Inno**HEALTH**

India's First Magazine of Healthcare Innovations

VOLUME 6 | **ISSUE 1** | **JANUARY - FEBRUARY 2021** | **INR 100/-**

Reinventing India post COVID-19

Polypharmacy in Elderly patients

Pandemic resilient ecosystem

"All's well that ends well"

True to the words of Shakespeare who has himself witnessed and survived the Spanish Flu pandemic. The year 2020 will always be engraved as a year whose end we were eagerly looking forward. This year taught the humanity that we play an insignificant role in the vast Universe. With the lockdown period due to COVID-19 pandemic, the people get to spend time with family and they understood the basic necessity for good life is simple where healthy diet comes from home cooked food.

*With so many new experiences,
we wish our readers a very*

Happy Christmas
and
Happy New Year 2021 !!!

Readers' Feedback
A Brief Review on InnoHEALTH
Most liked article of the last Issue....

Feedback and Testimonials

Fight Corona IDEAthon & Mega Online Challenge SAMADHAN

It is a huge crowd and immense responses ...you guys are managing it well

Sujith R
SRM Medical College Hospital and Research Center
SRM IDT, India

Congratulations to all the teams, mentors and not to forget - the organizing teams; you pulled out a great initiative and took it to the logical conclusion - Great!

A loud shout to the Organizing Team - Its not easy to get all this planned, coordinated and executed flawlessly - Hats off!

Atul Bengeri
Director
AcumenToday, India

I would like to express my gratitude to the chief editor and editorial team of "InnoHealth" for the excellent coverage in the magazine published. The positive exposure you gave me on the International Nursing day - praising, thanking and protecting nurses amid COVID-19 challenges segment provided the community with a nice introduction to our goals and services.

Neha Lal
Sr. General Manager
GCS Medical College, India

To Forge and IC - You guys pulled it off! A first-of-its-kind 100% Digital Ideathon. Hats off to the whole team. You brought so many Indians together to synergize on a country-wide problem. The commitment, the program structure, crisis management was commendable! Cheers to everyone from your team who worked behind the scenes too!

Arjun Ramakrishnan
Asst. Manager - Innovation
National Life and General Insurance Company
SAOG, Oman

Supporting Nurses & Midwives webinar

Panel Discussion on Supporting Nurses and Midwives in Pandemic COVID-19 was very interesting and informative.

Sheetal Kothare
Assistant Professor
L. T. College of Nursing,
SNDT Women's University, India

Working with you all was a good experience, I really appreciate the efforts and the coordination by your team.

Manju Chhugani
Professor & Dean
Jamia Hamdard, India

The session was very informative.we got different options & suggestions by panelists to handle the COVID19 pandemic. Thanks to the support of the organiser.

Debashree Dash
Nurse Educator
**Sri Sathya Sai institute of higher medical sciences India**

Solving Diabetic Retinopathy diagnosis through Artificial Intelligence webinar

Thank you for giving me this opportunity to join such an informative webinar like this. I enjoyed a lot and learned a lot hoping for more webinars in future on different topics.

Yashwant Technohand
Sales & service Engineer
Technovision India Pvt Ltd, India

Diabetic Retinopathy webinar was very useful. Speakers presentation was very excellent

Hemapriya Prabakarane
Assistant Professor
Vinayaka Missions College of Nursing, India
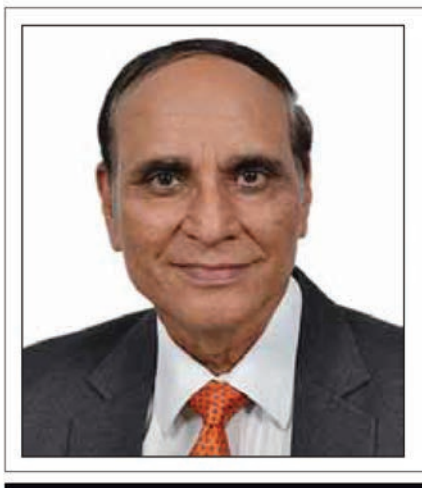
Dr. V K Singh

Editor-in-Chief & MD,
InnovatioCuris

vksingh@innovatiocuris.com

EXECUTIVE OPINION

COVID-19: Pandemic Lessons for Future

The present pandemic has been a great learning for the future. It has changed social behaviour of human beings, there is hardly any extravagant expenditure, it has brought self-discipline, unpretentious showcase during social functions and it has also tested our capability to fight amidst the adversities. There is conservation of limited resources by all, should it not be called mock exercise for disaster which included testing mettle of health workers too. It has taught us to be self-reliant. We were importing PPE, ventilators, and other healthcare products and the same is being exported to other countries.

We should look back at Spanish flu, a virus pandemic of 1918-19, a century ago which affected 1/3 of world's population that is 500 million in those years and 50 million people died. Does COVID 19 show an another way of population stabilization, a warning to human race to keep watch on pollution and climatic changes which is one of contributory factor of Pandemic?We are making lifestyle changes, accepting balance diet, and doing yoga etc. to boost our immunity as well as to make robust psycho social efforts to fight isolation and uncertainties.

We as a nation need to pay more attention to public health, quality of life rather than curative medicine. We are overwhelmed with an idea that vaccine and herd immunity would come to our rescue to control pandemic which by all logic would take a year to control. A credible Vaccine with all scientific parameters is also six months away. Though few countries have started using it out of desperation to control, few questions are still unanswered; how long immunity would last, what are safety data/side effects and its acceptability with all right answers. There is also commercial angle to push vaccine, the stand of India is more appropriate to accept after due consideration and deliberation. It would be appropriate to draw parallel like use of plasma therapy, tablet Chloroquine since nothing was available to treat, is now recommended to be discarded. Let us not panic instead we should let scientific community work without stress to find proven vaccine. With all technology standpoint we are better to tackle COVID-19 compared to Spanish flu of 1918.

We have neglected healthcare in terms of spending and have limited number of beds, 1 bed per thousand population compared to 3.5 as recommended by WHO, limited number of health workers and inappropriate quality of healthcare. We are still riddled with malnutrition, infant mortality, lack of awareness, and health education. We have woken up out of slumber to cover the situation at breakneck speed to handle pandemic, this certain unprecedented time has forced us to think about the health infrastructure. Do we have to wait for crisis to develop to plan, but one can argue that we have done better than advanced countries. We hope to have good lesson to learn about holistic healthcare in future. We need to strengthen health systems, primary healthcare, and strict control on private and corporate healthcare. National Digital Health Mission is good beginning to use technology to make healthcare system robust.

We need to make qualitative healthcare system at optimum cost. The political will is gaining momentum to make responsive healthcare system. What many healthcare organisations demanded year after year could not be achieved earlier but now feasible as pandemic has made it happen. Accountability of each stakeholder in healthcare is to be enforced to meet our objective to provide "Health for All" which we failed and remained unfulfilled slogan of year 2000.

InnoHEALTH

CONTENTS

PERSONA

Reinventing India post COVID-19 with Speed, Scale and Sustainability

Dr. Raghunath Anant Mashelkar, National Research Professor, has been the Director General of Council of Scientific and Industrial Research, Chairman of National Innovation Foundation, the President of Indian National Science Academy, Global Research Alliance and Institute of Chemical Engineers (UK). In recognition of his pioneering research contributions in polymer science & Engineering, he has been honoured as a Fellow of Royal Society, Foreign Fellow of US National Academy of Science as also Engineering.

He has received 42 honorary doctorates from many Universities around the world apart from the 60+ awards won by him which include the prestigious TWAS-Lenovo Science Prize, Business Week (USA) award of `Stars of Asia'& JRD Tata Corporate Leadership Award. He is the member of the Scientific Advisory Council to the Prime Minister for over thirty years and has been honoured with India's highest civilian award Padmashri, Padmabhushan and Padma Vibushan for his exemplary contributions for mankind

Dr. Debleena Bhattacharya, Associate editor, InnoHEALTH interviewed Dr. Raghunath Anant Mashelkar in November 2020, for his valuable scientific insights.

Q1. India post covid-19 is ready to reinvent itself. You have been at the helm of affairs from a Science &Technology perspective. What is your advice on the top 3 thrust areas for the country to be?

I would say that there are three D's that we need to concentrate on. These are technologies that will drive digitalisation, decentralisation and decarbonisation. **Let me explain each of these.**

First digitalisation. The dream of digital India is taking good shape. For example, it took India 25 years for 2G but Jio helped move India to 4G in just 3 years. India jumped from 155th position in mobile data consumption to the first position in just a matter of few months, thanks again to Jio. But digitisation of education, health, financial services, and also digitalisation for business transformation was proceeding slowly. Post COVID the digital transformation will take place at a rapid pace. Why?

Satya Nadella has saidthat two years of digital transformation took place in two months. A medical expert in UK has said that what would have happened in tele medicine in 10 years time, has happened in just 10 days. And in USA, it is reported that what one would have seen in e-commerce in 10 years has happened in 10 weeks.

Working from home, telemedicine, digital financial transactions are gathering pace. For instance, it was reported that India jumped to the top position in real time digital financial transactions by doing 41 million transactions per day.

But digitalisation will become critical in other areas. For example, within hundred days, 1.6 billion children around the world went out of school, and home became their school and Indian children were no exception. Online learning by using digital technology became the new norm. This process was taking place slowly, it has suddenly accelerated. Indian poor suffer from digital depravation. Their children will suffer, if we do not do digitalisation.But no digital access would mean no access to education.

The second is decentralisation. Rather than aiming for mega factories in urban India, which causes the shift of migrant labour from rural India, we need to aim for decentralised development. We need to promote technologies that will make it possible.

For example, 3 D printing, which is based on additive manufacturing, helps in decentralised manufacturing and does away with usual manufacturing, which involves huge supply chains, which create carbon foot print.

We need technologies that will create less carbon footprints. For instance, hydrogen produced from centralised large refineries is one option, which has the additional burden of cost of transportation, but hydrogen produced from local biomass can do away with this problem, while also generating local employment.

Rather than having centralised medical testing facilities, creation of decentralised point of care non invasive user friendly testing technology will again lead to decentralisation. Shifting to decentralised

micro grids for electricity is already happening. In every endeavour, be it energy, water, health, and several other endeavours in manufacturing and services, development of technologies leading to decentralisation is possible.

The third is decarbonisation. The pandemic was a trailer of what would happen if there was a full fledged impact of our inability to control the climate change. Huge disruption of supply chains, also of demand, and also extremely rapid global transmission and amplification happened during the pandemic. Worst will happen with climate change threatening our common future.

We need green growth and for that we will need green technologies, that will help us become net carbon neutral in coming years. Renewable energy, be it solar or wind orbio based will be the key. We will have to focus on technologies that will help us build our new economies, like bio economy based on biofuels technologies, hydrogen economy based on hydrogen fuel cells technology, etc. We have to look at similar strategies fo technologies in other areas such as electronics, where our import from China is heavy.

Q2. When we look at healthcare, the new normal is digital delivery of health care. PM recently launched the National Digital Health Mission. We have always resisted digitisation in traditional sectors in the country. Healthcare is one of them. What challenges and opportunities do you see for a diverse country like India with Digital Health?

COVID-19 has amplified digital innovation to historic levels. Healthcare organisations around the world are setting aggressive technology agendas to explore the enormous benefits of emerging digital technologies. The greatest shift in the pandemic is towards digital health, and especiallyTelehealth. Customer adoption of Telehealth during the pandemic has skyrocketed worldwide. For instance, the pandemic, in USA, use of Telehealthjumped to 46 percent which was just 11 percent in 2019. But India was no exception. 50 million Indians accessed healthcare online from March to May 2020, with 80 percent of all telemedicine users and patients using it for the first time.

Indian shortages in doctors per patient are not only severe but also very uneven. In India, 60 % of hospitals, 75 % of pharmacies, and 80 % of doctors are in urban areas. This creates the challenge of access for the rural areas. But we can meet with this challenge with Telehealth by ensuring better connectivity in villages, which is the agenda of GOI anyhow.

Internet of Things(IOT) —connected devices—is part of the Telehealth revolution. Smart devices have become more prominent as people have invited them into their lives to help fight COVID-19 and to share data with their doctors.

Dozee is a young Indian start up, which showed the power of IOT. It created a contact free health monitor based on IOT, that can be placed below a mattress and track vital parameters, which can convert any bed into a continuous health monitoring unit, almost like converting normal beds into step down ICUs. **Let me tell you about other breakthroughs in digital health created by Indian startups.**

Mumbai-based startup Qure.ai uses an artificial intelligence powered solution to identify 24 abnormalities in a chest x-ray including ones indicative of a Covid 19 infection. And does it fast and very cheaply.

