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VIGYAN PRASAR

COVID-19

Science & Technology Efforts in India

In the face of adversity we have a choice - stay updated with scientific facts

COVID REPOSITORY

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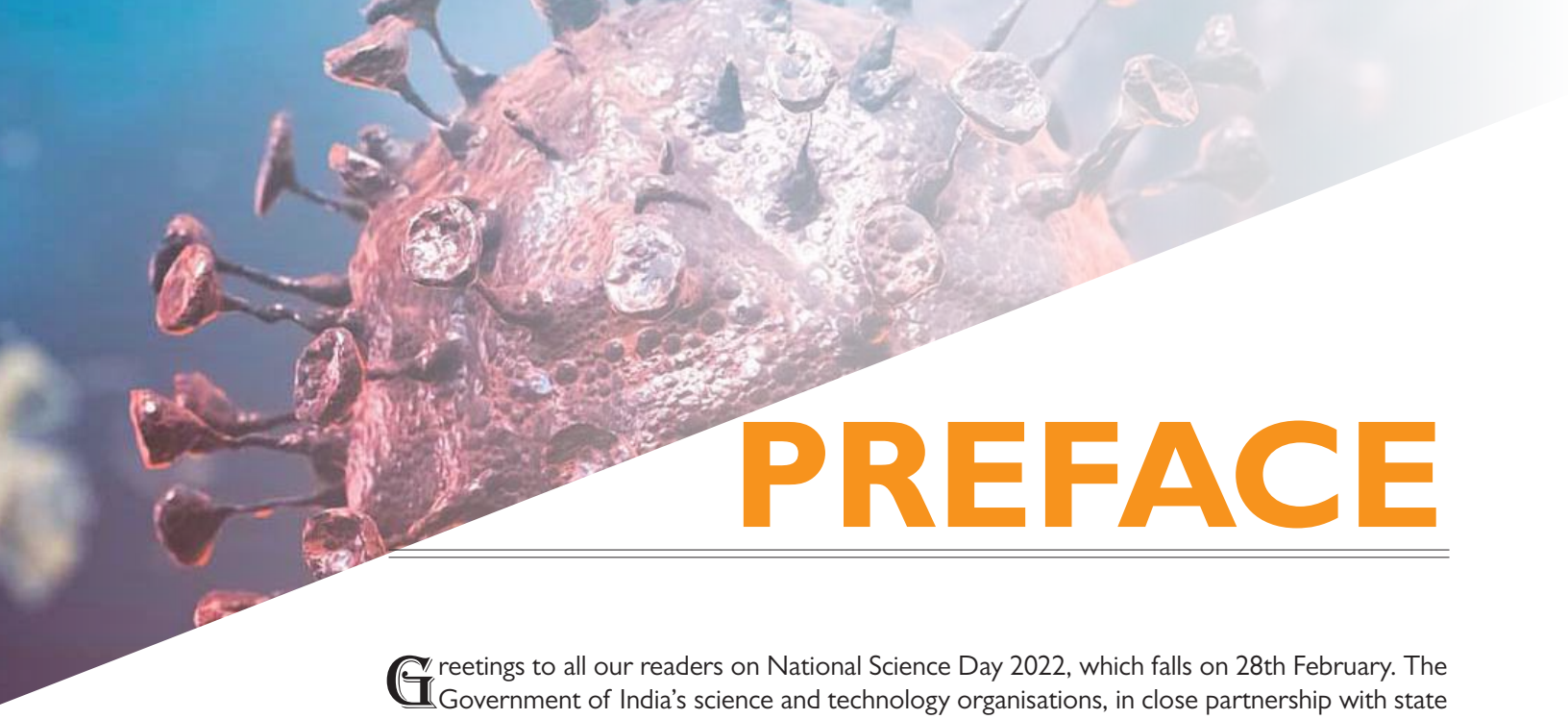
INDIA SCIENCE, TECHNOLOGY & INNOVATION (ISTI) PORTAL

Reflecting Science, Technology & Innovation in India



PREFACE

Greetings to all our readers on National Science Day 2022, which falls on 28th February. The Government of India's science and technology organisations, in close partnership with state agencies, are leveraging Azadi Ka Amrit Mahotsav as an opportunity to showcase our scientific legacy and technology prowess that have helped find solutions to problems in various domains of life. This Showcase – titled Vigyan Sarvatra Pujyate – is being celebrated during Science Week, February 22-28, 2022. .

In some ways, our collective destiny is intertwined with India's. And this comes with collective responsibility. Public participation is a powerful medium for realising all of a nation's hopes and dreams. India demonstrated great fortitude by using collective strength to pull herself out of trouble.

As the pandemic has been superimposed on unresolved tensions between people and technology, the current edition focuses on various impactful initiatives to mitigate the pandemic and recent developments in S&T to apprise the scientific fraternity, like research outputs, industry collaborations, communications & resources, along with additional fact-check questionnaires. We continue compiling new information related to the pandemic to sensitise our readers about COVID-related latest developments, to inform the readers and strengthen the usefulness of the information. This edition also includes a trending story on the contribution from a science centre towards various teaching-learning methods developed in crisis time to reach out to the broader and most captive audience and subsequently take-home-points.

Hopefully, the coverage about how the country is overcoming challenges with the help of knowledge will instil confidence and trust in the country's scientists, eventually inculcating scientific temper among the general public. We look forward to suggestions and feedback from our readers at covidnewsletter@vigyanprasar.gov.in.

February 2022

Vigyan Prasar

New Delhi

Vigyan Sarvatra Pujyate!

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

INDEX

1

TRENDING IN INDIA @COVID-19 PANDEMIC

The strategy for this section is to fill the gap area identified and as per the popular demand risen from the reader database. The communication stories compiled here are signature science stories related to the COVID-19 pandemic. The featured stories cover amongst ongoing research, recognised innovations, developed technologies/products/services, recent trends about variants-of-concern, the trend in diagnostics & prognostics, trend analysis of therapeutic regimens, communicating science & generating awareness, the contribution of a specific organisation in COVID warfare, the role of startups/private sectors in COVID mitigation, or any other relevant/significant related topic.

SECTION GUIDELINES

How billion people combat COVID-19: Government of India Strategy

Efforts of VASCSC - A science centre - in mitigating COVID-19

How billion people combat COVID-19: Government of India Strategy

Introduction

Two years ago, the first Coronavirus Disease-2019 (COVID-19) case was detected in India in Kerala in March 2020. The Government and the citizens of India have united together to combat the virus since then. India is the second highest populous country with an estimated 1.36 billion population. The country has witnessed three major waves of the COVID-19 pandemic in the past three years, the second being the worse. As of 20th February 2022, India has reported 42,822,473 confirmed cases of COVID-19 and 511,903 deaths. Maharashtra has been the worst affected in all three waves. Presently the recovery rate from COVID-19 in India has crossed 98%.

COVID-19 crisis in India

The first wave in India started in March 2020, achieved a peak in September 2020 with more than 90,000 confirmed cases/day, and gradually decreased in intensity with 10,000 cases/day in February 2021. The main focus during the first wave was the flattening of the curve, that is, the epidemic curve reaching a plateau. The second wave of COVID-19 in India with the Delta Variant of SARS-CoV-2 had severe consequences in the form of spiralling cases, reduced supplies of essential treatments, and increased deaths, particularly in the young population. This wave of COVID-19, which began in February 2021, hit India very hard, with the daily cases reaching nearly triple the first peak value as of 19th April 2021. The country was slightly away from touching five million everyday case mark.

The country is presently facing the third wave caused by the new strain, Omicron, which started in the last week of December 2021 and currently is in the phase of decline. The doubling rate of the Omicron wave is two days, but the severity of the infection and related mortality was much lesser than the previous two waves.

Strategies to combat COVID-19 and the way forward

The principles of COVID-19 resilience planning in India mainly focus on health system strengthening, development of surge capacity and development, and an intersectoral response plan. Consolidating the lessons learnt and best practices from each wave and bridging the health system gaps have helped operational research and innovations tackle the pandemic. The following strategies have been designed and followed by the Government of India in its initiative to combat COVID-19:

1. Coordination and Intersectoral Response Plan

India is working closely with Ministry of Health and Family Welfare (MoHFW), National Centre for Disease Control (NCDC), Indian Council for Medical Research (ICMR) and National Disaster Management Authority (NDMA) at the national level and supporting through the task force and control rooms at the state and district levels in Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Telangana and Puducherry. WHO field offices continue to participate in the current response and vaccination, chaired by Chief Ministers, Health Ministers, Health Secretaries, National Health Mission (NHM), etc.

2. Promoting COVID Appropriate Behaviour

The main focus during the first wave was the flattening of the curve, that is, the epidemic curve reaching a plateau. Along with the implementation of global and national lockdown, early tracing of variants, maintaining strict preventive COVID appropriate behaviour like wearing a face mask,

frequent use of hand sanitisers, maintaining a social distance of at least six feet, increasing the number of tests/day, ensuring the availability of test kits, performing timely serosurveys were found helpful to restrict the spread.

3. Containing Transmission - Surveillance, Quarantine and Isolation

When the pandemic started, containment and isolation was the only resort to slow down the spread of the virus. The Central and state task forces continue to provide technical support for COVID-19 containment activities in various states, including supportive supervision to monitor contact tracing; identify containment zones, and share regular feedback. There is also support provided for house-to-house surveys and technical assistance given to states for conducting sero-surveillance.

4. COVID-19 Vaccination

India has been running the World's largest vaccination drive against COVID-19 since 16th January 2021, and presently, 1.75 billion people have been vaccinated against the deadly disease (as of 21st February 2022). The major two vaccines that have been administered in India are the Covishield and Covaxin Vaccines. The GOI has developed a real-time COVID-19 Vaccine Delivery Management System for real-time tracking of stock and temperature through the Electronic Vaccine Intelligence Network. (eVIN). The COVID Vaccine Intelligence Network (Co-Win) portal conducts real-time recording of vaccination events.

Co-Win is a scalable, inclusive, interoperable and open platform for Universal Vaccination by 2022. It was developed for equitable vaccination across multilingual states, with multiple modes for registration to ensure accessibility for all. It ensures equitable distribution of vaccines through a single data source to remove information asymmetry and align stakeholders.

5. Augmentation of Oxygen Supply and Ventilatory Support

To fast-track the availability of Medical Oxygen in Health facilities, an IT-enabled Management Information System called OxyCare has been developed to track each oxygen device for providing better services to the patients. As of now, Oxygen Concentrators (OCs) and PSA Plants are being monitored using this system. A secure QR Code has been placed on each Oxygen Device, which is read by a mobile app to facilitate various tasks in a secure and fast manner. OxyCare Management Information System (OC-MIS) has been empowered with allocation, distribution, supplies, receipt, installation, maintenance, online monitoring of purity, flow and pressure in case of PSA Plants.

A panel - called the Empowered Group 2 (EG 2) under the Prime Minister's Office - monitors the oxygen supply. The EG 2 has members from all states, major oxygen manufacturing firms and departments involved in transport. A total of 850 oxygen plants are being set up in various districts of the country from PM Cares Fund to cater to the country's needs to fight the pandemic COVID-19.

6. Strengthening Telemedicine

The Implementation of Telemedicine in India is approved by National Medical Council (NMC). On 9th August 2020, the Government of India introduced its telemedicine service, eSanjeevani, as part of its 'Digital India' initiative. The platform currently permits two types of telemedicine services: Doctor to Doctor (eSanjeevani) and Patient-to-Doctor (eSanjeevani OPD). It is based on a "hub and spoke" model. Medical college hospitals and large government hospitals in the States act as 'hubs' to provide teleconsultation services to 'spokes' or primary health care centres.

7. Strengthening of Existing Infrastructure - Graded Response in case of Upcoming Waves

A draft has been created regarding the colour coding alert. Based on various parameters, the strategies that shall be implemented in case of a rise in the number of COVID cases have been divided into five levels, Level 0 to Level 4. Each of these levels has been awarded a different colour coding. This shall be a helpful aid in deciding when to implement Standard Operating Procedures (SOPs) along with CAB. Presently the element of the framework used by States & UTs to facilitate decision making at the district level is based on Test positivity of 10 % or more in the last one week or bed occupancy of 40% or more on oxygen supported or ICU beds.

8. Additional Strategies

Containment measures like the imposition of night curfews, strict regulations on large gatherings, limited numbers in offices, industries, public transport. Testing and surveillance strategies like a door-to-door case search, testing of vulnerable, comorbid and ILI cases, ensuring right proportion of RT-PCR tests in total tests being conducted daily. Strengthening clinical management, increased bed capacity, ambulances, a mechanism for seamless shifting of patients, availability of oxygen equipment, and ensuring buffer stock of drugs. Providing 100% coverage of left out first and second dose eligible beneficiaries in an accelerated manner. Activation of war rooms and call centres and keep analysing all trends and surges, no matter how small and keep taking proactive action at the district /local level.

Conclusion

With the advent of Omicron as the new dominant strain in India, strategies and SOPs also need to be updated. The roadmap ahead is to look at the complementing opportunities of different organisations as each association is a strong pillar in itself. The need of the hour during pandemics and times to come has been to sensitise the government & National Institution for Transforming India (NITI) Aayog about creating taskforces and strengthening existing infrastructure. The country's education system has also been affected miserably. It should be imperative for the government to innovate and implement strategies to compensate for this loss.

The GOI has also started administering the Precaution dose of COVID-19 vaccine as a booster dose to all Healthcare workers and elderly aged above 60 years. While many privileged nations have resorted to booster vaccines as a strategy to control the spread of this variant, the utility of this strategy is debatable.

Dr Suneela Garg

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Efforts of VASCSC - A science centre - in mitigating COVID-19

March 2020 created enormous havoc in everybody's lives. Every individual in India was cluelessly stuck at their respective homes or workplace with literally nowhere to go. Individuals were hearing about different terms like pandemic, virus, asymptomatic, antibody, transmission, silent spreader, immunity, vaccines and many more on various platforms. It is often difficult for an individual to understand the proper scientific meaning of the terms used. When there is no correct knowledge, an individual may fall prey to fake information or news.

To increase scientific awareness about COVID-19 among the masses, Vikram A Sarabhai Community Science Centre (VASCSC) team started simplifying the intricate details related to

the pandemic. This scientific information was published in a creative format on various social media platforms and distributed to the schools via WhatsApp. This step of VASCSC has been highly appreciated among the masses and school teachers.

VASCSC reaching out to students by staging a drama

The key factors that were kept in consideration while making the publicity material were:

- Clear and effective communication
- Increase the scientific understanding and scientific temper of common masses
- Give facts and authenticate information without any language barriers
- Communicate controversial science topics objectively.

At the same time, there was a dire need to reach those who are not active on social media and are based at the grassroots level. National Council of Science and Technology Communication (NCSTC), Department of Science and Technology (DST), Govt. of India supported VASCSC to reach out to this section of the community of not only Gujarat but across India.

Under this initiative, VASCSC developed a set of 10 posters distributed among 2000 schools across India. This poster exhibition consisted of a compilation of relevant information presented in an exciting format. Information about different types of microorganisms focusing on viruses, the structure of SARS-CoV-2 virus, its possible transmission pathways, mutations, and the preventive measures to be taken was mentioned. There was also a focus on immunity and its types and symptoms of COVID -19, working and principle behind early detection methods of COVID-19 like thermal scanner HRCT Scan. Antigen and antibody detection tests, the use of antimicrobials, and types of vaccines were mentioned in a very simplified manner.

The next step was reaching out to school students in in-person mode. VASCSC conducted COVID-19 Science Outreach for government and underprivileged students of standard 6 – 12 in over 50 schools of Gujarat.

