SCIENCE & TECHNOLOGY EFFORTS IN INDIA ON COVID-19

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

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

जय विज्ञान
जय अनुसंधान

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

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 COVID19.

(Dr. Harsh Vardhan)

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PREFACE

At 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 (EoIs) 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.

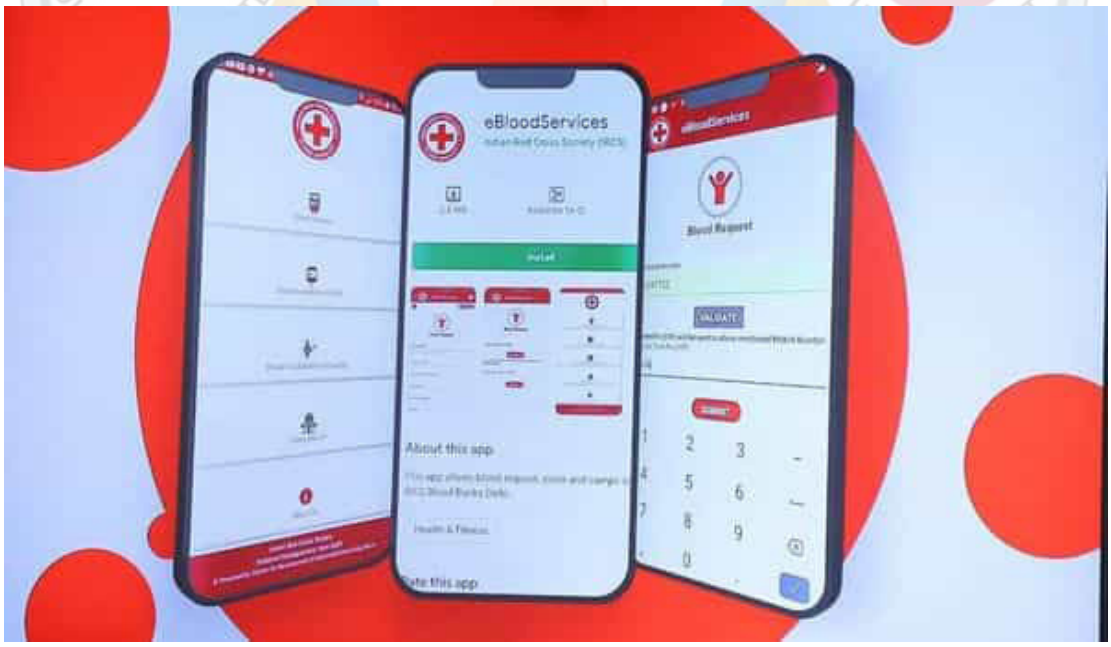
Vigyan Prasar
New Delhi

Dr Harsh Vardhan launches Indian Red Cross Society's 'eBloodServices' Mobile App and congratulates for the initiative during COVID-19 crisis

25th June 2020, New Delhi

Dr Harsh Vardhan, Union Minister of Health & Family Welfare launched the 'eBloodServices' Mobile App developed by The Indian Red Cross Society (ICRS), here today, through a video conferencing. The Union Health Minister is also the Chairman of Indian Red Cross Society.

This application is developed by the E-Raktkosh team of Centre for Development of Advanced Computing (CDAC) under the Digital India scheme launched by Prime Minister Shri Narendra Modi in 2015. Dr Harsh Vardhan said, "In keeping with the people-centred vision of the Hon. Prime Minister, Digital India has now become an integral part of every person's daily life. This Blood Donation App is a prime example of how the Digital India Scheme is serving the need for accessing blood services." He added that "Many people require blood-related services regularly because of certain medical conditions in their families. Through this App, four units of blood can be requisitioned at a time and the blood bank will wait for as long as 12 hours for the person to collect it. This App makes it easy for those in need to request for Blood units



at IRCS NHQ." At a time when the country is facing such a pandemic, the Mobile App will provide succour to all those who direly require blood, he stated.

Once the request is placed through the App, the requisite units become visible to IRCS, NHQ blood bank in its E-Raktkosh dashboard and this allows assured delivery within the specified time. This feature will make it easy for a blood seeker to obtain blood and shall bring the added advantage of complete transparency and single-window access to the service.

Dr Harsh Vardhan praised all the voluntary blood donors who have donated blood during the ongoing COVID-19 outbreak. Red Cross has facilitated donation by voluntary blood donors by either providing transport or sending blood collection mobile vans for on-site blood donation.

Urging people to become voluntary blood donors, Dr Harsh Vardhan stated that voluntary blood donation can be done by any person under the age of 65 years as many as four times in a year. "Regular blood donation can prevent obesity, cardiac problems and many other ailments. Not just this, blood donation is also a spiritual path by which mankind can be served," he added.

After the launch, Dr Harsh Vardhan presided over the Managing Body Meeting of the Indian Red Cross Society. Appreciating the efforts of IRCS, Dr Harsh Vardhan said, "IRCS has been performing a major role during COVID-19 pandemic alongside the Government, especially in maintaining adequate supply of safe blood by issuing passes to blood donors, organizing blood donation camps." All 89 IRCS Blood Banks and 1100 branches across the country have collected more than a staggering 1,00,000 units of blood through in-house donations and from around 2000 blood donation camps organized during the lockdown period. Also, more than 38,000 voluntary blood donors registered with NHQ Blood Bank have been contacted and motivated to donate blood.

The NHQ Blood Bank conducted 55 blood donation camps collecting 2896 units of blood. A total of 5221 units were collected during the lockdown period. Blood has been issued to 7113 patients, including 2923 thalassaemic patients as well as to Government hospitals such as AIIMS Delhi (378 units) and Lady Hardinge (624 units).

Also, IRCS has served more than 3,00,00,000 cooked meals and provided ration to more than 11,00,000 families.

Dr Harsh Vardhan Launches DBT – AMTZ Mobile Diagnostic Unit for COVID-19 Testing - I-Lab

18th June 2020, New Delhi

The Minister for Science & Technology, Earth Sciences and Health & Family Welfare Dr Harsh Vardhan inaugurated and flagged off India's first I-Lab (Infectious disease diagnostic lab) for COVID-19 testing in rural and inaccessible areas of India. Secretary, Department of Biotechnology Dr Renu Swarup and other officials were present on the occasion. Dr Jitendar Sharma, CEO, Andhra Med Tech Zone CEO and senior officials from NITI Aayog, Ministry of Health & Family Welfare, MeiTY, other ministries, ICMR, DST, CSIR etc. joined the function through web online.

Expressing his happiness to launch the I-Lab, a mobile testing facility, Dr Harsh Vardhan dedicated this to provide COVID-19 testing access to rural India. This mobile testing facility will be deployed through the DBT testing hubs to remote regions of the country for COVID-19 testing. He congratulated and appreciated the efforts of the DBT in tackling the pandemic and added that DBT coordinated in scaling-up testing for COVID-19 by reorienting premiere laboratories as COVID-19 testing centres in a hub-and-spoke model. There are now over 20 hubs in the country with 100 testing laboratories and these have tested more than 2,60,000 samples.

Dr Harsh Vardhan said, "This has been possible through the DBT-AMTZ COVID Command Consortia (COVID Medtech Manufacturing Development Consortia) to cope with the current situation in the country and move progressively towards a stage of self-sufficiency. The I-lab will be deployed through these hubs into remote and interior places." The Minister appreciated the "Andhra med-tech zone team for building this unique, innovative facility for the country at the period of lockdown through tireless, dedicated and committed efforts." He informed that AMTZ through the support of DBT has also established manufacturing facility for indigenous manufacturing of kits and reagents for various testing kits which were initially imported thereby helping us realise the vision of Pradhan Mantriji on 'Make-in India', 'Make for India'. He pointed out that today there are 953 testing laboratories in all corners of the country and elaborated on "Various steps taken by the ministry and departments towards achieving research components indigenization and their in-house manufacturing." Dr Harsh Vardhan emphasised that "In the near future with all these collective and cooperative efforts, India will achieve self-sufficiency in healthcare technologies leading towards Atma Nirbhar Bharat."

Dr Renu Swarup said on the occasion that through the concerted efforts Indian scientists, the country has achieved a capacity of producing nearly 5 lakh testing kits per day, exceeding the target of having one lakh test kits by May 31, 2020. She pointed out that this I-Lab has been created in a record time of 8 days by the Andhra Pradesh Med-tech Zone team with the support of DBT under the National Biopharma Mission being implemented by the Public Sector BIRAC. She highlighted that the unit has biosafety facility and is capable of performing RT-PCR as well as ELISA tests.

DBT-AMTZ COMManD

The Department of Biotechnology (DBT), Ministry of Science & Technology along with Andhra Pradesh Med-tech Zone (AMTZ) has initiated the DBT-AMTZ COMManD [COVID Medtech Manufacturing Development] Consortia to address the shortage of critical healthcare technologies in India and move progressively towards a stage of self-sufficiency.

Under this Consortia, India's first I-Lab has been built at AMTZ in record time of 8 days from the date of receipt of Automotive Chassis from Bharat Benz. This is a mobile diagnostic unit with biosafety facility. The I-Lab is a BSL-2 facility with on-site ELISA, RT-PCR, Bio chemistry analysers. It can run 50 RT-PCR reactions and about 200 ELISA in a day. Double set of machines can help increase the capacity to about 500 per day in 8 hours shift

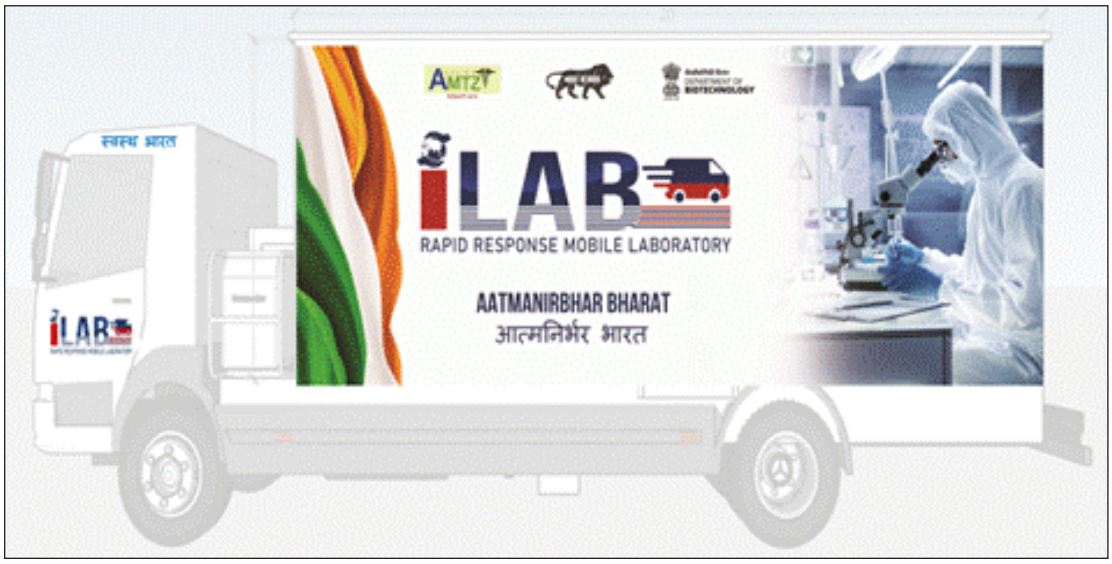
It can be deployed in remote areas and can be lifted from automotive chassis and can be put on goods train for sending to any location in the country. The BSL-2 Lab is as per NABL specifications and is being attached to DBT's certified testing centres.