Hyderabad -based start-up Salcit technologies addressed the issue of pre-screening of Covid 19 patients by re-proposing its mobile application that uses artificial intelligence to analyse the coughing.

But there are concerns also about telehealth. In a recent healthcare consumer survey, 70 percent said that they were concerned about data privacy and businesses tracking their online activities, behaviours, locations, and interests. Digital health of the future has to address how we're going to protect data privacy.

Q3. Has COVID-19 been a boon for some of the industries?

Technology companies (for example Apple, Amazon, Google) that had adapted to platformisation did very well. Jio Platform was a classical case, being able

to get an amazing investment of US $15 billion during the pandemic. Technology sectors got a big boost as working from home, disappearance of physical meetings and emergence of virtual meetings took place. For example, Zoom Video Communications grew exponentially during the pandemic. Zoom began the year with a market cap of $19 billion and on Oct 29, Zoom's market valuation crossed $139 billion, surpassing the oil major Exxon Mobil!

The Online Gaming and Entertainment grew exponentially with Netflix adding 25.86 million subscribers in the first half of 2020, giving the company its biggest growth spurt in its history. The E-Commerce growth was phenomenal, for instance, Amazon's Market cap grew from $945 Billion to $1661 Billion since beginning on the year.

The same was the case with Fintech. For example, Zerodha, a broking firm jumped from 1 lakh new customers per month to about 3 lakh customers per month during lock-down period. UPI payments jumped from 1.3 billion in February to 2.07 billion in October. Google Pay grew 3X in September 2020

Closure of schools during the pandemic and demand on online learning suddenly catapulted the Edtech sector. About 5X growth in funding was observed in just 12 months, with India becoming home to the second highest number of Edtech companies after US.

There are 4000 + active Edtech start-ups in India today. Among these new-age Indian edtech companies like Byju's, Unacademy, Vedantu, Toppr and Whitehat Jr grew exponentially as consumers in India as well as outside lapped up their services.

Q4. How do you see the Atmanirbhar Bharat initiative by the GOI? What does Atmanirbhar Bharat mean to you in today's globalised world?

'Atmanirbhar Bharat' means self reliant India. But in today's globalised world, idea of self-reliance cannot be about a return to import substitution, or to licence-permit raj and inspector raj but an active participation in post-COVID global supply chains coupled with a strategy to attract foreign direct investment.

Atmanirbhar Bharat must be built with Atmavishwas, with self confidence, it is all about standing up confidently in the VUCA world that is volatile, uncertain, complex and ambiguous. It is not about isolationism behind "narrow domestic walls" but it is about integration with the world.

Also 'make in India' has to be converted from assembled in India to invented and made in India.

In 2020, the situation has changed dramatically. With the Chinese Government and their companies being viewed with great suspicion by the global business community, India has a great opportunity to establish itself as a global manufacturing hub. India will be able to attract global investment provided it brings in the much needed reforms in terms of land, labour, law, logistics and cost of inputs. We must also insure our industry from vulnerabilities of different kinds and make it resilient.

Q5. What are these vulnerabilities? How do we make our industry resilient?

I have recently proposed ten tenets of resilience for Indian industry. These are adaptability, agility, resilience thinking, scenario-based planning, building a purpose-driven organisation, platformisation, digital readiness, ability to foster self-disruption, climate preparedness and autonomous innovation. Our industry must become future proof against all our current and future vulnerabilities.

What are these vulnerabilities? Let's look at the Chinese import component in various sectors of the Indian economy. In descending order, it is Pharma API (68%), Electronics (45%), Manufactured Capital goods (32%) and the list goes on. Secondly, let us look at how strongly our exports are dependent on Chinese imports to produce our own exports.

The Foreign Value Added (FVA) contribution of China to India's exports as a total FVA is overly dominated at 34.1% as against that from imports from Germany (5.2%), US(4.9%), South Korea(3.6%), etc. That's a very heavy dependence. There is no other option but to reduce it. We can't suddenly go Chinaless, we have to go for 'less China' and more precisely a pragmatic China +1 with a calibrated strategy.

Q6. Can you illustrate this calibrated strategy that you have in mind by taking some sector specific examples?

India is known as the pharmacy of the world in terms of manufacturing of very high quality generic drugs and therapeutics, which we export to the whole world. But this industry is hugely dependent on the imports of APIs from China. We had shocks during the COVID times, because for some time, the Chinese exports stopped. Now new shocks are coming because China is recently increasing the prices of APIs. What happens if they altogether stop the supply of APIs just as they stopped the import of coal from Australia?

Now there is a welcome rethinking at a national level in terms of boosting indigenous API manufacturing. Government of India has acted decisively, rapidly and positively. The proposed new incentives and investments , setting up of API parks, etc are exactly the right steps.

We must, however, remember that we stopped manufacturing not only because imported APIs were cheaper but also because API manufacturing was polluting. So now we must gear up our great Indian strength in process chemistry and process engineering for green manufacturing, that will produce cost competitive APIs. That will be the challenge in our quest towards make in India, with invent in India.

We have already received these shocks of the penalties for just going for assembling and not inventing, when we make in India.

Q7. Very interesting. Can you sight some more specific examples and say as to what are the lessons from these for building Atmanirbhar Bharat of our dreams?

Indian mobile phone manufacturers had begun dominating the domestic market. Home-grown brands, such as Micromax, Karbonn, Lava and Intex, held a 45 percent smartphone market share in 2015. However, demand for these brands was decimated quickly once Chinese competitors like Xiaomi, Vivo and Oppo entered the Indian market.

From a mere 9 percent market share in 2015, these chinese brands reached 68 percent by the end of 2019, while the Indian brands in the smartphone category plummeted from 45 percent to a mere 7.5 percent by 2019, just in 4 years!

How did Indian brands lose their home turf despite having early movers' advantages, in a short span of four years?

Indian companies largely adopted a trading business model. They were not Original Equipment Manufacturers (OEMs). Their 'manufacturing' activity was limited to mere assembling, since then they were importing Semi-Knocked Down (SKD) kits, instead of Completely Knocked Down (CKD) kits. Further there was no product research or innovation done.

Chinese did aggressive innovations, localisation to reduce their tariff tax and transportation cost, innovative customisation for local customers, and large economies of scale. The lessons for us on what not to do and also on what to do are obvious. Innovate or perish.

Q8. Can you give us some specific examples?

When the pandemic arrived, we had negligible diagnostic capability, no point of care diagnosis, no vaccines, no therapeutics, the biology and mechanism of action of the virus was unknown. Our scientists delivered actionable science to the decision-maker that was timely.

Indian innovations during the COVID pandemic have made a difference in all areas. Also they came from young startups to big industrial enterprises, from universities to national research laboratories, from foundations to NGOS. All Indian hands have been on deck in times of crisis.

Q9. Has the Indian scientific community risen to the challenge posed by the pandemic? Have their actions given you the confidence that they will not just be at the periphery but at the centre, while building Atmanirbhar Bharat?

Let us just take Council of Scientific and Industrial Research, our largest chain of publicly funded R &D institutions.

In March, 38 laboratories of CSIR formed one 'Team CSIR', which quickly identified the unmet needs, assessed its strengths and capabilities for addressing the pandemic and adopted a multi-pronged strategy of working on diagnostics, surveillance, drugs and therapeutics, vaccines, hospital assistive devices, personal protective equipment and supply chain and logistics.

Over 100 technologies in the last 6 months have been developed with the strong partnership with major industries to MSMEs to start-ups. CSIR laboratories contributed to the molecular, digital surveillance alongwith the development of diagnostics and augmentation of COVID-19 testing.

In the drugs and therapeutics vertical, the strong chemistry expertise and experience in pharmaceuticals of several CSIR contributed immensely to the development of repurposed drugs such as Favipiravir, Remedisvir, Umifenovir and others for COVID-19.

They also had world class breakthroughs. Let's just talk about one world class breakthrough that is in the news. IGIB laboratory of CSIR created a game changing innovative test called FELUDA, which uses cutting edge CRISPR technology for detection of genomic sequence of novel coronavirus with 98% plus selectivity and specificity.

Its main advantages are rapidity (detection in just one hour), affordability (Rs 500 only), relative ease of use and non-dependency on expensive Q-PCR machines.A company from the TATA group is bringing it out in the market, with an aggressive drive of these diagnostic test kits. Just imagine we were importing millions of them from China, when the pandemic started earlier this year!

Q10. How do you feel Startup India, the flagship program of the GOI to encourage private entrepreneurship can play a role in Atma Nirbhar Bharat initiative? What type of incentive should entrepreneurs provide?

Indian startup ecosystem has risen magnificently to the challenge. Here are some examples first in health and then in education.

Mylab startup in Pune is nearly all-female team of researchers, that developed a PCR diagnostic tool using RT-PCR in a record setting six weeks. It was the first Indian medical kit to receive the commercial approval from CDSCO.

Take education now. Because of the lockdown, classrooms have been forced to shift online and digitise in a short span of time. Ed-tech startups have gained immense popularity post lockdown. At least 15 ed-tech startups including Vedantu, Classplus etc. have raised funds during COVID-19 and even before that BYJU's and Unacademy had raised large investments.

Six Indian start-ups beat the pandemic to become unicorns this year. They are Pinelabs, Razorpay, Zerodha, Unacademy, Postman and Nykaa. The way to incentivise start-ups is by making life hassle-free for them.

For instance, I chair the Maharashtra State innovation Society. We created a new start up policy with several incentives for them but also a special tendering process for the start ups, so that they get work orders from the government departments based on their excellence and not get handicapped due to of lack of experience, which is the handicap of a normal Government tendering process. I am happy to see that different states are competing with each other now in this space!

Q11. Recently, the GOI came up with the new education policy (NEP). What improvements would you suggest in the same if we have to create a workforce that is capable of undertaking all types of roles required to make Indian Atma Nirbhar?

The NEP is excellent. However, in terms of the workforce, I suggest that nationwide audit of all the higher educational technological institution should be undertaken to understand the current level of preparedness in terms of exponential technologies, industry 4.0 and the needs of future jobs, that will replace the old jobs in Industry 3.0.

These exponential technologies, as you know, are Internet of things (IOT), Artificial Intelligence (AI) (Machine Learning), Robotics Process Automation (RPA), Virtual/Augmented/Mixed Reality, Sensors, 3D Printing, 3D Visualisation, Mobile Internet and Cloud, Big Data Analytics/Open Data, Blockchain. In what way are they exponential?

New skills in the era of industry 4.0 will be the ability of the students with complexity, critical thinking, emotional intelligence, cognitive flexibility, creativity, etc. Considering creativity, India's education system has given more importance to logical thinking and reasoning capabilities, but now, with Al, the new jobs will be more focused on creative thinking.

Universities of the future need to transition towards a learner-centred education model where learning and work go hand in hand. Customised learning modules coupled with adaptive, dynamic and agile life-long learning should be the focus of the universities to create workforce with long-term sustainability.

Indian academia must adjust to the power of open disruptions such as open knowledge (Udacity, Courser, a Kahn), open-source development/collaboration (GitHub), open innovation (Quirky) and open research (Materials project, OSDD).

The disruptions post-COVID in terms of huge acceleration of digitalisation must be factored into NEP, which was written in the pre-COVID era. India will have to move from 'right to education' to 'right education' to 'right way of education' in view of the great disruption that exponential technology is going to create. NEP, that was framed in the pre-COVID era must factor this in now.

Further, new exponential technology will be high technology. It will be based on a solid foundation of high science. India must continuously raise its investments in high science, so that India's high science base remains strong and globally competitive.

Interviewed by

Dr. Debleena Bhattacharya, Associate Editor, InnoHEALTH interviewed him where he shared his insightful perspective about the recent pandemic situation and the way India can bounce back with speed, scale and sustainability.

GUEST COLUMN

Medical Devices: Prioritise Quality Checks & a Strong Ecosystem

■ **Mr. Rajiv Nath**

The Covid-19 pandemic situation was initially dreadfully challenging in India with a huge population and high import dependent medical devices sector. The Government of India through its flagship "Make in India" initiative relied heavily on the Indian manufacturers to meet the rising demand of essential healthcare equipments for the country, pushing the Indian medical devices sector for an Atmanirbhar Bharat.

To establish India as a dependable Manufacturer of high quality medical devices in Global supply chain & to vie for being the 2nd factory in world, India needs to bring in a quality culture to maintain global standards in quality of healthcare products and the Prime Minister should constitute a Quality Advisory Council and a dedicated Principal Quality Advisor to the PM to evaluate the quality & standard of Indian products e.g. medical devices, advice & guide the PM, like they have office of Principal Scientific advisor to PM.

