VIGYAN PRASAR

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COVID-19

Science & Technology Efforts in India

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

DISCLAIMER

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In case of any variance between what has been stated and that contained in the relevant document, the latter shall prevail.

Unless otherwise specifically stated, the information contained herein is made available to the public for information purposes only.

Although we have made the best effort to keep the information updated, the accuracy, completeness or adequacy of information will depend on what is made available by the third party or the same being up-to-date.

This will depend on the availability of the same. The e-Newsletter is continuously evolving and the aggregation of information is an unceasing process.

The process requires the co-operation of and synergy with all stakeholders.

PREFACE

As the nation stupendously marches ahead with its mammoth vaccination exercise — having achieved an incredible feat of administering 1 billion doses last month — we cannot afford to be complacent in our fight against the COVID-19 pandemic at any cost. Though the majority population has reposed trust in the indigenous vaccines and have taken the jab, some are still sitting on the fences. Whatever might be the reason for their steadfastness, this section of the population that the Government tries to convince, educate, and vaccinate in a war footing manner through its month-long Har-Ghar-Dastak. This door-to-door campaign tends to achieve absolute vaccination by the end of this year.

We continue compiling new information on the pandemic every fortnight to remain aware of the latest developments. The aim is to inform the readers and strengthen the usefulness of the data and showcase the efforts of our scientific communities and institutions in fighting the disease tooth and nail with a singular aim to defeat it once and for all. For all the sections, a section guideline has been provided and hyperlinked with the respective locations. 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 and scientific administrators, ultimately resulting in inculcating scientific temper. Together we can, and we will beat the pandemic, with the collective strengths and spirit of services as the backbone.

We wish an engaging reading to our audience across all strata of the society and look forward to their suggestions and feedback at covidnewsletter@vigyanprasar.gov.in. Additionally, feedback questionnaires have been included, and a link has been provided for submission. This, in turn, will help our readers in finding desired and more relevant compiled information.

India has been the melting point of numerous customs, traditions, and languages, but the nation is closely knit in one fabric despite the diversity. Share happiness in this festive season by following the COVID appropriate behaviours. Wishing you all a very Happy Festive Season!

11 November 2021

Vigyan Prasar

New Delhi

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

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EFFORTS IMPACTING COVID MITIGATION

The efforts made by various agencies, apex bodies, domain institutions, and so on, who 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

Government launches Har-Ghar-Dastak campaign to maximise the reach of vaccine

COVID-19 vaccination for children: Eligibility expansion to the 5-11 year age group

Government releases fresh guidelines for international arrivals

Ministry of Health releases comprehensive guideline for Management of Post-COVID Sequelae for Doctors for better disease management

ICMR invites expression of interest for validation of rapid antigen detection assays for COVID-19

Government launches Har-Ghar-Dastak campaign to maximise the reach of vaccine

With India having already achieved the milestone of one billion vaccinations last month and surging ahead at a greater pace, we cannot afford to be lackadaisical in our fight against coronavirus. Despite a majority of population participating in the vaccination drive, there are many who are on the fringes. In the backdrop of this scenario, the Government has launched a month-long 'Har-Ghar-Dastak' campaign to cover those who have not taken their first dose or have missed the second one.

According to the empirical data, 77 per cent of the eligible population in India has been vaccinated with the first dose against COVID-19 while 32 per cent have received both the doses. According to the Prime Minister's Office, 45 districts in India still lag in vaccination coverage as they are yet to administer even a single shot to more than half of the adult population when the national average is at least 78 per cent.

Website link:

https://pib.gov.in/PressReleasePage.aspx?PRID=1769187

COVID-19 vaccination for children: Eligibility expansion to the 5-11 year age group

The international community is committed to ensuring that children from five through 11 years of age have access to COVID-19 vaccines. Scientists have conducted clinical trials with about 3,000 children, and the Food and Drug Administration (FDA) has determined that the Pfizer-BioNTech COVID-19 vaccine has met the safety and efficacy standards for administration in children between five and 11 years. The safety of COVID-19 vaccines continues to be monitored.

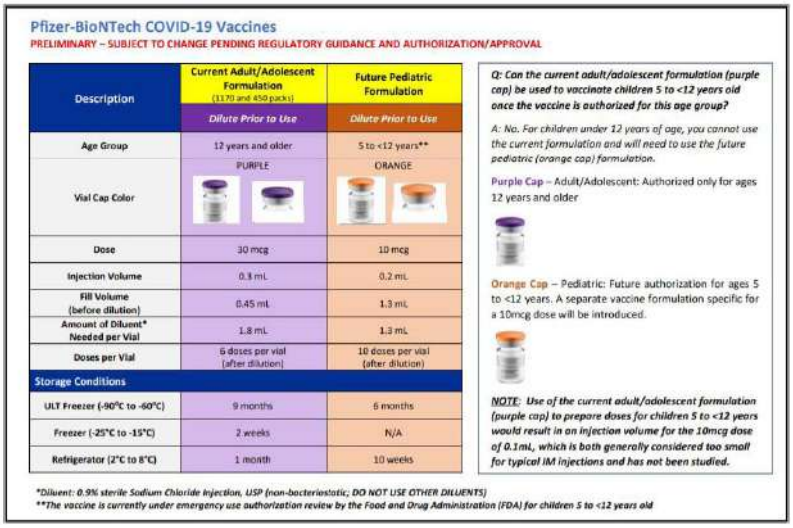
The Pfizer-BioNTech COVID-19 vaccine for children between five and 11 years of age is administered as a two-dose primary series, three weeks apart.