The Department of Biotechnology (DBT), under the Ministry of Science & Technology, promotes and accelerates the development of biotechnology in India, including growth and application of biotechnology in the areas of agriculture, healthcare, animal sciences, environment and industry.

AMTZ is Asia's first medical equipment manufacturing ecosystem, uniquely dedicated for Medtech and supported by various Ministries.

INFECTIOUS DISEASE DIAGNOSTIC LABORATORY (I-LAB)

- To promote last-mile access of testing to rural India, DBT under the COVID-Command strategy has supported building of mobile testing labs through AMTZ.



- The unique feature of these mobile testing labs is their utility in diagnosing other infectious diseases beyond the COVID period

Specifications

- Automotive Chassis, Diagnostic Equipment, Clean Room, BSL-2 lab, bio-safety cabinets
- 25 Tests (RT-PCR) per I-Lab per day
- 300 ELISA tests/day
- Costs of additional test for other diseases for TB, HIV etc. to be as per CGHS rates.

Deployment

- The first I-Lab was launched in New Delhi on 18th June, 2020 by Dr Harsh Vardhan, Minister for Science & Technology, Earth Sciences and Health & Family Welfare.

- The Labs will be provided to the regional/City hubs and they will deploy it further in the interior, inaccessible parts of the region.

Dr Harsh Vardhan elected as Chair of Executive Board of WHO

22nd 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 17th Lok Sabha and sworn in on May 30th, 2019 as Union Cabinet Minister and was given the portfolios of Health and Family Welfare; Science and Technology and Earth Sciences.

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

11th May 2020, New Delhi

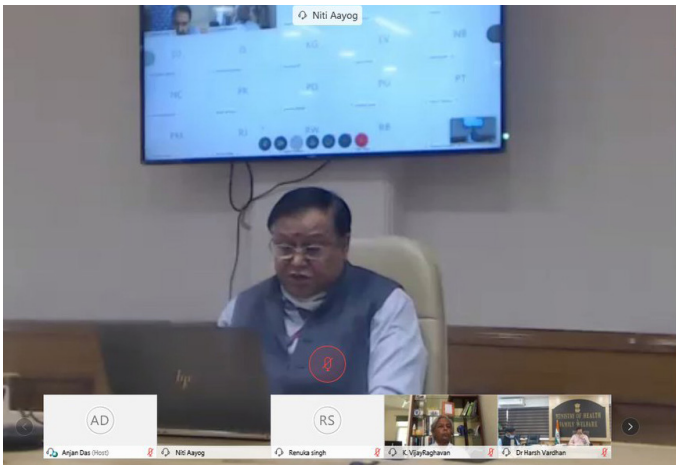
The Union Minister of Science & Technology, Earth Sciences and Health & Family Welfare, Dr. Harsh Vardhan said on 11 May, 2020 that India’s fight against Covid-19 is moving fast ahead strongly and steadily. He was addressing a Digital Conference, RE-START – ‘Reboot the Economy through Science, Technology 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

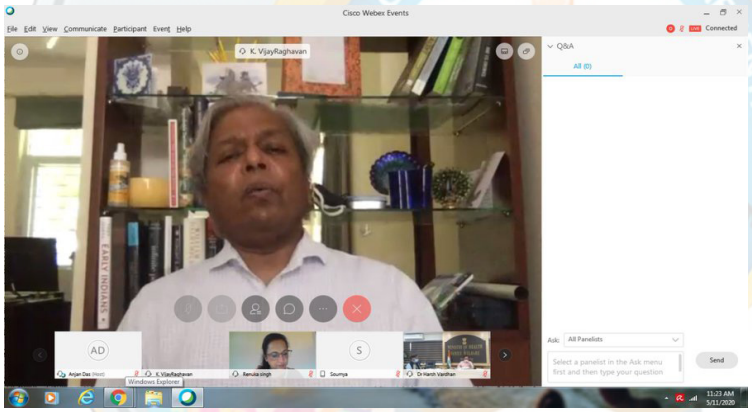
supported the 'Make in India' Programme. This has brought in scientific institutions and start-ups to develop the Covid-19 tests, masks, sanitizers, personal protective equipment (PPEs) and ventilators," he further added.



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 50th 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-1 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-vardhan

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 7th 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

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.

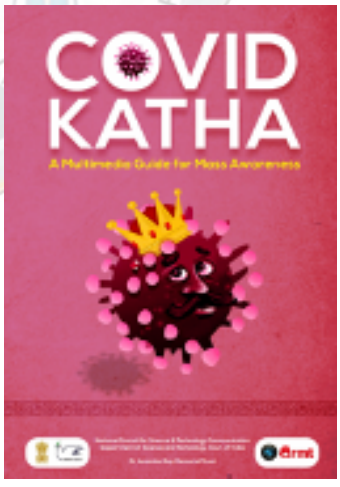
DST & ITS AUTONOMOUS INSTITUTIONS ELEVATED SCIENCE AND TECHNOLOGY IN INDIA TO INTERNATIONAL LEVELS — DR. HARSH VARDHAN

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 49th DST Foundation Day (3rd 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 50th 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 3rd 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

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

"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 BIBCOL 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-PCS 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

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 Systems. Dr. Mande also mentioned that 15 CSIR labs are working in close partnership with

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

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 Prasar were present in the review meeting with the Union Minister. Directors of remaining 38 CSIR labs attended the meeting through Video Conference.

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

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/

SCIENCE & TECHNOLOGY EFFORTS TO DEAL WITH COVID-19
BY

OFFICE OF THE PRINCIPAL SCIENTIFIC ADVISER (PSA)

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.

CSIR-National Aerospace Laboratories (NAL) develops PPEs and Hospital Assistive Devices in partnership with industries to fight COVID-19

CSIR-NAL and MAF Clothing have jointly developed and certified polypropylene-spun laminated multi-layered non-woven fabric-based coverall to ensure safety of doctors, nurses, paramedical staff and healthcare workers. The coverall made with indigenous material have gone through stringent testing at SITRA, Coimbatore and have been certified to ASTM F1670/ F1670M-08(2014) for use. After the technology transfer to MAF Clothing Pvt. Ltd, Bengaluru, they have already manufactured and supplied 65000 PPE coverall to HLL-Thiruvananthapuram and others.

Additionally, CSIR-NAL has also developed BiPAP Non-Invasive ventilator – SwasthVayu – which is a microcontroller-based precise closed-loop adaptive control system with a built-in biocompatible "3D printed manifold & coupler" with HEPA filter (Highly Efficient Particulate Air Filter). These unique features help to alleviate the fear of the virus spread. It has features like Spontaneous, CPAP, timed, AUTO BIPAP modes with provision to connect Oxygen concentrator or Enrichment unit externally. The system has been certified for safety and performance by NABL-accredited agencies. The system has undergone stringent biomedical tests and beta clinical trials at NAL Health Centre. The system is best suited for treating the mild and moderate COVID-19 patients. The aforesaid technology has been transferred to Apollo Computing Laboratories (P) Ltd, Hyderabad; Kavitul Technologies Pvt. Ltd., Vadodra; Paras Defence & Space Technologies, Navi Mumbai; Datasol (B) Pvt. Ltd., Bengaluru; Nfotec Digital Engineering Pvt Ltd., Bengaluru; and Unimech Aerospace & Manufacturing Pvt. Ltd. Bengaluru. Prototypes are under clinical trials. Industries are ready to take-up manufacturing after clinical trials and orders to be received from hospitals.

NCBS-TIFR and inStem, Bengaluru working on pooled sampling and compressed sensing of COVID-19, supported by Punjab National Bank and Standard Chartered Global Business Service

NCBS and inStem have fully functional BSL-3 level facilities and have been granted permission to start a COVID-19 testing facility. Both are now fully operational and are coordinating with the state health authorities.

Given the acute shortage of reagents for the manufacture and procurement of COVID-19 test kits, a rapid and compressed sensing technology for COVID-19 testing is being developed. As used currently, most of the test results appear negative, which is a waste of resources and effort. The idea is to use smart pooling of samples to dramatically reduce the number of tests. This work is being led by Sandeep Krishna of the Simons Centre at NCBS.

In addition, a rapid, RNA-based point–of-use screening technology is also being developed. This will allow COVID-19 screening to be done at the point of use. The reaction will be completed and results readied within the hour. This work is led by Arati Ramesh of NCBS.

The development of these technologies is a step closer towards enabling low-cost, mass testing that is critical to the reopening of industries and public infrastructure in a post COVID-19 scenario.

NCBS and inStem working on repurposing FDA drugs for COVID-19 treatment, supported by Punjab National Bank

A method to rapidly screen FDA-approved drugs that interfere with key steps of viral entry and processing is being developed by Arjun Guha of inStem, in collaboration with Satyajit Mayor and Vardharajan Sundaramurthy of NCBS-TIFR.

These approaches will yield targets that will be tested in virus uptake in airway epithelial cells – the primary target of tissue of the SARS-CoV-2 virus. In parallel, this pipeline will be useful for drugs that are being simultaneously screened *in silico* by the well-known Computational Biology group at NCBS.

Since these drugs are already FDA-approved, rapid and pilot clinical trials may be carried out by clinicians to test the efficacy of the same, based on these inputs. This project aims to greatly reduce the cost of treatment of COVID-19, helping boost health infrastructure at national and global scale.

Please connect with Dr Sapna Poti (sapna.poti@gov.in) for further information on any of the industry engagement with S&T organisations.

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST)

COVID Diagnostic Training Centre at JNCASR kicks off crash course in molecular diagnosis of infectious diseases focusing on COVID-19

Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous research institute under the DST, Government of India, has established a state-of-the-art COVID Diagnostic Training Centre at its Jakkur campus to help build capacity for the national fight against COVID-19 pandemic.

Molecular diagnostic techniques, such as the real-time PCR, play a crucial role in the diagnosis and tracking of epidemics, including COVID-19. Unfortunately, India lacks personnel skilled in and adept at performing a real-time PCR in clinical diagnostics. Appreciating the crucial and unmet needs of the nation, JNCASR has embarked upon a campaign by establishing a state-of-the-art diagnostic training facility to train personnel in a real-time PCR for COVID-19. The primary objective of the programme is to train multiple batches of trainees, 6-10 trainees per batch, in real-time PCR.

Website link:
https://dst.gov.in/covid-diagnostic-training-centre-jncasr-kicks-crash-course-molecular-diagnosis-infectious-diseases

RRI comes up with simulation toolkit to ensure safety in secure quantum communication platforms

The recent advisories by the Ministry of Home Affairs to ensure online communication via secure platforms have highlighted the increasing need for measures to ensure security in the virtual world as COVID-19 confines most day-to-day activities to the digital space.