This COVID-19 Science Outreach programme in schools aimed to develop a scientific understanding of the pandemic. Students knew about following basic protocols like washing hands regularly, wearing masks, or keeping 6 feet social distance, but they did not see the science behind following these procedures. The students were made aware of the science behind the following basic safety measures and hygiene practices. Relevant concepts like silent spreaders, the structure of the virus, antigen and antibody, the importance of herd immunity and vaccination were explained through various hands-on activities, demonstrations, games, exhibitions and role play.

The necessary material required to perform the activities was given to students byVASCSC. An activity book, the science of COVID-19 (booklet) and various other templates in the Gujarati language were developed and designed to enhance their scientific understanding of the coronavirus disease. The students were also encouraged to share the scientific information gained with their family, friends and relatives and develop scientific temper.

VASCSC demonstration - training the trainers

The VASCSC team is also developing a Teachers Activity Handbook. The objective of this co mponent is to build the capacity of teachers to educate their students with correct scientific information and develop their understanding of concepts. This handbook will be a reference book to learn and understand the science related to COVID-19. This will help create a scientific perspective of the users so as to prevent transmission of this disease and other infectious diseases by making informed choices to adopt good personal hygiene and sanitation practices.

The purpose of the initiatives mentioned above was to make the students and the community understand why and how, by bringing small, lifelong changes, one can get protection against various diseases like COVID-19. Once the reason behind any practice is conveyed among the masses, they quickly adopt it and adapt to it in the long run. These activities were meant to bridge the gap between learnings from the laboratories to the community simplified and scientifically correct.

In addition to these, COVID-19 protocols were followed in all training and education programmes of VASCSC. Some modules were included in ongoing teachers training programmes and Mobile Science Lab (MSL) visiting schools in Gujarat.

It was the dream of Dr Vikram Sarabhai to teach science to students, children and lay public in a simple, easy and effective manner and the sole reason behind the establishment of VASCSC in 1966. Since then VASCSC team has been actively involved in carrying forward his dream. To teach science or mathematical concepts or explain the science behind any natural calamity to the community, the VASCSC team always makes an effort to convey its reason in a simplified manner.

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EFFORTS IMPACTING COVID MITIGATION

The efforts made by various agencies, apex bodies, domain institutions, and so on, which are working in the STI ecosystem towards meeting the requirements posed due to the pandemic are compiled here for the consumption and benefit of the general public. These efforts are presented here in terms of deliverables, outputs, technologies, products, services, etc., which are impactful and bring in STI elements in the activities and initiatives.

SECTION GUIDELINES

MoHFW releases revised guidelines for international arrivals

Revised clinical guidance for management of adult COVID-19 patients released jointly by ICME and AIIMS Delhi

NDMA in collaboration with TISS released a report on psychosocial support for individuals diagnosed with COVID-19

ICMR guides management of diabetes through tele-consultation during endemic

Success stories of community health workers providing maternal and child health services during COVID-19 pandemic

Revised comprehensive guidelines for management of COVID-19 in children and adolescents (below 18 years) released by MoHFW

ICMR reaches out to unreached regions through i-DRONE for delivery of vaccines and medical supplies

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

MoHFW releases revised guidelines for international arrivals

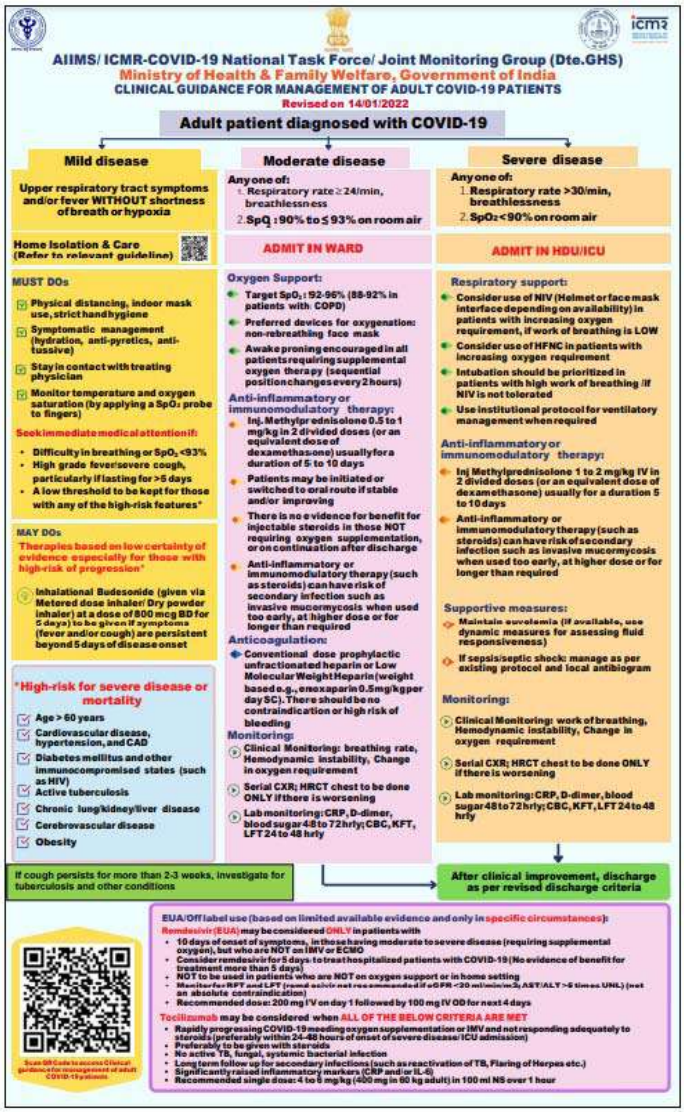
Ministry of Health and Family Welfare (MoHFW) has released guidelines for international arrivals in supersession of all guidelines issued on the subject on and after 20 January 2022. This document provides protocols to be complied by international travellers as well as those to be followed by airlines and all points of entry (airports, seaports and land border). This standard operating procedure is effective from 14 February 2022 till further orders. Based on the risk assessment, this document shall be reviewed from time to time.

Website link:

https://www.mohfw.gov.in/pdf/GuidelinesforInternationalarrivalsupdatedon10thFebruary2022.pdf

Revised clinical guidance for management of adult COVID-19 patients released jointly by ICME and AIIMS Delhi

All India Institute of Medical Sciences (AIIMS) and the Indian Council of Medical Research (ICMR) have jointly issued new guidelines for the treatment of COVID-19 patients depending on the severity of a case — mild, moderate, or severe. It explained in details the treatment



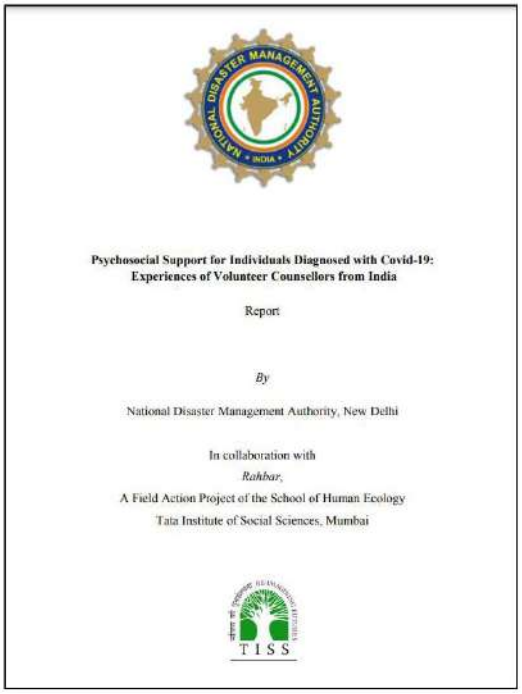
for mild, moderate and severe COVID-19 cases, which includes method of identification, recommendations, required oxygen support, use of medication or drugs, dos and don'ts, supportive measures and monitoring of health parameters, etc. Also mentioned specifically, if cough persists for more than 2-3 weeks, investigate for tuberculosis and other conditions.

Website link:

https://www.mohfw.gov.in/pdf/ClinicalGuidanceforManagementofAdultCovid19Patientsupdatedason17thJanuary2022.pdf

NDMA in collaboration with TISS released a report on psychosocial support for individuals diagnosed with COVID-19

The ongoing COVID-19 pandemic is a major health crisis, which has affected millions of people worldwide since its outbreak. The disruption caused by the pandemic, like the enormity of living in isolation, changes in daily life, job loss, financial hardship and grief over the death of loved ones has the capacity to affect the mental health and well-being of many. Stigma and discrimination against person(s) who have tested positive for COVID-19 is another major cause of distress, in addition to the already existing physical and mental health issues.


Psychosocial Support for Individuals Diagnosed with Covid-19:
Experiences of Volunteer Counsellors from India

Report

By

National Disaster Management Authority, New Delhi

In collaboration with

Rahbar,

A Field Action Project of the School of Human Ecology

Tata Institute of Social Sciences, Mumbai

TISS

National Disaster Management Authority (NDMA) collaborated with Tata Institute of Social Sciences (TISS) to provide training and supervision for the counsellors delivering their service to people diagnosed with COVID-19.

The present report provides a firsthand insight into the range of psychosocial concerns that people experienced during the pandemic, as conveyed to the counsellors. It aims to shed light on the reality of the immense emotional impact caused by the pandemic and the psychosocial interventions that have been implemented successfully. The outcomes of the report can generate a deep understanding about policy recommendations and strategies to tackle the mental health impact of disasters of this scale.

Website link:

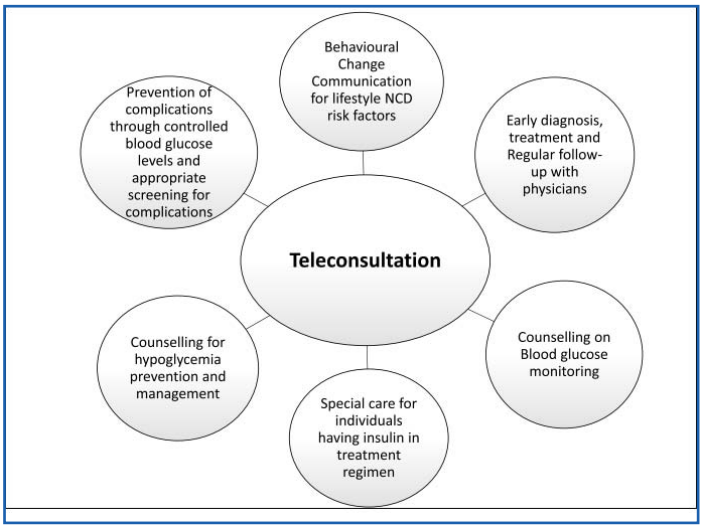
https://ndma.gov.in/sites/default/files/PDF/covid/Psychosocial-Support-for-Individuals-Diagnosed-with-Covid-19.pdf

ICMR guides management of diabetes through tele-consultation during endemic

Indian Council of Medical Research-National Centre of Disease Informatics and Research (ICMR-NCDIR), Bengaluru steered the development of a framework for telemedicine use in the management of cancer, diabetes, cardiovascular disease (CVD), and stroke in India,

which explains practices to be followed by primary healthcare providers in adopting and using telemedicine effectively for Non-Communicable Diseases (NCD) care.

The emergence of the COVID-19 pandemic has led to increased use of telemedicine in healthcare delivery. Telemedicine facilitates long-term clinical care for monitoring and prevention of complications of diabetes mellitus. In this, precise indications for teleconsultation, clinical care services, which can be provided, and good clinical practices to be followed during teleconsultation are explained. Guidance on risk assessment and health education for diabetes risk factors, counselling for blood glucose monitoring, treatment compliance, and prevention of complications are described. The guidelines will help physicians in adopting teleconsultation for the management of diabetes mellitus, facilitate access to diabetes care and improve health outcomes.



Uses of telemedicine in the management of diabetes mellitus

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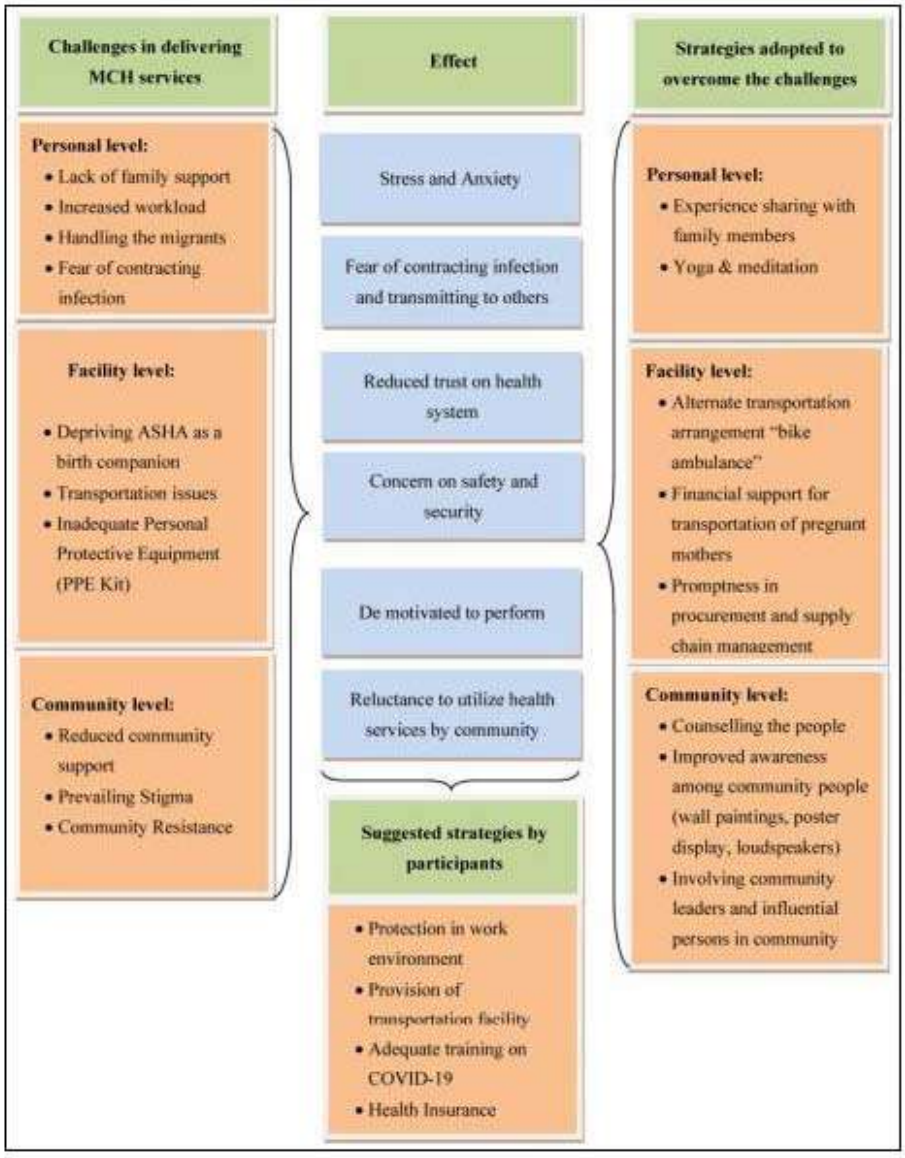
Website link:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8349457/pdf/main.pdf

Success stories of community health workers providing maternal and child health services during COVID-19 pandemic

Community health workers (CHW) faced increased challenges in delivering maternal and child health (MCH) services during the current COVID-19 pandemic. In addition to routine services, they were also engaged in pandemic management. In view of a dearth of evidence, the current study explores the challenges faced by CHWs while rendering maternal and child health services. A qualitative study through in-depth interviews (IDI) and focus group discussions (FGD) in six districts of Odisha were conducted from February to April 2021 by the researchers of ICMR-Regional Medical Research Centre, Bhubaneswar. Data were analysed using MAXQDA software. Personal-level challenges, like lack of family support, stress, and fear of contracting COVID-19; facility-level challenges, like transportation problems and inadequate personal protective measures; and community-level challenges, like stigma, resistance, and lack of community support were major hindrances in provisioning routine MCH services.

