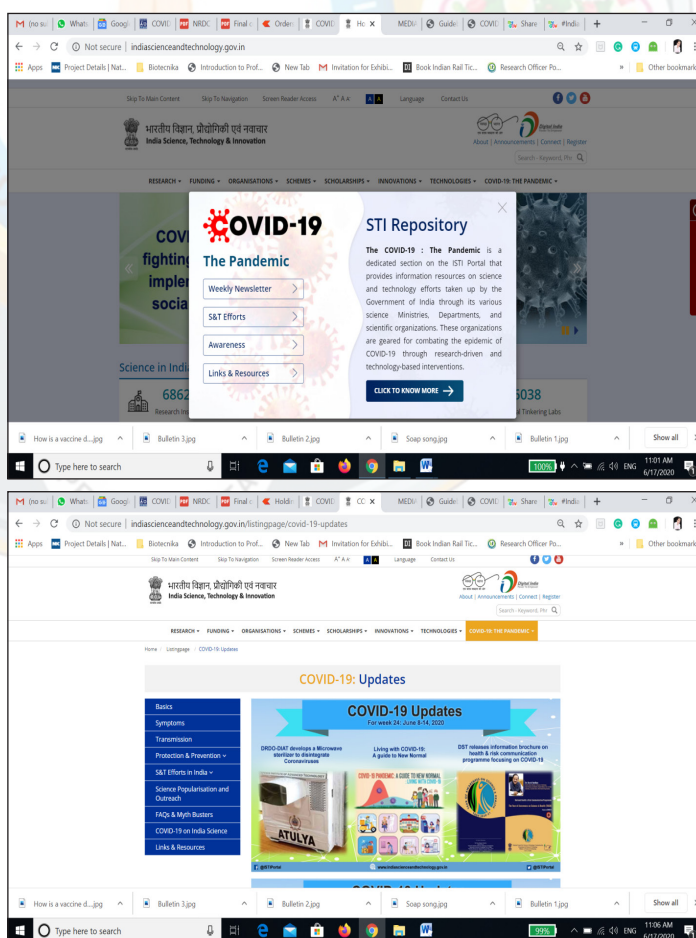
1. Daily video bulletin in Hindi and English;
2. COVID Explained - Short films to explain research project findings in layman's lingo; and
3. Face book live sessions on interviews of various stakeholders and media with DST Secretary.

Contact info: [kapil@vigyanprasar.gov.in](mailto:kapil@vigyanprasar.gov.in)

**Website link:**  
<https://www.indiascience.in/>

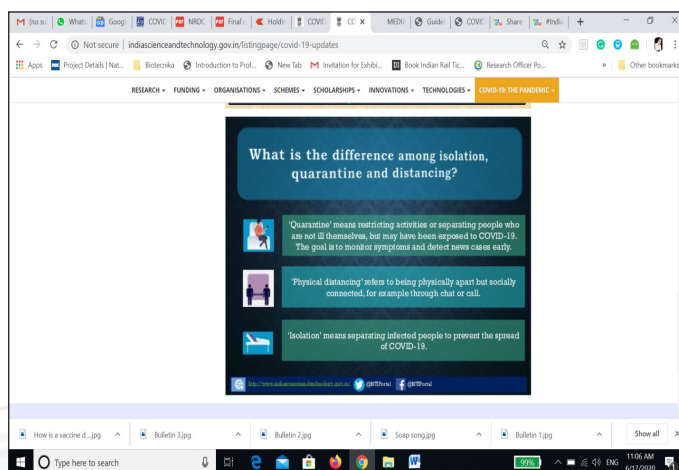
## India Science, Technology and Innovation (ISTI) Web Portal

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 projecting science in India with its major achievements. The ISTI web portal has been developed by Vigyan Prasar, 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.

Contact Info: [kdgm@vigyanprasar.gov.in](mailto:kdgm@vigyanprasar.gov.in)

**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 who are interested in knowing various aspects of COVID-19 and contributing to the coronavirus warfare in whatever minuscule way.



Contact Info: [kdgm@vigyanprasar.gov.in](mailto:kdgm@vigyanprasar.gov.in)

**Website link:**

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