SCIENCE & TECHNOLOGY EFFORTS IN INDIA ON COVID-19

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Vigyan Prasar

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

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

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

Greetings from the desk of e-Newsletter Science & Technology Efforts in India on COVID-19, highlighting scientific, technological, and innovative efforts and supports to mitigate and minimise the pandemic's transmission and its after-effects. The COVID-19 global pandemic soured much of 2020 and unleashed great human developmental crisis. On some dimensions of human development, conditions today are equivalent to levels of deprivation. The crisis hit hard on all constitutive elements of it: economy, health and education. The pandemic has posed one of the biggest challenges to the entire humanity. It changed our lives in ways we had never imagined before. Attentions were focused on immediate problems and proximate causes. And, now we are armed with various weaponries in our armour, like vaccines, therapeutics, immune boosters, and so on to tackle the situation.

During these critical times, access to authentic information was of paramount importance. Since the early days, with the science communication perspective, Vigyan Prasar has been digitally reaching out to the general public as well as scholars with the relevant information related to the pandemic, ensuring that science and safety are the primary focus. Governments from diverse dispositions have responded to the pandemic by arming themselves with unprecedented emergency powers. For the benefit of the stakeholders and target audience, Vigyan Prasar is preparing and publishing a compilation of the most relevant initiatives, efforts, and wartime protocols, engaged by the Government of India through its various Science Ministries, Departments, and Funding organisations, in the shape of daily, weekly, and now fortnightly e-Newsletter.

The pandemic was superimposed on unresolved tensions between people and technology, between people and the planet, between the haves and the have-nots. These tensions were already shaping a new dimension of inequalities of enhanced capabilities and the novel necessities. But the response to the crisis carries the potential to shape strategies on how those tensions can be addressed and how inequalities in human development are reduced. The coronavirus has also revealed something profound about the way societies should treat knowledge. Something good might come from the misery of the pandemic year. It should include a new social contract fit for the 21st century.

The COVID-19 pandemic is a gateway between the present world and the future. We can choose to walk through it, get rid of our prejudices, dead ideas and smoky skies, and build a better world. With these thoughts, as 2021 approached us with hopes anew, Vigyan Prasar wishes all its readers a wonderful spring season and Basant Panchami.

15 Feb 2021

Vigyan Prasar
New Delhi

High level committee constituted for distribution and administration of COVID-19 Vaccines

2 February 2021, New Delhi

A National Expert Group on Vaccine Administration for COVID-19 (NEGVAC) has been established, which provides guidance on all aspects of COVID-19 vaccination including prioritization of population groups, procurement and inventory management, vaccine selection, vaccine delivery and tracking mechanism, etc.

NEGVAC is chaired by Member (Health), NITI Aayog and co-chaired by Secretary (H&FW). It has representation of Secretaries from Ministry of External Affairs, Department of Expenditure, Department of Biotechnology, Department of Health Research, Department of Pharmaceuticals, Ministry of Electronics and Information Technology, representative from five State Governments, and technical experts.

NEGVAC has prioritized healthcare workers and frontline workers during the initial phase of COVID-19 vaccination followed by prioritized population groups of persons aged 50 years and above, and those aged less than 50 years with comorbidities. The vaccination of healthcare workers is going on.

During the first phase of COVID-19 vaccination, the vaccine is being provided by the Central Government, free of cost to States and UTs for vaccination of healthcare workers and frontline workers.

Website link:
https://pib.gov.in/PressReleasePage.aspx?PRID=1694439

Supply of Indian manufactured vaccines to neighbouring and key partner countries

19 January 2021, New Delhi

The Government of India has received several requests for the supply of Indian manufactured vaccines from neighbouring and key partner countries. In response to these requests, and in keeping with India's stated commitment to use India's vaccine production and delivery capacity to help all of humanity fight the COVID pandemic, supplies under grant assistance to Bhutan, Maldives, Bangladesh, Nepal, Myanmar and Seychelles will begin from 20 January 2021. In respect of Sri Lanka, Afghanistan and Mauritius, confirmation of necessary regulatory clearances is awaited.