The secure part of any information transfer protocol is in the distribution of the key used to encrypt and decrypt the messages. Such standard key distribution schemes, usually based on mathematical resolution of problems, are vulnerable to algorithmic breakthroughs and possibility to run new codes on the up and coming quantum computers. The solution to ensuring the security of the key transfer process lies in using the laws of quantum physics, wherein any eavesdropping activity will leave tell-tale signs and hence will be easily detected. This is achieved by using Quantum Key Distribution or QKD.

Presenting qkdSim: a QKD experimentalist's best friend. Two QKD experimentalists figuring out the most cost-effective and efficient design for their experiments. They run qkdSim, include all the perceived device and precess imperfections and optimize their design for the best possible key rates and lowest possible error rates.

To tackle this challenge, researchers from Raman Research Institute (RRI), an autonomous institute of the DST, Government of India have come up with a unique simulation toolkit for end-to-end QKD simulation named as 'qkdSim', which is based on modular principles that allow it to be grown to different classes of protocols using various underpinning technologies. The research led by Prof. Urbasi Sinha and her team, in collaboration with Prof. Barry Sanders from the University of Calgary, Canada is a part of the Quantum Experiments using Satellite Technology (QuEST) project, India's first satellite-based secure quantum communication effort, supported by the Indian Space Research Organisation (ISRO). This work is going to appear in the journal Physical Review Applied (in press).

Website link:
https://dst.gov.in/rri-comes-simulation-toolkit-ensure-safety-secure-quantum-communication-platforms

NIF supports tea dehydration machine & agar wood oil extraction machine of serial innovator from tea gardens of Assam

Durlobh Gogoi is a small tea garden owner from Assam who was recognized by the National Innovation Foundation (NIF) for developing Reciprocating Tea Dryer and other machineries. He has utilized the COVID-19 lockdown period to work vigorously on new ideas – a tea dehydration machine and an agar wood oil extraction machine, to reap the benefits of agar wood expanse in his hometown. Over the last few years, ever since the innovation has become part of NIF's database, it has incubated and supported value addition and product development activities.

NIF, an autonomous institute of the DST, recognized Gogoi's efforts at the National Grassroots Innovation Award Function in the year 2019.

The tea industry in Assam is nearly 200 years old. However, the trend of small-holding tea plantation started in Assam much later – in the 90s – and came with its own set of prospects and constraints. It had prospects for profitability but faced constraints in terms of machinery to process the produce, as all leading manufacturers of that time were large enterprises.

Mr Durlov Gogoi was conferred with an award in the year 2019 during National Grassroots Innovation Award Function

Website link:
https://dst.gov.in/nif-supports-tea-dehydration-machine-agar-wood-oil-extraction-machine-serial-innovator-tea-gardens

Research proposals invited for COVID-19 for bilateral collaboration in science between India & Australia

Hon'ble Prime Minister of India Shri Narendra Modi and the Hon Scott Morrison MP, Prime Minister of Australia jointly announced a Special COVID-19 Collaboration in 2020 during an India-Australia Leaders' Virtual Summit on 04 June 2020.

Accordingly, DST, Ministry of Science & Technology, GOI and Department of Industry, Science, Energy and Resources (DISER), Australia have invited joint research projects on COVID-19 from interested scientists and researchers under the Australia-India Strategic Research Fund (AISRF), a platform for bilateral collaboration in science, jointly managed and funded by the governments of India and Australia.

The research proposals are expected to focus on antiviral coatings, other preventive technologies, data analytics, modelling, AI applications, and screening and diagnostic testing as priority areas. The project duration would be for 12 months with maximum extension of 6 months.

More details are available on online: dst.gov.in

Last date for submission of online application: 2nd July 2020

Website link:
https://dst.gov.in/research-proposals-invited-covid-19-bilateral-collaboration-science-between-india-australia

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

A new research call for botanical and traditional medicines for COVID-19

The ongoing COVID-19 pandemic is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). No specific therapeutics are available and current management includes travel restrictions, lockdown, patient isolation, and supportive medical care.

The rapid increase in patients of COVID-19 during the last few weeks is posing a tremendous challenge for the healthcare systems across the world including India. Effective strategies for prophylaxis and holistic management are of paramount importance in curtailing the spread of the disease and reducing burden on hospitals. There is an urgent need for its management and prevention.

Some traditional medicines appear to be effective in treating the viral infection by enhancing the immunity of the body. Also, they could be a potential source of antiviral drugs and various bioactive compounds. Randomized clinical trials suggest the possibility to obtain natural products to treat viral infections and its complications from traditional medicinal plants.

Much effort is needed to isolate active ingredients from plants with a confirmed antiviral activity that leads to explore their mechanism of action and, lastly, to develop a conventional dosage form design that not only controls viral infections but also reduces the associated complications.

To manage COVID-19 pandemic through the application of medicinal and aromatic plants, the DBT and its public sector enterprise, Biotechnology Industry Research Assistance Council

(DBT-BIRAC) has come out with a new call soliciting project proposals from industry/ academia/industry-academia in following research areas:

(a) Development of experimental models for evaluation of anti-viral activity of extracts, fractions and phytochemical constituents from medicinal and aromatic plants:

(i) In vitro antiviral activity (nCoV2, non-infective, pseudo-RNA virus);
(ii) Antiviral (anti-nCoV-2) efficacy in animal model; and
(iii) MTT/PI/CCK8 assay for cell toxicity.

(b) Screening of extracts, fractions, phytochemical constituents and traditional formulations from medicinal and aromatic plants:

(i) Development of research leads/candidates based on screening to move towards developing phytopharmaceuticals;
(ii) Development of phytopharmaceuticals for prevention, co-administration and mainstay therapy; and
(iii) Development of herbal products for prevention against COVID-19 – Proof-of-efficacy, pre-clinical and clinical.

(c) Studies on extracts, fractions and phytochemical constituents from medicinal & aromatic plants:

(i) Immunomodulatory and anti-inflammatory activity (PBMC, Neutrophils, Th1/Th2-driven T-cell responses, antigen presentation);
(ii) Effect (if any) on obesity, diabetes, lung fibrosis;
(iii) Drug-drug interaction studies (CYP450 studies); and
(iv) Essential oils compounds inhibitory to SARS-COV-2 proteins & infections.

Last date for submission of proposals is July 03, 2020.

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_01S_29June2020.pdf
www.birac.nic.in/index.php

ReMeDi NOVA™ Digital Health Solutions - Potential COVID-19 Solution

DBT-BIRAC is supporting a new digital health solution called MeDi® SCAN-CORONA that is a combination of a set of medical devices and software applications. The solution which can be of immense use in the context of the COVID-19 pandemic sweeping across the world has been jointly developed by e-Zest Solutions Ltd. and Neurosynaptic Communications Pvt. Ltd.

This System can be used both as an individualised application for self-screening by individuals or for mass screening by nurses and other health workers. Any individual can, he or she can download the application and get a risk assessment for the infection by filling up details like travel history, contact history and symptoms. Screening can be done as as many times as required for risk assessment and also to check for updates. If the individual is at high risk, the application would prompt him or her to immediately visit a hospital. The location of the individual is also tagged with his/her consent.

The Screening Kit for Health Workers/Nurses is very similar to that for self use by individuals. The only difference is it will be used for mass screening. This Kit includes a tablet, an IR thermometer and a rapid test kit (lateral flow assay) for the Corona suspects, and BP, SPO2 for other patients, who might need care, but are not corona suspects. The health worker/nurse will fill up the details for the patients. It is ideal for hospitals or NGOs to carry out screenings at a large scale. There is a facility for tele-consultation for non-Corona patients who have been indicated as medium or low risk and may need consultation.

The package includes an application named ReMeDi® CORONA Solution that offers direct-to-home or clinic tele-consultation. This is an application which can provide tele-consultation to either a person assisted by a health worker at a mass screening location or directly to the masses either through a web-based application on a laptop, or as a downloadable app on an android smartphone. Hospitals can utilize this application by setting up tele-consultation hubs with doctors. It offers an ideal mechanism for providing healthcare services to a large number of patients, who may wish not to visit the hospitals due to fear of infection. It will also help the hospitals to avoid patients from crowding and thus prevent overloading of their infrastructure.

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:
http://ww.birac.nic.in/index.php
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_02S_29June2020.pdf

Hand-held multi-analyte diagnostic device for COVID-19 monitoring

The COVID-19 pandemic has caused an unprecedented disruption in the global economy. Several young entrepreneurs and innovators are trying to help overcome the situation by coming up with innovations that can potentially assist in managing it.

One such start-up is PathShodh HealthCare Pvt Ltd. It has come up with an innovation called "Anupath" which is a point-of-care hand-held multi-analyte diagnostic device. It can be a

Features:

- On the spot testing
- Separate disposable strip for each test
- Tiny sample drop
- No sample / reagent preparation required
- No special storage requirement for test strips
- Bluetooth Connectivity

lifesaver in terms of monitoring COVID-19 patients particularly in hospitals and that too in intensive care units.

It is a portable, handheld diagnostic device which can measure multiple analytes in human blood and urine with an electrochemical test strip with a single drop of blood. The device is equipped with Bluetooth connectivity and can store a large set of data of approximately 50,000 records. The results are generated instantaneously and are accurate to the highest standards. The product uses an electromechanical biosensing platform and is unaffected by environmental variations. The device is very easy to use and requires no prior preparation.

The eight different tests measured by the device are

- HbA1c (Glycated Hemoglobin);
- Glycated Albumin;
- Blood Glucose;
- Hemoglobin;
- Serum Albumin;
- Microalbuminuria;
- Urine Creatinine; and
- Urine ACR.

The product is priced at Rs50,000 and has already sold more than 45 units. This Make-in-India device will be useful in both national and international markets and can be a boon since it can provide an instantaneous diagnosis.

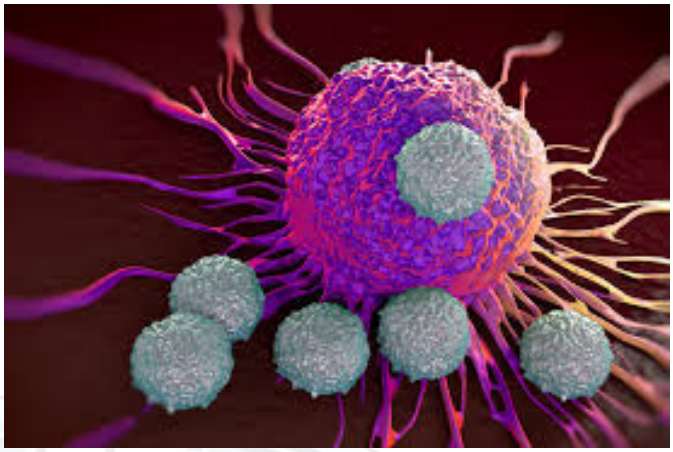
Contact Info: Dr Shirshendu Mukherjee (mdpmubmgf@birac.nic.in); Dr Hafsa Ahmad (nbm9@birac.nic.in); Ms Ginny Bansal (pmubmgf6@birac.nic.in)

Website link:
www.birac.nic.in/index.php
https://vigyanprasar.gov.in/wp-content/uploads/vigyan_samachar_dbt_03S_29June2020.pdf

Harnessing immune checkpoint blockade and hyper-inflammation: A viable option for therapeutically tackling COVID-19 severity

At DBT's National Institute of Biomedical Genomics (NIBMG), Kalyani, recent research findings pointed towards decreased T cell counts (the key players that attack the virus infected cells) and T cell exhaustion (loss of effector function of T cells, i.e., inability to attack the infected cells) among COVID-19 patients. With cues from cancer studies and mouse models of various infections, it seems plausible that T cell exhaustion could also result due to over-expression of immune checkpoint molecules such as PD-1, CTLA-4, TIM3 etc., for which effective inhibitory molecules are available that have shown success in case of cancer immunotherapy.