Such a dedicated team will ensure high quality standards yet affordable medical devices, lend greater credibility to the quality of Indian Medical Devices, bring in innovation, incentivize the Indian Manufacturers and enhance globalcompetitiveness from Brand India.

During this covid pandemic India faces huge hurdles in identifying and weeding out low quality & sub standard healthcare products flooding the markets in the absence of an able Quality scientist with pandemic leadership.

The various quality institutions available are reporting to different Ministries and act in silos and defend their turf rather than working in complementary roles assigned to them as a team. Teams need leaders who are capable of handling the unprecedented situations.

So, if country needs labs and testing infrastructure to test PPE coverall or masks or ventilator who plans and decides? Not NABL, as their job is only accreditation of the lab after its set up, not BIS as they have too many products & not equipped, not DGCI- CDSCO as they have no funds and no claim no mandate to regulate as yet, MSME Manufacturers(?) they can invest in some simple testing equipment but not complex ones. Indian Institute of Science or the IIT? Well yes, some have great infrastructure, but industry is not clear who has what and whether access is possible for commercial 3rd party testing.

To have Make in India to thrive one needs a quality mindset of vertical product standards, horizontal process (and common product family) quality standards, specifications, voluntary standards setting and at times safer regulatory controls and demonstration of compliance to standards with the help of test labs. These labs are not only needed for tests but to benchmark evaluations as well as Research and Development studies.

It is still being noticed that most of the PPE & Medical Masks being sold in India during COVID-19 are not manufactured to comply with Basic Standards of PPE as recommended by WHO. Concerned with the falling Standards of Quality & Safety apart from the huge surge in prices during COVID 19, AiMED (Association of Indian Medical Device Industry) representing interest of over 700 medical device manufacturers has sought intervention of Govt., Drug Prices Regulator, NPPA, in capping prices, and ensuring quality, both with ramifications on consumers, health workers and industry but is challenged by lack of coordination.

The penal system in the Drugs Act is a disincentive for medtech investors. The Act is not appropriate for innovative engineering products like medical electronics. Consumers do need access to high-quality PPEs and ventilators. An appropriate legal framework envisaged by the NITI Aayog is awaited as a medical devices law that would decriminalise most oversight and regulatory lapses and will have

> **To establish India as a dependable Manufacturer of high quality medical devices in Global supply chain & to vie for being the 2nd factory in world.**

> **It is still being noticed that most of the PPE & Medical Masks being sold in India during COVID-19 are not manufactured to comply with basic standards of PPE as recommended by WHO.**

have risk-proportionate penalties. This will encourage new entrants to venture into medical devices—as being engineering products and not drugs.

Amid Covid pandemic & growing Indo-China tensions, India has to address every issue linked to national security. Healthcare being the most critical, India has to evolve imaginative policies and usher in reforms that will accelerate its economic revival. Developing our own domestic medical industry is the best way forward.

The Department of Pharmaceuticals has recognised that indigenous manufacturers have a disability of 12-15% on account of:
1. Lack of adequate infrastructure, supply chain and logistics;
2. High cost of finance;
3. Inadequate availability and cost of quality power;
4. Limited design capabilities; and
5. Low focus on R&D and skill development.

There is no mechanism to address these disabilities in manufacturing of medical devices. The Department of Biotechnology (DBT), the Biotechnology Industry Research Assistance Council (BIRAC), the NITI Aayog and the Office of the Principal Scientific Adviser have been working to create an ecosystem for nurturing start-ups and incubators. But once they create a commercial product and graduate to MSME entrepreneurs, the real challenge comes for these start-ups to cope up with the above-mentioned 12-15% disabilities and marketing challenges.

The focus needs to shift from chasing investment value by foreign brands and onto creating an ecosystem for making in India. Consider nurturing Indian manufacturing champions who will lead other mid-size and small-size manufacturers to follow. The COVID-19 crisis has shown that Indian medical device manufacturers can scale up manufacturing to tackle spiked demands for ventilators and other life-saving medical supplies.

For manufacturers demand comes from local consumption or exports. Imports of Medical Devices are a negative demand as domestic purchasing power is diverted to foreign goods. Converting negative demand to positive demand is what the Govt. should try to achieve and boost economy as well as create jobs.

Another concern area that the Indian Medical Devices industry has been requesting the Govt. to address is Artificial Inflation where labeled MRP instead of protecting consumers in case of Medical Devices has become a license to charge the full MRP which may lead to profiteering at retail/ hospital end. By rationalizing trade margin over import landed price consumer can gain and not feel exploited post COVID. This will also help Make in India prove itself in stents and knee implant and favor Ethical Marketing by Overseas and Indian Manufacturers.

We recommend the following reforms to give encouragement & boost Manufacturers producing in India :
- Preferential Pricing for Domestic Manufacturers based on World Bank norms.
- Preference for ICMED / ISO Certified Manufacturers to boost quality.
- Preference for Design India Certified Manufacturers to boost indigenous development.
- Timely payment against Govt. Supplies.
- Penal provision against Hospitals that keep exclusionary compliance Clause of USFDA Certification as 3rd Country Regulatory approval.

What's meant by Preferential Pricing? How does World Bank support Indigenous manufacturers in a developing country?
World Bank has a clause to support domestic manufacturers by adding 15% to import CIF price of imported goods for the sake of bid comparison and thereafter the lowest price is winner. So if Indian manufacturer wins he will supply at his bid price, not at a higher price.

We are glad Govt. has begun taking various initiatives to end the 80-90% import dependence forced upon us and an ever increasing import bill of over Rs Rs.42000 Crore, expediting steps for patients' protection, stronger quality & safety regulations, price controls to make medical devices and quality treatment accessible and affordable and ethical indigenous manufacturing to be viable.

> **Another concern area that the Indian Medical Devices industry has been requesting the Govt. to address is Artificial Inflation where labeled MRP instead of protecting consumers in case of Medical Devices has become a license to charge the full MRP which may lead to profiteering at retail/ hospital end.**

Mr. Rajiv Nath is the Managing Director of Hindustan Syringes & Medical Devices Ltd. He is the President of All India Syringes & Needles Mfg. Association. (AISNMA). He is also the Founder and Forum Coordinator – Association of Indian Medical Device Industry (AiMeD).

▶ THEME

Artificial Intelligence for Healthcare 2.0

■ **Dr. Swati Subodh**

The present pandemic has been unprecedented in history in terms of the number of people affected by it, directly and indirectly. The communities have gradually started adapting to this new normal even as the second, and at some places the third wave, of COVID-19 infections are being reported. It is clear that, as we attempt to find a balance between health and economic priorities, life will not be business as usual, at least not yet.

Healthcare has suddenly come back into round table discussions for policy and practice, more to ascertain that a situation of this magnitude that paralyzed entire global societies and economies overnight, can be averted in future.

To have a sharper outlook on existing and emerging infections and diseases, it becomes imperative that data-driven intelligence complements human intelligence such that outbreaks can be better predicted, and their spread can be better managed and controlled. Additionally, diseases need to be monitored, managed and treated more efficiently remotely to make the best use of limited resources while protecting care givers from risk of infections, wherever possible.

Healthcare is a global priority, with a wide spectrum of diseases, acute and chronic, that needs to be monitored for hundreds of parameters for millions of people at any given point of time. To make informed

choices, decipher emerging trends, plan public health interventions and ascertain optimal treatment regimens from this humongous quantum of data will require real-time analytics and interpretation that can be used to make critical time sensitive decisions. This is where artificial intelligence (AI) comes in to complement and simulate human intelligence.

AI is a sector that was on an exponential rise even before the COVID outbreak, however since the beginning of the year its growth has further accelerated. Although the application of AI in healthcare has so far been dominated by fitness trackers for wellness monitoring, health notifications and personalized recommendations, there are avenues in which AI has started
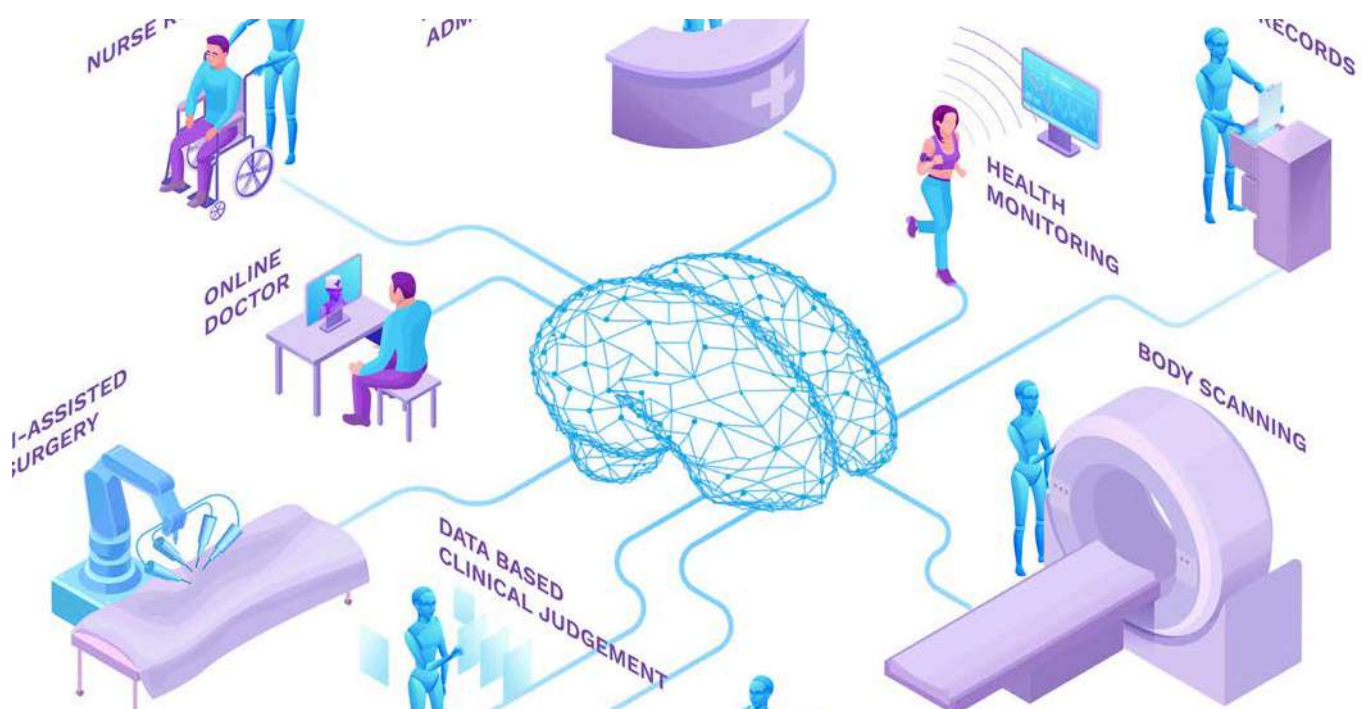
> ## AI is a sector that was on an exponential rise even before the COVID outbreak, however since the beginning of the year its growth has further accelerated.

impacting healthcare which are lesser known.

AI techniques such as machine learning (ML), optimization and natural language processing (NLP) have been useful in providing critical insights and predictions on the spread of the coronavirus and the effectiveness and impact of countermeasures. Additionally, as many other healthcare services were disrupted or severely compromised due to the pandemic, the need for technological advancements, like AI, to sustain healthcare delivery in an already challenging ecosystem becomes imperative.

AI for surveillance

Bringing together AI/ML and geographic information systems (GIS) has created GeoAI which has an emerging role in health and healthcare at population and individual levels.

Factors such as the environment, environmental exposures, and social determinants allow us a better understanding of the risk for specific diseases and help in identification of appropriate strategies for ramping up prevention and containment efforts. To achieve this, spatial big data such as social media, electronic health records, satellite remote sensing, and personal sensors, are being used to advance the science of public health.

BlueDot, an AI company, used data to predict the emerging risk of a potential outbreak of COVID-19 in the Hubei province of China on 31st December 2019. They also went on to correctly predict the first 8 out of the 10 cities where the virus would spread based on various transport, environmental and other factors. This highlights how critical an information of this nature could have been to break the chain of transmission early on and

prevent the spread of the disease.

Globally many efforts are presently ongoing for real-time syndromic surveillance system to detect disease outbreaks earlier by classifying health-related geotagged tweets that allowed for the geo-visualisation of health symptoms. Going forward these systems aim to improve the surveillance system by incorporating disease-specific information (e.g., mode of transmission) to enhance disease forecasting accuracy. With major changes in determinants of environmental quality in recent times, the effect of climate change is also becoming important in disease resurgences and management. Facebook has developed highly detailed population maps to assist health organizations, researchers and universities understand as well as tackle disease outbreaks and plan public health interventions. As per the research the American Red Cross is one of the users of such maps.