Immunization programme is being implemented in India, as in other countries, in a phased manner to cover the healthcare providers, frontline workers and the most vulnerable. Keeping in view of the domestic requirements of the phased rollout, India will continue to supply COVID-19 vaccines to partner countries over the coming weeks and months in a phased manner. It will be ensured that domestic manufacturers will have adequate stocks to meet domestic requirements while supplying abroad.

Prior to the delivery of vaccines, a training programme, covering administrative and operational aspects, is being conducted on 19-20 January 2021 for immunization managers, cold chain officers, communication officers and data managers of the recipient countries, both at national and provincial levels.
India had earlier supplied hydroxychloroquine, Remdesivir and paracetamol tablets, as well as diagnostic kits, ventilators, masks, gloves and other medical supplies to a large number of countries during the COVID-19 pandemic.

India has also provided training to several neighbouring countries to enhance and strengthen their clinical capabilities, under the Partnerships for Accelerating Clinical Trials (PACT) programme. Separately, several training courses have been organized for healthcare workers and administrators of partner countries under the Indian Technical and Economic Cooperation (ITEC) programme, sharing India's experience in dealing with the pandemic.

In an on-going effort, India will continue to supply countries all over the world with vaccines. This will be calibrated against domestic requirements and international demand and obligations, including under GAVI's Covax facility to developing countries.

Website link:
https://www.mea.gov.in/press-releases.htm?dtl/33399/Supply_of_Indian_manufactured_vaccines_to_neighbouring_and_key_partner_countries

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

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

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Study shows significant reduction of heavy metal pollution during COVID-19 pandemic

Efforts to minimize industrial wastewater can substantially reduce heavy metal pollution in the Ganga water in a short time span of a few months, a study carried out during the COVID-19 pandemic has shown.

The COVID-19 pandemic lockdown provided a team of scientists from Indian Institute of Technology Kanpur a rare opportunity to quantify the impact of restricted anthropogenic activities on the water chemistry resilience of large rivers. It also showed the high resilience of dissolved heavy metals.

They analysed the daily geochemical record of the Ganga River and showed that reduced industrial discharge during 51 days of mandated nationwide lockdown decreased the dissolved heavy metal concentrations by a minimum of 50%. In contrast, inputs from agricultural runoff and domestic sewage like nitrate and phosphate remained almost the same as these sources were not impacted by the nationwide confinement.

The research is supported by the Indo-U.S. Science and Technology Forum (IUSSTF), a bilateral organization under the DST, Government of India and U.S. Department of States and recently published by 'Environmental Science and Technology Letters'.

Website link:
https://dst.gov.in/study-shows-significant-reduction-heavy-metal-pollution-during-covid-19-pandemic

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SCIENCE & TECHNOLOGY EFFORTS ON COVID-19
BY

DEPARTMENT OF BIOTECHNOLOGY (DBT)

DBT-NCCS scientist helps dispel doubts on COVID-19 vaccination

The largest vaccination campaign against COVID-19 launched by India recently has caught the attention of the world. However, there are several questions and misconceptions about the efficacy, safety and logistics of vaccination against the coronavirus.

To help address some of these questions and spread awareness among the general public, a Pune-based NGO, Bhavatal, organised in association with the Association of the Microbiologists of India a discussion on the topic with Dr Yogesh Shouche, Scientist Emeritus at DBT-National Centre for Cell Science (DBT-NCCS), in Pune. This discussion was held in Marathi to reach out to a wider regional audience.

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Website link:
https://www.nccs.res.in/
https://vigyanprasar.gov.in/wp-content/uploads/Vigyan_samachar_dbt_01S_25Jan2021.pdf

DBT-NCCS holds webinar on infectious diseases

DBT-National Centre for Cell Science (DBT-NCCS) organised a webinar on the topic 'Infectious Diseases and How to Think About Them' in collaboration with the Indian Institute of Science Education and Research (IISER), Pune and Persistent Systems under the 'Manav: Human Atlas Initiative' on 21 January 2021.

It was presented by Prof. Gautam Menon, Professor of Physics & Biology at the Ashoka University in Sonipat, and Professor of Computational Biology & Theoretical Physics at the Institute of Mathematical Sciences (IMSc) in Chennai.

He described models for the spread of COVID-19 in India, illustrating some of the difficulties such modelling presents and the need for better data to constrain models. He discussed some of the unexpected results that have followed from these studies and indicated how modelling can help frame a better health policy and why this is especially crucial for India.