Furthermore, cytokine storm syndrome (CRS) is another phenomenon that contributes to the disease aggravation in COVID-19 pathogenesis through elicitation of acute respiratory distress with co-existence of venous thromboembolism and multiple organ dysfunctions. A number of therapeutic options for reducing hyper inflammation or CRS are being considered worldwide, some of which are already in clinical trials. Of these, tocilizumab has an FDA approval for treatment of rheumatoid arthritis and related diseases as well as an oncology supportive care drug. Therefore, it is tempting to propose that a combination therapy could be designed to counteract CRS on one hand, together with reversal of immune checkpoint blockade, as an antiviral for tackling severe COVID-19 pathogenesis.



The latter phenomenon could bolster the activation of effector T cells to specifically target the virus-infected cells and act to prevent future infections through generation of memory T cells. However, such translational insights could be implemented only after examining the spectrum of host immune-related factors such as, antigen presentations, immune activations and inhibitions, cytokine profiles etc. associated with the various stages of COVID-19 pathogenesis, i.e., SARS-COV-2 positive asymptomatic individuals, individuals with mild symptoms (not required to be transferred to ICU) and individuals with severe disease (admitted in ICUs, succumbing to death or recovering).

COVID-19, the disease caused by the RNA virus SARS-CoV-2, has a spectrum of effects in different patients. This is suggestive of the key role played by host immunity in COVID-19 pathogenesis. Some of the thrust areas of therapeutically tackling severe cases of COVID-19 are development of antiviral drugs, monoclonal antibodies, use of convalescent plasma from recovered severe patients and prophylactic vaccines against SARS-CoV-2.

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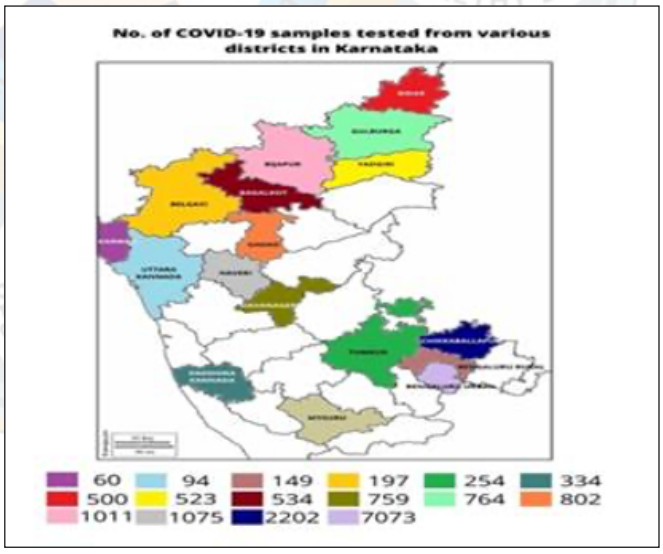
Website link:
https://www.nibmg.ac.in/

On-campus COVID-19 testing effort by inStem

The DBT's Institute for Stem Cell Science & Regenerative Medicine (inStem), Bengaluru have received contributions from the Punjab National Bank (PNB), the Azim Premji Foundation, Standard Chartered Global Business Service, and the Nuclear Power Corporation of India Limited (NPCIL) among others for on-campus COVID 19 testing.



The InStem in partnership with national agencies and state healthcare systems has tested more than 16,000 samples, since the laboratory began on April 13, operating entirely by volunteers among the campus community. This effort has impacted diagnosis across the state.

Website link:
http://news.ncbs.res.in/bigger-picture/behind-scenes-blisc-testing-effort-about-our-contributors
https://instem.res.in/

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH (CSIR)

1. CDRI suspends hands-on skill development training program due to COVID-19

Although India is slowly unlocking itself, COVID-19 continues to hamper certain activities. One such activity impeded by COVID-19 is the hands-on skill enhancement programmes envisaged by the Central Drug Research Institute (CDRI). In a press release to this effect, CDRI has announced the suspension of its seven hands-on skill enhancement training programmes for the time being.

"As these are hands-on programmes and they cannot be done online so we have decided to suspend them. We would try to resume them as early as possible depending on the situation," said Dr Vinay Tripathi, Chief Scientist and Skill Development Programme Coordinator, CDRI.

There were six skill development courses planned under the life science sector and one under the healthcare sector. Under the life science sector, the programmes scheduled were (1) computational approaches to drug design and development; (2) advanced spectroscopic (NMR, HPLC, LC- MS, UV/IR) techniques; (3) advanced course on care; (4) management of laboratory animals and experimental techniques, (5) plant authentication, phytochemical extraction; and (6) formulation and HPLC analysis of herbal products, basic training in electron microscopy techniques for life sciences, pharmaceutical product development and quality control.

Under the healthcare sector, pathological tools and techniques for biomedical applications was planned.

CDRI runs these courses throughout the year. Some of them are happening twice a year too. "These courses improve job prospects of trainees as there is limited expertise available in India while there is a great demand for trained manpower in this area. Trained candidates will also have an edge while applying to various research institutes that require practical experience in these techniques," said Dr Tapas Kumar Kundu, Director, CDRI.

Website link:

https://www.vigyanprasar.gov.in/isw/CDRI-suspends-hands-on-skill-development-training-program-due-to-COVID-19.html

https://cdri.res.in/Home.aspx

CSIR-NEERI tested over 3000 COVID-19 samples

The COVID-19 testing facility has become operational at CSIR-National Environmental Engineering Research Institute (CSIR-NEERI) from April 2020. So far, more than 3000 samples have been tested for COVID-19.

With testing capacity of 50 samples per day, CSIR-NEERI has the requisite infrastructure to test COVID-19 samples and take all appropriate bio-safety and bio-security precautions before testing. All the mandatory approvals required for testing of clinical samples were obtained to operationalise the testing facility, said Dr Rakesh Kumar, director of the institution.

The facility is open to testing COVID-19 samples from Nagpur and surrounding areas of Vidarbha. Apart from testing of clinical samples, the CSIR-NEERI is also supporting healthcare professionals by providing Personal Protective Equipment (PPE) to prevent them from contracting any infection while serving patients.

CSIR-NEERI Virology Lab team engaged in COVID-19 testing

Website link:
https://vigyanprasar.gov.in/wp-content/uploads/Vigyan-Samachar-CSIR-News-1-23-June-20.pdf

https://www.neeri.res.in/

दूरदराज क्षेत्रों में महत्वपूर्ण हो सकती है एनसीएल की ऑक्सीजन संवर्धन यूनिट

सीएसआईआर–एनसीएल और जेनरिचमेम्ब्रेन्स द्वारा विकसित ऑक्सीजन संवर्धन यूनिट कोविड–19 के बढ़ते मामलों को देखते हुए नेशनल केमिकल लैबोरेटरी (एनसीएल) पुणे के वैज्ञानिकों द्वारा विकसित ऑक्सीजन संवर्धन यूनिट (ओईयू) का महत्व बढ़ रहा है। इसे विकसित करने वाले शोधकर्ताओं का कहना है कि यह एक पोर्टबल उपकरण है, जिसका उपयोग घरों, अस्पतालों और ग्रामीण तथा दूरदराज क्षेत्रों में आवश्यकता पड़ने पर किया जा सकता है।

शुरुआत में पूरक ऑक्सीजन मिल जाए तो मरीजों के स्वस्थ होने की दर बढ़ायी जा सकती है। ऐसे में, उन मरीजों की संख्या में भी कमी लायी सकती है, जिन्हें आगे चलकर वेंटिलेटर की जरूरत पड़ती है। वेंटिलेटर पर रखे जाने के बाद भी मरीजों को इस ऑक्सीजन संवर्धन यूनिट की मदद से उपचार दिया जा सकता है। इसकी एक खूबी यह है कि इसमें ऑक्सीजन सिलेंडर की जरूरत नहीं पड़ती। शोधकर्ताओं का कहना है कि इस यूनिट के उपयोग से वेंटिलेटर और ऑक्सीजन सिलेंडरों की मांग को कम करने में मदद मिल सकती है।

सीएसआईआर–एनसीएल और जेनरिच मेम्ब्रेन्स द्वारा विकसित ऑक्सीजन संवर्धन यूनिट

ओईयू से जुड़ी प्रौद्योगिकी एनसीएल के पॉलिमर साइंस ऐंड इंजीनियरिंग डिविजन के वैज्ञानिकों और उनके द्वारा समर्थित स्टार्टअप कंपनी जेनरिच मेम्ब्रेन द्वारा मिलकर विकसित की गई है। एनसीएल के पॉलिमर साइंस ऐंड इंजीनियरिंग विभाग के प्रमुख उल्हास खारुल के नेतृत्व में वैज्ञानिकों की एक टीम ने ऑक्सीजन को संवर्धित करने के लिए हॉलो फाइबर झिल्ली का उपयोग किया है।

Website link:
https://www.vigyanprasar.gov.in/isw/NCL-oxygen-enrichment-unit-may-be-important-in-remote-areas-hindi.html
https://www.ncl-india.org/

एनआरडीसी ने एक और कंपनी को सौंपी पीपीई सूट 'नवरक्षक' की तकनीक

नौसेना द्वारा विकसित पीपीई सूट 'नवरक्षक' की तकनीक एक और कंपनी को हस्तांतरित की गई है। नेशनल रिसर्च डिवेलपमेंट कॉरपोरेशन (एनआरडीसी) द्वारा इस पीपीई सूट को बनाने की तकनीक आगरा की मेसर्स इंडियन गारमेंट कंपनी को सौंपी गई है। इससे पहले, इस पीपीई सूट के निर्माण की तकनीक पाँच अन्य सूक्ष्म व लघु उद्यमों को व्यावसायिक उत्पादन के लिए सौंपी जा चुकी है।

नव रक्षक की तकनीक हस्तांतरित करते एनआरडीसी के प्रबंध निदेशक डॉ एच. पुरुषोत्तम (दाएं से चौथे)

भारतीय नौसेना के मुंबई स्थित आईएनएचएस अस्विनी अस्पताल से संबद्ध इंस्टीट्यूट ऑफ नेवल मेडिसिन के नवाचार प्रकोष्ठ के शोधकर्ताओं ने अग्रिम पंक्ति में तैनात चिकित्सकों एवं अन्य कर्मियों के आराम और सुरक्षा को ध्यान में रखते हुए उन्होंने अपने व्यक्तिगत अनुभवों के आधार पर इस सूट को बनाया है।