Vaccine administration

The pediatric vaccine is already being shipped around the country. Vaccine providers must use the pediatric vaccine formulation with orange caps and labels. Children aged 5-11 years will be vaccinated with two 10-microgram doses administered 21 days apart. The dosage is one-third of the adolescent and adult dose.

Dosages are determined by age, not a child's size or weight. Some children may be 11 years old when they get their first dose and 12 at the time of their second dose. They should receive a dose based on their age on the day of vaccination, according to the CDC.

The COVID-19 vaccine can be given at the same time as other routine vaccines but should be done in a different injection site. CDC and AAP also recommend that children with prior COVID-19 infection get vaccinated. This includes children who have a history of multisystem inflammatory syndrome in children (MIS-C) if they meet several criteria including clinical recovery; if at least 90 days have passed since their diagnosis; if onset of MIS-C occurred before COVID-19 vaccination; and if they are in an area of high or substantial community transmission or otherwise have increased risk for exposure to the virus. Even if they don't meet all the criteria post-MIS-C, the CDC said vaccination may be considered.



Pfizer-BioNTech COVID-19 Vaccines

PRELIMINARY – SUBJECT TO CHANGE PENDING REGULATORY GUIDANCE AND AUTHORIZATION/APPROVAL

Description	Current Adult/Adolescent Formulation (1170 and 450 packs)	Future Pediatric Formulation
	Dilute Prior to Use	Dilute Prior to Use
Age Group	12 years and older	5 to <12 years**
Vial Cap Color	PURPLE	ORANGE
Dose	30 mcg	10 mcg
Injection Volume	0.3 mL	0.2 mL
Fill Volume (before dilution)	0.45 mL	1.3 mL
Amount of Diluent* Needed per Vial	1.8 mL	1.3 mL
Doses per Vial	6 doses per vial (after dilution)	10 doses per vial (after dilution)
Storage Conditions		
ULT Freezer (-90°C to -60°C)	9 months	6 months
Freezer (-25°C to -15°C)	2 weeks	N/A
Refrigerator (2°C to 8°C)	1 month	10 weeks

Q: Can the current adult/adolescent formulation (purple cap) be used to vaccinate children 5 to <12 years old once the vaccine is authorized for this age group?

A: No. For children under 12 years of age, you cannot use the current formulation and will need to use the future pediatric (orange cap) formulation.

Purple Cap – Adult/Adolescent: Authorized only for ages 12 years and older

Orange Cap – Pediatric: Future authorization for ages 5 to <12 years. A separate vaccine formulation specific for a 10mcg dose will be introduced.

NOTE: Use of the current adult/adolescent formulation (purple cap) to prepare doses for children 5 to <12 years would result in an injection volume for the 10mcg dose of 0.1mL, which is both generally considered too small for typical IM injections and has not been studied.

*Diluent: 0.9% sterile Sodium Chloride Injection, USP (non-bacteriostatic; DO NOT USE OTHER DILUENTS)

**The vaccine is currently under emergency use authorization review by the Food and Drug Administration (FDA) for children 5 to <12 years old

Contact info:

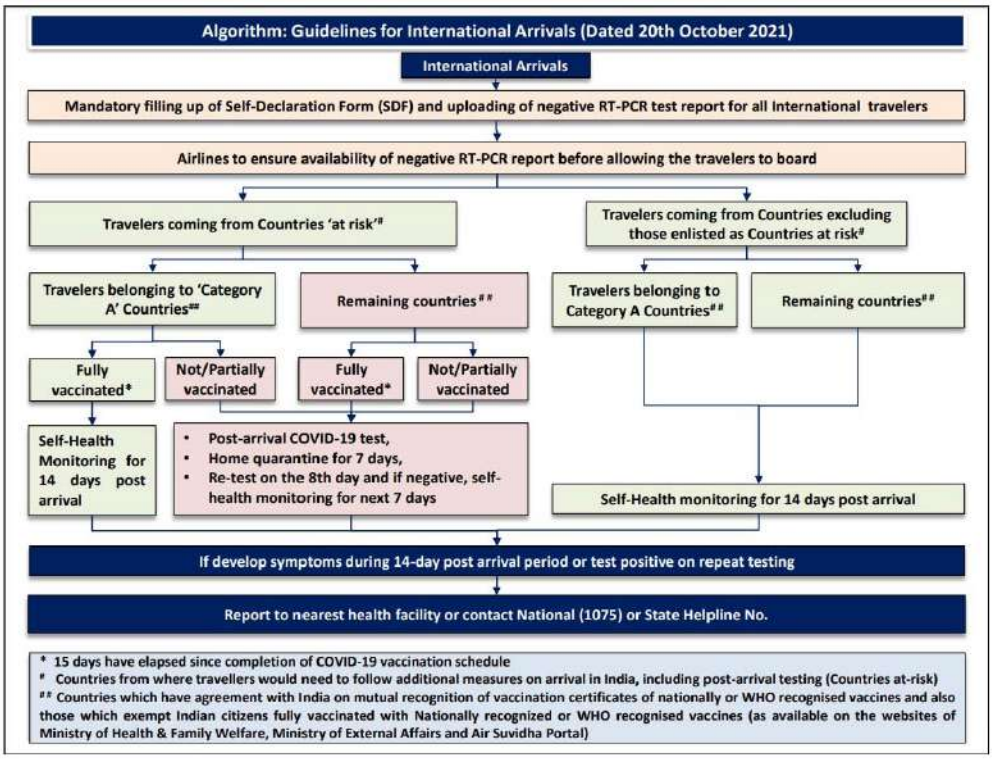
PfizerMediaRelations@pfizer.com

Website link:

https://www.pfizer.com/news/press-release/press-release-detail/pfizer-and-biontech-receive-first-us-fda-emergency-use-0

Government releases fresh guidelines for international arrivals

The Ministry of Health and Family Welfare (MoHFW), in supersession of all guidelines issued on the subject on and after 17 February 2021 issued new guidelines for international arrivals in the form of algorithm. This document provides protocols to be complied with by international travellers as well those to be followed by airlines, points of entry (airports, seaports, and land borders) for risk profiling of passengers in easy step format so that people can understand this easily. This standard operating procedure is valid effective 25 October 2021.

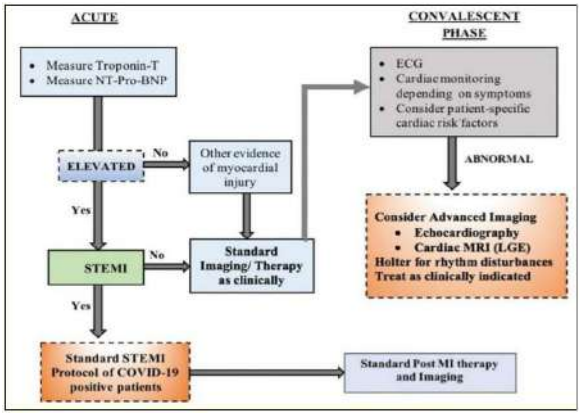


Website link:

https://www.mohfw.gov.in/pdf/GuidelinesforInternationalArrival20thOctober2021.pdf

Ministry of Health releases comprehensive guideline for Management of Post-COVID Sequelae for Doctors for better disease management

Ministry of Health and Family Welfare (MoHFW) guidelines for Management of Post-COVID Sequelae for Doctors. The purpose of this document is to guide doctors on managing post-COVID-19 complications affecting cardiovascular, gastrointestinal, nephrological, neurological and respiratory systems. This



Recommendations to identify patients with cardiac injury during acute and convalescent phase

Do's during Post COVID period	Don'ts during Post COVID period
• Frequent hand washing and social distancing • Restructure routines at home • Greater emphasis on healthy weight • Healthy eating habits • Moderate intensity exercise (30 minutes per day- 5 times a week) • Avoid alcohol • No smoking or tobacco products • Avoid self-medication • Arrange for telemedicine contacts for follow up with physician/cardiologist • Vaccination after 3 months post recovery if not vaccinated prior • Important to control HT, DM and dyslipidemia. Follow guideline directed medical therapy for cardiovascular risk factors like HT, DM, dyslipidemia and cardiac conditions as prescribed by physician/ cardiologist • Practice meditation, Yoga within your tolerance limits	• Persistent symptoms (such as fatigue, cough, breathlessness, fever): limit activity to 60% of maximum heart rate (220- age in years) until 2-3 weeks after symp-toms resolve • Intense cardiovascular exercise in known cardiac patients and all cardiovascular training in case of athletes to be avoided for 3 months. • Do not stop medications or take over the counter medications without consulting your cardiologist • Do not ignore warning signs such as high grade fever, oxygen saturation< 93%, chest pain, dizziness, syncope or palpitations.