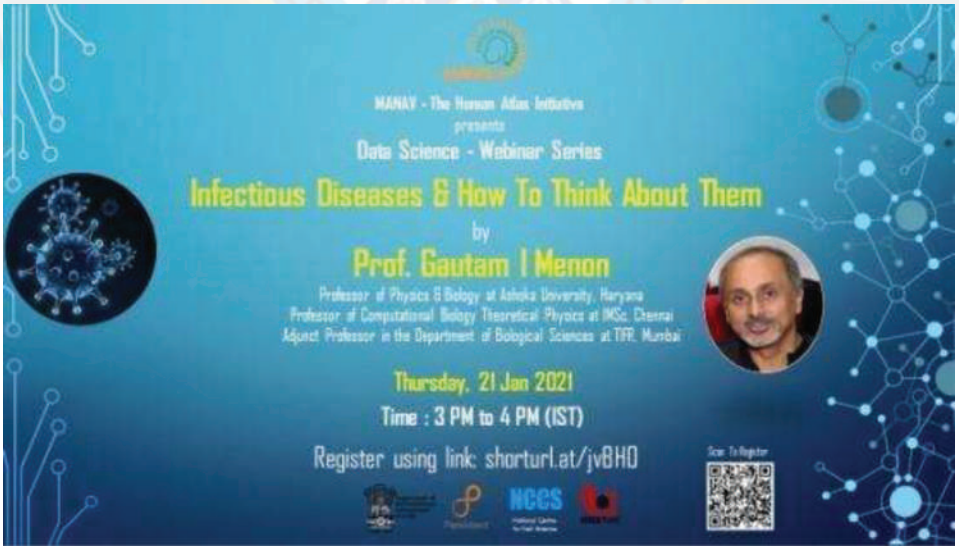
This was the first webinar of 2021 in the data science webinar series organized under the auspices of the "Manav: Human Atlas Initiative". This initiative is a collaborative project between the National Centre for Cell Science (DBT-NCCS), the Indian Institute of Science Education and Research (IISER-Pune), and Persistent Systems and is funded by the DBT, Government of India and co-funded by Persistent Systems.

The webinar series was initiated soon after the lockdown began, turning this challenging situation into an opportunity to create awareness about data science and its applications. The webinars are open to all and have attracted thousands of registrations, mainly from students.

The 'Manav: Human Atlas Initiative' aims to annotate the extensive information related to the human body that is available in the scientific literature and databases and initiate steps towards creating a human atlas eventually. It serves as a platform to help students across India learn how to comprehend and analyse scientific literature and extract relevant information from it using a digital annotation tool.

Online workshops on how to read scientific literature are also routinely conducted. Colleges interested in having a session organized for their students can write to manav.iiserpune@gmail.com. Students, faculty members, and researchers interested in participating in the project can learn more from the project's website (https://manav.gov.in/) and social media: Twitter (Manav Human Atlas; @ManavAtlas) and Facebook (MANAV Human Atlas). The Rajya Sabha TV has also featured this initiative on Gyan Vigyan and Science Monitor.

Contact Info: jyoti@nccs.res.in



Website links:
https://vigyanprasar.gov.in/wp-content/uploads/Vigyan_samachar_dbt_01S_25Jan2021.pdf

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SCIENCE & TECHNOLOGY EFFORTS ON COVID-19

BY

INDIAN COUNCIL OF MEDICAL RESEARCH (ICMR)

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 such test. 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; drneetu.vijay@icmr.gov.in

Website Link:
https://www.icmr.gov.in/pdf/tender/Revised_EOI_for_Ag_kit_validation_29122020.pdf

Extension of validity of SOP for Epidemiological Surveillance & Response for the new variant of SARS-CoV-2, issued by MoHFW

A Standard Operating Procedure for Epidemiological Surveillance and Response in the context of new variant of SARS-CoV-2 virus detected in United Kingdom was issued on 22 December 2020, describing the activities to be undertaken at the point of entry and in the community for all International passengers who have travelled from or transited through UK from 25 November to 23 December 2020. Ministry Health of Family & Welfare, in consultation with Ministry of Civil Aviation, had reviewed the situation with regard to resumption of international flight services to/from UK and it was decided to allow limited flight connectivity to/from UK with effect from 8 January, 2021. In consultation with Ministry of Civil Aviation, it has been decided to continue flight services in a calibrated manner by allowing flight movement to/from UK to five international airports, that is, Delhi, Mumbai, Bengaluru, Hyderabad and Chennai only and to continue these operations till 14 February 2021. This Standard Operating Procedure thus shall be valid till 14 February 2021 or further orders, whichever is earlier.