Aside from population-level surveillance, efforts are also underway to monitor pathogens and their transmission. Under the Global Virome Project developed by scientists at EcoHealth Alliance, unknown viral threats are being analysed. Combining factors such as deforestation, land use, level of wildlife diversity, population density, human-wildlife interaction, etc. a map was created. They claim that with this data they have identified potential hotspots that could kickstart future pandemics if timely counter measures are not taken.

AI for screening and diagnosis

The COVID pandemic has left millions infected across the globe and a larger proportion that have been exposed and at potential risk of disease outbreak. When millions in scattered communities across the globe are at risk, screening them to ascertain their risk to plan interventional

strategies becomes a herculean task, not to mention a very resource intensive one in a fragmented and under-resourced sector.

AI has already been deployed to assess chest CT scans, MRI scans and X-Rays to screen for potential SARS-Cov-2 infection in patients, especially in early stages of the disease where the scans might appear normal on visual inspection. Studies are also underway to identify infection and disease progression from a patient's cough pattern. AI enabled interventions, such as these, can ramp up the screening efforts and connect the patients to appropriate care for their treatment and for prevention of infection from spreading further.

AI based screening solution have already made inroads in screening for chronic disease and NCDs. In early 2018, IDx-DR, an AI based software algorithm for analysis of images of the eye, received US FDA approval, marking a historic moment in healthcare. IDx-DR achieved 87.4% accuracy rate while detecting 'more than mild' diabetic retinopathy. Closer home, Google partnered with leading eye care chains Narayana Nethralaya, Aravind Eye Hospital and Sankara Nethralaya to train its AI system on the detection of diabetes retinopathy, especially using low-quality images.

In India considerable focus is on AI in cancer due to a high incidence to mortality rate. According to an EY report, 55% of the breast cancer cases in India were detected at late stage compared to 11% in the UK. Similarly, for cervical cancer, 85% of the cases were detected at the third or fourth stage, against 25% in the UK. A large number of resulting mortality are avoidable with awareness and early screening. Having low cost, minimally invasive screening solutions can democratize cancer care across strata. Niramai Health Analytix, and OncoStem Diagnostics are two startups offering AI based solutions in this space.

Ten3T's AI based palm-sized cardiac care monitor, Cicer, tracks ECG, respiration, pulse, temperature easier and on real-time basis. The data is streamed to the doctor or at the clinic for monitoring the patient. It is adapted for various clinical, nursing and in-home applications.

To overcome the lack of infrastructure and expertise for reading pathology samples, Sigtuple leverages AI and machine learning to analyse blood samples thereby helping hospitals and healthcare centres improve the speed and accuracy of blood reports and save crucial time, while at the same time decreasing the cases of mis-diagnosis. Pune based Optrascan does a similar task with their digital pathology solution that can replace microscopes in laboratories.

As policy frameworks are set in place, the screening and diagnosis by AI is positioned to aide a technician or clinician requiring their consent and sign-off for further action.

AI for precision medicine

Precision medicine is being made possible by person-specific data (eg clinical, nutritional, behavioural) and information on personal genomes. This will find application in disease management in which assessing the best treatment

regime to follow based on individual drug susceptibility profiles can be crucial to ensure adherence, treatment success, and minimizing resurgence of disease.

The Application of deep learning, a variation of machine learning, to genomic datasets is an exciting area that is rapidly developing and is primed to revolutionize genome analysis. It extracts novel features from 3 billion base pairs of human DNA faster thereby providing invaluable insights which would have taken months, or years, to identify.

Orbuculum has brought together AI with genomics to predict cancer, diabetes, neurological disorders, cardiovascular diseases in a fast and cost-effective way. It extracts meaningful information from the enormous amount of genomic data generated globally and utilizes it to understand the genetic basis of many life-threatening diseases.

In drug development, insights into the patient's genomic data can ascertain the

drug, or the drug combination, that they are likely to respond to without much side effects. This is important from the patient's standpoint of immediate relief from suffering but also for drug manufacturers who are developing and testing newer drugs for a particular population. The focused genomic information will enable them to select the drug which is most likely to succeed in the target population. The clinical trials on the drugs can also be more efficiently planned and executed thereby saving them millions, if not billions, of dollars.

Deep learning is also making substantial contributions to the understanding of gene regulation, genome organization, and mutation effects which will be useful in disease assessment and management.
AI in Drug Design, Discovery & Development

Another area that would benefit from AI in healthcare is drug discovery. The task of developing a new drug conventionally takes years to fructify and many billions of dollars in investment. This sector is expected to benefit from the quick identification of drug targets and prediction of structures of potential drug molecules due to AI engagement throughout this pipeline.

Atomwise's algorithm scans through a database of molecular structures through its AI platform for drugs which could potentially be safe and efficient against

> **AI has already been deployed to assess chest CT scans, MRI scans and X-Rays to screen for potential SARS-Cov-2 infection in patients, especially in early stages of the disease where the scans might appear normal on visual inspection.**

Ebola. Their success in identification of two potential drugs would conventionally take months or years to accomplish.

In case no known molecule is identified, the AI will be able to make suggestions on what the structure of the drug should be and what kind of physio-chemical characteristics it should have to enhance the change of its success. Additionally, AI-based simulations can be used to assess whether prospective drugs will be effective before going to a full-on clinical trial also.

DeepMind, an AI arm of Google's parent Alphabet Inc., outperformed biologists at predicting the shapes of proteins; this information is vital for efficiently speeding up the designing, discovery and development of new drugs. However, DeepMind simulation doesn't yet produce the atomic-level resolution that is important for drug discovery. This has been a challenge for biologists and AI could be used to scan millions of high-resolution cellular images more than humans could ever process on their own, and also to decipher other appropriate interventional molecules. In the context of the present pandemic, AI is being deployed to identify and test from millions of potential drug molecules to select the ones with a higher chance to succeed.

AI Mental Health

The social distancing norms and lockdowns during the ongoing pandemic has had various psychiatric, psychological and psycho-social behavioural effects on people as communities were forced into self-isolation and quarantine amidst fear, stress and an unfamiliar lifestyle.

Before the onset of the pandemic it was estimated that about 15.5% of the global population is affected by mental illnesses, and those numbers are rising steeply during the present situation, the numbers for which currently unavailable. A large fraction of these require treatment but more than half of these go untreated. Diagnosis of mental health disorders are based on an age-old method that can be subjective and unreliable. In addition, the lack of adequately skilled practioners can lead to many of the patients being missed.

Now machine learning technology is able to precisely detect day-to-day changes in speech that hint at mental health decline is being developed. Picking up behavioural and cognitive changes can be crucial for timely intervention. For example, sentences without a logical pattern can be a critical symptom in schizophrenia. The perspectives pertaining to the shift in the tone or pace can hint for mania or depression, and memory loss is also a sign of both cognitive and mental health problems. It is predicted that in the next decade will solve 'specific' problems with high accuracy. AI's speech & image recognition is expected to be 100% accurate, and in 5-10 yrs, AI speech recognition will be better than human.

Touchkin is a predictive healthcare app which records parameters as sleep, activity, and patterns of communication through sensors and smartphone to identify changes in behavioural pattern. Whereas, World Well-Being Project (WWBP) analyzed social media with an AI algorithm to identify language markers of depression. These markers could predict depression up to three months before the person receives a formal diagnosis. Furthermore, facial expression, use of certain words, tone or language could indicate suicidal progressions. With remote consultations and therapies becoming common place, there is a good chance for patients struggling with mental health issues to access care in a timely manner.

Since 2012 the medical data has been digitized in India in public health systems and an equivalent patient data also exists in the private sector. Sadly, this valuable information that can help build and train many AI/ML algorithm for advancements in patient care is non-uniform, siloed and inaccessible. Guidelines of usage, safety nets, and frameworks need to be put in place so these can be openly accessed and utilized.

IT service firms are extending their AI and ML capabilities to healthcare by partnering with hospital chains for domain expertise, and more importantly, curated data. For example, NTT DATA Services, a Japanese technology firm, in partnership with Pune's Deenanath

Mangeshkar Hospital last year, achieved a 170% higher detection rate in its proof-of-concept AI based solution to diagnose emphysema, a chronic condition of the lungs, as compared to traditional systems. People are participating by volunteering their curated data to develop AI solutions in exchange for early access to algorithms for making their data actionable efficiently. Microsoft partnered with SRL Diagnostics to source 1 million biopsy samples from confirmed patients to train its AI to detect cancer. They have also partnered with Apollo Hospitals to build an AI system that can detect heart irregularities in patients, to give them a health score.

Although collaborative projects and alliances such as these will ensure that these AI solutions are sharpened for diseases analysis and they survive in a competitive market, however data assess will need to be assured and facilitated for the development of neglected diseases like tuberculosis, malaria etc. which are not driven by market economics but remain a major healthcare problem in developing countries, like India. For such diseases open access to requisite data maybe the only way to attract AI solution developers. To conclude, we're at a turning point in healthcare delivery with increasing AI based interventions. The inevitable change in the healthcare ecosystem is set to redefine, reshape and reimagine this space to keep pace with the emerging challenges and evolving needs in the domain.

Dr. Swati Subodh is a scientist and healthcare professional in the field of Infectious Diseases for nearly 20 years. Her work spans from basic research to identification of high potential innovations for better public health outcomes. She has published widely and has led her research team in various government and industry supported projects. She has written forvarious media platforms; delivered talks, including at TEDx, UN Headquarters, and a keynote address. Additionally, as an entrepreneur, a guest faculty and member in national institutes she evangelizes #bridgingsilos to accelerate ideas to action.

[1]AI could give Big Pharma a run for its money.

INNOVATIONS

PERSONA
THEME
INNOVATIONS
WELL-BEING
IN FOCUS
RESEARCH
NEWSCOPE

AI ENABLED 'FASTMRI' DEVELOPED TO MAKE MRI SCANS FOUR TIMES FASTER THAN THE CURRENT TECHNOLOGY

Nearly two years ago Facebook's Artificial Intelligence Research (FAIR) group and New York University Grossman School of Medicine joined hands to try and develop a neural network which can produce effective MRI images by using as little data as possible. The traditional MRI scan can be very uneasy for a patient as the scan machine is claustrophobic and it takes time to carry out the scan. The thought behind the creation of fastMRI is to relieve the patients of this unsettling feeling wherein the scientists trained a machine learning model on pairs of high-resolution and low-resolution MRI scans to predict what a final MRI scan looks like by using just a quarter of the usual input data.

For the study, six independent radiologists were recruited to test the interchangability of traditional MRI images with the AI-enabled MRI images. From a sample size of 108 patients whose knee scans were taken using both the new AI model and the standard MRI scan, two different datasets were created. All the datasets were then blindly evaluated by the radiologists. The surprising part was that all the diagnoses

were the same regardless of whether the images were taken by the AI model or the standard scan. Infact, it was noted that the radiologists rated the overall quality of AI images much better than the traditional MRI images.

Thus the USP of fastMRI is that this model promises to dramatically speed up MRI scans without the need to upgrade the presently used imaging hardware. The MRI hardware vendors can rapidly incorporate new algorithms into their products. The training data and model created by fastMRI are completely open access and can be incorporated into existing MRI scanners conveniently. This

model shows scans can be done faster, in lesser time causing less inconvenience to the patients and eventually aiding quicker diagnosis.

The innovation is another tool to improve patient experience while creating images for an effective diagnosis. This study was published in the American Journal of Roentgenology. The publication of this research has validated the efficacy of AI algorithm which is designed to produce accurate MRI scans by using four times less data than which is usually required.

The real challenge would be to take something from research into a clinical setting. The adoption and implementation from the manufacturer needs to be efficient, effective and seamless. The researchers are already in talks with the scanner companies and believe within a few years the AI model scans will be used in most of the hospitals to provide a faster diagnosis by doctors and an enhanced patient experience while imaging for patients.

SOURCE: www.inshorts.com

TRANSPARENT SOLAR PANELS TO REFORM THE FUTURE ENERGY SUPPLY

The first fully transparent solar concentrator which could turn virtually any glass window or shield into a PV cell was created in 2014 by researchers at Michigan State University (MSU). The good news is by 2020 researchers in the US and Europe had already achieved full transparency for their solar glass. This makes solar panels highly appealing and efficient, thus getting rid of the unsightly rooftops or extensive land parcels. The new solar panel technologies are ready to transform the solar energy landscape globally.