Common dos and don'ts during post-COVID-19 period

Parameters	COVID-19 induced	Drug induced
AST, ALT	AST>ALT	ALT>AST
ALP	Normal / ↑	↑ / Normal
Serum bilirubin	Normal / ↑	↑ / Normal
Degree of enzyme elevation	< 5 times ULN	> 5 times ULN
Temporal association with drug	No	Yes
Abnormal LFT at presentation	Yes	No

Differences between COVID-19 induced and drug induced liver injury

Drug	Class	GI side effects
Azithromycin	Antibiotic	Diarrhea, Cholestatic hepatitis,Nausea, Pain abdomen
Hydroxychloroquine	Antimalarial	Abdominal pain, anorexia, diarrhoea,nausea, vomiting
Lopinavir	Antiviral	Dysgeusia, nausea, vomiting, pain abdomen, diarrhea, elevated amylaseand lipase
Remdesivir	Antiviral	Nausea, transaminitis
Favipiravir	Antiviral	Nausea, vomiting, diarrhea, transaminitis
Tocilizumab	IL6 inhibitor	Transaminitis

Drugs used in COVID-19 management and GI side effects

is the first such series of seven modules released in India, providing extensive guidelines for the medical fraternity. This includes a module for healthcare providers to deal with mental health, which is of utmost importance.

Website link:

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

ICMR invites expression of interest for validation of rapid antigen detection assays for COVID-19

ICMR invites applications for validation of rapid antigen detection tests for COVID-19 from all manufacturers who have developed rapid antigen 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

Contact info:

guptanivedita.hq@icmr.gov.in, drneetu.vijay@icmr.gov.in

Website link:

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

IIT Kanpur working to develop a novel therapeutics for COVID-19

IISc developed online self-assessment tool for workplaces: COVID-19 readiness indicator tool

Creating scientific resources for outreach initiatives by CESSI at IISER Kolkata on COVID-19

PDE-based modelling of COVID-19 infections developed by IISc

AMCHSS developed an interactive dashboard to visualise the COVID-19 situation in India

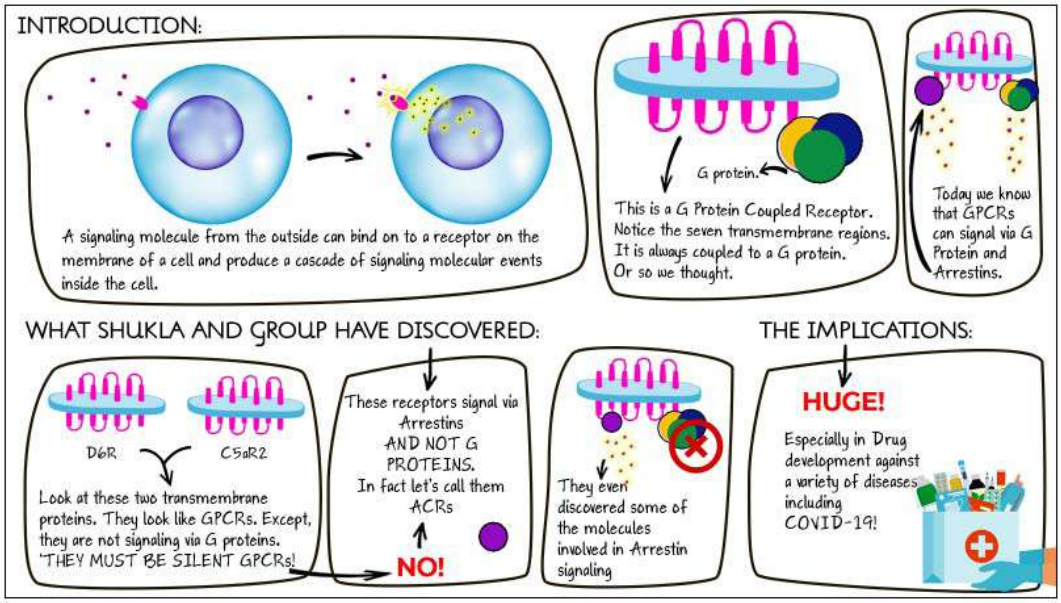
IIT Bombay, in association with city-based Kasturba Hospital, develops technology that can measure the severity of COVID-19

IIT Kanpur working to develop a novel therapeutics for COVID-19

IIT Kanpur's Dr Arun Shukla and his team, Department of Biological Sciences and Bioengineering, have described the working mechanism of a new class of receptors that were earlier believed to be 'silent' or 'non-functional'. This discovery opens up the possibility of targeting these receptors for novel therapeutics development in multiple inflammatory disorders like COVID-19 as well as rheumatoid arthritis and sepsis.

Shukla and his team have shown that the two specific GPCRs they studied, D6R and C5aR2, both of which were classified as non-signalling GPCRs, could transmit a signal through Arrestins, but not G Proteins. The current discovery highlights a non-classical signalling mechanism induced by two receptors that are structurally similar to GPCRs. Almost half the current drugs in the market, including drugs for hypertension, asthma, allergy, acidity, cancer and more, target GPCRs. The drugs work by blocking the GPCR region that can stimulate the G protein – then, the cell will fail to respond to the signal. This is medically useful, especially if the signal triggers the cells to produce, say, an allergic reaction.

Scientists are currently trying to block the interaction of the C5a peptide with C5aR1 as a potential therapy in certain COVID-19 cases. The understanding from the present study could now allow the development of drugs targeting C5aR2, in addition to C5aR1.