यह पीपीई सूट बनाने के लिए बेहतर गुणवत्ता वाले विशिष्ट कपड़े का उपयोग किया गया है, जिसमें हवा का प्रवाह बना रहता है। जबकि, इसे कुछ इस तरह डिजाइन किया गया है, जिससे इसकी सिलाई को मजबूती देने के लिए महंगी टेपिंग और सीलबंद करने की आवश्यकता नहीं पड़ती। इस पीपीई सूट का परीक्षण और प्रमाणन रक्षा अनुसंधान और विकास संगठन (डीआरडीओ) की प्रयोगशाला नाभिकीय औषधि तथा सम्बद्ध विज्ञान (इनमास) ने किया है।

नवरक्षक सूट का उपयोग करने वाले व्यक्ति की त्वचा से उत्सर्जित ऊष्मा और नमी पीपीई से बाहर निकलती रहती है। अलग–अलग परिस्थितियों के अनुसार एक परत और दोहरी परत में ये पीपीई सूट उपलब्ध हैं। यह सूट हेड गियर, फेस मास्क और जाँघ के मध्य भाग तक जूतों के कवर के साथ भी आता है।

Website link:
https://pib.gov.in/PressReleasePage.aspx?PRID=1634797
http://www.nrdcindia.com/

कोविड–19 के परीक्षण के लिए एनबीआरआई में वायरोलॉजी प्रयोगशाला

कोविड–19 परीक्षण केंद्र के बारे में बताते हुए एनबीआरआई के वैज्ञानिक

कोरोना वायरस के बढ़ते प्रकोप को नियंत्रित करने का एक प्रभावी तरीका इसके परीक्षण को बढ़ाकर कोविड–19 के शिकार लोगों की पहचान करना है।इस दिशा में एक नई पहल के अंतर्गत कार्य करते हुए वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद (सीएसआईआर) की लखनऊ स्थित प्रयोगशाला राष्ट्रीय वनस्पति अनुसंधान संस्थान (एनबीआरआई) में कोविड–19 के परीक्षण के लिए अत्याधुनिक वायरोलॉजी प्रयोगशाला की शुरुआत की गई है।

इस वायरोलॉजी प्रयोगशाला का उद्घाटन उत्तरप्रदेश सरकार के मुख्य सचिव आर.के. तिवारी और किंग जॉर्ज मेडिकल यूनिवर्सिटी के कुलपति प्रोफेसर एम.एल.बी. भट्ट ने किया है। एनबीआरआई के निदेशक प्रोफेसर एस.के. बारिक ने बताया कि यह परीक्षण सुविधा भारतीय आयुर्विज्ञान अनुसंधान परिषद (आईसीएमआर), विश्व स्वास्थ्य संगठन (डब्ल्यूएचओ) तथा स्वास्थ्य एवं परिवार कल्याण मंत्रालय के दिशा–निर्देशों के अनुसार स्थापित की गई है।

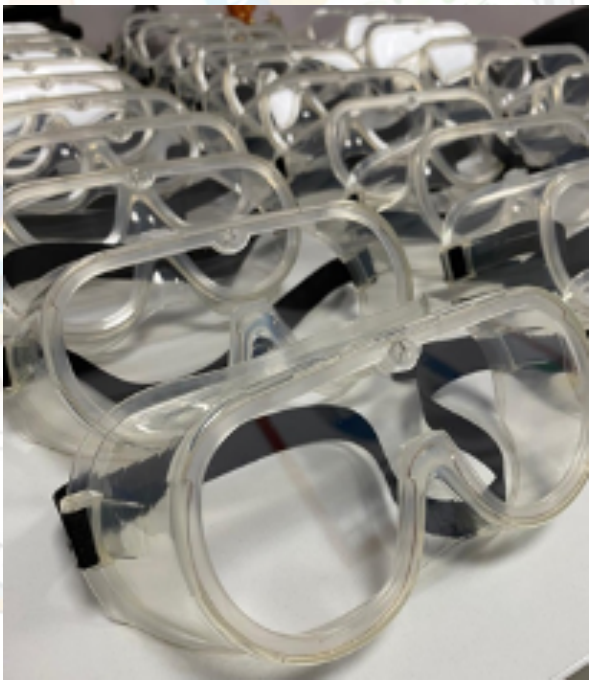
कोरोना वायरस से लड़ने के लिए किए जा रहे प्रयासों के तहत कोविड–19 के परीक्षण के लिए लखनऊ में शुरू की गई यह सीएसआईआर से संबंधित तीसरी प्रयोगशाला है। इससे पहले सीएसआईआर–सेंट्रल ड्रग रिसर्च इंस्टीट्यूट (सीडीआरआई) एवं सीएसआईआर–इंडियन इंस्टीट्यूट ऑफ टॉक्सिकोलॉजी (आईआईटीआर) में भी कोविड–19 के परीक्षण केंद्र बनाए गए हैं।

एनबीआरआई को कोविड–19 के नमूने लखनऊ की ही किंग जॉर्ज मेडिकल यूनिवर्सिटी द्वारा प्रदान किए जाएंगे।प्रोफेसर बारीक ने बताया कि कोरोना वायरस महामारी को ध्यान में रखते हुए एनबीआरआई ने पादप विज्ञान के क्षेत्र में एक प्रमुख शोध संस्थान होने के नाते उच्च अधिकारियों के निर्देशन में परीक्षण सुविधा विकसित करने की पहल की है।

Website Link:
https://www.csir.res.in/slider/newly-developed-%E2%80%9Cadvance-virology-lab%E2%80%9D-where-covid-19-testing-facility-has-been-established

https://nbri.res.in/

CSIR-CSIO develops protective eyewear to combat COVID-19



CSIR-Central Scientific Instruments Organisation (CSIO) has developed a technology for precision manufacturing of Safety Goggles for healthcare professionals involved in treating high viral load patients as in the case of COVID-19 pandemic. The current situation has brought out the need and significance of effective Personal Protective Equipment (PPE) to protect the healthcare service providers, patients, and visitors from accidentally getting infected. The technology was transferred to M/s Sark Industries, Chandigarh on 26th June, 2020 for its commercialization and mass production.

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

A team of CSIR-CSIO scientists led by Dr Vinod Karar, Chief Scientist & Head, Optical Devices & Systems, had taken up the design and development of the Safety goggles as a protective eyewear in consultation with various industries and stakeholders to come up with an affordable

and innovative precision manufacturing technique for commercial scaling-up. These safety goggles are designed with flexible frame to provide tighter sealing with the face and would cover the eyes and the surrounding areas and even accommodating for prescription glasses.

Website link:
http://newsonair.com/News?title=CSIO-develops-precision-safety-eyewear-for-healthcare-professionals-treating-COVID-19-patients&id=392367

https://www.csio.res.in/

A dedicated portal on the activities of CSIR about COVID-19

A dedicated portal on the activities of CSIR on COVID-19 can be found at https://urdip.res.in/covid19/. This portal is continuously been updated and upgraded as per the needs to showcase CSIR efforts. A new section namely "Blogs & Articles" was recently added to the portal with an aim of harnessing all the views, opinions, experiences and popular insights into development of technologies and techniques related to COVID-19 from the researchers of CSIR. This "Blog & Articles" page can be found at https://urdip.res.in/covid19/publications.jsp. This sections not only links to external articles, blogs, reports and other publications published but also enables researchers to publish on the blog itself.

Under the CSIR-Supply Chain Management vertical, CSIR-URDIP is coordinating the channel on pre-emptive identification of supply chain issues in new launches of CSIR products and services for COVID-19 management. The work involves constant coordination with project coordinators and project leaders from other labs to identify issues in the launch of products in various areas of therapeutics, diagnostics, hospital-assisted devices and PPEs. CSIR-URDIP has been able to compile and highlight the issues and a timeline in the launch of various products.

Provided Patentability Search Reports

(i) CSIR-NEERI's Hands Free Hand Washing System (NEERWASH) containing separate foot pedal-operated hand sanitizing system and hand washing sink, which also has a pre-recorded audio playing to motivate the user and entertain for ensuring 20 seconds of hand washing and a standalone Hand Sanitization System (NEERJANTUK) which is a pull-type foot pedal-operated sanitizer dispenser.

(ii) CSIR-CEERI's Automatic sanitizer dispenser which senses the presence of a user using infrared sensor and sends signal to the microcontroller for actuating a solenoid valve which opens to suck in sanitizer using pressurised air and dispense it through the nozzle to the user.

Conducted Freedom to Operate (FTO) Studies

(i) CSIR-NAL designed single-limb BIPAP ventilator which is primarily intended to augment patient ventilation by supplying pressurized air through a patient circuit.

(ii) Giant magnetoresistance (GMR) Sensor which is a multi-layered sensor with configuration of GMR elements in the form of single Wheatstone bridge to generate a differential output voltage with respect to magnetic field gradient along the sensor's sensitive direction.

Website link:
https://urdip.res.in/covid19/

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

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

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

ICMR invites Expression of Interest for validation of rapid antigen detection assays for COVID-19

ICMR invites applications for validation of rapid antigen detection tests for COVID-19 from all manufacturers who have developed rapid antigen-based detection assays for Coronavirus wherein all manufacturers who have developed antigen-based assays have been invited for validation.

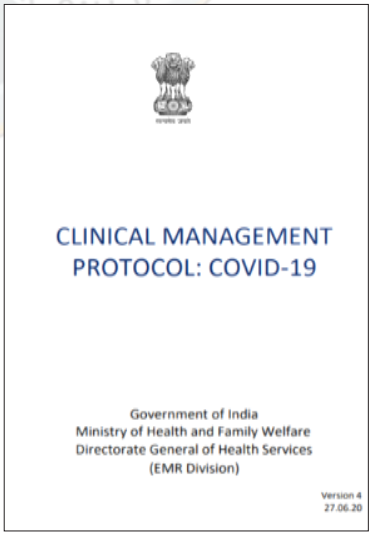
The gold standard RT-PCR diagnostic test for COVID-19 has limitations in terms of widespread availability. In view of this, there is urgent requirement of reliable and convenient rapid point-of-care antigen detection assays with high sensitivity and specificity. Such assays could be used as potential diagnostic tests in all possible public and private healthcare settings and made available for mass testing.

Contact Info: guptanivedita.hq@icmr.gov.in

Website Link:
https://www.icmr.gov.in/pdf/tender/EOI_for_Ag_kit_validation.pdf
https://www.icmr.gov.in/tender.html

MoHFW releases fourth version of Clinical Management Protocol for COVID-19

On 27 June 2020 Ministry of Health and Family Welfare (MoHFW) has released revised version (version-4) of Clinical Management Protocol for COVID-19. This document contains all information related to COVID-19 pandemic, like disease epidemiology, case definition, risk factors, infection prevention and control practices, laboratory diagnosis, investigational therapies, prevention of complications, etc. In this guideline, the MoHFW said that Dexamethasone can be given to severe COVID-19 patients as an alternative to another steroid, Methylprednisolone, which was included in the protocol earlier. Dexamethasone is a type of corticosteroid that has long been used for its anti-inflammatory and immunosuppressant properties.



Website Link:
https://www.mohfw.gov.in/pdf/ClinicalManagementProtocolforCOVID19dated27062020.pdf

ICMR releases guidelines for storage of respiratory specimens collected for COVID-19 diagnosis by RT PCR platforms in Government laboratories

In the ongoing laboratory testing for COVID-19 diagnosis by molecular diagnostic methods, clinical specimens or a subset of the clinical specimens may need to be retained for various purposes such as performing additional tests, for quality control purposes, or for use as control materials to assess newer diagnostic tests. In addition, a laboratory may need to store specimens for projects aimed at studying genomic epidemiology of the SARS CoV-2 virus across regions and over time.