Photovoltaic glass is the game-changer in expanding the scope of solar energy and these PV glass are nothing but transparent solar panels which can literally generate electricity from windows in homes, offices, sunroof's of cars or even smartphones. These transparent solar panels can be easily and conveniently used in various settings ranging from skyscrapers with large windows to mobile devices like a phone, an e-reader or a laptop.

This new solar panel technology is changing the way solar cells absorb light wherein the solar cell selectively harnesses a portion of the solar spectrum which is visible to the naked eye alongside allowing the normal visible light to pass through. To achieve this technological breakthrough, the researchers developed transparent luminescent collar concentrator (TLSC) which is composed of organic salts that are designed to absorb specific invisible ultraviolet and infrared light wavelengths that glow as another invisible wavelength. This wavelength is then guided to the edge of the window plastic as thin PV solar strips which convert it into electricity.

Researchers estimate that once mass production for these panels begin, TLSC should be able to deliver an efficiency of nearly 10%.

A supplement to transparent solar glass or panels are the solar panel blinds which are designed to harvest sunlight to produce energy and also act as a window by blocking the direct sunlight from entering inside. Such solar panel blinds have been launched by an innovative startup named SolarGaps which claims that these blinds can cut down the energy costs by 70%. For every 10 square feet of window space, these window blinds can generate approximately 100 watts of power. The solar blinds can be installed outside or inside and the user can control their angle and positioning by using an application which will also apprise the user of the energy generation figures. Another great feature is that the angle of the solar blinds can be automatically optimised as per the position of the sun.

This technology is surely a revolution in the field of utility of solar energy and holds the potential to literally turn every building in the world into a solar producer.

Pioneers in promoting this new solar panel technology are researchers at Michigan State University and manufactures like Brite Solar, Physee and Ubiquitous Energy. The European manufacturer, Physee has introduced PowerWindow which is an advanced product and can only be found installed as transparent solar panel covering an area of 300 square feet in a building of Dutch Bank. These power windows use small solar panels which are installed along the edges of the window panes to generate power. These solar panels or windows and blinds are a huge part of the concept of sustainable buildings which is going to give us a better future. The company is promoting these power Windows as a clear photovoltaic glass which will become the glass facade for next generation sustainable buildings. In future they expect these panels to work autonomously to sense, power and regulate the climate inside the building using intelligent systems.

SOURCE: www.inshorts.com

SARVA- THE YOGA START-UP TO EXPAND ITS DIGITAL WINGS

Chennai-based yoga and mindfulness-focused wellness start-up by Sarvesh Shashi 'SARVA' has recently raised undisclosed funding from US-based venture capitalist fund Mantra Capital and it's strategic partner, the Patni family to enhance its digital offering. The funding from international
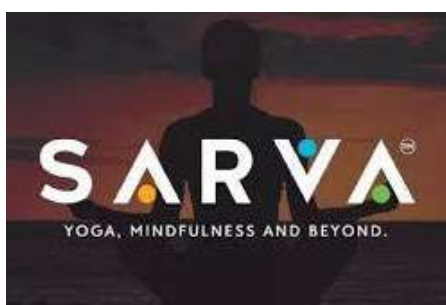
music provider Cutting Edge Group will help sarva to gain access to over 20,000 minutes of music and content based on meditation provided by Myndstream, Cutting Edge's record label.

Sarva, a yoga and wellness ecosystem focuses on the physical, mental and emotional well-being of an individual. This ecosystem offers yoga, mindfulness and wellness to people around the world through it's physical and digital approaches. Presently the services are being provided in 25 countries worldwide in which sarva offers 25 forms of yoga with an aim to organise the presently fragmented wellness and yoga industry. Sarva's unique blend of an online and offline playbook has made it very attractive and accessible for people who desire to grow mindfully and spiritually. In the past this start-up has raised funding from many celebrities too like Aishwarya R Dhanush, Jennifer Lopez, Shahid and Meera Kapoor and Malaika Arora among others.


SOURCE: The Economic Times

PERSONA

THEME

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

INDIAN COVID WARRIOR, A 17 YEAR OLD MAKES LUNGAI APPLICATION

The Government of India has been making multiple efforts to contain covid-19 ever since it's outbreak in India from March onwards 2020. As one of the initiatives, the central Government launched 'Aatmanirbhar Bharat App Innovation Challenge' for techies and start-ups. So under the category of Sustainable Environment of the Ministry of Human Resource Development's (HRD) 'Aatmanirbhar Bharat Ideathon', Aryan Gulati, a Delhi school student of class XII has won by creating a web-based application named LungAI which can detect COVID-19 in 3 to 5 seconds and other lung disorders. Praiseworthy point is that the app is estimated to have an accuracy of 90%. This also makes Aryan the youngest winner of the contest wherein he has received an amount of INR 2 lacs. The inspiration for the young innovator comes from the fact that he wanted to create a system wherein there was no physical contact with potential COVID-19 patients and thus he used x-ray and CT scan images for detection of abnormalities.
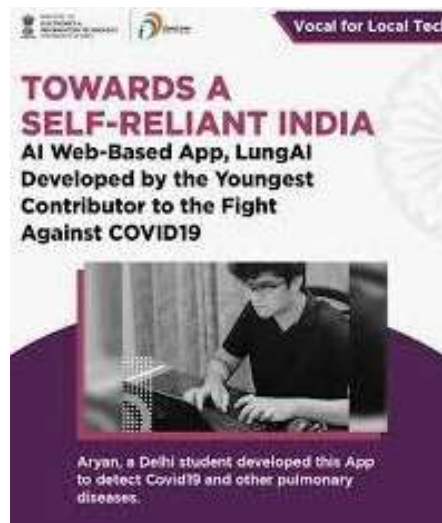
The reports show that this application provides the user with the results in 3-5 seconds after the CT scan or an X-ray of the chest has been uploaded on the website. The app is enabled with a messaging system through which one can directly send the detection to doctors and hospitals. The website can detect positive and negative cases of COVID-19 and if the result comes out to be positive then it also furnishes the user with a list of hospitals situated near him/her. If the result for COVID-19 comes out to be negative then the patient can check for other lung diseases using the same application.

ICMR is in talks with the innovator to launch the LungAI application on a large scale in India.

SOURCE: republicworld.com

'COVIRAP' – THE LOW COST, PORTABLE COVID-19 TESTING DEVICE BY IIT KHARAGPUR

Coverage of huge population living in rural areas of India for screening of COVID-19 is a challenge for the Government in containment of this pandemic. In an attempt to tackle this challenge, researchers at IIT Kharagpur, have developed a device named 'COVIRAP' which is a cuboid shaped portable, low-cost testing device that can deliver results within an hour of taking the sample from a potential infected person. The device has already got the certification from ICMR which intends to use COVIRAP to scale up screening of coronavirus cases in peripheral and rural areas.

The USP of this device is its high quality, accuracy and affordability making the test available at INR 500 per test. The device also uses very low energy for its operation and minimally trained rural youth can operate this device. Since the development cost of this machine is less than INR 10,000 with minimal infrastructural requirement, it is affordable to make this technology reach common people at low-cost.

Patent for this device is still pending but once it is done, the device will be available for commercial use by medical technology companies. IIT is welcoming corporates and start-ups to approach them for technology licensing and commercial scale of production. Since the test can detect extremely low levels of viral loads in a sample, researchers feel COVIRAP can replace the already in use RT-PCR test as it gives results faster, with accuracy and at a cheaper rate. The research team has expressed that the number of tests per one-hour batch in a single machine unit can be further increased to higher limits so that testing can be done on a large scale. The machine is robust, flexible and generic implying that apart from conducting COVID-19 testing, it can also conduct isothermal nucleic acid-based tests (INAT) like dengue, malaria, influenza, tuberculosis, Japanese encephalitis and many other infections as well as vector-borne diseases. This feature makes COVIRAP need of the hour solution for screening large number of population in shorter duration in India.

SOURCE: www.hindustantimes.com

BRAINWAVES TO TRACK HUMAN PERFORMANCE DURING CRISIS BY IIT MADRAS

A research team under the mentorship of Prof. Rajagopalan Srinivasan of the Department of Chemical Engineering at IIT Madras conducted a research to show that electroencephalogram(EEG) can be used to measure brainwaves in workers to gauge their mental sharpness especially during crisis times. EEG measures the cognitive workload which is the measurable mental effort that is put in by an individual to perform a task. High cognitive workload state of workers make them prone to commit mistakes which then lead to accidents. The cognitive workload measurement will help in assessing the capability of a worker to respond to an emergency situation in real-time which could in turn prevent accidents and mishaps in a factory. World over nearly 70% industrial accidents are caused due to human errors which occur either at the planning or execution stage, depend not only on a person's skill but also his/her mental state and sharpness in that situation or moment. Mismatch between the demands of a task to be performed and the ability of a person to perform it, leads to high cognitive workload often leading to poor performance or committing mistakes.

IIT Madras Researchers Use Brainwaves (EEG) to Track Human Performance During Crises

In the study six participants were included and each of them performed eight tasks. Sensors were affixed to the heads of the participants to make observations. The tasks were to monitor a typical section of an industry for any disturbances which if not controlled by the participant in a given time frame would lead to accidents. The disturbance increased their cognitive workload and only if they made the correct decision in time, did the cognitive workload reduce. Thus the participants needed a thorough understanding of the industrial unit they were to take care of. Different types of brainwaves were observed and their results showed that the amount of theta waves could identify any mismatch between the participant's mental model of the process and the actual plant behaviour during abnormal situations. Thus the researchers deduced that the spectrum of power density in the theta band correlated well with participants' successes and failures during the task.

The study was recently published in the Journal of Computers and Computer Engineering. The research thus suggests one of the ways to assess whether a person is fit to handle a high-risk situation. The training processes can be altered to cater to the need of workers to improve their stress handling situations. The aim is to enable weak performers perform better with reduced chances of committing errors.

SOURCE: The Print

NEW ELECTRONIC SKIN DEVELOPED TO MAKE ROBOTS "FEEL PAIN"

and a part of intelligent robotics. The e-skin would react instantly when heat or cold, pressure reach a painful threshold. This effort is truly an example of smart prosthesis bringing robots closer to reality.

The prototype already has biocompatibility and skin-like stretchability but further development needs to be done to integrate this technology into biomedical applications.

The research paper titled 'Artificial Somatosensors: Feedback Receptors for Electronic Skins' is published in Advanced Intelligent Systems.

A team of scientists led by Prof. Madhu Bhaskaran at RMIT University, Australia have developed a prototype of an electronic skin that can mimic the body's feedback response and react to pain. The e-skin fires signals with the same lightning speed with which the nerve signals travel to the brain. Thus this e-skin could make robots and other machines more sensitive to touch, contact and pain. The prototype is a step towards next generation biomedical technologies

SOURCE: www.inshorts.com

Compiled by:

Dr. Avnatika Batish, working as the Director Strategy and Healthcare at International Health Emergency Learning and Preparedness.She is also a guest faculty for MBA (HR) and MBA Healthcare Management at various B-Schools and is a soft skills trainer.

▶ WELL-BEING

Rare Health Conditions that
rejuvenate the fighting back spirits

■ **Rachit Shah**

At times, my dark memory grips me to a life-altering event between the months of Feb'16 when Leonardo DiCaprio (one of the finest actors in Hollywood) won his first Oscars and World Health Day in April'16. Between these two diversified events another life experienced a tectonic shift during a jogging session on an evening in Feb'16. The change came much faster than expected when I got diagnosed with a rare medical condition, *Isaac Syndrome* (a diverse disorder as a result of muscular hyperactivity), *Membranous Glomerulonephritis* (a slowly progressive disease of the kidney), *Lymes* (a bacterial infection that can be spread to humans by infected ticks), *Glaucoma* (an eye conditions that damage the optic nerve often caused by high pressure) and the journey still continues...... If you had told me a couple of years back, I wouldn't be writing this note, instead planning into my future. A part of me is still surprised, as I was all healthy & hearty with no experience of visiting doctors.

As Anne Frank once said '' If I haven't any talent for writing books or newspaper articles, well, then I can always write for myself'', I thought of penning down a lot from my personal experience, hoping to help others suffering from Rare Health Conditions.

World Health Organization (WHO) defines a Rare Disease when the number of people affected is less than 5 per 10,000. There are 5000 and 8000 rare diseases, most of them with a genetic basis.

The Covid episode is opposing our delusionary footing & blowing the bugle loud & clear to act on future health hazards in tightening arrangements,

PERSONA

THEME

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

to do otherwise is to settle with severe repercussions.