Prevailing myths and misconceptions concerning COVID-19 were factors behind the stigma and resistance. Sharing experiences with family, practicing yoga and pranayam, engaging ambulance bikes, financial assistance to mothers, counselling people, and involving community leaders were some effective strategies to address these challenges. Development and implementation of appropriate strategy guidelines for addressing the challenges of frontline warriors will improve their work performance and achieve uninterrupted MCH services during pandemics or similar health emergencies.



Conceptual framework depicting the challenges faced, their effect, and strategies adopted by CHWs

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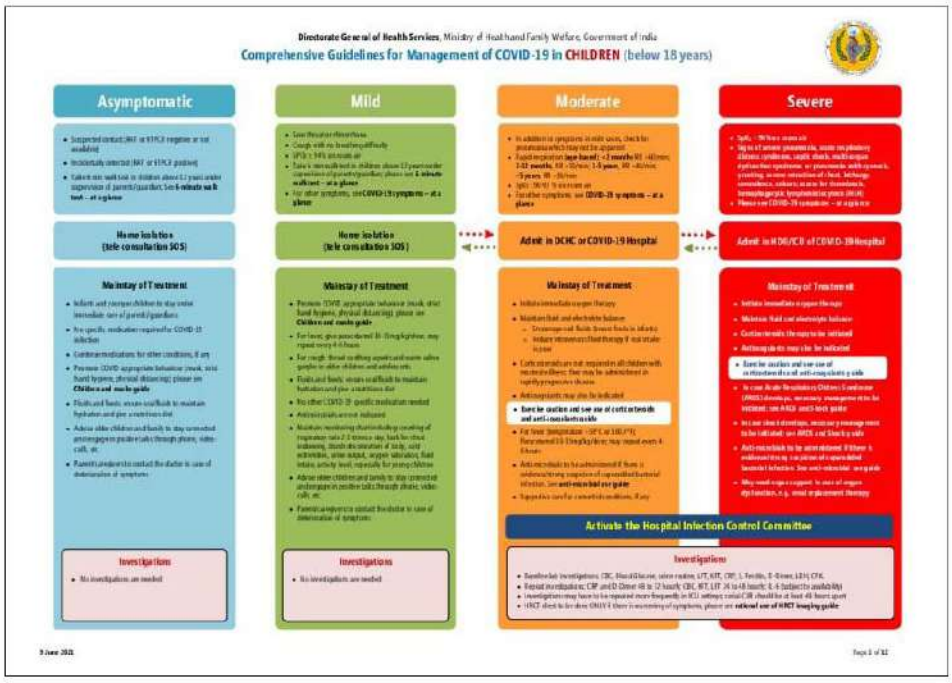
Website link:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8775981/pdf/healthcare-10-00088.pdf

Revised comprehensive guidelines for management of COVID-19 in children and adolescents (below 18 years) released by MoHFW

MoHFW, Government of India has reviewed the comprehensive guidelines for management of COVID-19 in children and adolescents (below 18 years) in view of the current surge mainly attributed to the Omicron variant of concern. The available data from other countries suggests that disease caused by the Omicron variant is less severe. However, there is a need for careful watch, as the current wave evolves. These guidelines are dynamic and will be reviewed and updated, on the availability of new evidence. In these revised guidelines, a new section on post-COVID-19 care has also been added, which was not included in the previously issued guidelines.



Website link:

https://www.mohfw.gov.in/pdf/RevisedComprehensiveGuidelinesforManagementofCOVID19inChildrenandAdolescentsbelow18years.pdf

ICMR reaches out to unreached regions through i-DRONE for delivery of vaccines and medical supplies

Project i-DRONE – ICMR's Drone Response and Outreach for North East – assessed the feasibility of using drones to deliver vaccines and medical supplies. This was carried out in difficult geographical terrains including land, island, foothills, and across the hills. Collaborations with the State Health Mission of Manipur and Nagaland were key to such assessment. All necessary regulatory approvals from the Ministry of Civil Aviation (MoCA), Directorate General of Civil Aviation (DGCA), Airport Authority of India (AAI), and the state health authorities of Nagaland and Manipur were obtained prior to implementation of this initiative. Eighty drone sorties were undertaken in three districts of Manipur namely Imphal West, Bishnupur, and Churachandpur, and two districts of Nagaland-Mokokchung and Tuensang. The aforementioned operations connected the district hospitals to the community and primary health care centres in the study districts.

The medical supplies delivered under i-Drone project included COVID-19 vaccines, vaccines used in routine immunisation programmes, antenatal care medicines, multi-vitamins, syringes, and gloves. The drone delivery system focussed on an end-to-end ecosystem for drone-based logistic transportation within the states and was the first successful example of delivering vaccines through drones from land to islands in South Asia. The longest drone flight under this project carried 3525 units of medical supplies from Mokokchung to the district Tuensang in Nagaland (approximately 40 km). A total of 17,275 units of medical supplies were delivered through drones in the states of Manipur and Nagaland.

Website link:

https://www.icmr.gov.in/idrone.html

ICMR invites Expression of Interest (EoI) 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 test (RAT) kits. Requirements for validations are based on various categories, like first-time validation, revalidation, and validation with alternate sample types. 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 for 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 health care settings and made available for mass testing.

Deadline: Open till next announcement

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Website link:

https://www.icmr.gov.in/pdf/tender/Revised_EOI_for_Ag_kit_validation_13082021.pdf

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RESEARCH SUPPORTS

The scientific approach has driven the ways the country is mitigating the pandemic. Here is an effort to sew up the significant contributions made by STI communities to humankind. The information is most suitable for the research fraternity, for whom the contact information is also provided to communicate further and up-skill the research.

SECTION GUIDELINES

Scientists develop a new technology platform to detect SARS-CoV-2 by fluorescence readout

Studies of IIT Delhi shows way to select a sustainable medical waste disposal firm during COVID-19 times

CSIR-CDRI scientists developed RT-PCR kit for Omicron detection

ICMR studies external quality assessment of COVID-19 real time reverse transcription PCR laboratories in India

IndiCoV – an Indian resource for genetic variants and annotations in COVID genomes

CSIR-CDRI scientists working on two combinations of COVID-19 drugs

Scientists develop self-disinfecting, biodegradable face masks to combat COVID-19

Persistence of antibodies against spike glycoprotein of SARS-CoV-2 in healthcare workers after taking both jabs of vaccine

Immunogenicity and safety of a heterologous prime-boost COVID-19 vaccine schedule: ChAdOx1 vaccine Covishield followed by BBV152 Covaxin

ICMR-NIV studies neutralisation of delta variant with sera of Covishield vaccines and COVID-19-recovered vaccinated individuals

Scientists develop a new technology platform to detect SARS-CoV-2 by fluorescence readout

A team of scientists has developed a new technology and platform for fluorometric detection of pathogens such as viruses by measuring fluorescent light emitted. The potential of the new technology has been demonstrated for the detection of SARS-CoV-2. This technology platform can also detect other DNA/RNA pathogens such as HIV, influenza, HCV, Zika, Ebola, bacteria, and other mutating/evolving pathogens.

Viruses are a major global threat to human health, and the ongoing Covid-19 pandemic caused by SARS-CoV-2 continues to inflict catastrophic effects on all aspects of our lives. The unprecedented transmission rate of the RNA virus has necessitated rapid and accurate diagnosis to facilitate contact tracing (prevent spreading) and to provide timely treatment.

Scientists from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of the Department of Science & Technology, Govt. of India, along with scientists from India Institute of Science (IISc), have demonstrated a noncanonical nucleic acid-based G-quadruplex (GQ) topology targeted reliable conformational polymorphism (GQ-RCP) platform to diagnose Covid-19 clinical samples. This work has been published recently in the journal 'ACS Sensors' and the team has also filed a patent for the novel technology.

The present work demonstrated the first GQ-targeted diagnostic platform for SARS-CoV-2 in clinical samples, based on a novel platform GQ-RCP. This molecular detection platform can be integrated into field-deployable isothermal amplification assays with more reliability and sequence specificity.

Website link:

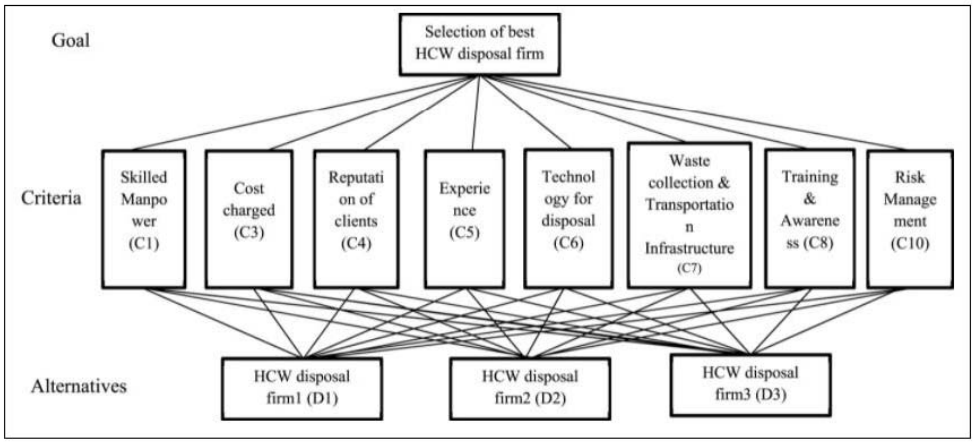
https://dst.gov.in/scientists-develop-new-technology-platform-detect-sars-cov-2-fluorescence-readout

Studies of IIT Delhi shows way to select a sustainable medical waste disposal firm during COVID-19 times

A study led by IIT Delhi professor Dr Surya Prakash Singh from the Department of Management Studies has thrown light on how hospitals can select a sustainable medical waste disposal firm. Hospitals, which often encounter difficulty in disposing of their medical waste in a hygienic and sustainable way, can utilise a decision support framework proposed in their study.

The research study shows a way to facilitate the hospitals with a real-time decision support framework considering numerous criteria and constraints for the selection of healthcare waste disposal firm(s).

In COVID-19 pandemic time, this resource becomes relevant due to the increasing amount of healthcare waste and its hazardous and infectious composition such as syringes, masks, PPE kits, face shields, scalpels, bandages, blooded cotton, heavy metals, chemicals, etc. The World Health Organization has also advocated considering these wastes different from other wastes such as non-hazardous municipal solid waste. The aim of this study is to propose a hybrid multi-criteria decision support framework integrated with a mathematical model to tackle the issue of the safe disposal of hazardous and infectious healthcare waste. The study shows a direction to the hospital management in selecting economically, socially, and environmentally sustainable healthcare waste disposal firms. Literature of the last 25 years has been carefully sifted through for leads in the identification of the selection criteria.



Website link:

https://home.iitd.ac.in/show.php?id=92&in_sections=Press

CSIR-CDRI scientists developed RT-PCR kit for Omicron detection

Scientists from CSIR-Central Drug Research Institute (CDRI) have developed an indigenous RT-PCR kit called Om, for testing the Omicron variant. The kit is meant to detect COVID-19 disease with Omicron variant and also make India self-reliant in RT-PCR diagnostics.

Currently, the detection of this variant depends upon tests like the S-gene dropout or by NGS (nextgen sequencing) of the whole viral genome. While the S-gene dropout method is not specific to pinpoint the type of variant, the NGS method has its limitations in terms of expense, turnaround, and the number of centres that can provide such service.

The team comprises Dr Atul Goel, Dr Ashish Arora, and Dr Niti Kumar at CSIR-CDRI. The indigenous RTPCR kit – INDICoV-OmTM – is one of the very few specific kits for detecting Omicron in the entire world.

INDICoV-OmTM enables quick and cost-effective detection of Omicron variant over genome sequencing for a large population. It was made within two months and will cost around Rs 150. Further, it will give the test results in around two hours. According to the scientists, it can also be aligned for the detection of other emerging variants of COVID-19 infection and other respiratory infections. Once the kit gets approval from the Indian Council of Medical Research (ICMR), it will be launched by mid-February. The kit has been referred to the ICMR-National Institute of Virology (NIV) and is yet to be validated.

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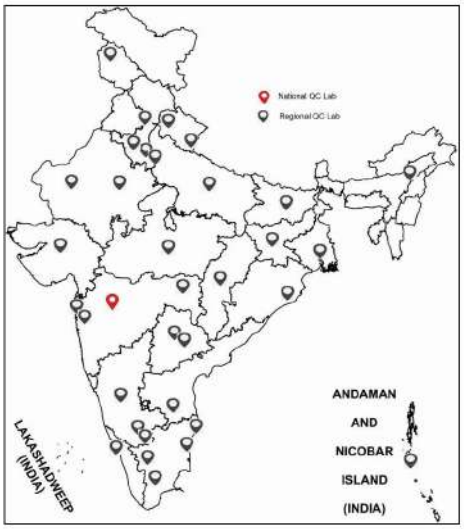
Website link:

https://www.csir.res.in/sites/default/files/21%20To%2025%20January%20%202022_0.pdf

ICMR studies external quality assessment of COVID-19 real time reverse transcription PCR laboratories in India



The sudden emergence and rapid spread of COVID-19 created an inevitable need to expand the COVID-19 laboratory testing network across the world. The strategy to test-track-treat was advocated for quick detection and containment of the disease. Being the second most populous country globally, India was challenged to make COVID-19 testing available and accessible in all parts of the country.

The molecular laboratory testing network was augmented expeditiously, and the number of laboratories was increased from one in January 2020 to 2951 till mid-September 2021. This rapid expansion warranted the need to have inbuilt systems of quality control/ quality assurance. In addition to the ongoing inter-laboratory quality control (ILQC), India implemented an External Quality Assurance Program (EQAP) with assistance from the World Health Organization (WHO) and Royal College of Pathologists, Australasia.

Out of the 953 open system rRTPCR laboratories in both the public and private sector who participated in the first round of EQAP, 891(93.4%) laboratories obtained a passing score of > = 80%. The satisfactory performance of Indian COVID-19 testing laboratories has boosted the confidence of the public and policymakers in the quality of testing. ILQC and EQAP need to continue to ensure adherence of the testing laboratories to the desired quality standards.

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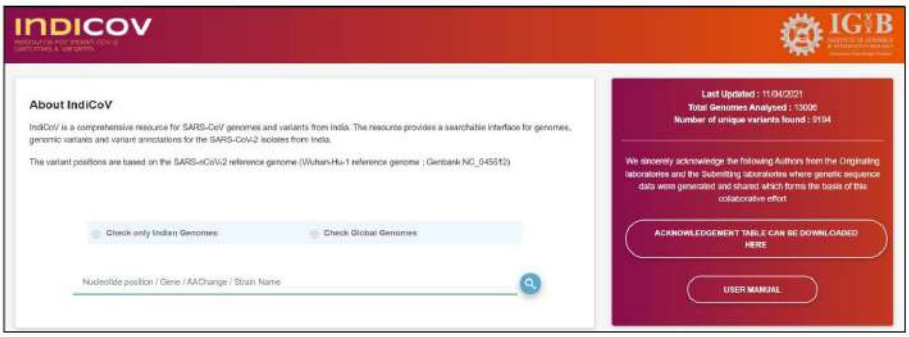
https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263736

IndiCoV – an Indian resource for genetic variants and annotations in COVID genomes

Viral genome sequencing turned out to be one of the approaches which helps in understanding the epidemiology of COVID-19 pandemic. Wuhan Hu 1 isolate (GenBank NC_045512), the earliest high quality viral genome sequence shared by researchers in China, is widely used as the reference template for comparing other global strains thus providing insights on the diversity and evolutionary transformation of the pathogen.