Website Link:
https://www.mohfw.gov.in/pdf/ExtensionofvalidityofStandardOperatingProcedureforEpidemiologicalSurveillance&ResponseforthenewvariantofSARSCoV2.pdf

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SCIENCE & TECHNOLOGY EFFORTS ON COVID-19
BY

SCIENTIFIC AND ACADEMIC INSTITUTIONS

JMI researchers invent solar-powered disinfection tunnel for COVID-19

Researchers at the Department of Mechanical Engineering, Jamia Millia Islamia (JMI) have developed a "Solar Powered Self Generating Disinfection System for Preventing Coronavirus in Remote Places". The invention has been published in the Official Journal of The Patent Office, Government of India and awaiting grant of patent.

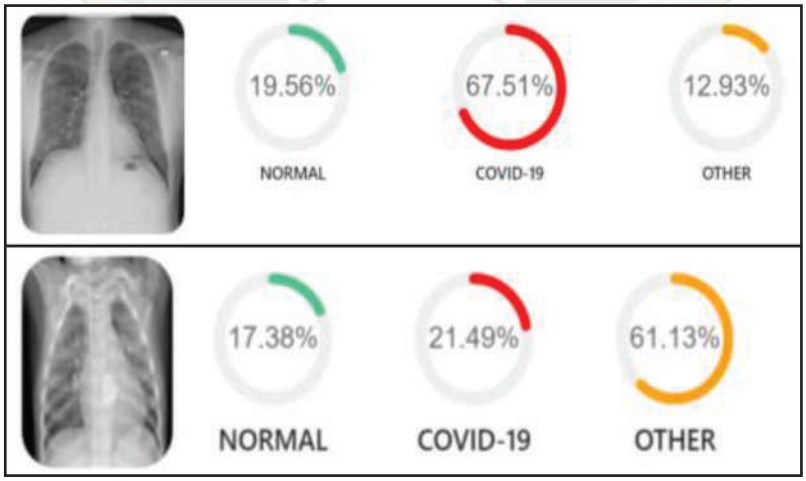
The main objective of the invention is to provide a self-generating disinfection system powered by solar energy in order to prevent COVID-19 or similar diseases in large gathering, public and remote places.

The disinfection system is mainly intended for remote or public places such as, banks, malls, hospitals, marriage halls, party halls, airports, universities, schools, temples, colleges, etc. and where the transportation of chemicals and availability of electricity for disinfection is scarce, thereby self-generating the mixture with available tap water using the solar energy.

Website link:
https://www.jmi.ac.in/upload/publication/pr1_English_2020December4.pdf

AI-based online platform for COVID-19 detection by using chest X-ray developed by IIT Gandhinagar

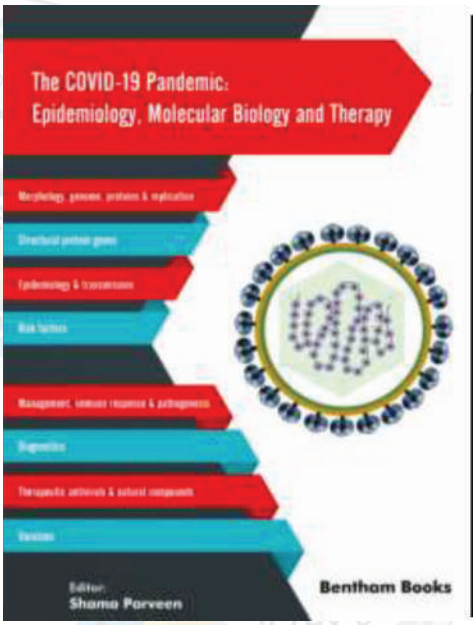
IIT Gandhinagar has made an online platform for COVID-19 detection called CVD-19 detector. It is an AI-based diagnosis detector that works on only chest X-Ray and uses standard X-ray images. This model has 2049 distinct images from 1800 distinct patients, 708 COVID-19 images, and healthy patients' X-Ray images. This model is 95% accurate.