I therefore wish to be 'The Voice' initiating a gradual evolutionary phase to compete with true globalization as dealing with Rare Health Conditions need extra efforts :-

As a victim, I'm tempted to wonder why in emerging economies the sufferer, treatment infrastructure & directorates are insured with apertures in promises & authenticity. I appeal by adhering to the customs and request for government initiatives percolating to ground reality. Incentives like compulsive Corporate Social Responsibility (CSR), affordable & transparent Health Insurance, a dedicated rare disease portal could comprehend the basics and extended an helping hand to geographically dispersed choric patients and explore cost effective measures to discover remedies. Graduating to helpful millennial artificial intelligence could recognize forthcoming dilemmas by unfolding mysteries on exotic doctrinal concepts like gene & cell therapies which could in-turn bridge the abyss of an holistic approach missing with Specialists to Doctors to System officials. Considering the costs involved a onetime assistance

upto Rs 15 lakh announce in 2020 under the umbrella scheme Rashtriya Arogaya Nidhi should be re-considered.

From a community's perspective though we need to stand tall in OUR falling world and gracefully accept the meaning of RARE till mother-wit strike chords offering affordable robust infrastructure prepared to tackle complicated track records, I wish to share some key learning's from personal experience which could help ease our journey :-

1) There are times when going by the book is not an option :- I relied on anecdotal experiences than proven evidences before deciding on small but important miscellaneous changes by paying attention to body postures (curbs pain & channelize uninterrupted flow of energy), ingraining a self motivating attitude (acceptance is virtue), wearing surgical mask while being exposed to a crowded place (helpful while consuming medicines like immunosuppressant's), wearing loose clothes (to avoid nerve compression & feel relaxed), managing stress levels (meditation, music therapy) etc…..

2) Insurance support system for expensive treatments could be a savior

3) Sports Medicine :- a specialization which amalgamates both the medical field & fitness. I decided to even take up Table tennis as a drug- free therapy

4) Instead of being cranky, optimum utilization of available resource could work wonders during the treatment duration & help ease financial, social & personal enforcements

5) Our 'Monkey Brain' needs utmost attention when Manmade crisis manifests in God gifted body

6) Adding Humor to life can be transformational easing care takers, family members & oneself. I still credit cartoons for a dopamine experience on a tough day

7) Keep informed about your health condition, try finding solutions with a fight-back spirit

8) Adopting to new aspects of treatment can contribute to healing: - Yoga, Meditation, Walking, Calmness of mind & body etc….

9) Changes in lifestyle can work wonders (eating, sleeping, drinking habits etc.)

10) Respect People:- one of my biggest strengths in this tedious war field. I never realized when it became 'our' journey from 'my' journey

As instances like Covid re-write the rules of the game each one of us from Institutions to Organizations to Platforms & Support groups should write & re-write the future as OUR burden of sufferings could only be relieved by the balm of meaningful implementations of an evolution & plant tress of wellness under which our upcoming generations could sit with carnival of joy.

Rachit Shah (pseudonym identity for writing articles to create awareness) has master's in business management with over 13 years of Investment Banking experience (had to quit because of his health condition).

The change came much faster than expected when I got diagnosed with a rare medical condition

Pregnancy in the time of COVID

■ **Dr. Manu Lakshmi**

COVID-19 and pregnancy

Sharadha was ecstatic when her pregnancy was confirmed - after years of struggle to grow her family . At 39 years - she knew that hers was considered a high risk pregnancy due to her age and diabetes. Amidst hospital visits for scans and check ups , the couple were confronted with the realisation that her husband was having high temperature for the last 24 hours. His job involved being in a public facing role and the COVID test was done. As they were waiting for the results, questions swirled inside Sharadha's mind - what did this mean for her pregnancy , and what was the risk to her unborn child?

As the whole world grapples with COVID and its fallout, an added challenge awaits pregnant women - worry about themselves and about their unborn baby. Fortunately - studies show that pregnant women are at no greater risk of becoming seriously unwell than other healthy adults if they develop coronavirus. The large majority of pregnant women experience only mild or moderate cold/flu-like symptoms.

The current recommendations are that pregnant women who have been exposed to someone with COVID infection - are advised to stay in self isolation. The purpose of self-isolation is to prevent spread of infection from an infected person to others who are not infected. Women who test positive for the infection have to contact their doctors for advice specific to their medical history. What to do in self isolation ? While home-isolation or home-quarantine may sound like a staycation or holiday - women should be prepared for a long period during which they may feel disconnected from others and anxious about their.health.Staying in touch with others by phone or online can be helpful to maintain social connections. It is important to stay hydrated, and to keep active with some kind of exercise program or online fitness routine and yoga.This is to reduce the chance of blood clots forming.People in self isolation should monitor themselves for fever by taking their temperature twice a day and remain alert for cough or difficulty breathing.

What about hospital appointments when in self isolation? There may be medical problems like bleeding in pregnancy or pain - which require hospital visits. It is important to inform the medical team so that arrangements can be made to attend the hospital at a different time or a different place - to protect other patients.

Staying alert and staying safe are the most important precautions to follow. This is especially true for women in the third trimester of pregnancy . Staying attentive to social distancing and making sure to wear a mask and frequent hand washing are the best tools we have to protect ourselves.

PERSONA

THEME

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

It is customary for women to have a family member accompanying them for check ups at the hospital. But in the current scenario it becomes necessary to limit the number of people at the hospital. Pregnant women are advised to attend hospital alone and these measures are being put in place to protect maternity staff and other women and their babies. Where possible - blood tests ,scans and routine antenatal care are combined in a single visit.

It is often a stressful and anxious time for the mother and upsetting to learn that she can't have her family around during her delivery . But these measures are being put in place to reduce the number of people in the hospital. New born babies do not appear to be at higher risk of becoming unwell with the virus, but the same precautions of hand hygiene and masks are advised for the people handling the baby. If the mother is COVID positive at the time of delivery her doctors will advise on breastfeeding or isolating the baby depending on the severity of her infection.

Birth of a baby is a joyous event , usually celebrated with a large gathering to announce the baby's arrival. Limiting these gatherings is recommended to protect the new mother and her baby. The need of the hour is for the family and health care personnel to wholeheartedly support the women during their delivery - a joyous long awaited event. With social distancing being advocated - the onus is

on the obstetrician and her team to care for women with covid infection while taking precautions for their own safety. And doctors are up for the challenge.

After two weeks of self isolation - Sharada was relieved that her family was safe, The pandemic has taught us that good health is a privilege. Staying optimistic, practising gratitude and staying physically active can help us cope with the difficult circumstances.

Dr. Manu Lakshmi is a student of Madras Medical College who has finished her Diploma in Anaesthesia from Stanley Medical college with special interest in Obstetric Anaesthesia. Apart from anaesthesia she is also specialised in Gynecology and have obtained training from hospitals of UK and Singapore.

▶ IN FOCUS

COVID-19 and its impact on Adolescent Mental Health

■ **Kashish Behl**

"Covid-19 and this lockdown has become really frustrating now. We are kids, we are supposed to be in school. I feel I am missing onto so much. This is just getting maddening now." ~ Riya, Grade 9, International school in Gurugram (name changed for confidentiality purpose)

The covid-19 pandemic has undoubtedly resulted in a deep psychological impact on individuals (Asmundson and Taylor, 2020; Li et al., 2020). It's been over 6 months now that the schools have been shut in India and students are attending virtual classes. The uncertainty of COVID-19 has impacted the adults and children alike. Adolescents are one of the vulnerable groups as they are experiencing this difficult time of transition along with their socio-emotional and physical changes as per the study of Larsen and Luna, 2018 and Sturman and Moghaddam, 2011.

It is quite a known fact that schools provide an opportunity for holistic and overall development of children. To adolescents, school means interaction with peers, school means learning new perspectives and ideas, school means developing socio-emotional quotient, school means learning social skills, school means shaping their own identity and role and hence school means acquiring various life skills apart from academic knowledge.

Studies have time and again proved that adolescents' focus and priority in their teenage years start revolving around their peers and social circles. This is the time when they are preoccupied with their self-image, need attention from peers, need to impress and please friends as well as wanting to be accepted in their social circles. Their formation of self-identity and self-esteem all are rooted in their transactions with their social circle.

The covid-19 outbreak and being quarantined at homes has resulted in various adverse consequences on lives of teenagers: worrying and uncertainty about future, sudden shutting down of school, increased time on their tech devices, home confinement with parents, no athletic/physical activity, acute stress, feelings of loneliness and anxiety. Odriozola-González et al., 2020 mentioned about the studies conducted in

Adolescents are one of the vulnerable groups as they are experiencing this difficult time of transition along with their socio-emotional and physical changes.

Spain have established that large number of children experienced anxiety and depression during the initial weeks of the lockdown.

Some of the major psychological impacts one can expect and see the teenagers experiencing are discussed below.

Loneliness and missing socialization: As defined in the work of Tomova et al. 2020 he established how prolonged isolation and confinement could result in social craving which has brain craving activity very similar to neural responses to hunger. Social distancing and quarantine as a result of COVID-19 has made adolescents prevent hanging out with their friends which is one of the crucial markers of adolescence. This could result in frustration, irritability and even anger with the whole ongoing scenario.

One of my students expressed how she does make sure to catch up with her friends over video calls and texts but really misses hanging out, carrying out pranks and just whiling away time together in school.

Missing out on major events: The lockdown happened when it was just about time for the previous academic year to pass school and enter college. The sudden lockdown resulted in teens and young adults losing onto some major year-end events and celebrations for instance, farewell and spending some last days with friends. Isha Goswami (passed out year 12 in 2020) shared how she felt miserable on not being able to say a proper goodbye to her friends or even getting dressed up in a saree for her farewell (a big day for every adolescent student). Uncertainty around college admissions has also contributed to the stress, apprehension and anxiety in

them.

Infact the current grade 12 is also on the verge of entering their board preparatory time in next couple of months. These students are spending last year of their school life sitting at home and unable to enjoy with friends, having fun and moreover, making memories!

I recently spoke to a few students in grade 12 and they expressed their apprehension, sadness and frustration about missing onto their last leg of school life. They clearly sounded hurt, upset and even irritated. No matter how much they socialize with their peers on calls, the feeling of spending last few days of school with your friends in person is priceless and irreplaceable.

Impact on self: Adolescents, as a result of all that discussed above have been reportedly undergoing a lot of uncomfortable experiences such as sleep disturbances, appetite changes and feelings of loneliness and isolation. With the lockdown, just like

Studies have time and again proved that adolescents' focus and priority in their teenage years start revolving around their peers and social circles.

> **Some of the parents shared that the amount of disagreements, arguments and conflict has doubled between them and their teenage children during this pandemic.**

adults, teenagers too have experienced great amount of change in their routines. Sri (Grade 9) shares, "Since the lockdown has begun, our whole routine has gone for a toss. We are sleeping late, eating junk and spending a large amount of time in front of the screens. The rules that my parents had laid down for me and my brother have all been forgotten because of this lockdown."

It won't be uncommon to see many teenagers experiencing a range of intense emotions from fear and anger to sadness and grief because of such mixed and major changes in their life suddenly.

Confinement and struggle with parents:

It is a well-known fact that during adolescence, teenagers prefer spending time alone or with friends and wanting more space from parents. Due to this lockdown and confinement where they have to forcibly stay with their parents 24x7 has made things tougher for them. Priya (pseudo name, grade 11) shared, "It is sometimes very frustrating to see that parents' involvement has increased since we all have started staying at home. They want to know everything I am doing and they comment on everything like my clothes too".

Some of the parents shared that the amount of disagreements, arguments and conflict has doubled between them

and their teenage children during this pandemic. They shared that more than ever, the adolescents are preferring to stay in their rooms and watching shows online or spending time on their phones.

However, after considering all these psychological impact of COVID-19 on adolescents, we cannot not mention the amount of optimism, positivity and resilience one could expect from this age group. The ability to bounce back from a challenging, stressful and an uncertain situation could be best expected by these teenagers who also add a sense of hope and optimism for all of us for wishing this pandemic's end soon.

Kashish Behl is a psychologist working with an International school in Gurugram as a counsellor. She has been working with children for 8 years now, first as a social worker and then as a psychologist.

I'll be your heart

■ **V. Krushna**

PERSONA

THEME

TRENDS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

Healthcare along with technologies have evolved in a positive way, this combination has brought a lot of success and it has also made the work of the health care professionals efficient by providing a quality care to the patients.