Considering all these requirements, ICMR, on 25th June 2020, has released the specific guidelines for the storage of respiratory specimens in government laboratories.

Website Link:
https://www.icmr.gov.in/pdf/covid/labs/Govt_labs_sample_retention_advisory_25062020.pdf

ICMR releases fresh additional strategies for COVID-19 diagnostic testing

Since test, track and treat is the only way to prevent spread of infection and save lives, it is imperative that testing should be made widely available to all symptomatic individuals in every part of the country and contact tracing mechanisms for containment of infection are further strengthened. On 23rd June 2020 ICMR released advises all concerned public and private authorities and institutions to take required steps to scale-up testing for COVID-19 by deploying combination of various tests as advised in the advisory.

Website Link:
https://www.icmr.gov.in/pdf/covid/strategy/New_additional_Advisory_23062020_2.pdf

ICMR issues revised guidelines for positive sample storage by ICMR-approved private labs doing COVID-19 testing

ICMR issues revised guidelines for positive sample storage by ICMR-approved private labs that are doing COVID-19 testing by Real-time RT-PCR/CB-NAAT/TrueNat. According to the new guidelines, all labs will send 10 random positive and 5 random negative samples per month to QC labs. All testing labs will liaise with the recommended QC labs and will ensure regular participation in QC activity. All testing labs will ensure storage of samples at -80^{0}C (or at least at -20^{0}C) and will ensure regular monthly transfer to QC labs.

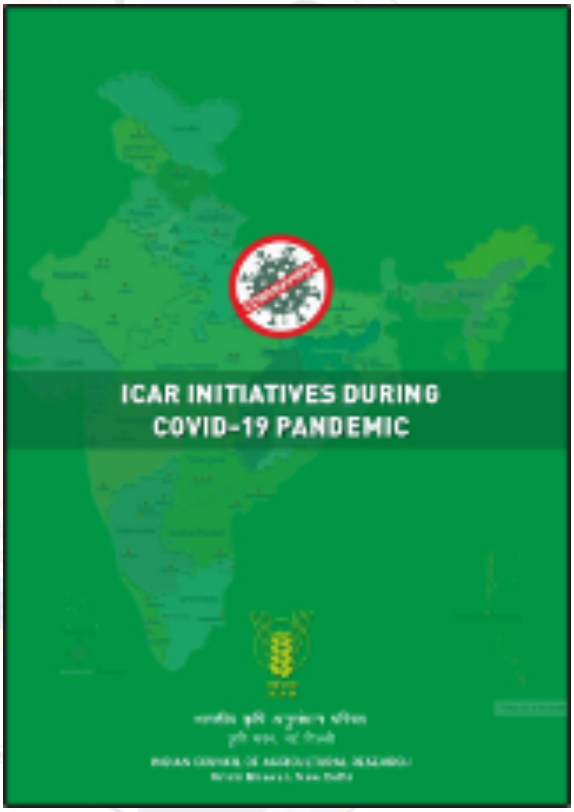
Website Link:
https://www.icmr.gov.in/pdf/covid/labs/Private_Lab_Advisory_11062020.pdf

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

INDIAN COUNCIL OF AGRICULTURAL RESEARCH (ICAR)

Activities undertaken by ICAR Research Institutes to mitigate farmers' problems during COVID-19 pandemic



The ICAR has responded to the challenges posed by COVID-19 pandemic to farmers and farming sector across the country in tune with the policy directions and guidelines issued by the Government of India to all the States and Union Territories.

ICAR alerted the farmers and stakeholders across the country on the precautions, safety measures and need for social distancing while carrying out the time-bound field operations such as harvesting, post-harvest processing, storage and marketing of grains, fruits, vegetables, eggs meat and fish. It also issued an agro-advisory at the national level, which has been translated into 15 regional languages, widely circulated and has received prime coverage in print, electronic and social media across the country.

ICAR has prepared state-wise agro-advisories for farmers in all the 29 states depending on prevailing crop stage and safety measures to be followed in various farm operations related to standing crops and crops that are getting ready for harvest. The advisories will be used for dissemination after translation in local languages through various print and electronic media and digital platforms by all stakeholders.

This e-book captures the ICAR initiatives for supporting farmers and farming sector across the country in our endeavour to fight this pandemic ever to fight this dreaded disease by dovetailing safety measures with the time-bound agricultural operations to ensure health and wellbeing of our farming community and ensure food security through stability in production systems.

Website link:
https://icar.gov.in/sites/default/files/eBook-COVID-19-ICAR-Initiatives.pdf

ICAR comes up with an e-book on innovative agri-solutions during COVID-19

COVID-19 pandemic challenged many assumption of the modern life throughout the world. The economy of major countries has by and large come to a grinding halt. The challenge became still tougher as the lockdown resulted in shortage of farm labour on one hand and disruption of marketing channels at the end of consumers on the other. Items like poultry, dairy, fruit and vegetables started perishing and this resulted into destruction of a lot of food which otherwise could have been consumed by the people.

ICAR Agricultural Extension Network took the challenge and became proactive in devising and suggesting practical solutions to the affected farmers. There were a very large number of such innovative examples throughout the country which needed to be documented for their subsequent emulation by the farmers and extension personnel. The urgency of delivering contents of this compilation to the ultimate beneficiaries at the earliest possible necessitated keeping the form of this publication as an electronic one.

The compilation of an electronic book on 'Innovative agri-solutions during COVID-19' is an important collection of unique examples of innovative actions and options suggested to the farmers.

Website link:
https://www.icar.org.in/sites/default/files/Innovative_Agri-Solutions_COVID-19-2020-1106.pdf

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION (DRDO)

DRDO develops herbal sanitizer, sanitizing wipes, hand towels and herbal shwas

Alcohol is main ingredient of widely available sanitizers; however alcohol has harsh drying effect on skin. Prolonged use of hydrogen peroxide causes peeling and loosing of the skin. Keeping this in view a HERBO-SAFE herbal sanitizer, has been developed containing 70% Isopropyl alcohol that helps in killing 99.9% microbes. It has 2% aloevera extract to neutralize harsh drying effects of alcohols on skin.

Hydrogen peroxide has been replaced with natural bio-active extracts such as neem extract, lemon extract, tree tea oil etc. exhibiting anti-microbial and anti-viral effects owing to presence of bio-active compounds. This is produced in gel form also.

This herbal sanitizer has been infused in wipes (box packing) and towels (individual packing) for usage by doctors and as travel companion. Liquid Infusion per wipe of size 100 x 50 mm is about 4-5 ml until completely wet. Seventy to hundred small circular wipes of 60-100 mm in diameter are packed per container. These are infused with 20-25 ml or until completely wet. Herbal Shwas is a Spray used for disinfecting masks for immunity boosting.

Website link:
https://drdo.gov.in/hand-surface-sanitizers

Personnel sanitization disinfectant life enhancer developed by DRDO

High Energy Materials Research Laboratory (HEMRL) has developed a hydrogen peroxide-based disinfectant with additives referred to as PerSan Enhancer (RTU) [RTU = Ready to use, no dilution required]. The major ingredient of the enhancer is distilled/RO water, free of suspended matter. Hydrogen peroxide is the active ingredient which is 6-7 times more effective in microbicidal activity than hypochlorite in liquid form. It is well reported that in vapour phase the microbicidal efficiency of hydrogen peroxide is further enhanced, especially in aerosol form.

The composition of disinfectant solution has been optimized in association with National Chemical Laboratory, Pune. The disinfectant solution contains 0.25% hydrogen peroxide with additives in distilled or RO water. The disinfectant fog deployed for 15 seconds is found to be effective against all the microbes.

Website link:
https://drdo.gov.in/miscellaneous

Portable UVC Killer

Portable Ultra Violet C-band (UVC) virus killer system is developed by Laser Science and Technology Centre (LASTEC), Delhi to disinfect various objects by inactivating bacteria and viruses 99.9999%.

The device uses UVC Lamp of 254 nm wavelength as excitation source. Irradiance of 0.5 mW/cm² is created over the object for 2 minutes delivering a UVC dose of maximum 60 mJ/ cm² (required 40 mJ/ cm² to achieve 99.9999% inactivation). The system is very compact having dimensions 48 cm x 38 cm x 23 cm and weight of 6 kg only. It can sanitize office files, letters/envelops, laptop etc. As a safety feature UV light turns OFF once the top cover is open. The user can do monitoring through acrylic window provided on side.

Website link:
https://drdo.gov.in/uv-based-disinfection-devices

UVC-based sanitization enclosure

An enclosure having rotating platform is developed by LASTEC, Delhi, to provide uniform UV exposure and sanitization of packets, bags, briefcases, purses, medical accessories, etc. The system uses UVC radiation (254 nm) and delivers total output power of 180 Watt through 6 tubes so fitted to give full coverage on the item. UVC reflective walls further enhance the irradiance. The virus can be inactivated within less than 3 minute (99.99%). A timer knob is provided for variable sanitization time (pre-setting).

The system has auto switch-off feature of the UVC lamp while the door is open. Further, a front acrylic window has been provided for see-through vision. The enclosure has dimensions of 1650(H) × 676(D) × 763(W) mm and provides total sanitization area of 0.809 m^2. The product has been made commercially available through industry partnership.

Website link:
https://drdo.gov.in/uv-based-disinfection-devices

N-95 reusable masks

A reusable anti-microbial N95 fabric mask has been designed and developed by the Defence Bio-Engineering & Electro Medical Laboratory (DEBEL), Bengaluru. The mask is an offshoot of the previously developed NBC Respiratory Mask to protect the respiratory tract and face of the individual against chemical and biological warfare agents.

The mask covers the nasal, mouth and chin portion of the face. It provides reliable respiratory protection of at least 95% filtration efficiency against airborne particles and liquid contaminating the face. The mask is impervious to particles of dimension 0.3 microns and above.

The outer layer of the mask is made of anti-microbial fabric and the intermediate layer is the filter layer. The skin-contacting layer is fine quality cotton and the active functional layer is secured in a cotton sleeve. The mask is provided with metal nose strip for grip and elastic tape for comfortable fitment. The filter is replaceable after use and the mask can withstand 10-20 washes. The mask is being bulk produced through industry.

Website link:
https://drdo.gov.in/ppe

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

MINISTRY OF ELECTRONICS AND INFORMATION TECHNOLOGY (MeitY)

Centre of Excellence in IPR launches scheme to provide IPR support to COVID-19-related applications

Centre of excellence (CoE) in Intellectual Property Rights (IPR) has launched a scheme to support the IPR claims of the requests received related to innovative technologies in information and communication technology domain concerning to the combating of COVID-19 challenge.

These Centres have been established towards developing a conducive infrastructure for creation of IPR eco-system at Department of Electronics & Information Technology (DeitY), New Delhi; and CDAC-Pune is providing a gamut of value-added IPR-related services to academic institutions, scientific societies of DeitY, SMEs, start-ups and independent inventors.