Contact info:

arshukla@iitk.ac.in

Website link:

https://researchmatters.in/news/silent-receptors-discovered-be-not-so-silent

IISc developed online self-assessment tool for workplaces: COVID-19 readiness indicator tool

With COVID-19-related restrictions easing and many workplaces slowly resuming work, an online self-assessment tool known as the COVID-19 Workplace Readiness Indicator has been developed by a team of researchers led by Rajesh Sundaresan at the Department of Electrical Communication Engineering, in collaboration with the Karnataka State Disaster Management

Readiness category	Score (Max. 100)	Specific suggestions for each readiness category
Infrastructure	42	Minimum gap of 1 hour between consecutive shifts is recommended.
Epidemic related: Precautions	69	For your establishment, there is a maximum 33% attendance requirement which is not met.
Epidemic related: Awareness and readiness	99	Well done!
Epidemic related: Advertisement and outreach	100	Well done!
Transportation	85	Consider reducing numbers per journey
Employee interactions: Mobility	74	Consider allowing a few high mobility users to work from home
Employee interactions: Meetings	53	Consider shifting to online meetings
Employee interactions: Outside contacts	95	Consider reducing the number of employees that meet outsiders
Canteen/pantry	54	You have too many outside contacts during lunch time. Encourage employees to bring lunch from home or provide lunch on premises.
Hygiene and sanitation	61	Disinfect the premises more often.

Authority (KSDMA). It was designed as part of research efforts at the new Centre for Networked Intelligence established at IISc with CSR support from Cisco.

The tool takes into account broad epidemic factors and social objectives. It suggests a simple readiness threshold that organisations need to meet or exceed to operate effectively while managing their pandemic response. An organisation can enter information about their workplace and current level of operation into the website, then calculate their readiness level using 10 specific indices, each with a maximum score of 100, and provide a consolidated report. It also provides targeted suggestions if particular weaknesses are identified.

Contact info:

contact.cni@iisc.ac.in

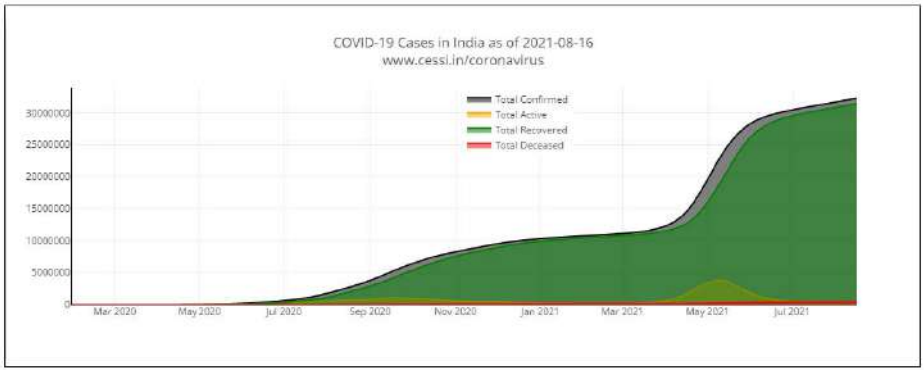
Website link:

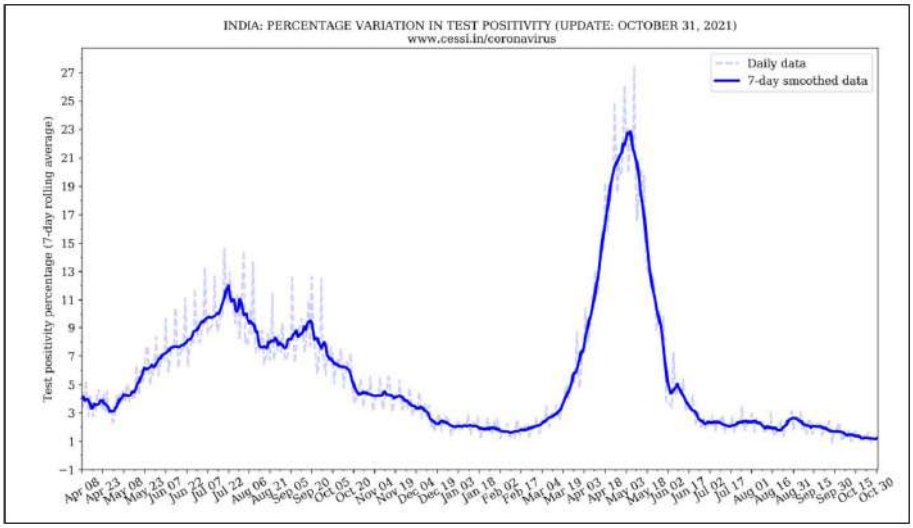
https://covid.readiness.in/

Creating scientific resources for outreach initiatives by CESSI at IISER Kolkata on COVID-19

The Center of Excellence in Space Sciences India (CESSI), IISER Kolkata have utilised their in-house modelling and data analytics capabilities to create resources intended for spreading scientific awareness about the pandemic among the general public and guiding future policies related to the same. The resources available here are based on the CESSI-nCoV-SEIRD model, which has been optimised for the Indian context at IISER Kolkata, data analysis of India specific and some global data on the progress of the pandemic, and informational graphics and social media messages created by the Indian Scientists' Response to COVID-19 (ISRC) group – to which IISER Kolkata scientists have contributed.