PATIENTS WITH CARDIAC ISSUES:

Previously, when a person faced issues with his heart either he gets treatment for the existing one, or undergoes an operation, in case if he has a hole in his heart he gets replaced with a new one from those who got a brain injury (donor). But, now the scenario is entirely

> **Artificial devices earlier only helped the better working of the heart, but now the case is that the artificial devices can be a substitute for the human heart itself.**

different, so many artificial means have come to cope up with those having issues with their hearts. Artificial devices earlier only helped the better working of the heart, but now the case is that the artificial devices can be a substitute for the human heart itself.

EVOLUTION OF ARTIFICIAL HEART

Discovery of artificial heart:

Earlier the idea of artificial heart was discovered in the year 1969 where the device supported the life of a person until he got a donor to replace his heart. This type of artificial heart was considered as a

supporting device.

First Implantation of artificial heart:

The artificial heart was first implanted in the year 1982 to a patient named Barney Clark by surgeons at the University of Utah. The name of the artificial heart was JARVIK 7.

EXTRACORPOREAL ASSISTED DEVICE

The extracorporeal ventricular assisted device is an implantable mechanical pump that helps pump blood from the lower chamber of the heart to the rest of the body. This is for those who have weakened hearts or heart failure.

As mentioned earlier, this is implanted until the patient gets a donor, doctors recommend this ventricular assisted device implantation for a long term treatment. The implantation of this device
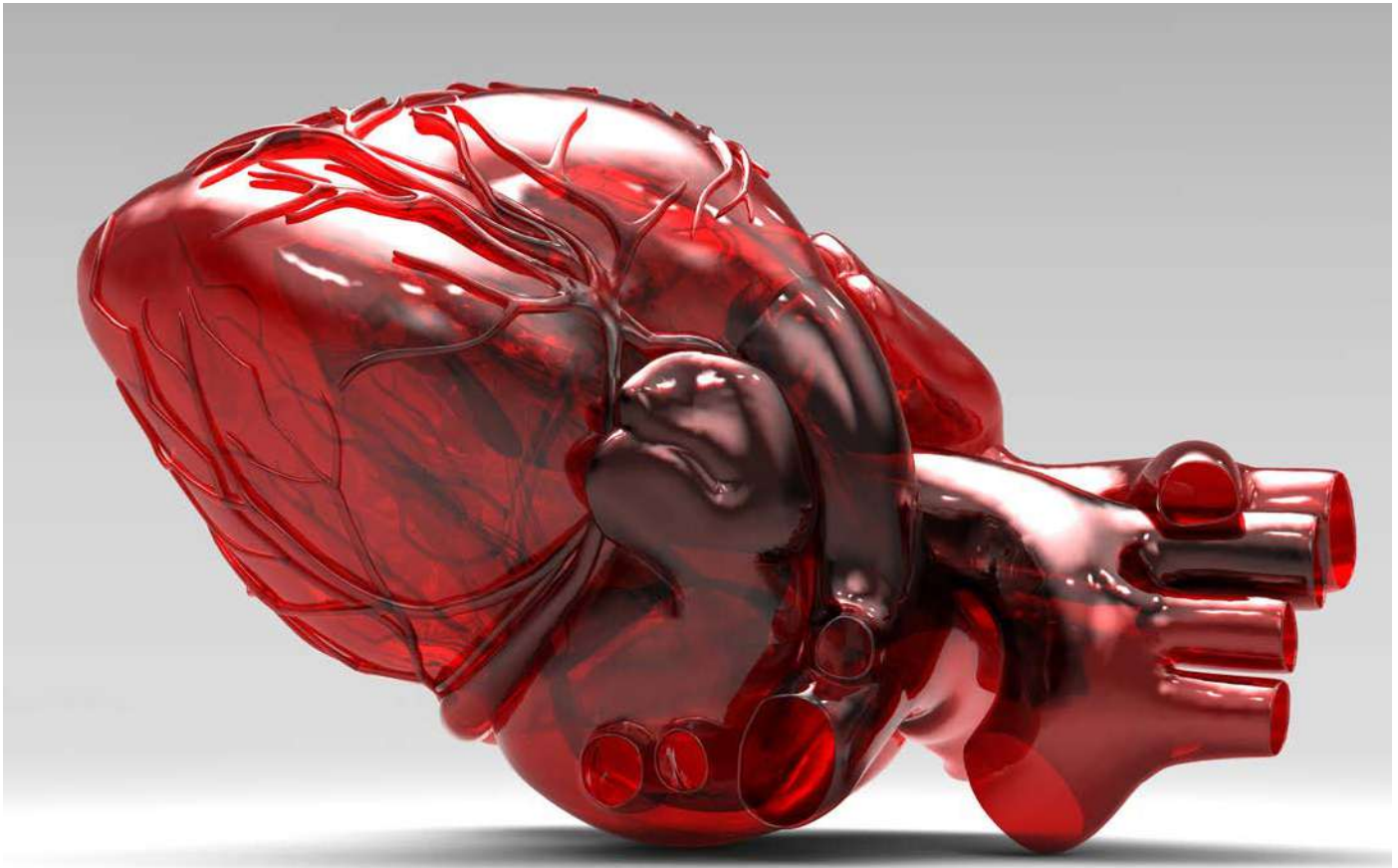
was denied as it has a lot of complications. This device can also be carried in a bag connected with the human body. Along with the device in the bag, the bag has one extra battery that can be used in case of any improper working on the battery in use.

TOTAL ARTIFICIAL HEART:

In the month of May 2020, first implantation of Carmat total artificial heart in Denmark was done.This is a therapeutic alternative for people suffering from end stage bi-ventricular heart failure.

Carmat is basically a developer of the next generation advanced total artificial heart.

FACTS ABOUT TOTAL ARTIFICIAL HEART:

It can be noted that there have been 13 artificial heart designs used in patients, but only one has received commercial approval from the FDA.

The total artificial heart is pulsate and has two ventricles and four valves. This total artificial heart is similar to that of a human heart.

The life expectancy rate has been increased after the invention of total artificial heart.

CHALLENGES FACED BY THE TOTAL ARTIFICIAL HEART:

- It can possibly damage other body organs, as it is a mechanical device.
- Any external or hardcore physical activity like trekking can be dangerous.
- Since it is a mechanical device, sudden malfunctioning is possible.
- Another major issue before implanting one can be an ethical issue, whether it is correct to implant one total artificial heart substituting a natural heart. Along with this superstitious beliefs can also be imposed, saying that it is not correct to implant one.

Therefore, as a health care professional it is not only essential to look after the needs of the patients. But also to assess the problems proactively and to bring in solutions so that it can be a major boon for the future generations. If these aspects are seen in a right way, then definitely a total artificial heart can be a true human friendly heart, helping a person to live happily ad it will encourage them to bring in a lot of technological advancements in the area of healthcare.

V. Krushna is currently pursuing P.G degree (Master of hospital Administration) in Christian medical college and hospital, Vellore. She has carved a niche in various platforms like Google,WHO and have written articles for scientific journals and online platforms. Her areas of interests are in the fields of Healthcare Technology, Operational planning in Hospitals, Human resource management.

The artificial heart was first implanted in the year 1982 to a patient named Barney Clark

PERSONA

THEME

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

My Life ….My Pathology

An Untold experience……

■ **Dr. Shubha H. V**

I penned down this article as I sat down looking at the first ray of dawn through my window which rose over the horizon with my microscope infront of me as if starring at me and asking……..Why did you choose me over a stethoscope????

I too started thinking over this question and for the next few minutes I closed my eyes trying to figure out my little compromises and sacrifices and cherishing few wonderful memories and experiences with "Pathology----- My love of life".

Every day I stepped into my department- No less than a mansion with many rooms. I was served with a tray full of slides in the morning instead of a tray with coffee/tea. I spent most of my time in a day nudging at the rectangular glass slides over the microscope stage at different powers instead of glancing at my favorite TV programs with a remote in my hand.

Rather than listening to the mesmerizing music using headphones, I have enjoyed the clicking sound of a cell counter in the lab and the ringing of telephone from various departments asking for the reports.

While my friends celebrated cutting a cake amidst fragrant flowers on their birthdays, I have spent few of my birthdays in a grossing room cutting the specimens amidst the unpleasant formalin vapours shedding tears.

> **I sat late at night amidst the eerily silence with my slides and alone know who will live and who will die.**

> **Rather than listening to the mesmerizing music using headphones, I have enjoyed the clicking sound of a cell counter in the lab and the ringing of telephone from various departments asking for the reports.**

When my near and dear ones at home enjoyed playing with colors in during festival of holi, I was busy staining my slides and imparting them different colors.

When my son enjoyed watching FROZEN movie in a theatre, I was engaged in furnishing an urgent frozen section report.

And while my son enjoyed playing "hide and seek" with his father, I tried seeking the notorious tumor cells, parasites, fungi and bacteria hiding within the tissues.

There are days when others gazed at the beautiful night sky counting the stars, but I was appreciating the various patterns on my slide from "cribriform to storiform,whorled to reticular and rosettoid to herring- bone" and counting the cells in a Neubauer's chamber.

Even though I have scolded my son for wasting the papers, I have wasted them too for refining and revising my descriptions in a report before dispatching them.

Even though I have warned my son for

breaking things, I too have broken my slides and test tubes by dropping them especially while trying to preserve them with utmost care.

I sat late at night amidst the eerily silence with my slides and alone know who will live and who will die.

At times have gained courage to read out an untoward report of my own near and dear ones.

At other times have dreamt strange dreams of dispatching a wrong report or of mismatching a sample or of losing a specimen.

Inspite of all these little sacrifices, compromises and mistakes, an amazing thing happens when you get honest with yourself and start doing what you love, what makes you happy. You stop merely looking forward to special events and stop wishing for the weekend.

PERSONA
THEME
INNOVATIONS
WELL-BEING
IN FOCUS
RESEARCH
NEWSCOPE
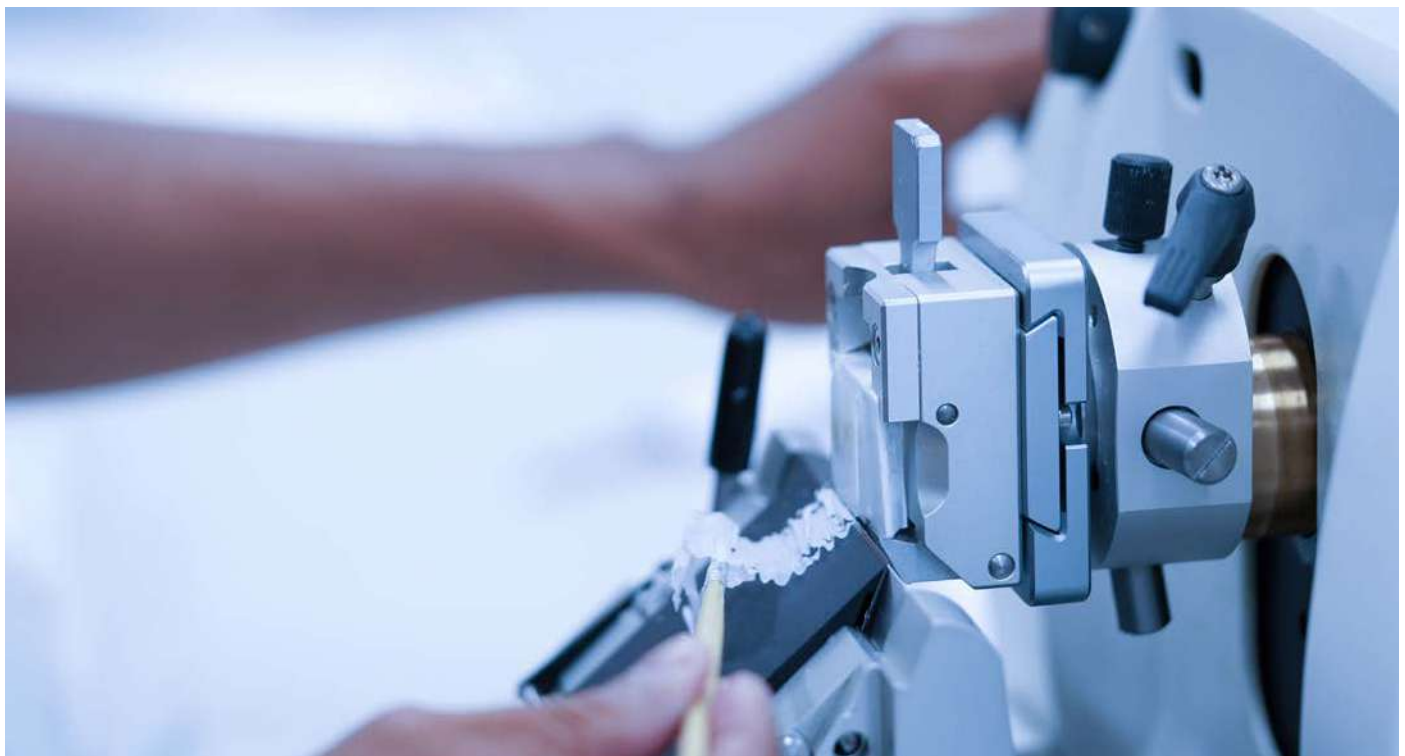
I have always honoured pathology as it has given me my joyous knowledge amidst the sufferings of people.