IndiCoV is a comprehensive resource for SARS-CoV genomes and variants from India. The resource provides a searchable interface for genomes, genomic variants and variant annotations for the SARS-CoV-2 isolates from India.

This website was developed by the Institute of Genomics and Integrative Biology (CSIR-IGIB). It would serve as beneficial to the scientific community in understanding the potential impact of the genetic variants carried by this pathogen. Immediate clinical implications include identifying the effect of these genetic variants in target sites of molecular diagnostic probes. Provision



of state-wise allele frequencies exposes the prevalence pattern of these variants across the nation. Information on Protein domains and Secondary structures would throw limelight on the functional impact and pathogenesis.

Website link:

https://clingen.igib.res.in/indicov/

CSIR-CDRI scientists working on two combinations of COVID-19 drugs

There may be another drug available for COVID-19 treatment in the future. After successful clinical trials of the antiviral drug, Umifenovir, for COVID treatment, scientists of CDRI are trying to develop another drug without any side-effects. A team of scientists led by chief scientist Ravishankar is working on two combinations to provide the safest medication to coronavirus patients.

The other combination is Umifenovir with Niclosamide. Niclosamide is known for its efficacy for COVID-19 treatment but the biggest challenge is that its high dosage is required for treatment and that leads to side effects. Research is on for a safe and efficacious combination of Umifenovir with Niclosamide and exact dosage in the combination that can give positive results, Ravishankar added.

Website link:

https://www.csir.res.in/sites/default/files/21%20To%2025%20January%20%20 2022_0.pdf

Scientists develop self-disinfecting, biodegradable face masks to combat COVID-19

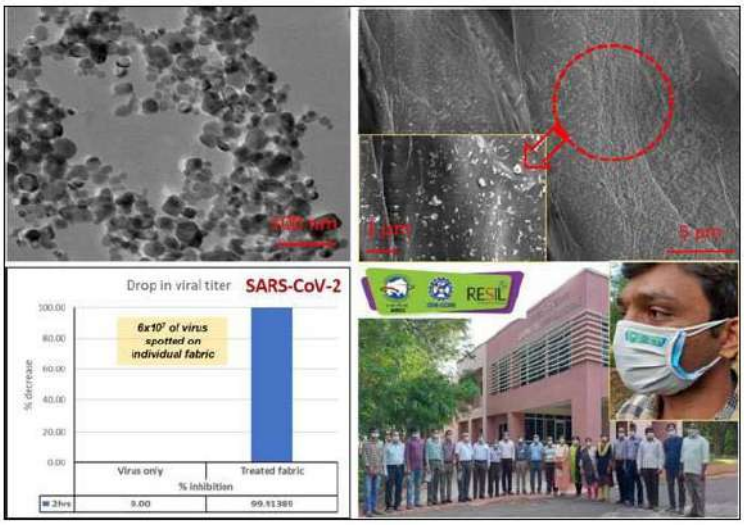
A team of Indian Scientists in collaboration with an industry partner have developed a self-disinfecting 'Copper-based Nanoparticle-coated Antiviral Face Mask to fight against the COVID-19 pandemic. The mask exhibits high performance against the COVID 19 virus as well as several other viral and bacterial infections, is biodegradable, highly breathable and washable.

Public mask wearing is most effective in reducing the spread of the virus COVID-19 caused by SARS-CoV-2, an enveloped positive sense single-stranded RNA virus, where the mode of transmission is via respiratory particles that are mainly airborne.

With the science around the use of masks to impede transmission is advancing rapidly, the Indian market is selling expensive masks that neither exhibit antiviral nor antibacterial properties. Hence, it is very difficult to control the transmission by wearing the conventional mask particularly in

densely populated places like hospitals, airports, stations, shopping malls and so on where the virus load is very high. In the present scenario, where mutations in coronavirus causing the COVID-19 pandemic are fast emerging, it is an urgent necessity to develop a low-cost antiviral mask.

To this end, Scientists at International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), an autonomous R&D Centre of Department of Science and Technology (DST), Govt. of India, in collaboration with the Centre for Cellular & Molecular Biology (CSIR-CCMB) and Resil Chemicals, a Bengaluru based company have developed the self-disinfecting 'Copper-based Nanoparticle-coated Antiviral Face Masks' under the DST sponsored Nano-Mission project, to fight against the COVID-19 pandemic.



(a) TEM image of the Cu based nano powders, (b) FE-SEM image of nanoparticle coated fabric, (c) Mask fabric exhibiting an efficacy >99.9% against SARS-CoV-2, and (d) Demonstration of the single layer self-disinfecting masks at ARCI

<CAP>Double Layer Antiviral (self-disinfecting) Cloth Masks

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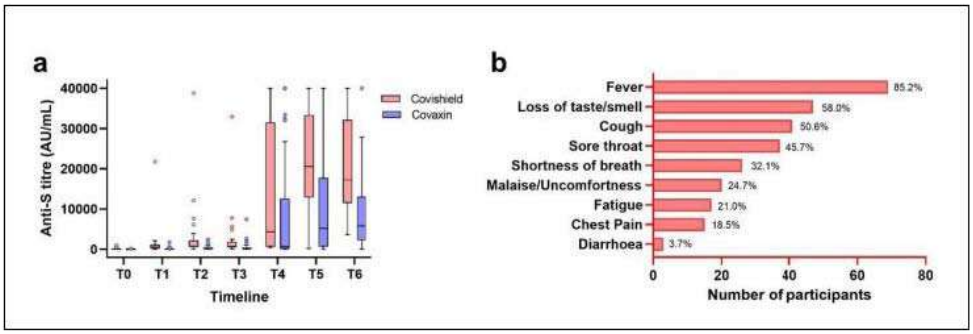
Website link:

https://dst.gov.in/scientists-develop-self-disinfecting-biodegradable-face-masks-combat-covid-19

https://pib.gov.in/PressReleasePage.aspx?PRID=1795413

Persistence of antibodies against spike glycoprotein of SARS-CoV-2 in healthcare workers after taking both jabs of vaccine

Vaccine rollout in India was initiated in mid-January, 2021 and is supposed to be the only antidote against SARS-CoV-2 as of now. In this study, the aim of ICMR-Regional Medical Research Centre, Bhubaneswar researchers is to study the dynamicity of vaccine-induced IgG antibodies against SARS-CoV-2. The present cross-sectional cohort study was undertaken to determine IgG antibody among healthcare workers with a completed dose of either Covaxin or Covishield and was followed for 24 weeks after the first dose of either vaccine to record the periodic changes in titer, concentration, clinical growth, and persistence of vaccine-induced SARS-CoV-2 antibodies. Serum samples were collected from 614 participants during each follow-up and tested in two CLIA-based platforms for testing SARS-CoV-2 antibodies, both qualitatively and quantitatively. Among these participants, 308 (50.2%) were Covishield recipients and the remaining 306 (49.8%) took Covaxin. A total of 81 breakthrough cases were recorded among the cohort participants for whom infection post-vaccination acted as a booster. The remaining 533 heathcare workers without any history of post-vaccination infection showed significant antibody waning either from T3 (Covaxin recipient) or T4 (Covishield recipient). The clinical implications of waning antibody levels post-vaccination are not well understood, and it remains crucial to establish S-antibody thresholds associated with protection against clinical outcomes.



<CAP>(a) Anti-S IgG antibody concentration for the vaccine recipient having breakthrough infection

(b) Symptomatic status of the breakthrough cases

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Website link:

https://assets.researchsquare.com/files/rs-888762/v1/df11e269-6508-4a59-b87a-101dce5bfd38.pdf?c=1631889305

Immunogenicity and safety of a heterologous prime-boost COVID-19 vaccine schedule: ChAdOx1 vaccine Covishield followed by BBV152 Covaxin

The evidence for effectiveness of heterologous priming of COVID-19 vaccine is very limited. Here, researchers from ICMR-National Institute of Virology (NIV), Pune studied 18 participants who received heterologous vaccination regimen of AstraZeneca's ChAdOx1-nCov-19 followed by inactivated whole virion BBV152. Heterologous group participant doesn't report any adverse event following immunisation and demonstrated high humoral and neutralising antibody response.

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https://www.icmr.gov.in/pdf/covid/papers/Web%20Page_211109_220444.pdf

ICMR-NIV studies neutralisation of delta variant with sera of Covishield vaccines and COVID-19-recovered vaccinated individuals

The second wave of the COVID-19 pandemic in India was dominated by the Delta variant, affecting millions of people, causing a serious public health crisis. Similarly, it spread rampantly and dominated over the Alpha variant in the UK and gained a foothold in over 92 countries. The worldwide endeavour of scientists to create a safe and effective COVID-19 vaccine has resulted in the availability of 18 vaccines, which have received emergency use authorisation. Currently, available vaccines appear to induce robust humoral and cellular immune responses against the SARS-CoV-2 spike protein. However, the newly emerged SARS-CoV-2 variants have led to breakthrough infections after completion of the vaccination regimen. Hence, it is crucial to evaluate the natural, vaccine-induced humoral immunity to SARS-CoV-2 and the phenomenon of breakthrough infection to understand the immune escape due to emerging VOCs. Covishield is a replication-deficient viral vector-based SARS-CoV-2 recombinant vaccine, which has been rolled out under the national COVID-19 vaccination programme in India. Lacobucci et al. demonstrated significant immune responses following the first dose and complete seroconversion in the subjects after the second dose of Covishield in a study conducted in England and Wales. As the Delta variant has important mutations in the spike region; it could pose a real challenge to the vaccines specifically developed targeting the spike gene.

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Website link:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8385819/pdf/taab119.pdf

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4

INDUSTRIAL COLLABORATIONS

The information related to contributions from industries, their timely pitching-in and joining the warfare against mitigating the COVID pandemic is provided here to sensitise the larger group of the community.

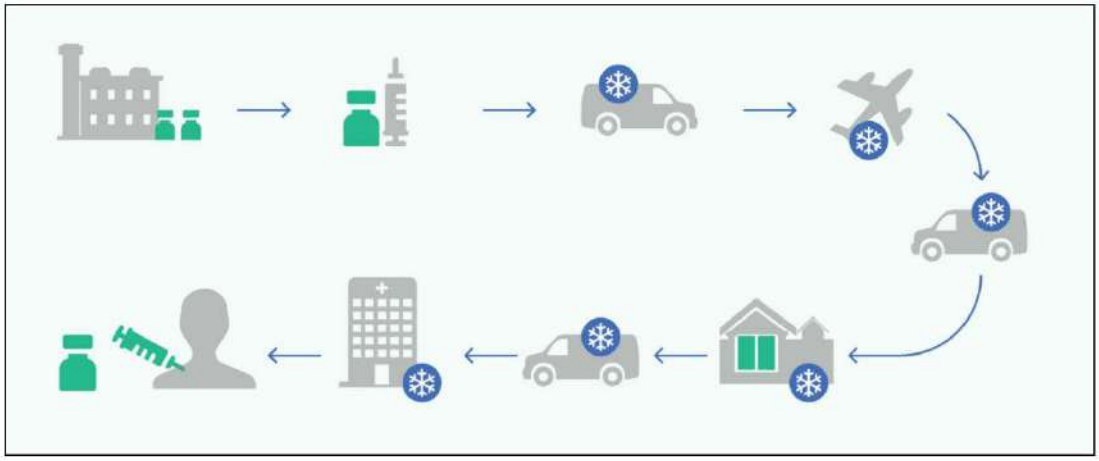
SECTION GUIDELINES

Award winning service by TagBox: Real-time cold chain monitoring solution delivery of COVID-19 vaccines

Award winning service by TagBox: Real-time cold chain monitoring solution delivery of COVID-19 vaccines

Bengaluru-based start-up, TagBox Solutions Private Limited is helping organisations control supply chain outcomes by solving problems like product quality and compliance, end to end traceability, and operational efficiency. TagBox's Boxlens platform combines IoT-based real-time sensing, ML-driven predictive insights, and AI-driven actions to resolve supply chain problems.

TagBox Solutions Private Limited has developed solutions for the last-mile delivery of COVID-19 vaccines, among other products. The distribution of vaccines is vulnerable to pilferage, and there are temperature compliance requirements as well. The TagBox sensor is attached to the vaccine shipment, and it's mapped with its TagSync app. The live status of the shipment is then viewed on the Boxlens platform. The solution comprising IoT devices like Tag360 temperature sensors and TagHub gateways, TagSync mobile app and the Boxlens software platform, will be helping to get end-to-end visibility of the storage and transit conditions of COVID-19 vaccine batches as they are moved across various cities in the country.



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Website link:

https://www.tagbox.co/covid-19-vaccine-monitoring/

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5

COVID RESOURCES AND OUTREACH

The efforts made by multiple agencies and institutions in compiling the information, releasing the knowledge products in print or digital form, and reaching out to multiple target audiences are gathered here for one point, ready-to-use evidence. These include resource books, newsletters, magazines, exclusive editions, and so on.

SECTION GUIDELINES

TISS and NDMA jointly reach out to COVID-19 patients by addressing gaps in training and supervision of the mental health

PGIMER reaches out to school children through a pictorial booklet for COVID-19 prevention

Outreach initiatives by India Science Channel

PGIMER brings forth an infographic booklet providing knowledge and education on post-COVID-19 complications

PGIMER and Panjab University releases a resource book to sensitise children and parents on COVID-19 vaccination

Press Information Bureau releases daily bulletin on COVID-19

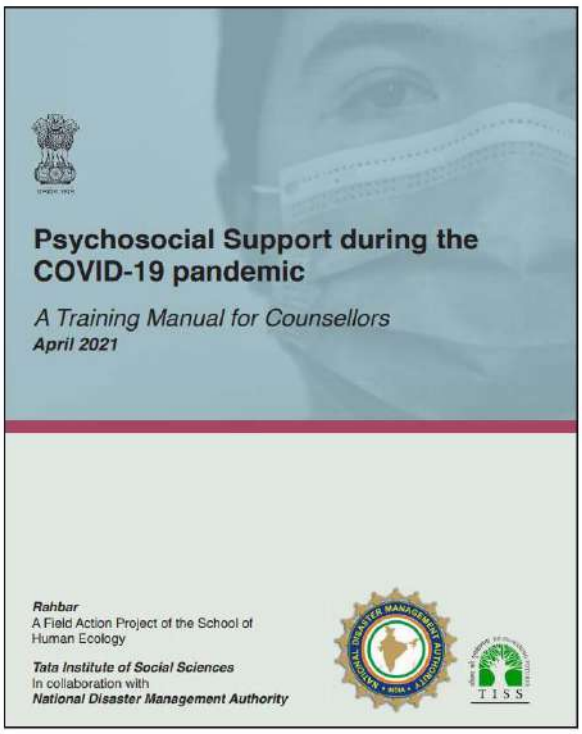
Government of India presents a regular COVID-19 India factsheet and immunisation programme

CSIR bulletin on COVID news and updates about the pandemic

Outreach initiatives through India Science, Technology and Innovation (ISTI) Web Portal

COVID-19: Science & Technology Efforts in India – An information resource on the pandemic

TISS and NDMA jointly reach out to COVID-19 patients by addressing gaps in training and supervision of the mental health



The ongoing COVID-19 pandemic is a major health crisis that has affected millions of people worldwide since its outbreak. The disruption caused by the pandemic has affected the mental health and well-being of many. The National Disaster Management Authority (NDMA) started a helpline initiative to offer basic psychosocial support to the people who were diagnosed with COVID-19 through telephonic counselling to be carried out by qualified and experienced counsellors.