Further, details on the epidemiology model developed at CESSI can be found in the 'Model' section. India-specific information on the disease progression and critical parameters characterising the progression of the pandemic can be found in the 'Data Analytics' section. Socio-scientific awareness materials can be found in the 'Public Outreach' section. Researchers from CESSI have also analysed the COVID-19 progression for different Indian states and cities, which can be found out by selecting the name of the state or the city in the dashboard.





Contact info:

dnandi@iiserkol.ac.in

Website link:

http://www.cessi.in/coronavirus/

PDE-based modelling of COVID-19 infections developed by IISc

Researchers from Indian Institute of Sciences (IISc), Bengaluru has developed a model, which is based on a high-dimensional population balance equation. The model predicts the distribution of infected population across the region, the age of the infected people, the day since infection, and the severity of infection, over a period of time. Moreover, the developed model also incorporates the immunity, pre-medical history, effective treatment, point-to-point movement of infected population (e.g., by air, train, etc), interactivity (community spread), hygiene and the social distancing of the population.

Contact info:

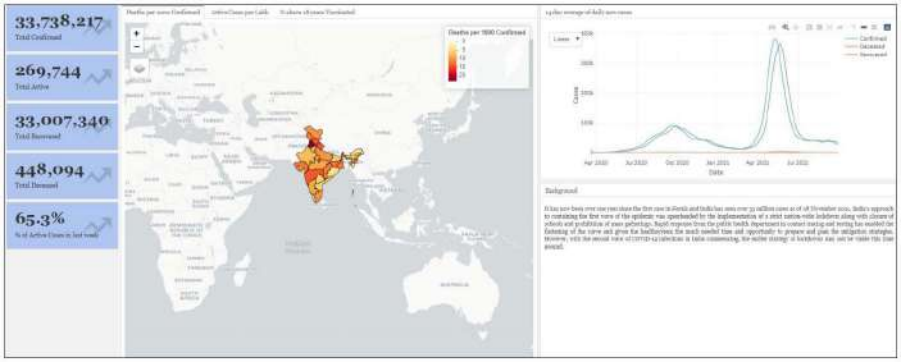
sashi@iisc.ac.in, deepakns@iisc.ac.in

Website link:

https://covid19.iisc.ac.in/pde-based-modelling-of-covid-19-infections/

AMCHSS developed an interactive dashboard to visualise the COVID-19 situation in India

Achutha Menon Centre for Health Science Studies (AMCHSS), a centre of excellence for public health, developed an interactive dashboard to visualise the COVID-19 situation in India. The dashboard uses data science and epidemiological methods to monitor and track the spread of



COVID-19. It offers insights into the transmission dynamics and progression of the epidemic to the public health programme managers, scientific community and general public. The dashboard is updated on a weekly basis. This dashboard gives the information of total confirmed cases, total active cases, total recovered cases, total deceased cases and percentage of active COVID-19 cases in India in the last week.

Contact info:

sarma@sctimst.ac.in

Website link:

https://amchss-sctimst.shinyapps.io/covid_dashboard/

IIT Bombay, in association with city-based Kasturba Hospital, develops technology that can measure the severity of COVID-19

India's COVID-19 cases saw a massive surge in March and April 2021. The second wave of the COVID-19 pandemic put a lot of pressure on the medical infrastructure. Appropriate medical facilities were at times not available to those who needed them the most — the ones who had severe symptoms. There was no way to predict how severe the symptoms of an infected person could become. The golden test to check for COVID-19, the RT-PCR test can only tell whether a person is infected or not. Unfortunately, the test cannot determine the severity of the infection.

Researchers from the Indian Institute for Technology Bombay (IIT Bombay) and Kasturba Hospital for Infectious Diseases, Mumbai, led by Prof Sanjeeva Srivastava of IIT Bombay, have found that levels of specific proteins in the nasopharyngeal samples of a person can differentiate between low and high severity of infection. This information would help hospitals distribute healthcare resources on time and ensure that those who require critical care could be identified with relative ease. The study was funded by the Council of Scientific & Industrial Research (CSIR) and IIT Bombay.