The intention of the CVD-19 detector is to be used as a reference model that can be built upon and enhanced as new data becomes available. Currently, this model is at the research stage and not yet intended as a production-ready model. It means that people should not use it as a direct clinical diagnosis. A person should not use this model for self-diagnosis and seek help from local health authorities.

Website Link:
https://news.iitgn.ac.in/2020/06/30/iitgn-researchers-develop-an-artificial-intelligence-based-tool-to-detect-covid-19-from-chest-x-ray/

A book entitled The COVID-19 Pandemic Epidemiology Molecular Biology and Therapy compiled

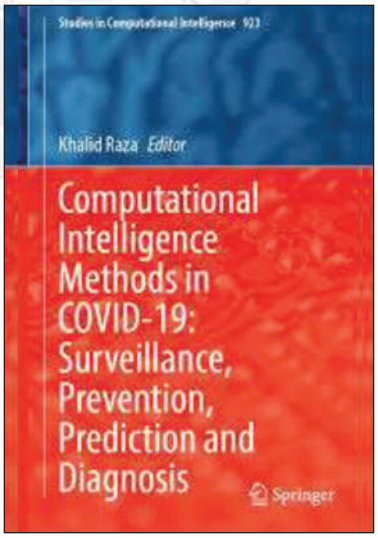


COVID-19 has equally affected almost every part of the globe with millions of cases and deaths. In these unprecedented times, which is gripping the whole world, the idea of writing a book on "The COVID-19 Pandemic: Epidemiology, Molecular Biology and Therapy" (https://benthambooks.com/book/9789811481871/) by faculty member of Jamia Millia Islamia Dr Shama Parveen and the research team is a much timely effort to provide a comprehensive account about COVID-19 for the readers.

The book is divided into 11 chapters focusing on various aspects of the COVID-19 which includes topics such as pathogen (morphology, genome, proteins, structural protein genes, and replication), global epidemiology, transmission, risk factors, clinical manifestation, management, host immune response and pathogenesis. It also covers the diagnosis, therapeutic agents (antiviral and other drugs, natural compounds) and vaccines for COVID-19.

Website link:
https://www.jmi.ac.in/upload/publication/pr1_English_2021February5.pdf

Jamia Millia Islamia faculty edits book titled "Computational Intelligence Methods in COVID-19: Surveillance, Prevention, Prediction and Diagnosis"



Dr Khalid Raza, one of the youngest faculty members of the Department of Computer Science, Jamia Millia Islamia (JMI), has edited a book on the on-going COVID-19 pandemic which is published in one of the reputed series of Springer, Singapore. The book entitled "Computational Intelligence Methods in COVID-19: Surveillance, Prevention, Prediction and Diagnosis" has been published in the 923rd volume of Studies in Computational Intelligence Series (Hindex=62). All the chapters of the book are indexed in the Scopus database.

The book contains 22 chapters covering different aspects of COVID-19 that includes fundamentals of coronaviruses, epidemic forecast models, surveillance and tracking systems, IoT- and IoMT-based integrated systems for COVID-19, social network analysis systems for COVID-19, radiological images (CT, X-Ray)-based diagnosis system, and in silico drug design and drug repurposing methods against COVID-19 receptors.

The contributing authors of this volume are experts in their fields from JMI and other reputed institutions across the world. This volume is a valuable and comprehensive resource for computer and data scientists, epidemiologists, radiologists, doctors, clinicians, pharmaceutical professionals, along with graduate and research students of interdisciplinary and multidisciplinary sciences. The book is being sold by major online sellers including Amazon and Springer.