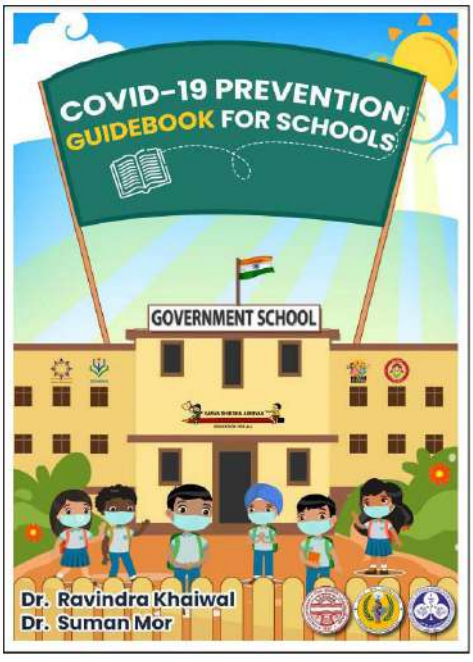
NDMA collaborated with 'Rahbar' of TISS to provide training and supervision for the counsellors delivering their service to people diagnosed with COVID-19.

This manual is for counsellors with basic training in mental health counselling, who are currently working in India to address psychosocial concerns during the COVID-19 pandemic. This is a complete manual in itself designed to be used by practitioners who can read English and it does not need access to any other resources or in-person training.

Website link:

https://ndma.gov.in/sites/default/files/PDF/covid/RAHBAR_%20NDMA-manual.pdf

PGIMER reaches out to school children through a pictorial booklet for COVID-19 prevention



The health of the children is the reflection of the future. Education is essential for the overall growth and development of every child. The future of the country depends on their development and education plays a vital role in the process of development.

School plays an important role in nation-building. The online education platforms are not that effective as during online classes, many other aspects get missed, which affects the overall development of the child.

Most underprivileged students were deprived of online classes as they could not afford a mobile

phone with a good internet connection. To avoid this situation, reopening schools is a must. The school closures exposed socio-economic and educational inequality and exacerbated it as online education platforms relied heavily on family support and resources available both at home and at school. Physical classes are a necessity to ensure equitable opportunities for students.

The booklet has been written and designed by Dr Suman Mor from Panjab University, Chandigarh and Dr Ravindra Khaiwal from the Post Graduate Institute of Medical Education & Research, Chandigarh. The booklet provides essential information about COVID-19, its mode of transmission and symptoms, including step by step measures to be taken by students, parents, teachers and school authorities.

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Website link:

https://www.care4cleanair.com/_files/ugd/bce95d_25bc1dfde1b1422bb3d73ddbc39ee55f.pdf

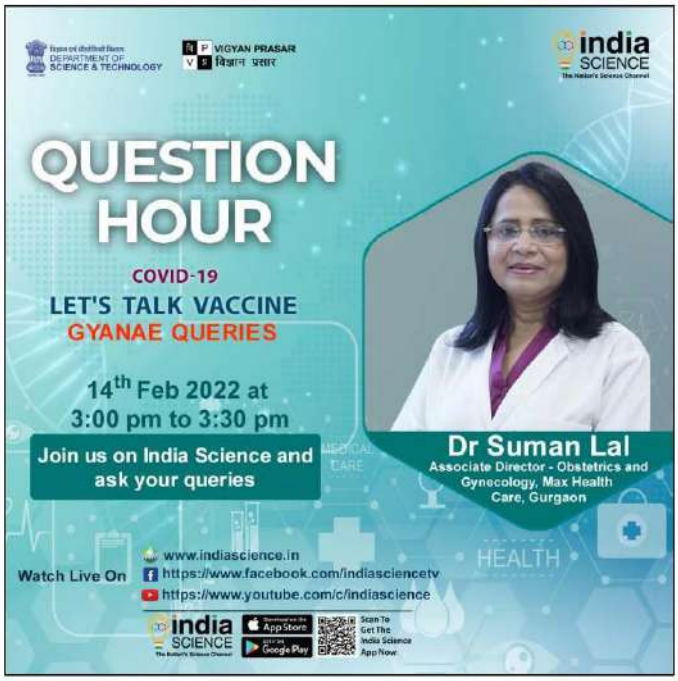
Outreach initiatives by India Science Channel

India Science is an Internet-based Over-The-Top (OTT) science TV channel. An initiative of the Department of Science and Technology (DST), Government of India, it is implemented and managed by VigyanPrasar (VP), an autonomous organisation of the DST. 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:



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 telecast 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.

India Science started 'Corona Ko Harana Hai' from April 2021. In this programme, India Science team conduct interviews on COVID-19-related different issues with top medical professionals of the country. 6. India Science makes infographics on COVID-19-related different issues regularly.

COVID-19 vaccine: Fact File also telecast every Saturday from India Science.

Produced COVID-19 related videos in Self Reliant series.

Special interview telecast with Secretary, DBT on COVID-19 related work done by DBT.

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Website link:

https://www.indiascience.in/

PGIMER brings forth an infographic booklet providing knowledge and education on post-COVID-19 complications

COVID-19 has had a profound impact on many elements of human existence and society around the world. COVID-19 is an aggressive disease and has affected India, too. In comparison to the first wave, the second wave moved at a rapid pace. The Government of India had taken several steps to restrict the spread of coronavirus and to create awareness. Once recovered, patients are still at risk of complications such as lung disease, heart disease, mental health issues, etc. Adverse events that occur after the COVID-19 recovery may have long-term consequences.

For preventing and managing post-COVID-19 complications, there is a need to develop a comprehensive plan to mitigate patient's clinical, economic and public health repercussions, as well as to provide support to individuals who suffer from delayed morbidity and impairment. In India, major initiatives for post-COVID-19 care have been taken for the patients who recovered from COVID-19 but later developed post-COVID-19 symptoms. These post-COVID-19 care centres provide facilities like medicines, meditation and yoga sessions (to boost their mental health) to COVID-19 recovered patients.

The infographic booklet aims to make people aware by providing knowledge and education regarding post-COVID-19 complications and their management. Its purpose is to make people more aware of their health and to encourage them to eat a nutritious diet even after they have recovered from COVID-19. This booklet provides comprehensive information on post-COVID-19 symptoms and their management at post-COVID-19 care centres.

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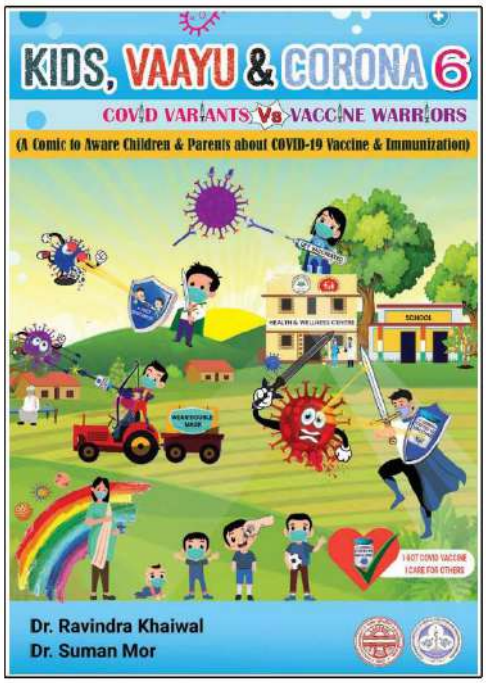
Website link:

https://www.care4cleanair.com/_files/ugd/bce95d_addb0f0a1e2d462880dd074617df86d2.pdf

PGIMER and Panjab University releases a resource book to sensitise children and parents on COVID-19 vaccination

There is growing concern and perceived threat about coronavirus, its variants and vaccines among the general public. The people use available media such as newspapers, social media, and television for news updates on the same. Now, there is a discussion about the COVID-19 variants and possible impact on children including the vaccine for children. This could make children worried as they don't have authentic information. Children are also using the internet

for information, but information overload may misguide them. The parents should talk to them and resolve their queries, so that they do not panic. PGIMER Chandigarh, and Panjab University, Chandigarh, have come out with a six-part comic called Kids, Vaayu & Corona to help them understand.



COVID-19 vaccines are safely being administered to the adult population after rigorous human trials and regulatory procedures. Some countries have also approved COVID-19 vaccine for children. In India, vaccine trials are under process. This comic is an effort to guide them scientifically about the vaccines, clear their doubts and concern.

The comic has been created to educate them about the COVID-19 vaccine for children, including routine immunisation, which saves millions of lives every year. Children are our heroes as they follow COVID-19 appropriate behaviour. They can better guide and convince their family and parents about the vaccines to enhance their acceptance for the prevention and control of COVID-19 disease.

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Website link:

https://www.care4cleanair.com/_files/ugd/bce95d_cb2b7297c8c049f58ca5b1d5c3f8f6f8.pdf

Press Information Bureau releases daily bulletin on COVID-19

Press Information Bureau (PIB), Government of India releases a daily bulletin on COVID-19, starting from the early days of its outbreak. The bulletin contains press releases concerning

174.64 cr vaccine doses have been administered so far under Nationwide Vaccination Drive
India's Active caseload currently stands at 2,92,092
Active cases stand at 0.68%
Recovery Rate currently at 98.12%
66,254 recoveries in the last 24 hours increases Total Recoveries to 4,19,77,238
25,920 new cases recorded in the last 24 hours
Daily positivity rate (2.07%)
Weekly Positivity Rate (2.76%)
75.68 cr Total Tests conducted so far; 12,54,893 tests conducted in the last 24 hours

COVID-19, issued in the last 24 hours, inputs from PIB field offices, and fact checks undertaken by PIB. These bulletins are published in 14 languages: Hindi, English, Urdu, Marathi, Telugu, Tamil, Punjabi, Bangla, Kannada, Oriya, Gujarati, Assamese, Malayalam and Manipuri. The following data points were released on 18 February 2022.

Website link:

https://pib.gov.in/PressReleasePage.aspx?PRID=1799317

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

Government of India has provided, through the free-of-cost category and direct-state procurement category, more than 175 crore vaccine doses (1,75,03,86,834) to States/ UTs.

India's coronavirus cases have crossed four crores, and as of 19 February 2022, 08:00 AM, it stands at 4,28,02,505 cases, of which 4,20,37,536 have recovered. The recovery rate stands at 98.21 per cent while the case fatality rate has been pegged at 1.19 per cent.

Website link:

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

CSIR bulletin on COVID news and updates about the pandemic

CSIR was at the forefront of the battle against COVID-19 pandemic. It also put in place measures to counter the infodemic. CSIR-In-Media is a weekly newsletter published by CSIR magazine that showcases the institute's significant research contributions.

Website link:

https://www.csir.res.in/news-bulletin

Outreach initiatives through 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 vision is to provide a single-window source of information on a web portal about all data related to the Indian STI ecosystem by aggregating data on scientific inputs and outputs, bringing stakeholders together and disseminating science, technology and innovation content. 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 significant achievements. The ISTI web portal has been developed by Vigyan Prasar, an autonomous organisation of the DST.

In the critical times of the COVID-19 outbreak, 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 the Government of India and a string of institutions

spread across the country. 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, from presenting symptoms to vaccine science, distribution strategy, and preventive measures initiated for envisaged future waves. It contains content on fact-checks and myth-busters in the question and answer format, contributions from the research fraternity, start-up spotlights, industry collaborations, communications and resources, reaching out to society and so on. A dedicated focus has been given to exhibiting funding opportunities catering to the second wave of the COVID-19 pandemic.

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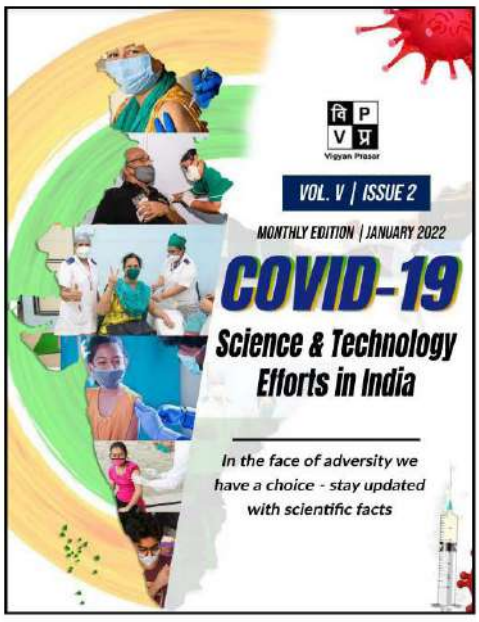
Website link:

https://www.indiascienceandtechnology.gov.in/

COVID-19: Science & Technology Efforts in India – An information resource on the pandemic

Effective communication is in its own right a non-pharmaceutical intervention for any epidemic that can increase adherence to protective behaviours necessary to mitigate its spread. There is no 'best practice' for communication during a complex public health emergency, but past experiences have led to several principles that contribute to a successful strategy. India is fighting the second wave of the COVID pandemic with a lot of resilience and grit. A very encouraging and precise trend is now visible as the positivity rate is declining rapidly. In 2020, India dealt with the first wave of the COVID-19 pandemic with collective measures, scientific approaches, and awareness. The intelligent use of technology and well-planned resource allocation to tackle the new wave of the pandemic has been dealt with at a war footing. The newsletter – COVID-19: Science & Technology Efforts in India – is being compiled to inform our readers and strengthen the usefulness of any published information.



To bridge the gap between scientific contributions, leadership and administrative efforts, and the general public's perspective, Vigyan Prasar is continuously reaching out to its audiences by way of a regular e-newsletter, taking its mandate of science communication, popularisation and extension to the next level. Our effort is firmly based on the fact that "Science gathers knowledge faster than society gathers wisdom." The steady increase in the number of recoveries and the significant and continuous decrease in positivity rate provide us with the much-needed assurance that this may be the outcome of improving the health infrastructure and making health the cornerstone at the policy level. The e-Newsletter aims to be a handy guide to scientists, researchers, and scholars, especially those interested.

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https://www.indiascienceandtechnology.gov.in/covid-19-the-pandemic/newsletter-archive

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6

COVID FACT-CHECKS

This section attempts to answer frequently asked questions (FAQs) on various aspects of the COVID-19 disease, variants and mutants, associated illnesses and diseases, riding the second wave, assumptions on future waves, and, subsequently, busting the myths spread in the society.

SECTION GUIDELINES

1. COVID-19 & Cancer
2. COVID-19: OMICRON Variant
3. SARS-CoV-2 surveillance in India
4. COVID-19: Delta and Delta Plus variants
5. COVID-19 vaccination for pregnant women
6. COVID-19 & Children
7. COVID-19 and White Fungus infection
8. COVID-19 & Use of oxygen
9. COVID-19 & Therapeutics
10. COVID-19 & Black Fungus Disease
11. COVID-19 & Indoor Air

1. COVID-19 & Cancer

Q. Should patients with cancer receive the COVID-19 vaccine?

A. The data on efficacy and safety of COVID-19 vaccination in patients with cancer is limited. However, as patients with cancer are more prone to contract a severe form of illness due to COVID-19 infection, the benefits of getting vaccinated are more than the risks.

Q. Should people who have completed their treatment for cancer receive the COVID-19 vaccine?

A. Patients who have completed their treatment for cancer should receive the COVID-19 vaccine as soon as it is available to them as long as there are no major allergies.

Q. What does it mean to be immune-compromised?

A. 'Immune compromised' refers to individuals whose immune system is considered weaker, more impaired, or less robust than that of the average healthy adult. The primary role of the immune system is to help fight off infection. Individuals with compromised immune systems are at a higher risk of getting infections, including viral infections such as COVID-19. There are many reasons that a person might be immune-compromised. Health conditions such as cancer, diabetes, or heart disease, older age, or lifestyle choices such as smoking can all contribute to weakened immune systems.

Q. Does receiving chemotherapy or radiation raise your risk of getting COVID-19 or having a more serious course of illness?