Contact info:

sanjeeva@iitb.ac.in

Website link:

https://www.iitb.ac.in/en/research-highlight/how-severe-one%E2%80%99s-covid-19-infection

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3

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

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

Press Information Bureau releases daily bulletin on COVID-19

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

Outreach initiatives by India Science Channel

myGOV reaches out to citizens by inviting blogs for the largest vaccination drive

Initiative by myGOV to engage the general public in thanking the healthcare workers

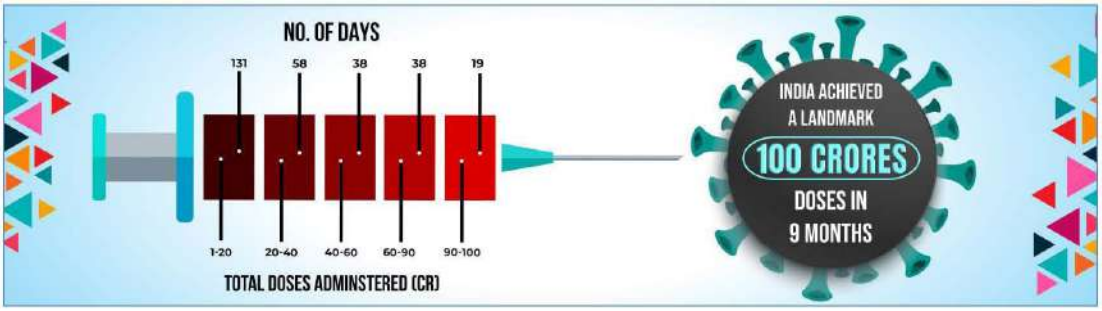
COVID-19: Science & Technology Efforts in India – An information resource on the pandemic

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 outbreak of the COVID-19 pandemic, the web portal serves as a one-stop online information guide to bring together a collection of resources in response to COVID-19. These resources are generated by efforts made by numerous initiatives and schemes taken up by several departments and ministries of the Government of India and numerous 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 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.



Contact info:

kdgm@vigyanprasar.gov.in

Website link:

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

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 the COVID-19 outbreak. The bulletin contains press releases

109.08 cr vaccine doses have been administered so far under Nationwide Vaccination Drive
10,126 new cases in the last 24 hours; lowest in 266 days
Recovery Rate currently at 98.25%; Highest since March 2020
11,982 recoveries in the last 24 hours increases Total Recoveries to 3,37,75,086
Active cases account for less than 1% of total cases, currently at 0.41%; Lowest since March 2020
India's Active caseload stands at 1,40,638; lowest in 263 days
Daily positivity rate (0.93%) less than 2% for last 36 days
Weekly Positivity Rate (1.25%) less than 2% for last 46 days
61.72 cr Total Tests conducted so far

concerning 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 are released on 9 November 2021.

Website link:

https://pib.gov.in/PressReleseDetailm.aspx?PRID=1770332

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 100 crore vaccine doses (1,09,63,59,208) to States/UTs.

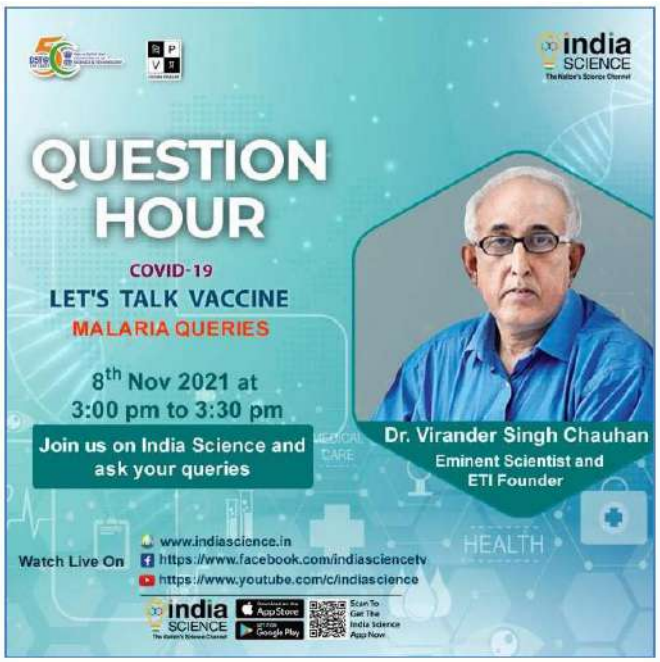
India's coronavirus cases have crossed three crores, and as of 10 November 2021, 08:00 AM, it stands at 3,43,88,579 cases, of which 3,37,87,047 have recovered. The recovery rate stands at 98.25 per cent while the case fatality rate stands at 1.34 per cent.

Website link:

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

Outreach initiatives by India Science Channel

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

1. Weekly COVID-19 video bulletin: Produced in both Hindi and English on a weekly basis from 7 July 2020, COVID-19 bulletin apprises the audience about the latest developments happening in the S&T scenario in India that are helping in managing and overcoming the challenges thrown up by the pandemic. Vigyan Prasar produced a daily COVID-19 bulletin from 11 April to 6 July 2020. Thereafter, a weekly bulletin is being produced, which provides details about the most important S&T updates from the country related to COVID-19. From January 2021 onwards the COVID-19 bulletin carried news about the vaccination drive initiated by the Government of India.
2. COVID-19 Explained: Short films to explain the important research findings related to COVID-19 and COVID-19 vaccination in layman's language are produced on a weekly basis. The topics chosen for COVID-19 Explained cater to the curiosity of the common man towards COVID-19.
3. Facebook live sessions on interviews of various stakeholders on COVID-19 vaccination programme.
4. Facebook and India Science live sessions on interviews with experts on COVID-19 vaccination.
5. 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.