Website link:
https://www.springer.com/gp/book/9789811585333

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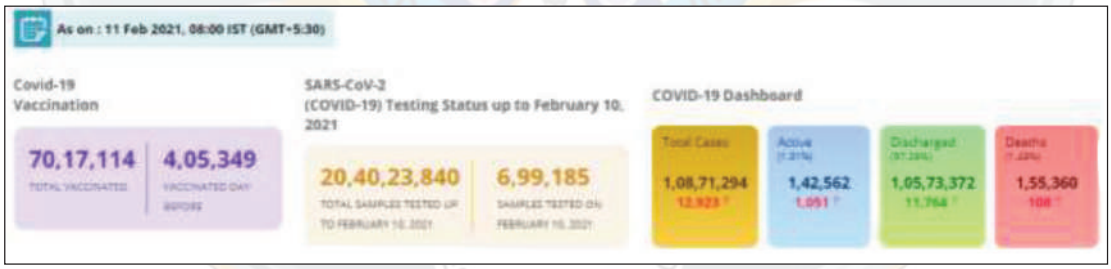
SCIENCE OUTREACH & POPULARISATION EFFORTS

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

Efforts from Ministries, Departments & Scientific Organisations

Government of India presents regular COVID-19 India factsheet and immunisation programme

India's coronavirus cases have crossed 1.08-crore mark and as on 11 February 2021, 08:00 AM, stands at 1,08,71,294 cases out of which 1,05,73,372 have recovered. The recovery rate stands at 97.2% while the case fatality rate stands at 1.43%, the lowest in the world. The number of people vaccinated till 10 February 2021 stands at 70,17,114.



Website Link:
https://www.mygov.in/covid-19/

Ministry of Youth Affairs & Sports released SOP for reopening of swimming pools in COVID-19 environment

Ministry of Youth Affairs & Sports has permitted for use of swimming pools by all in fresh COVID-19 reopening guidelines. According to these new guidelines, swimmers must follow 6 feet distance, mandate use of face mask, except when in pool, self-monitoring of health & avoid use of pool if suffering from COVID-19 and others practices must be followed. The swimmers have also been asked to furnish "Obligatory self-declaration" and trainees will have to submit a mandatory Covid-19 negative report before being allowed inside the premises.

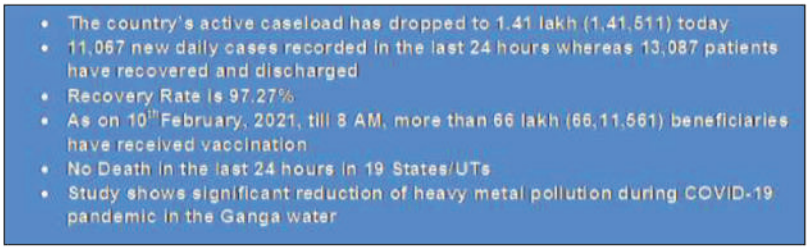
All personal training equipment belonging to an athlete shall be disinfected while the athlete is inducted into the training centre. Athletes and staff shall be screened before being allowed access to common field-of-play/training facilities. RT-PCR test shall be conducted for new/returning athletes. It also bars residential athletes from sharing soaps, towels and any other utility in common shower areas. Besides, spitting and clearing of nasal/respiratory secretions on the pool especially during swimming or at any place within the facility other than toilets shall be prohibited. The swimmers will also need perform hand-hygiene before and after use of all training equipment. The usage of Aarogya Setu app has also been made mandatory.

Each training centre will have a COVID-19 Task Force to guide and monitor all trainees, coaches and staff within the centres. The Task Force shall be responsible for overall implementation of protocols suggested by the government in the SOP. It will also work closely with the coaches and support staff to define guidelines and protocols to conduct the training in the COVID environment.

Website link:
https://transformingindia.mygov.in/wp-content/uploads/2021/02/SOPs-for-Swimming-Pools-English.pdf

Press Information Bureau releases daily bulletin on COVID-19

Press Information Bureau (PIB), Government of India releases a daily bulletin on COVID-19. The bulletin contains press releases concerning COVID-19, issued in last 24 hours, inputs from PIB field offices and fact checks undertaken by PIB. The last release is dated 10th February 2021.



Website Link:
https://pib.gov.in/PressReleasePage.aspx?PRID=1696846

Efforts from Vigyan Prasar

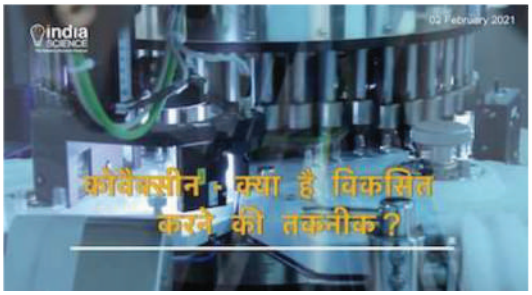
Outreach by India Science Channel

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

Science and Technology are the main driving forces of the nation and fundamental to progress and growth. So, the advantages of science and technology must reach all sections of 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 account of the information products produced by India Science.