A. To date, limited evidence is available to suggest that any cancer treatment raises your risk for getting COVID-19 any more or less than anyone else who is exposed to the virus. There is some evidence that patients with cancer may experience more serious COVID-19 infection if they acquire it, more so because cancer and cancer treatment can contribute to weakened immune systems, which can then lead to a reduced ability to fight off infections. It is not clear at this point if cancer patients who have received chemotherapy or radiation in the past are at increased risk for COVID-19. The risk of infection may depend, in part, on the specific treatment received, the type of cancer treated, and how much time has passed since the treatment was completed.

Q. Should people who are on cancer-directed therapy receive the COVID-19 vaccine?

A. Patients who are on cancer-directed therapy can receive the vaccine after discussing it with their treating oncologist. The oncologist will suggest a suitable time based on the ongoing therapy (surgery, radiation, chemotherapy, immunotherapy, or stem cell transplant). Please inform the treating oncologist if you have had any drug allergies in the past.

Q. Which COVID-19 vaccine is the best for patients with cancer?

A. All the approved vaccines have been shown to be effective. There are no direct comparisons between the available vaccines for efficacy or safety. Therefore, it is suggested that you take any vaccine approved for use and available in your vaccination centre.

Q. Is there any contraindication for the COVID-19 vaccine in patients with cancer?

A. Patients who are allergic to polyethylene glycol (PEG) should not receive the COVID-19 vaccine. Individuals with a known history of polysorbate-80 allergy (used as excipient in certain chemotherapeutic drugs) should not receive COVID-19 vaccine.

Q. Should patients with a previous history of COVID-19 infection be vaccinated?

A. Yes, cancer patients who had been infected and recovered from the illness should also receive the COVID-19 vaccine as it will protect from re-infection.

Q. Should the vaccine be given to patients with positive COVID-19 antibodies?

A. The COVID-19 vaccine should be given to all patients with cancer irrespective of their antibody status. Serological testing should not be used to guide the decision and timing of vaccination.

Q. What are the side effects that may occur after the COVID-19 vaccine?

A. You may expect some minor side effects like soreness of the shoulder (injection site) for a few days after the vaccination. Also, you may have mild fever, tiredness for a day or two after the injection. Serious side effects are extremely rare, but we advise you to consult your doctor in case of any troublesome symptoms.

2. COVID-19: OMICRON Variant

Q. What is Omicron and why is it a Variant of Concern (VoC)?

A. This new variant of SARS-CoV-2, named B.1.1.529 or Omicron (based on Greek alphabets such as alpha, beta, delta, etc.) has recently been reported in South Africa. There are a large number of mutations in this variant, especially more than 30 in the viral spike protein, which is the major target for immune responses. The World Health Organization has declared Omicron as a Variant of Concern (VoC) because of the combination of mutations that previously individually have been associated with increased infectivity or immune evasion, and the sudden rise in number of positive cases in South Africa.

Q. Why is it called Omicron?

A. The WHO named the B.1.1.529 variant Omicron in the tradition of giving variants a Greek letter name.

Q. How easily does Omicron spread?

A. The Omicron variant is more likely to spread than the original SARS-CoV-2 virus. How quickly Omicron spreads, compared to Delta, is unknown. The CDC expects that anyone infected with

Omicron will be able to spread the virus to others, even if they have been vaccinated or do not have symptoms.

Q. Can the currently used diagnostics methods, detect Omicron?

A. The RT-PCR method is the most widely accepted and used diagnostic method for SARS-CoV-2 variant. To confirm the presence of the virus, this method detects specific genes in the virus, such as Spike (S), Enveloped (E), and Nucleocapsid (N), among others. However, because the S gene in Omicron is heavily mutated, some of the primers may produce results indicating the absence of the S gene (called S gene drop out). This specific S gene dropout, along with the detection of other viral genes, could be used as an Omicron diagnostic feature. However, genomic sequencing is required for the final confirmation of the Omicron variant.

Q. Should we be concerned about the new VoC?

A. It is important to note that Omicron has been declared as a VoC based on the observed mutations, their predicted characteristics of increased transmission and immune evasion, and preliminary evidence of a negative change in COVID-19 epidemiology, such as increased re-infections. The definitive proof of increased remission and immune evasion is still awaited.

Q. Will Omicron cause more severe illness?

A. More research is needed to determine whether Omicron infections, particularly re-infections and breakthrough infections in fully vaccinated people, cause more severe illness or death than infection with other variants.

Q. What precautions should we take?

A. Individuals can reduce the spread of the COVID-19 virus by keeping a physical distance of at least 1 metre from others, wearing a well-fitting mask, opening windows to improve ventilation, avoiding poorly ventilated or crowded spaces, keeping hands clean, coughing or sneezing into a bent elbow or tissue, and getting vaccinated when their turn comes.

Q. Will there be a third wave?

A. Cases of Omicron are increasingly being reported from countries outside of South Africa, and given its characteristics, it is likely to spread to more countries, including India. However, the magnitude and extent of the increase in cases and, more importantly, the severity of the disease that will be caused, are still unclear. In addition, given the rapid pace of vaccination in India and the high exposure to the delta variant as evidenced by the high seropositivity, the severity of the disease is expected to be low. However, the scientific evidence is still evolving.

Q. Will the existing vaccines be effective against Omicron?

A. Although there is no evidence to suggest that existing vaccines do not work on Omicron, some of the mutations reported in the Spike gene may reduce the effectiveness of existing vaccines. However, vaccine protection also involves antibodies and cellular immunity, which should be relatively better preserved. Therefore, vaccines are always expected to provide protection against serious disease, and vaccination with available vaccines is crucial. If you are eligible, but not vaccinated, you must be vaccinated.

Q. Why do variants occur?

A. Variants are an integral part of evolution and as long as the virus is able to infect, replicate, and transmit, they will continue to evolve. Also, not all variants are dangerous and most of the time we don't notice them. It is only when they are more contagious, or can re-infect people, etc., that they gain importance. The most important step in avoiding the generation of variants is to reduce the number of infections.

Q. Is the Omicron transmission capacity higher than that for the COVID-19 Delta variant?

A. The Omicron version has raised alarm amongst epidemiologists who're involved that the mutations within the new version ought to make it greater transmissible than the preceding variants. Further researches are being conducted to decide whether or not the Omicron version is greater transmissible than different variants, which includes the Delta version. The variety of checks for COVID-19 has been regularly growing across the world. Another extreme subject is that the Omicron version has already been detected in numerous countries, which includes Japan, Belgium, Botswana, Hong Kong, Australia, the Netherlands, South Africa, and Israel.

In addition to increasing the variety of COVID-19 checks, epigenetic researchers are urgently trying to make clear any hard elements related to the COVID-19 Omicron version. It is uncertain whether or not the Omicron version will increase COVID-19 severity. However initial researches have pronounced that the Omicron version elevated hospitalisation for COVID-19 sufferers in South Africa, which may be associated with COVID-19 complications. In addition, it remains uncertain as to whether or not the Omicron version might also additionally sell different variants, which includes the Delta version, thereby suggesting that in addition research might be wanted for complete clarification.

Q. Is there any impact of the Omicron variant on the COVID-19 severity in cancer patients?

A. Previous studies have stated that the Delta variant or other variants can sometimes increase the severity of COVID-19 in cancer patients. COVID-19 has been reported to promote cell senescence and oxidative stress, which is linked to complications of COVID-19 in cancer patients. Additionally, various studies have reported that COVID-19 can cause increased cytokine secretion, which is linked to the aggressiveness of COVID-19. However, more studies are needed to better understand the impact of the Omicron variant in cancer patients.

Q. Is the Omicron variant having an effect on monoclonal antibody treatments?

A. There is currently no virus-specific data available to determine whether monoclonal antibody treatments will continue to be effective against the Omicron variant. Based on data from other variants with significantly fewer changes in the RBD, the Omicron variant is expected to remain susceptible to some monoclonal antibody treatments, while others may be less effective.

Q. How is India responding?

A. The Indian government is monitoring the situation closely and issuing appropriate guidelines from time to time. Meanwhile, the scientific and medical community is prepared for the development and implementation of diagnostics, genomic surveillance, generation of evidence on viral and epidemiological characteristics, and development of therapies.

3. SARS-CoV-2 surveillance in India

Q. What is INSACOG?

A. The Indian SARS-CoV-2 Genomics Consortium (INSACOG) is a national multi-agency consortium of Regional Genome Sequencing Laboratories (RGSLs) established by the Government of India on 30th December 2020. Initially, this consortium had 10 laboratories. Subsequently, the scope of laboratories under INSACOG was expanded and at present there are 28 laboratories under this consortium, which monitor the genomic variations in SARS-CoV-2.

Q. What is the objective of INSACOG?

A. The SARS-CoV-2 virus, commonly known as COVID-19 virus, posed unprecedented public health challenges globally. To fully understand the spread and evolution of this virus, its mutations and resulting variants, the need for in-depth sequencing and analysis of the genomic data was felt. Against this backdrop, INSACOG was established to expand whole genome sequencing of SARS-CoV-2 virus across the nation, aiding understanding of how the virus spreads and evolves. Any changes to the genetic code, or mutations in the virus, can be observed based on the analysis and sequencing of samples done in the laboratories under INSACOG. INSACOG has the following specific objectives:

- To ascertain the status of variants of interest (VoI) and variants of concern (VoC) in the country
- To establish sentinel surveillance and surge surveillance mechanisms for early detection of genomic variants and assist in formulating effective public health response
- To determine the presence of genomic variants in samples collected during super-spreader events and in areas reporting increasing trend of cases/deaths, etc.

Q. When did India start SARS-CoV-2 viral sequencing?

A. India started sequencing SARS-CoV-2 viral sequencing of genomes in 2020. Initially, National Institute of Virology (NIV) and Indian Councilof Medical Research (ICMR) sequenced samples of international passengers who arrived in India from the UK, Brazil or South Africa or transited through these countries, which reported a sudden surge in cases. RTPCR positive samples from states reporting sudden surges in cases were sequenced on priority. This was further expanded through the efforts of Council of Scientific and Industrial Research (CSIR), Department of Biotechnology (DBT) and National Centre for Disease Control (NCDC), as well as individual institutions.

The initial focus of India was on restricting the spread of global variants of concern in the country – Alpha (B.1.1.7), Beta (B.1.351) and Gamma (P.1) – which had high transmissibility. The entry of these variants was carefully tracked by INSACOG. Subsequently, the Delta and Delta Plus variants were also identified based on whole genome sequencing analysis conducted in the INSACOG laboratories.

Q. What is the strategy for SARS-CoV-2 surveillance in India?

A. Initially, genomic surveillance was focused on the variants carried by international travellers and their contacts in the community through sequencing three to five per cent of the total RTPCR positive samples.

Subsequently, the sentinel surveillance strategy was also communicated to the States/UTs in April 2021. Under this strategy, multiple sentinel sites are identified to adequately represent the

geographic spread of a region, and RT-PCR positive samples are sent from each sentinel site for whole genome sequencing. Detailed Standard Operating Procedures (SOPs) for sending samples from the identified sentinel sites regularly to the designated RGSLs were shared with States/UTs. The list of INSACOG RGSLs tagged to States was also communicated to the States. A dedicated nodal officer was also designated by all States/UTs for coordinating the activity of whole genome sequencing.

1. Sentinel Surveillance (for all States/UTs/): This is an ongoing surveillance activity across India. Each State/UT has identified sentinel sites (including RT-PCR labs and tertiary health care facilities) from where RT-PCR positive samples are sent for whole genome sequencing.
2. Surge Surveillance (for districts with COVID-19 clusters or those reporting a surge in cases): A representative number of samples (as per the sampling strategy finalised by a state surveillance officer/central surveillance unit) are collected from the districts, which show a surge in the number of cases and are sent to RGSLs.

Q. What is the standard operating procedure (SOP) for sending samples to INSACOG laboratories?

A. The SOPs for sending samples to INSACOG laboratories and subsequent action based on genome sequencing analysis are as follows:

1. The Integrated Disease Surveillance Project (IDSP) machinery coordinates sample collection and transportation from the districts/sentinel sites to RGSLs. The RGSLs are responsible for genome sequencing and identification of VoCs/VoIs, potential VoIs, and other mutations. Information on VOCs/ VOIs is submitted to the Central Surveillance Unit, IDSP, to establish clinico-epidemiological correlation in coordination with state surveillance officers.
2. Based on discussions in the Scientific and Clinical Advisory Group (SCAG) established to support the INSACOG, it was decided that upon identification of a genomic mutation, which could be of public health relevance, RGSL will submit the same to SCAG. SCAG discusses the potential VoIs and other mutations and, if felt appropriate, recommends to the Central Surveillance Unit for further investigation.
3. The genome sequencing analysis and clinico-epidemiological correlation established by IDSP is shared with MOH&FW, ICMR, DBT, CSIR and States/UTs for formulating and implementing requisite public health measures.
4. The new mutations/VoCs are cultured, and genomic studies are undertaken to see the impact on vaccine efficacy and immune escape properties.

Source:

https://dbtindia.gov.in/pressrelease/qa-indian-sars-cov-2-genomics-consortium-insacog

4. COVID-19: Delta and Delta Plus variants

Q. Why are frequent mutations seen in SARS-CoV-2 virus? When will the mutations stop?

A. SARS-CoV-2 can mutate due to the following reasons:

- Random error during replication of virus

- Immune pressure faced by the viruses after treatments such as convalescent plasma, vaccination or monoclonal antibodies (antibodies produced by a single clone of cells with identical antibody molecules)
- Uninterrupted transmission due to lack of COVID appropriate behaviour. Here the virus finds an excellent host to grow and becomes more fit and transmissible.

The virus will continue to mutate as long as the pandemic remains. This makes it all the more crucial to follow COVID appropriate behaviour.

Q. What are variants of interest (VoIs) and variants of concern (VoCs)?

A. When mutations happen – if there is any previous association with any other similar variant, which is felt to have an impact on public health – then it becomes a variant under investigation (VuI).

Once genetic markers are identified, which can have an association with a receptor binding domain or which have an implication on antibodies or neutralising assays, we call them variants of interest (VoIs).

The moment we get evidence for increased transmission through field-site and clinical correlations, it becomes a variant of concern (VoC). VoCs are those that have one or more of the following characteristics:

- Increased transmissibility
- Change in virulence/disease presentation
- Evading diagnostics, drugs and vaccines

The first VoC was announced by the UK where it was found. Currently there are four VoCs identified by the scientists – Alpha, Beta, Gamma and Delta.

Q. What are Delta and Delta Plus variants?

A. These are the names given to variants of SARS-CoV-2 virus, based on the mutations found in them. The World Health Organization (WHO) has recommended using letters of the Greek Alphabet, i.e., Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1), Delta (B.1.617), etc., to denote variants, for easier public understanding.

Delta variant, also known as SARS-CoV-2 B.1.617, has about 15-17 mutations. It was first reported in October 2020. More than 60 per cent of cases in Maharashtra in February 2021 pertained to Delta variants.

It is the Indian scientists who identified the Delta variant and submitted it to the global database. The Delta variant is classified as a VoC and has now spread to 80 countries, as per the WHO.

The Delta variant (B.1.617) has three subtypes B1.617.1, B.1.617.2 and B.1.617.3, of which B.1.617.1 and B.1.617.3 have been classified as VoI, while B.1.617.2 (Delta Plus) has been classified as a VoC.

Compared to the Delta variant, the Delta Plus variant has an additional mutation. This mutation is called the K417N mutation. 'Plus' means an additional mutation has happened to the Delta variant. It does not mean that the Delta Plus variant is more severe or highly transmissible than the Delta variant.