6. 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.
7. India Science makes infographics on COVID-19-related different issues regularly. 8. COVID-19 vaccine: Fact File also telecast every Saturday from India Science.

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Website link::

https://www.indiascience.in/

myGOV reaches out to citizens by inviting blogs for the largest vaccination drive

myGOV is inviting blogs from Indian citizens for the largest vaccination drive in India. It is inviting citizens from all walks of life to share a blog write-up of 500 words. The topics are as follows:

1. Overcoming vaccine hesitancy
2. Getting Covaxinated (COVID vaccine) is important
3. Key to a successful COVID-19 inoculation drive

The blog write-up should be in any of the two formats – word/pdf and the writer should not imprint or watermark the entry. Entries are to be submitted online only. Any other medium/ mode will not be considered for evaluation.

Last date: 31 December 2021

Website link:

https://www.mygov.in/task/inviting-blogs-mygov-citizens-largest-vaccination-drive/?target=inapp&type=task&nid=309211

Initiative by myGOV to engage the general public in thanking the healthcare workers

As the second wave of COVID-19 once again tests India's strength and dedication in defeating coronavirus, doctors, nurses and frontline workers have isolated themselves away from their families and have been working day and night to battle the atrocities of the raging pandemic. To make their job easier and help them, people can support them by following Covid appropriate behaviour and take out time to say a heartfelt thank you.

To make them feel valued, myGOV has started an initiative for healthcare workers, for which you have to first join the Thank You Healthcare Workers Initiative and share your appreciation message

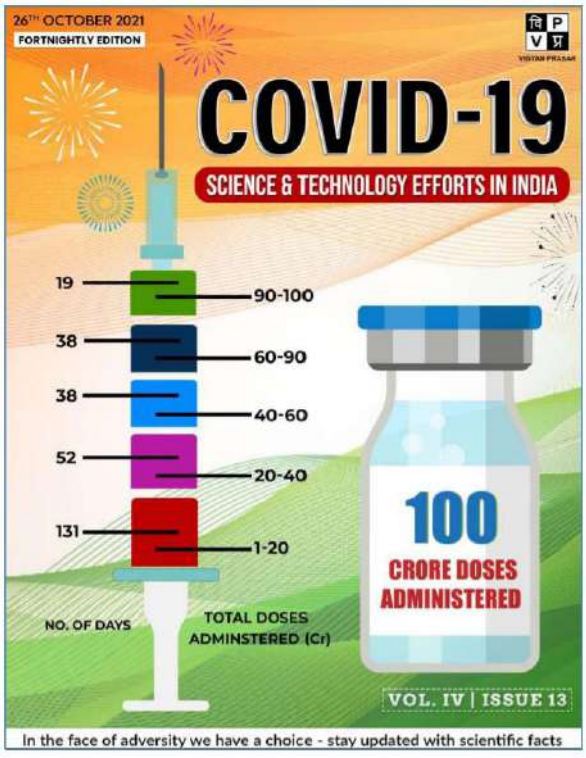
Last date: 31 December 2021

Website link:

https://www.mygov.in/group-issue/lets-thank-our-healthcare-workers/?target=inapp&type=group_issue&nid=309871

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.

The latest edition was digitally published on 26 October 2021.

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Website link:

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

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4

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. SARS-CoV-2 surveillance in India
2. Delta and Delta Plus variants
3. COVID-19 vaccination for pregnant women
4. The third wave of COVID-19 in India and protecting children
5. COVID-19 and White Fungus infection
6. Related to use of oxygen during current COVID-19 pandemic
7. Related to drugs and medications to fight the disease
8. Related to Black Fungus and COVID-19 disease
9. Related to indoor air and COVID-19 disease

1. 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 30 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 the SARS CoV-2 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, NIV and ICMR sequenced samples of international passengers who arrived in India from UK, Brazil or South Africa or transited through these countries, as these countries 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 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 is as follows:

1. The Integrated Disease Surveillance Programme (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

2. 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 behavior.

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 monitor 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

3. 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 health care 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, 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

4. The third wave of COVID-19 in India and protecting 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 (HDU) and intensive care units (ICU). 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

5. COVID-19 and 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.

6. Related to use of oxygen during current COVID-19 pandemic

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 health care 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 22 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 is 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 sets 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 there 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

7. Related to drugs and medications to fight the disease

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. 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.

8. Related to Black Fungus and COVID-19 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

9. Related to indoor air and COVID-19 disease

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 help 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

COVID-19

Science & Technology Efforts in India

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TOGETHER WE CAN AND WE WILL BEAT THE PANDEMIC OUT

For suggestions and feedback, write to us at: covidnewsletter@vigyanprasar.gov.in

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