Contact Info: info-ipr@cdac.in

Website Link:
http://ict-ipr.in/index.php?option=com_content&view=article&id=91

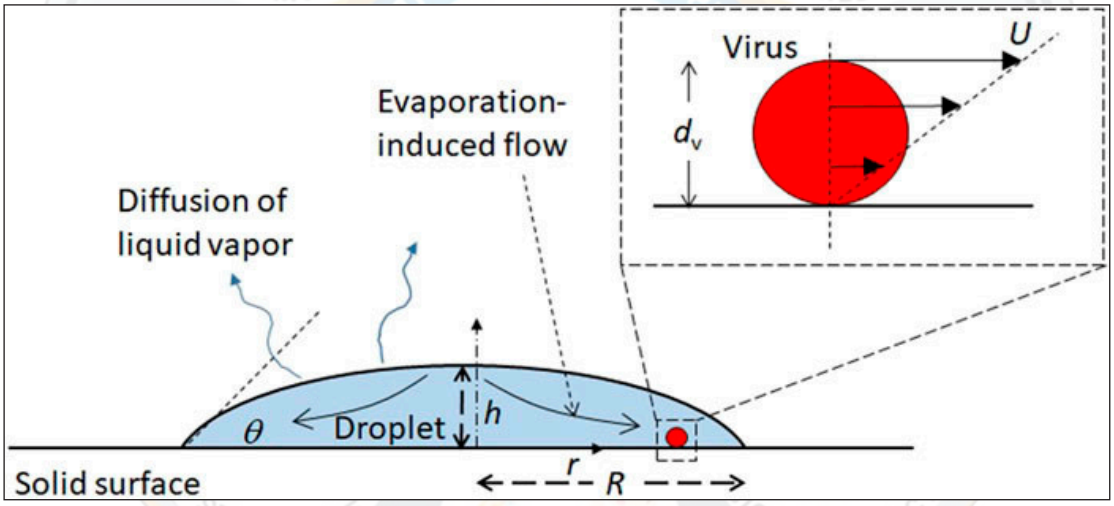
SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

OTHER SCIENTIFIC AND ACADEMIC INSTITUTIONS

IIT Bombay studies likelihood of survival of coronavirus in a respiratory droplet deposited on a solid surface

Researchers at Indian Institute of Technology (IIT) Bombay find how temperature, humidity and properties of different surfaces influence the evaporation rates of respiratory droplets infected with COVID-19. In a new study, they have explored how long it takes for such respiratory droplets to evaporate from different surfaces. They found that humidity, temperature and the properties of the surface are vital in determining when the droplets dry up. The study was published in the peer-reviewed journal Physics of Fluids.



Contact Info: rajneesh.bhardwaj@iitb.ac.in; amit.agrawal@iitb.ac.in

Website Link:

http://www.iitb.ac.in/en/research-highlight/what-influences-coronaviruses%E2%80%99-survival-different-surfaces

https://aip.scitation.org/doi/pdf/10.1063/5.0012009%40phf.2021.FATV2020.issue-1

https://aip.scitation.org/doi/10.1063/5.0012009

CPCB releases revised guidelines for handling, treatment and disposal of waste generated during treatment, diagnostics and quarantine of COVID-19 patients

In suppression of earlier guidelines, Central Pollution Control Board (CPCB) has released its revised guidelines for handling, treatment and disposal of waste generated during treatment, diagnostics and quarantine of COVID-19 patients. These guidelines are based on current knowledge on COVID-19 and existing practices in management of infectious waste generated

in hospitals while treating viral and other contagious diseases like HIV, H1N1, etc. These guidelines will be updated if need arises. This revision-3 of guidelines issued to incorporate guidance on segregation of general solid waste and biomedical waste. Further, this revision also addresses safety of waste handlers / sanitation workers associated with healthcare facilities, urban local bodies (ULBs) and Common Bio-Medical Waste Treatment Facilities (CBWTFs) in handling of biomedical waste and solid waste generated from quarantine centers/home-care/ healthcare facilities treating COVID-19 patients.

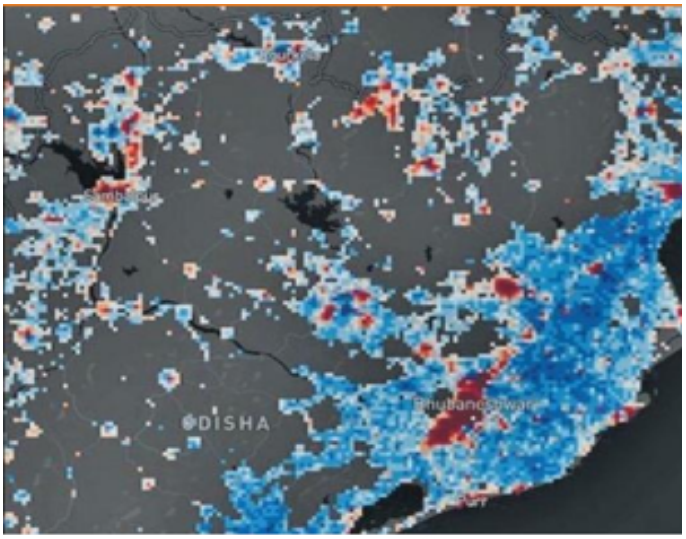
Website Link:
https://cpcb.nic.in/uploads/Projects/Bio-Medical-Waste/BMW-GUIDELINES-COVID_1.pdf

IIT Tirupati develops misinformation and fake news detection tool for COVID-19

Indian Institute of Technology (IIT), Tirupati researchers have developed a platform to detect fake/misinformation from text message or website based on machine learning classifier and natural language processing. This platform has been developed by the Research in Intelligent Software and Human Analytics (RISHA) Lab under the guidance of Dr. Sridhar Chimalakonda and Mr. Noble Saji Mathews. The initiative is aimed at putting an end to the infodemic related to COVID-19 pandemic.

Website Link:
https://stop-corona-iittp.herokuapp.com/

Odisha uses IIT Tirupati mobility analysis to track COVID-19 infection



In Odisha, the State Government deployed security checks and enforced restrictions to contain spread of infection by analysing the movement patterns of people in COVID-19 hot spots. Behind the analysis was a team of researchers from Indian Institute of Technology (IIT) Tirupati. Using Artificial Intelligence (AI), the IIT-Tirupati team led by Dr Kalidas Yeturu of Computer Science Department, analysed Facebook datasets, available for researchers and non-profits as a part of their Data for Good Program.

These anonymised and aggregated datasets, better known as Disease Prevention Maps, have helped the team to come up with near real-time mobility of people pointing at non-adherence of lockdown restrictions in particular areas of Odisha.

The analysis eventually helped State administration shape its strategic action. The mobility analysis showed spurt in movement of people in various pockets of Jajpur, Sundargarh, Balasore, Bhadrak and Bhubaneswar, despite lockdown restrictions.

Website Link:
https://www.newindianexpress.com/states/odisha/2020/may/26/odisha-uses-tirupati-iit-mobility-analysis-to-track-covid-19-infection-2147959.html

SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

PRIVATE SECTOR ENTERPRISES

COVAXIN, India's first COVID-19 vaccine candidate, set for phase I clinical trial

A potential COVID-19 vaccine, the primary to be developed in India, has been given DCGI (Drug Controller General of India) approval for phase I clinical trial and phase II human clinical trials that are scheduled to start out across the country in July.

Developed by Hyderabad-based Bharat Biotech, in association with ICMR (Indian Council for Medical Research), COVAXIN is an inactivated vaccine, made from a strain of the irresistible SARS-CoV-2 virus, that has indicated guarantee in preclinical investigations, demonstrating extensive safety and effective immune responses.

Drug manufacturers round the world are racing to develop a vaccine against the novel coronavirus; a completely unique virus is one that has never previously been identified in humans, making the task of making a vaccine much harder.

The proactive support and direction from the Central Drugs Standard Control Organization (CDSCO) had enabled approvals for the project, Dr Krishna M Ella, Chairman & Managing Director of Bharat Biotech International Limited, said during a statement. The indigenous, inactivated vaccine has been developed and manufactured in Bharat Biotech's Bio-Safety Level 3 (BSL-3) High Containment facility located in Hyderbad's Genome Valley.

The company is additionally involved in the development of CoroFlu, a nasal vaccine for COVID-19, as a part of a world collaboration of virologists at the University of Wisconsin–Madison and vaccine firm FluGen.

Website link:

https://twitter.com/BharatBiotech/status/1277661065002676224

https://www.thehindu.com/business/bharat-biotech-vaccine-gains-edge-on-dcgi-nod/article31948151.ece

https://www.ndtv.com/india-news/coronavirus-vaccine-india-covaxin-india-s-first-covid-19-vaccine-candidate-set-for-phase-i-ii-human-trials-2254189

Sun Pharma initiates Phase II clinical trial on a phytopharmaceutical drug as potential treatment for COVID-19 patients

Sun Pharmaceutical Industries Ltd announced that it has commenced Phase II clinical trial on AQCH, a phytopharmaceutical (plant-derived) drug for treatment of COVID-19. The Company received approval from the Drugs Controller General of India (DCGI) for conducting Phase II clinical trial.

The clinical trial will be conducted across 12 centres in India in 210 patients. The treatment duration for the patients will be 10 days. The results of the clinical trial are expected by October 2020. Human safety study of AQCH has already been completed and the drug has been found to be safe at the recommended dose for Phase II study.

Website link:
https://www.sunpharma.com/covid-19/news-and-updates

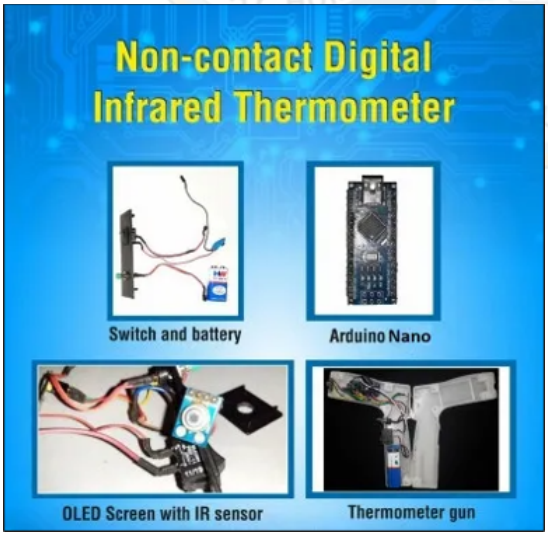
Sun Pharma receives approval from DCGI to initiate clinical trial with Nafamostat in COVID-19 patients

Sun Pharmaceutical Industries Ltd has announced that it has received approval from the Drugs Controller General of India (DCGI) to initiate a clinical trial with Nafamostat Mesilate in COVID-19 patients. Nafamostat is approved in Japan for improvement of acute symptoms of pancreatitis and treatment of Disseminated Intravascular Coagulation (DIC).
A group of scientists from the University of Tokyo, Japan and Leibniz Institute for Primate Research, Germany have recently demonstrated that Nafamostat, at very low concentrations, suppresses a protein (TMPRSS2) that the COVID-19 virus uses to enter human lung cells.