Q. Why has the Delta Plus variant (B.1.617.2) been classified as a VoC?

A. It has been classified as a VoC because of the following characteristics:

- Increased transmissibility
- Stronger binding to receptors of lung cells
- Potential reduction in monoclonal antibody response
- Potential post vaccination immune escape

Q. How often are these mutations studied in India?

A. Indian SARS-CoV-2 Genomics Consortium (INSACOG), coordinated by the Department of Biotechnology (DBT) along with the Union Health Ministry, ICMR, and CSIR, monitors the genomic variations in SARS-CoV-2 on a regular basis through a pan-India multi-laboratory network. It was set up with 10 national labs in December 2020 and has been expanded to 28 labs and 300 sentinel sites from where genomic samples are collected. The INSACOG hospital network looks at samples and informs INSACOG about the severity, clinical correlation, breakthrough infections and re-infections.

More than 65,000 samples have been taken from states and processed, while nearly 50,000 samples have been analysed of which 50 per cent have been reported to be VoCs.

Q. On what basis are the samples subjected to genome sequencing?

A. Sample selection is done under three broad categories:

1. International passengers (during the beginning of the pandemic)
2. Community surveillance (where RT-PCR samples report CT value less than 25)
3. Sentinel surveillance where samples are obtained from labs (to check transmission) and hospitals (to check severity)

When there is any public health impact noticed because of genetic mutation, then the same is monitored.

Q. What is the trend of VoCs circulating in India?

A. As per the latest data, 90 per cent of samples tested have been found to have Delta variants (B.1.617). However, B.1.1.7 strain, which was the most prevalent variant in India in the initial days of the pandemic, has decreased.

Q. Why is action regarding public health not taken immediately after noticing mutations in the virus?

A. It is not possible to say whether the mutations noticed will increase transmission. Also, until there is scientific evidence that proves a correlation between the rising number of cases and variant proportion, we cannot confirm there is a surge in the particular variant. Once mutations are found, it is analysed every week to find out if there is any such correlation between the surge of cases and variant proportion. Public health action can be taken only if scientific proofs for such correlation are available.

Once such correlation is established, it will help greatly to prepare in advance when such a variant is seen in another area/region.

Q. Do Covishield and Covaxin work against the variants of SARS-CoV-2?

A. Yes, Covishield and Covaxin are both effective against the Alpha, Beta, Gamma and Delta variants. Lab tests to check vaccine effectiveness on Delta Plus variants are ongoing.

Delta Plus variants: The virus has been isolated and is now being cultured at ICMR's National Institute of Virology, Pune. Laboratory tests to check vaccine effectiveness are ongoing and the results will be available in 7 to 10 days. This will be the first result in the world.

Q. What are the public health interventions being carried out to tackle these variants?

A. The public health interventions needed are the same, irrespective of the variants. The following measures are being taken:

- Cluster containment
- Isolation and treatment of cases
- Quarantining of contacts
- Ramping up vaccination

Q. Do public health strategies change as the virus mutates and more variants arise?

A. No, public health prevention strategies do not change with variants.

Q. Why is continuous monitoring of mutations important?

A. Continuous monitoring of mutations is important to track potential vaccine escape, increased transmissibility and disease severity.

Q. What does a common man do to protect self from these VoCs?

A. One must follow COVID appropriate behaviour, which includes wearing a mask properly, washing hands frequently and maintaining social distancing. The second wave is not over yet. It is possible to prevent a big third wave provided individuals and society practice protective behaviour. Further, test positivity rate must be closely monitored by each district. If the test positivity goes above 5 per cent, strict restrictions must be imposed.

Source:

https://pib.gov.in/PressReleseDetailm.aspx?PRID=1730875

5. COVID-19 vaccination for pregnant women

Q. Why is COVID-19 vaccine being recommended for pregnant women?

A. Pregnancy does not increase the risk to COVID-19 infection. Most pregnant women will be asymptomatic or have mild disease, but their health may deteriorate rapidly and that might

affect the foetus too. It is important that they take all precautions to protect themselves from COVID-19, including taking the vaccination against the same. It is, therefore, advised that a pregnant woman should take the COVID-19 vaccine.

Q. Who are at higher risk of getting infected with COVID-19?

A. Higher risk of infection involves with:

- A healthcare worker or a frontline worker
- A community with high or increasing rate of COVID-19 infections
- Those frequently exposed to people outside the household
- Those who have difficulty in complying with social distance if living in a crowded household

Q. How does COVID-19 affect the health of a pregnant woman?

A. Although most (>90 per cent) infected pregnant women recover without hospitalization, rapid deterioration in health may occur in a few. Symptomatic pregnant women appear to be at increased risk of severe disease and death. In severe disease, like all other patients, pregnant women may also need hospitalisation. Pregnant women with underlying medical conditions, for example, high blood pressure, diabetes, obesity, and age over 35 years are at higher risk of severe illness due to COVID-19.

Q. How does COVID-19 infection of pregnant women affect the baby?

A. Most (over 95 per cent) of newborns of COVID-19 positive mothers have been in good condition at birth. In some cases, COVID-19 infections in pregnancy may increase the possibility of a premature delivery; the baby's weight may be less than 2.5 kg; and in rare situations, the baby might die before birth.

Q. Which pregnant women are at a higher risk of developing complications after COVID-19 infection?

A. Pregnant women who are:

- Older than 35 years of age
- Obese
- Have an underlying medical condition such as diabetes or high blood pressure
- Have a history of clotting in the limbs

Q. If a pregnant woman has already had COVID-19, when should she be vaccinated?

A. In case a woman is infected with COVID-19 during the current pregnancy, then she should be vaccinated soon after the delivery.

Q. Are there any side effects of the COVID-19 vaccines that can either harm the pregnant woman or her foetus?

A. The available COVID-19 vaccines are safe and the vaccination protects pregnant women against COVID-19 like other individuals. Like any medicine a vaccine may have side effects, which are normally mild. After getting the vaccine, she can get mild fever, pain at the injection

site, or feel unwell for 1-3 days. The long-term adverse effects and safety of the vaccine for the foetus and the child born is not established yet. Very rarely, (one in one to five lakh people) the beneficiary may, after the COVID-19 vaccination, experience some of the following symptoms within 20 days after getting the injection, which may need immediate attention.

Q. When should the vaccine be given to the pregnant woman?

A. The COVID-19 vaccination schedule can be started any time during pregnancy.

Q. What other precautions should the pregnant woman take after vaccination?

A. Counsel the pregnant woman and her family members to continue to practice COVID appropriate behaviour: wearing double masks, frequent hand washing, maintaining physical distance, and avoiding crowded areas, to protect themselves and those around from spreading the COVID-19 infection.

Q. How does a pregnant woman register herself for the Covid-19 vaccination?

A. All pregnant women need to register themselves on the Co-WIN portal or may get themselves registered on-site at the COVID-19 vaccination centre. The process of registration for pregnant women remains the same as of the general population and as per the latest guidelines provided by the Ministry of Home and Family Welfare (MoHFW) from time to time.

Source:

https://www.mohfw.gov.in/pdf/OperationalGuidanceforCOVID19vaccinationofPregnantWoman.pdf

6. COVID-19 & Children

Q. What is the possibility of a third wave of COVID-19 in the coming months?

A. Pandemics are likely to occur in multiple waves, and each wave could vary in the number of cases and its duration. Eventually, most of the population may get immune by asymptomatic or symptomatic infections (herd immunity). Over time, the disease may die out or may become endemic in the community with low transmission rates.

Key Message: There is a possibility of a third wave, but it is difficult to predict its timing and severity.

Q. Are children at greater risk if the third wave strikes?

A. In the first wave, primarily the elderly and individuals with co-morbidities were affected with severe disease. In the current (second) wave, a large number of younger population (30-45 years) have developed severe disease as also those without co-morbidities. After the second wave is over, if we do not continue following COVID appropriate behaviour, the third wave, if it occurs, is likely to infect the remaining non-immune individuals and that may include children also. The latest sero survey (December 2020 to January 2021) showed that the percentage of infected children in the age group of 10-17 years was around 25 per cent, the same as adults. This indicates that while children are being infected like adults, they are not getting the severe disease.

Key Message: Children are as susceptible as adults and older individuals to develop an infection but not a severe disease. It is highly unlikely that the third wave will predominantly or exclusively affect children.

Q. Are children likely to suffer from severe disease as being witnessed in the adult population in the current wave?

A. Fortunately, children have been relatively less affected so far due to several factors. The most important reason is the lesser expression of specific receptors to which this virus binds to enter the host and also the immune system of the children. A very small percentage of infected children may develop moderate to severe disease. If there is a massive increase in the overall numbers of infected individuals, a larger number of children with moderate to severe disease may be seen. Apart from the infection, parents should watch out for mental health issues in children and keep a watch to prevent child abuse and violence. Also, it is worth limiting screen time and prepare children for safe school reopening as per the Indian Academy of Pediatrics (IAP) guidelines.

Key Message: Almost 90 per cent of the infections in children are mild/asymptomatic. Therefore, the incidence of severe disease is not high in children.

Q. Can we rule out the possibility of severe infections in children in the third wave?

A. As explained, the spectrum of illness is likely to be much less severe in children than adults; there is only a remote possibility of children being more severely affected than adults in the next wave. As per data collected during the first and second waves, severe COVID-19 infections in children were not reported and only in few cases they were admitted to ICU. However, we need to be watchful about how the mutant strains will behave. The dictum here is: better be ready and prepared for the worst and hope for the best!

Key Message: Severe COVID-19 cases in children are rare. Further, there is no evidence indicating that children will have severe disease in the third wave.

Q. Severe disease due to COVID-19 is already occurring in children. Why it is so?

A. Yes, a severe illness related to COVID-19 is known to occur in children. This includes pneumonia and multisystem inflammatory syndrome in children (MIS-C). However, COVID-19 pneumonia in children is uncommon as compared to adults. In some cases, after 2-6 weeks of asymptomatic or symptomatic COVID-19 infection, MIS-C may be seen due to immune dysregulation with the incidence of 1-2 cases per 100,000 population; some of these cases also may be severe. It's a treatable condition with a good outcome if diagnosed early. Also, most children suffering from MIS-C cannot transmit the infection to others.

Key Message: Children occasionally get the severe disease and may need ICU care, both during the acute illness and after 2-6 weeks due to MIS-C caused by COVID-19. But the majority are likely to recover if treated on time.

Q. What preparations are being made in case the third wave comes and affects the children?

A. Most affected children get a mild disease with fever and need supervised home care with monitoring. We have learned a lot about COVID-19 illness from our shared experiences in adult medicine in the last 15 months. IAP guidelines on the management of COVID-19 in children are in place, and paediatricians have been sensitised and trained on its management. We need to be ready for a more significant number of patients seeking consultations; educating the parents on different platforms regarding illness and warning signs; and arranging more COVID-19 wards for children with more special wards such as high-dependency units (HDUs) and intensive care units (ICUs). The preventive behaviours are the same for children. Parents should also be ideal role models for their children regarding mask etiquette, hand hygiene, and social distancing. Children

above the age of two to five years can be trained to use a mask; however, the adults have to follow the COVID-appropriate behaviour. IAP has also set guidelines for the safe reopening of schools for the safety of the children.

Key Message: We need to be prepared with more in-patient beds and intensive care beds for children. IAP has already developed the management protocol for disease categories in children. There is no reason to panic. Our preparations are in full swing.

Q. What is the plan for vaccinating children?

A. So far, the global data show that compared to children, older adults are a thousand times more likely to die from COVID-19 disease. So, it has been a priority to vaccinate the high-risk elderly age group first. Thereafter, the emphasis should be on adults who also have more severe diseases as compared to children. When there is the remote possibility of children getting affected, some countries consider vaccinating children and adolescents. The same vaccines being used in adults can be used in children only after adequate trials. One of the India-made vaccines will soon undergo trials in children, and if proven immunogenic and safe, it could be fast-tracked for mass vaccination in children.

Key Message: Children do get the severe disease, even if the number is small. Thus, there is no harm in considering vaccination for them. The safety and efficacy, however, are being assessed in trials for this age. The national expert group on vaccine administration for COVID-19 will develop a plan as and when new scientific data emerge.

Source

https://iapindia.org/pdf/hA5Gnpt_IQv63Bk_IAP%20view%20point%20for%203rd%20wave%20Covid%2022%20May%202021.pdf

7. COVID-19 & White Fungus infection

Q. What is White Fungus?

A. White Fungus, also known as candidiasis, is an opportunistic infection, which could spread fast to various body parts and, if not treated, could be serious. According to the Centre for Diseases Control and Prevention (CDC), White Fungus or invasive candidiasis can affect the blood, heart, brain, eyes, bones, or other parts of the body.

Q. Who are at high risk to get White Fungus infection?

A. White Fungus is all around us as it is found naturally in the environment. It primarily affects people with low immunity, who come in contact with objects that contain these fungal spores. For instance, COVID-19 patients on oxygen support can come in contact with these fungal spores if their ventilators and oxygen support equipment are not sanitised properly. Further, overuse of steroids and use of tap water in the humidifier attached to an oxygen cylinder can also heighten the risk of contracting White Fungus.

Q. Who can get infected by white fungus?

A. Invasive candidiasis is caused by a yeast (a type of fungus) called Candida. Candida can normally live inside the body, in areas like the mouth, throat, gut, and vagina, without causing any problems. However, individuals with low immunity, like patients recovering from a serious COVID-19 infection, are particularly at risk of contracting this fungal infection. In their bodies, the fungus can enter the bloodstream or internal organs to cause an infection.

People who are at high risk for developing this infection include those who:

- Have been admitted in the intensive care unit (ICU) for a prolonged period.
- Have weakened immune system (for example, people on cancer chemotherapy, people who have had an organ transplant, and people with low white blood cell counts).
- Have recently had surgery, especially multiple abdominal surgeries.
- Have recently received lots of antibiotics or steroids in the hospital.
- Receive total parenteral nutrition (food through a vein).
- Have kidney failure or are on hemodialysis.
- Have diabetes.
- Have a central venous catheter.

Q. Is White Fungus contagious?

A. White Fungus is not contagious in most cases, as it cannot spread directly from person to person. However, there exist some species of fungus that cause this infection on the skin. In such instances of external infection, the fungus can possibly be transferred from the patient to another individual who is at risk.

Q. What are the symptoms of White Fungus?

A. Only CT scans or X-rays can reveal and completely confirm the White Fungus infection. Health experts report that it is more dangerous than Black Fungus, as it affects the lungs as well as other parts of the body like the nails, skin, stomach, kidney, brain, private areas, and mouth.

Moreover, the White Fungus can also infect the lungs the same way COVID-19 does. In fact, patients who get infected with White Fungus displayed COVID-19-like symptoms despite having tested negative for the virus. According to some reports, the oxygen saturation level of one of the four patients infected with White Fungus dropped from normal levels. However, the oxygen levels became normal after the antifungal medication was administered.

Q. How can White Fungus be treated?

A. Patients infected with White Fungus should be examined carefully, perhaps with a fungus culture test of their phlegm or mucus, to detect the extent of fungal infection in their body. After detection of the infection, antifungal medications can be used to treat the patients. Such medications have led to an improvement in their condition. The type and dose of antifungal medication used to treat White Fungus will depend on the patient's age, immune status, location, and severity of the infection.

8. COVID-19 & Use of oxygen

Q. What is the normal respiratory rate of a healthy adult person?

A. Standard respiratory rates for a healthy adult range from 12 to 20 breaths per minute.

Q. Are 8 breaths per minute normal?

A. No. A patient needs to be evaluated medically.

Q. How many litres of oxygen per minute do we breathe?

A. The average tidal volume, i.e., the average amount of air inhaled and exhaled per breathing cycle, is 0.5 litre (500 ml). Minute Ventilation (VE) is the total volume of air entering the lungs in a minute, which is 6 litres per minute.