- Weekly COVID-19 video bulletin: Produced in both Hindi and English language on weekly basis from 7 July 2020, COVID-19 bulletin apprises the audience about the latest developments happening in the S&T scenario in India that are helping in managing and overcoming the challenges thrown up by the pandemic. Vigyan Prasar produced daily COVID-19 Bulletin from 11 April to 06 July 2020. Thereafter, a weekly bulletin is being produced which provides details about the most important S& T updates from the country related to COVID-19. From January 2021 onwards the COVID-19 Bulletin carried news about vaccination drive initiated by the Government of India.



- ❖ COVID Explained - Short films to explain the important research findings related to COVID-19 and COVID-19 vaccination in layman's language are produced on weekly basis. The topics chosen for COVID Explained cater to the curiosity of common man towards COVID-19.
- ❖ Facebook live sessions on interviews of various stakeholders on COVID-19 Vaccination programme.
- ❖ Facebook and India Science live sessions on interviews with experts on COVID-19 Vaccination.
- ❖ Live Phone in programme: A live phone in programme on COVID-19 vaccination is telecasted from India Science on every Monday and Tuesday. Experts from the field give answers to the questions related to COVID-19 vaccination received from the audience.

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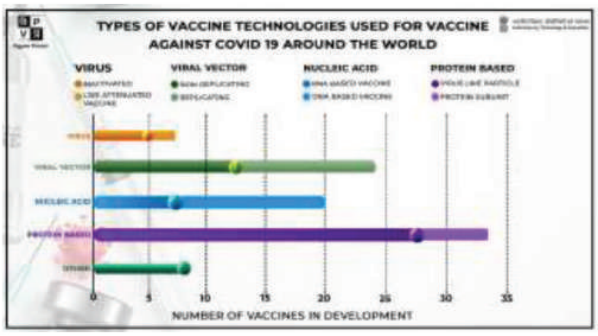
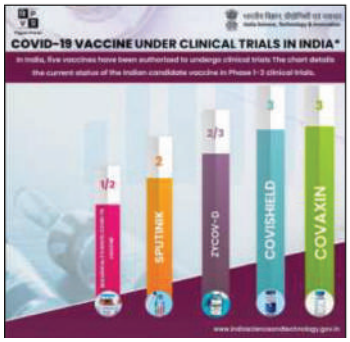
Website link:
https://www.indiascience.in/

Outreach by 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 and 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 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 and prevention from spreading to the community. The reasons, usefulness, and impact of social distancing have been communicated in an easy-to-understand manner. Around 2400 stories related to S&T efforts towards mitigating the COVID-19 pandemic have been captured on the portal.

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

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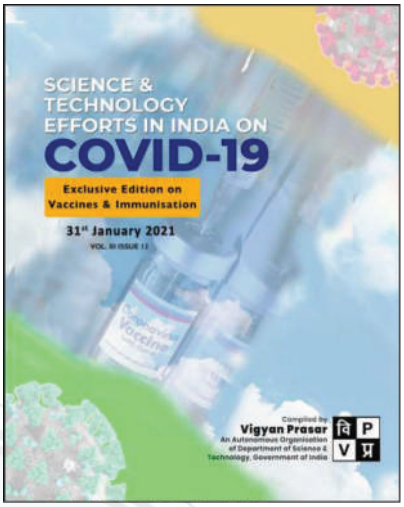
Publication of exclusive edition on vaccines and immunisation of e-Newsletter on S&T efforts on COVID-19

For the benefit of its stakeholders and target audience, Vigyan Prasar is bringing out a fortnightly 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 to combat the outburst of the pandemic.



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

In 31 January 2020 exclusive edition, emphasis was put on 'COVID-19 vaccines and immunisdation.' The edition was very contemporary with ongoing scenario.

Contact Info: kdgm@vigyanprasar.gov.in

Website link:
https://vigyanprasar.gov.in/covid19-newsletters/
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