Website link:
https://www.sunpharma.com/covid-19/news-and-updates

A start-up in Kochi run by children made non-contact IR thermometer and portable automatic sanitizer dispenser

Urav Advanced Learning Systems Private Limited, a company in Kochi for children, run by children, with the objective to develop useful products while learning and at the same time has loads of fun together.



The company is manufacturing DIY kits where the person can assemble and learn the working of the product. For example, a non-contact thermometer and portable automatic sanitizer dispenser is necessary for a situation like the pandemic now. At the same time, due to the lockdown, children do not have an opportunity to spend their time in a worthwhile manner. So, the start-up has created a thermometer kit where children will assemble the thermometer using a video tutorial to get the finished working product and learn about electronics at the same time. Similarly, they made a portable automatic sanitizer dispenser kit which comes with USB cable, charger and can be used directly with AC supply or with a power bank to make it portable.

Contact Info: info@uralstech.in

Website link:
https://uralstech.in/

SCIENCE OUTREACH & POPULARISATION EFFORTS

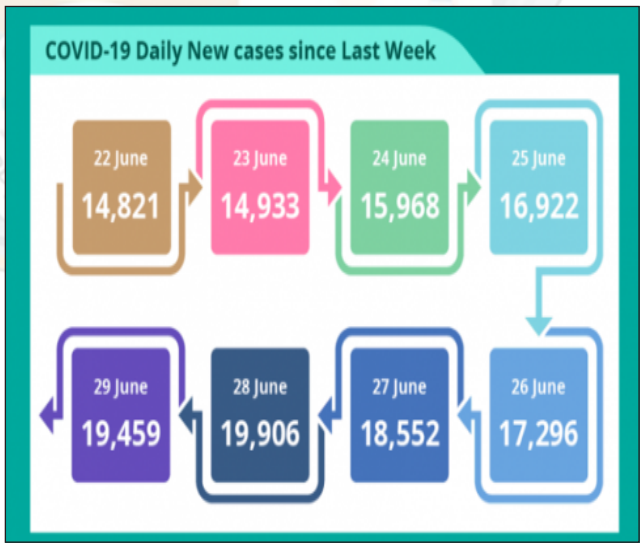
Since the eruption of COVID-19 pandemic, the Ministry has supported numerous research projects and technology interventions through its various Departments, Autonomous Organisations, Professional Bodies, Statutory Bodies, and Laboratories. In the expedition of science outreach and popularisation, a number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

Efforts from Science Ministries, Departments & Scientific Organisations

Government of India presents regular COVID-19 India Factsheet

India's coronavirus cases have crossed 5-lakhs mark and now, as on 29thJune 2020, 8:00 AM, stands at 5,48,318 out of which 3,21,723 have recovered. Government of India, through its Open Government Data (OGD) Platform https://data.gov.in/ has taken the initiative to present the regular factsheet related to COVID-19.

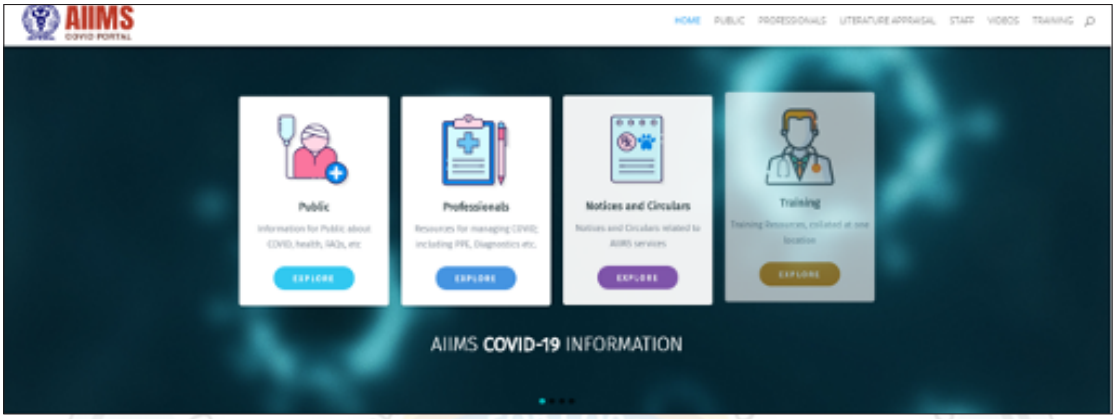
OGD platform is aimed at supporting Open Data initiative of Government of India. The portal is used by various Ministries, Departments, and their organizations, to publish datasets, documents, services, tools and applications collected by them for public use. It intends to increase transparency in the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



Website Link:
https://community.data.gov.in/covid-19-india-factsheet-as-on-29th-june-2020-800-am/

AIIMS, New Delhi launches a COVID web portal

All India Institute of Medical Sciences (AIIMS), New Delhi has launched a web portal related to the information about COVID-19. It aims to contain the infodemic related to the eruption, transmission, diagnostics and treatment aspects of the COVID-19 pandemic. The information on the portal are categorised as per the target audiences, like professionals, staff, scientific communities and general public. The portal aims to be update all the information with recent developments related to COVID-19 pandemic in the country and the institute.



Website Link:
https://covid.aiims.edu/

Government reaches to public through Ayush Sanjivani Pledge

Government of India has taken an initiative to reach out to general public through Ayush Sanjivani Pledge. Since immunity is playing a crucial role in transmission and acquiring of the COVID-19 infection, the Pledge initiative is aimed at sensitising the general public towards the adoption of safe and time-tested practices for immunity enhancement and disease prevention. The participants get the Certificate of Commitment after taking the pledge.

Website Link:
https://pledge.mygov.in/ayushsanjivani/

IIT Tirupati develops SurviveCovid-19 game for COVID-19 awareness

Indian Institute of Technology (IIT) Tirupati has developed an educational game 'SurviveCovid-19' for both Android and Web platform for increasing awareness of health measures for COVID-19 pandemic. In order to make people understand the prevailing emergency situation and the seriousness of it, a team at the Research in Intelligent Software & Human Analytics (RISHA)

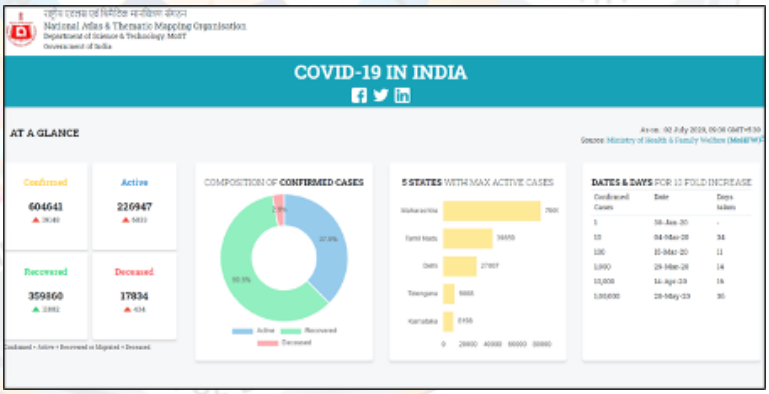
Lab of Department of Computer Science & Engineering, IIT Tirupati, thought of developing educational games for COVID-19 awareness. SurviveCovid-19 helps people understand the importance of masks, sanitizers and social distancing to keep themselves and others safe from this contagious virus when they walk around the theme of a city.

Contact Info: Dr Sridhar Chimalakonda; ch@iittp.ac.in

Website Link:
https://survivecovid-19.itch.io/game2020

National Atlas & Thematic Mapping Organisation brings forth the COVID-19 dashboard to create awareness amongst general public

COVID-19 pandemic is a worldwide health disaster and a state of global emergency leading towards immense hardships throughout the world to fight against this deadly disease. Under such circumstances, spreading awareness among the citizen to overcome the anxious and worrisome panic, is solicited. Creation of visualisation of situation analysis through the dashboard is considered as one of the most popular approaches. National Atlas & Thematic Mapping Organisation (NATMO) has taken an initiative to host the COVID19 dashboard, with the guidance from Geospatial Group, Department of Science & Technology, to create a single window platform to integrate all Government Department data including COVID19 combat initiatives.



As part of the societal commitment, NATMO has created the COVID19 DASHBOARD to provide up-to-date information on the COVID-19 Pandemic the nation is facing. The related information is covered under two headings, namely Dashboard and Information. The dashboard includes features related to the spread of COVID-19 pandemic based on the daily data updated and published by the Ministry of Health and Family Welfare. Information section contains the COVID-19 related information decentralised up to district level. Thematic layers such as COVID-19 health facilities, ICMR Test Labs and Blood Banks are available under this section.

Website link:
http://geoportal.natmo.gov.in/Covid19/

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

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

Website Link:
https://www.niscair.res.in/covidbulletin/view/9
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 VigyanPrasar (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.

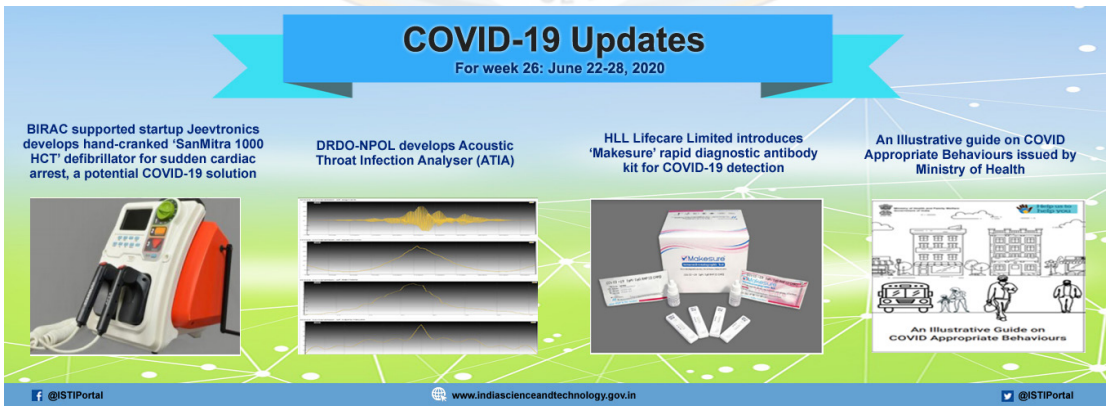
1. Daily video bulletin in Hindi and English;
2. COVID Explained - Short films to explain research project findings in layman's lingo; and
3. Face book live sessions on interviews of various stakeholders and media with DST Secretary.

Contact info: kapil@vigyanprasar.gov.in

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.

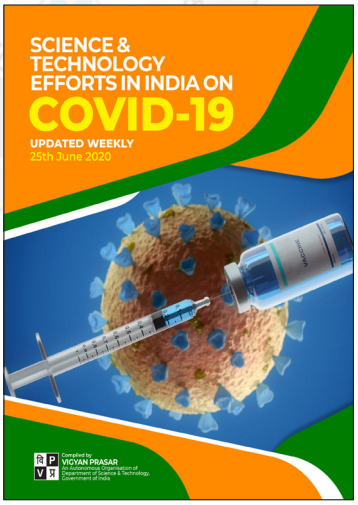
The web portal provides all information related to COVID-19, its presentation of symptoms, transmission modes and mechanisms, and various models of protection of individuals, healthcare professionals & prevention from spreading to the community. The reasons, usefulness and impact of social distancing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

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.



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