Q. What should be the normal oxygen saturation as recorded by a Pulse Oximeter?

A. The normal oxygen saturation level in the blood (SpO_2) should be 95 per cent or higher. Some people with chronic lung disease, such as Chronic Obstructive Pulmonary Disease (COPD) or sleep apnea, may have normal levels of around 90 per cent. The 'SpO_2' reading on a pulse oximeter shows the percentage of oxygen in the blood. If your home SpO_2 reading is lower than 94 per cent, call your healthcare provider.

Q. How do I check my oxygen level at home without a Pulse Oximeter?

A. If you do not have a portable finger pulse oximeter in your home, you can also learn how to assess signs and symptoms of low oxygen levels. Two classic signs of a low oxygen level are a rapid heart rate and a fast breathing rate. An average heart rate is 60–100 beats per minute and an average breathing rate is 12–20 breaths per minute. However, under low oxygen conditions, body responses include an increase in heart rate and breathing rate. Another sign of a low blood oxygen level is cyanosis or a bluish colour change on your lips, nose, or fingertips. As your body loses oxygen, the blood cells in your body change colour in your bloodstream to a dark blue, which can be seen from the outside of your skin if it is severe. Cyanosis is typically a late sign of low oxygen levels and is considered a medical emergency. If you notice this bluish discolouration, you should immediately visit the nearest hospital.

Q. Do we see many cases of silent hypoxia in this wave? How can this be addressed?

A. Silent hypoxia or happy hypoxia is referred to as the early stage of COVID-19. As the oxygen level drops, one may start feeling shortness of breath, confusion, and other symptoms. Keep watching for these signs and do not ignore them. This is true for young people as well. If you monitor low oxygen level, change in lip colour from natural to blue or persistent sweating, consult the COVID helpline or doctor. They could be the early sign of silent hypoxia.

Q. In brief, how can proning help enhance blood oxygen levels?

A. Proning is a medically accepted process to improve the distribution and exchange of oxygen in the lungs. A patient is safely placed from their back onto their abdomen (stomach), i.e., face down to improve breathing and oxygenation. It has been shown as beneficial for COVID-19 patients with compromised breathing comfort, especially during home isolation.

Q. Is pure oxygen used in hospitals?

A. Medical oxygen contains high purity oxygen used for medical treatments and is developed for use in human body. Cylinders contain a compressed oxygen gas and no gases are allowed in the cylinder to prevent contamination.

Q. What is the use of medical oxygen?

A. Oxygen is used for treatment in hospitals. Hence, it is considered a drug or a pharmaceutical product.

Q. What is the need for medical oxygen?

A. The human body requires oxygen to survive, and typically, we breathe in from air. However, if you have lung disease or other medical conditions such as COVID-19, you may not get enough oxygen due to compromised lungs. That can leave you short of breath and cause problems with your heart, brain, and other parts of your body.

Q. Can breathing 100 per cent oxygen harm your body?

A. Yes. Breathing 100 per cent oxygen also eventually leads to collapse of the alveoli (atelectasis).

Q. Can you get excess (more than required) oxygen from an oxygen concentrator?

A. It is possible to get excess (more than required) oxygen from an oxygen concentrator. However, this is quite rare when oxygen concentrators are used as directed and prescribed. All supplemental oxygen requires a prescription from a doctor, who carefully chooses your oxygen requirement.

Q. What is the role of oxygen during COVID-19 disease?

A. The demand for medical oxygen increases in COVID-19 as the disease primarily affects the lungs and, in severe cases, causes death due to Acute Respiratory Distress Syndrome (ARDS) and pneumonia.

Q. When does a patient require medical oxygen in a COVID-19 positive case?

A. As per AIIMS/ICMR-Covid-19/National Task Force/Joint Monitoring Group (Dte.GHS), MoHFW, Government of India, Clinical Guidelines for Management of Adult COVID-19 Patient issued on 22nd April 2021, moderate and severe cases of COVID-19 where the infection induces shortage of oxygen in the body due to its impact on lungs require medical oxygen and immediate oxygen therapy. Oxygen acts as a life-saver for COVID-19 patients.

Q. What are moderate COVID-19 cases?

A. In moderate COVID-19 cases, a patient has upper respiratory tract symptoms (and/or fever) with shortness of breath. They have a respiration rate more than or equal to 24/minute and SpO_2 90 per cent to 93 per cent with ambient air.

Q. What is severe COVID-19 cases?

A. In severe COVID-19 case, a patient has upper respiratory tract symptoms (and/or fever) with shortness of breath. They have a respiration rate more than 30/minute and SpO_2 less than 90 per cent in room air.

Q. When does a patient require mechanical ventilator support?

A. A patient may be put on a mechanical ventilator if it becomes very difficult to breathe or get enough oxygen into their blood. This condition is called respiratory failure. Mechanical ventilators are machines that act as bellows to move air in and out of the patient's lungs. The respiratory therapist and doctor set the ventilator to control how often it pushes air into the lungs and how much air the patient gets. The patient may be fitted with a mask to get air from the ventilator into the lungs. Or, they may need a breathing tube if their breathing problem is more serious.

Q. Can mechanical ventilation be given at home?

A. Mechanical ventilators are mainly used in hospitals and transport systems such as ambulances and medical evacuation by air transport, etc. In some cases, they can be used at home if the illness is long-term and the caregivers at home receive training and have adequate nursing and other resources at home. Being on a ventilator may make a patient more susceptible to pneumonia, damage to the vocal cords, or other problems.

Q. What is the six minute walk test for COPD?

A. The six minute walk test (6MWT) is an exercise test that measures functional status in chronic obstructive pulmonary disease (COPD) patients and provides information on oxygen desaturation. This test is also being used for COVID-19. In case of COVID-19 symptoms, SpO_2 level must be checked before taking a walk. Now, walk for six minutes without a break on an even surface and measure the SpO_2 level. It may fall 1-2 per cent, but consult a medical professional if it falls below 93 per cent.

Source:

https://ndma.gov.in/sites/default/files/2021-03/FAQs-on-Use-of-oxygen-.pdf

9. COVID-19 & Therapeutics

Q. Is Remdesivir effective in the treatment of COVID-19?

A. No study has conclusively been able to prove that Remdesivir is beneficial in the treatment of COVID-19. However, India has approved Remdesivir under the National Clinical Management Protocol for COVID-19, which was developed after many interactions by a committee of experts. The protocol acts as the guiding document for the treatment of COVID-19 patients in India. Remdesivir is listed as an investigational therapy in the protocol, i.e., where informed and shared decision-making is essential, besides noting contraindications mentioned in the detailed guidelines.

Q. What is Remdesivir? How does Remdesivir work?

A. Remdesivir is an investigational drug used to treat viral infections. It is classified as a broad-spectrum antiviral with potential antiviral activity against a variety of RNA viruses.

The drug works against the novel coronavirus by inhibiting replication of the virus in the body. Remdesivir functions as a pro-drug that is modified in the body before it becomes an active drug. It is classified as a nucleoside analog, one of the oldest classes of antiviral medications, and resembles the RNA base adenosine. In general, nucleoside and nucleotide analogues simulate the structure of a true nucleoside or nucleotide. The simulated structure may then be incorporated into the virus. Remdesivir works when the enzyme replicating the genetic material for the novel coronavirus – RNA polymerase – incorporates the adenosine analogue in place of the natural molecule into the growing RNA strand. By introducing the modified agent, Remdesivir, replication of the novel coronavirus is interrupted, and the virus ceases to multiply and cannot infect more cells in the body.

Q. When should a patient of COVID-19 take Remdesivir?

A. The timing of the drug, when it is administered, is most important. Taking it too early or too late could do more harm than good. Remdesivir is applicable only in hospitalised patients who showed very low oxygen saturation and infiltrated their chest X-ray or CT scan. The optimal timing for Remdesivir is usually after five to seven days of having the virus. Early to mild or asymptomatic patients should not take Remdesivir. Also, it is of no use if it's given very late because it would create a cytokine storm. A cytokine storm is when the immune system goes into overdrive. The body starts to attack its cells and tissues instead of just the virus.

Q. Can Remdesivir be taken at home?

A. Remdesivir comes in a vial and has to be injected only after prescription and in the presence of a health practitioner. It is for patients who are hospitalised and severe. Therefore, it should not be given at home. It is for patients who need to be admitted and need hospital care.

Q. Are steroids effective in the treatment of COVID-19?

A. There is no evidence to support the use of steroids in the treatment of COVID-19. The World Health Organization (WHO) recovery trial showed that steroids do have a beneficial effect. But again, the timing is critical. The recovery trial clearly showed that if we give steroids too early, it showed a harmful effect before oxygen saturation. Steroids are most effective during the later part of the disease when there is more inflammation and oxygen saturation is falling. Steroids are only helpful for moderate or severe cases.

Q. Is plasma a good way to fight off COVID-19?

A. Convalescent plasma has been a therapy devised to passively transfer antibodies from a recovered person to a new patient. While the therapy has been received with different opinions by the medical community, the important aspect is timing. It's better if plasma therapy is used early before clinical worsening. Also, plasma with high titer neutralising antibodies would have better results. Hence, to achieve good results, correct patient selection, timing and a good quality plasma donor are needed for success in this form of treatment.

Q. Should a person with COVID-19 take Tocilizumab?

A. Tocilizumab is a drug of last resort. It should only be used when a COVID-19 infection in a patient is worsening despite steroids, Remdesivir and other treatments like anticoagulants. Tocilizumab is required in less than 2 per cent of COVID-19 patients. Very few patients need this drug because it's only for treating a cytokine storm and has a limited role.

Q. Is Favipiravir effective in treating COVID-19?

A. Favipiravir is another antiviral that is being promoted for the treatment of COVID-19. It was initially doled out as a treatment of influenza after the H1N1 pandemic. There is not enough evidence in robust studies to show that it is a good drug. Since it's not a proven treatment, India's national guidelines also don't recommend its use.

Q. Is it possible to treat COVID-19 without any of the drugs mentioned above?

A. People with mild COVID-19 or those who are asymptomatic will improve with just symptomatic treatment. Mild COVID-19 infection can be treated with paracetamol, good hydration and multivitamins – without any treatment. Giving treatment when it is not required may be doing more harm than good.

10. COVID-19 & Black Fungus Disease

Q. What is Black Fungus?

A. Black Fungus, also known as mucormycosis, is a rare fungal infection. It is called 'black' because of the colour of the fungal growth. It is caused by exposure to mucor mold found in soil, manure, and rotten/decaying fruits and vegetables. It is ubiquitous and even present in the nose/mucosa of

healthy individuals. This disease usually affects the sinuses, eye orbit, and brain. That is why it is also called 'rhino-orbital-cerebral' mucormycosis. It may be life-threatening in immuno-compromised individuals (cancer patients, HIV/AIDS) and people with uncontrolled diabetes.

Q. What are the risk factors for acquiring Black Fungus infection?

A. Risk Factors are:

- Uncontrolled Diabetes Mellitus
- Treated for COVID-19 with corticosteroids
- Treated for COVID-19 with immunomodulators
- Treated for COVID-19 with mechanical ventilation
- Prolonged oxygen therapy
- Prolonged ICU stay
- Immuno-compromised state

Q. Why the sudden increase in Black Fungus cases?

A. It may be triggered by extensive use of steroids, which is a life-saving treatment for moderate to severe COVID-19 infection. Steroids lower the immunity and cause a sudden up-shooting of blood sugar levels in diabetes and non-diabetic patients. For patients on humidified oxygen, care should be taken to make sure there is no water leak to prevent the growth of the fungus.

Q. How serious is Black Fungus?

A. Black fungus infection causes a vision-threatening and life-threatening condition.

Q. Do all COVID-19 patients need to be worried about Black Fungus infection?

A. No. As discussed, high-risk patients need to be alert. Also, during COVID-19 recovery, everyone should watch out for early signs and symptoms.

Q. What are the precautions one can take to avoid this disease?

A. One can take the following precautions:

- Boost immune system with diet, hydration and exercise.
- Rational use of steroids by follow guidelines.
- Strict blood sugar monitoring and control in all patients who are on steroids.

Q. What are the early signs of Black Fungus?

A. Some of the early signs are:

- Facial pain
- Facial swelling/puffiness/discolouration
- Sinus headache
- Stuffy nose
- The blurring of vision/decreased vision
- Double vision
- Drooping of eyelid

- Blood-stained nasal discharge
- Dental pain

Q. Is Black Fungus treatable?

A. Yes. Early diagnosis and a prompt multi-speciality team of medical professionals can manage it.

Q. Which specialist should I visit for Black Fungus?

A. ENT and eye specialists are central to this disease. The team includes care coordination with neurosurgeon, endocrinologist and microbiologist.

Source:

https://www.eyeqindia.com/frequently-asked-questions-on-covid-and-black-fungus/#toggle-id-9

11. COVID-19 & Indoor Air

Q. Will running an evaporative cooler help protect my family and me from COVID-19?

A. Evaporative coolers (or 'swamp coolers') can help protect people indoors from the airborne transmission of COVID-19 because they increase ventilation with outside air to cool indoor spaces. Evaporative coolers are used in dry climates. They use water to provide cooling and improve relative humidity in indoor microenvironments. When operating as intended (with open windows), these devices produce substantial increases in ventilation with outdoor air. Some evaporative coolers can be performed without using water when temperatures are milder to increase ventilation indoors. Avoid using evaporative coolers if air pollution outside is high and the system does not have a high-efficiency filter.

Q. Is ventilation important for indoor air quality when cleaning and/or sanitising for COVID-19 indoors?

A. When cleaning and disinfecting for COVID-19, ventilation is essential – in general, increasing ventilation during and after cleaning helps to reduce exposure to cleaning and disinfection products and by-products. Increasing ventilation, for example, by opening windows or doors, can also reduce risks from particles resuspended during cleaning, including those potentially carrying SARS-CoV-2 (or other contaminants). Avoid ventilation with outdoor air when outdoor air pollution is high or when it makes your home too cold, hot, or humid.

Q. Will an air cleaner or air purifier help protect my family and me from COVID-19 in my home?

A. When appropriately used, air purifiers can help reduce airborne contaminants, including viruses, in a home or confined space.

Q. How can I increase ventilation at home to help protect my family from COVID-19?

A. Ensuring proper ventilation with outside air is a standard best practice for improving indoor air quality. To increase ventilation in your home, one can:

- Open the windows or screened doors, if possible;
- Operate an air conditioner that has an outdoor air intake or vent; and
- Operate a bathroom fan when the bathroom is in use and continuously, if possible.

However, the practices mentioned here are not enough to protect people from COVID-19. When used along with other best practices recommended by the Ministry of Health and Family Welfare, Government of India, the above methods can be part of a plan to protect yourself and your family.

Source:

https://www.epa.gov/coronavirus/indoor-air-and-coronavirus-covid-19

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FEEDBACK FORM

COVID-19

Science & Technology Efforts in India

It has been more than a year since the COVID e-Newsletter started reaching you and we want to hear what you think about it. The information product is designed to keep you conversant about the services and efforts the country has put up on the face of the sudden eruption of the COVID-19 pandemic. Your opinion is vital so that we can make sure we are including what you want to read. Please fill in the form below and rest assured that the information you give will help shape future editions of your coveted newsletter.

I. How do you rate the following aspects of COVID e-Newsletter, focused on the second wave of the pandemic?

1. The overall appearance

😄Very Good 😊Good 😐Average ☹️Poor 😞Very Poor 😶No Opinion

2. Ease to read and flow of information

😄Very easy 😊Fairly easy 😐Not very easy ☹️Not at all easy

For suggestions and feedback, click on:
https://www.indiascienceandtechnology.gov.in/covid-newsletter/feedback-form

DISCLAIMER

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COVID-19

Science & Technology Efforts in India

TOGETHER WE CAN AND WE WILL BEAT THE PANDEMIC OUT

For suggestions and feedback, write to us at:
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