I have always revered those surgeons who gave me each day my daily bread (specimens) no matter its insufficient always.

I salute the advances made in pathology- The immunostains for they make the unknown brown, the flow cytometry for identifying the mysterious cells.

I have always made room for improving myself in all aspects and never give a second thought for taking an opinion from my colleagues.

I would love to live my life king size like a tumour giant cell, cut the daily routine sometimes and show differentiation and have the courage to stand out and express my pleomorphism. There are times when I have to be a "monster cell" to perform my daily chores amidst the busy schedule. Above all , I am a pathologist and I am proud to be one…

I finally opened my eyes, looked at my microscope, smiled at it and embraced it with my arms and said……..

"I WAS NEVER WRONG IN CHOOSING YOU OVER A STETHOSCOPE"

Dr. Shubha H. V, a pathologist from bangalore working as an assistant professor in Sapthagiri Institute of Medical Sciences and Research Centre.

PERSONA
THEME
TRENDS
WELL-BEING
IN FOCUS
RESEARCH
NEWSCOPE

Hearing Health Care

■ **Dr. Raj Sharma**

Audiology is a branch of science that studies hearing, balance and related problems. Audiologists are healthcare professionals who use technology, create problem solving and social skills to identify and treat hearing and balance problems and thus help people communicate and connect better with the world around them.

The field of Audiology is about 55 years old in India and has grown exponentially in terms of manpower development, technological advancements and public awareness.

According to WHO (March,2020) around 466 million people worldwide have hearing disability and 34 million of these are children.

The way we deal with hearing loss is in the midst of a revolution with enormous changes and new approaches to testing and more affordable and effective treatments are clearing the way for healthier hearing.

For instance, in most of the developed countries, Universal Hearing Screening is mandatory for every new born child. On the other hand most of the developing countries are in the process of streamlining these programs. In India most of the public and private hospitals in bigger cities have already started the program and government is working to implement this at secondary and primary healthcare facilities.

These tests are simple, painless , easy to carry out and give immediate results. Early identification of hearing loss in children can help with timely intervention which may include surgery, hearing aids or cochlear implants etc.

These children can be mainstreamed in schools and lead an absolutely normal life and thus preventing a lifelong burden on parents, caretakers and in turn on the society.

Moving forward, school-age hearing screenings are an integral tool in identifying children with hearing loss who were not identified at birth, lost to follow-up, or who developed hearing loss later. Without mandated routine hearing screenings in schools, students with unilateral, less severe or late onset hearing loss may not be identified or will be misdiagnosed and managed.

Unfortunately, very few such programs are available in India at the moment and no guidelines are in place by policy makers.

The field of Audiology is about 55 years old in India

PERSONA

THEME

TRENDS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

> **Audiologists play a vital role in educating the masses about such lifestyle changes which can keep your ears safe and hearing intact.**

Hence the role of pediatricians becomes vital, to identify any children who could have any degree of hearing loss across various age groups and refer them to audiologists for timely intervention.Most of the audiologists in our country are qualified and trained to conduct these advanced tests which not only tell us the degree but also the type of hearing loss. These objective tests are called electrophysiological tests like BERA, ASSR etc which can be carried out as an OPD procedure. Nonethless, technical expertise is required to conduct and interpret the test findings and suggest an appropriate intervention.

Also,there is an estimate that 1.1 billion young people (aged between 12–35 years) are at risk of hearing loss due to exposure to noise in recreational settings or as an occupational hazard. In particular, it's due to the excessive use of headphones and earbuds that are perpetually on the heads

of countless young people today.

Audiologists play a vital role in educating the masses about such lifestyle changes which can keep your ears safe and hearing intact. More and more work needs to be done in this area. Like other health conditions, hearing should also be checked periodically. Hearing tests are

simple subjective tests done in a sound proof chamber and most of the hospitals have these facilities. In the last decade, we have seen a gradual increase in the number of young adults coming to get a routine hearing test for themselves but a lot needs to be done still.

Age-related hearing loss (presbycusis) is the loss of hearing that gradually occurs because of the natural aging process or as we grow older. It is one of the most common conditions affecting our senior citizens and elderly. Technology has come a long way for this age group.From

> **Without mandated routine hearing screenings in schools, students with unilateral, less severe or late onset hearing loss may not be identified or will be misdiagnosed and managed.**

diagnostic tests for intervention options there is a wide array of solutions available to address any kind of hearing loss.

Hearing aids over the last 10 years have undergone a big change … and have really started to meet the needs of people with hearing impairment far better. From a time when they were body worn, aesthetically unappealing with poor performance, working with AA batteries they are now small, discreet.

Rechargeable and have smart phone connectivity directly. Further principles of artificial intelligence have also been incorporated in latest hearing aids.

In India we have access to all the latest technology and few of the places do offer international level of patient care. But still there is a long way to go in awareness and education of masses to avail these advancements.

Similarly, when hearing aids do not benefit cochlear implants can be done for those individuals irrespective of the age. India has some fine surgeons and very well qualified audiologists to carry out these procedures with all international acceptable norms.

To conclude field of Audiology in India has come a long way, but still has a long journey ahead to reach at all levels of patient care.

Dr. Raj Sharma is an alumni of Cornell Ivy League University, New York and Graduate from AIIMS, New Delhi, India. He is an emblem of medical, allied medical and corporate entrepreneurship. His dynamic professional expertise is backed by over 12 years of entrepreneurial experience in steering initiatives towards achieving organizational goals and rendering responsibilities related to Healthcare Business Management. Raj Sharma is the director of Priority Hearing Care.

innovatio curis

VIRTUAL EVENT
as a SERVICE

OUR EXPERIENCE?

Domains
- Healthcare
- ICT
- MSME

Event types
- Hackathons
- Webinars
- Conferences

WHY VIRTUAL EVENTS?

- Low Cost with a Higher Return on Investments
- Modular and Repeatable
- Interactive and participative
- Great value for participants
- Greater Outreach
- Scalable and Measurable

HIGHLIGHT PROJECTS

HIGHLIGHT PROJECTS	PARTICIPANTS	WEBINARS
European Union ICT Standardization	1800+	27
European Higher Education Virtual Fair 2016	16000+	87
European Higher Education Virtual Fair 2015	13000+	73
Knowledge series webinars with European Union & Indian clients	2000+	30
Fight Corona IDEAthon	5400+	
SAMADHAN	9000+	
Smart India Hackathon 2020	10000+	
ScanBalt Digital Forum 2020	~ 200	
The Cancer Genome Atlas 2020	1500+	

PARTNERS

MHRD'S INNOVATION CELL (GOVERNMENT OF INDIA) · DAI Shaping a more livable world. · European Union · ScanBalt BioRegion · RICH · oncquest innovations · · · Ministry of Electronics and Information Technology Government of India · CARING · Department of Science and Technology Ministry of Science and Technology Government of India · National Board for Quality Promotion · CAHO · FORGE · QCI Quality Council of India · TARTU BIOTECHNOLOGY PARK Integrated expertise
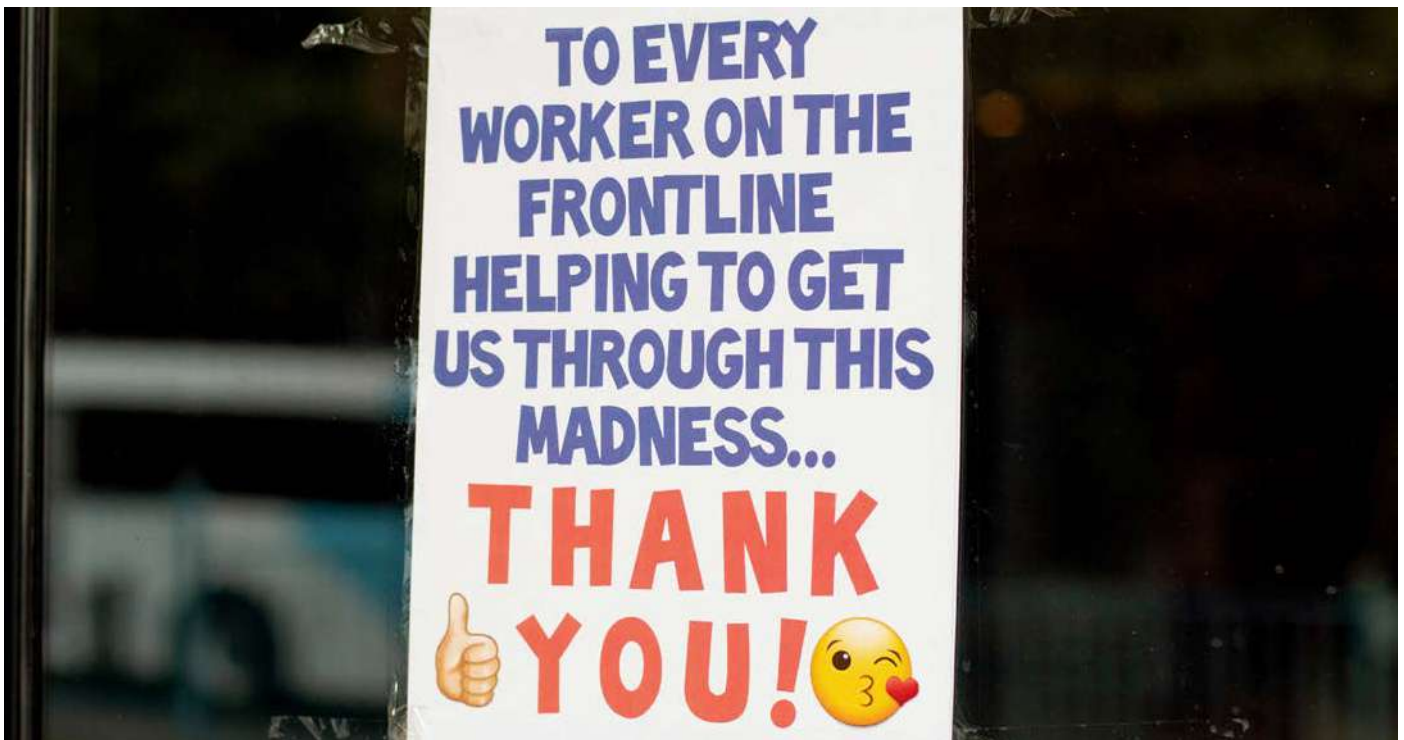
CONTACT

📞 +91 9643799179

✉ info@innovatiocuris.com

Are Frontline Healthcare Workers Ready to Take Up the New Revolutionary Digital Journey Ahead?

■ **Tamanna Sachdeva**

This question usually pops up in every mind while talking about any digital health intervention. This thought makes everyone think several times before implementing any new digital initiative. "Adoption" is a major challenge that everyone should take up in the limelight for the current digital revolutionary journey coming ahead.

Discussing India's healthcare access and quality index according to the Lancet journal it holds its position at 145 out of 195 countries. Front line healthcare workers are the first line of contact in India's healthcare system. The Active social health activists (ASHAs), Auxiliary nurse midwives (ANMs) and Anganwadi workers (AWWs) usually fall under the

cadre of frontline health care workers in India. Most of the FHWs in India are using m-health interventions as one of the tools in providing quality access to healthcare services in India. On the other hand, most of the m-health platforms are aligned towards mother and child health. There are several m-health platforms in India that are being used at frontline level. Not only this they are embedded with various tools and clinical decision support systems that help in tracking high-risk pregnancies, record management, antenatal care visits, scheduling, generating referrals, training, monitoring and end-to-end patient management.

In India the major challenge in providing health care service is mostly confined to

the rural areas and maternal and child health is one of those concerns that needs to be tackled. Various states has leveraged these m-health platforms in the tracking of mother and child health related issues and providing training as well as front line level. But the biggest dilemma is are they being implemented well? Are they helping out in bringing the potential of these m-health interventions? Answering these questions will always remain as difficult till we come out with the solutions to overcome the major deterrent that is "Adoption".

Talking About Challenges

If we articulate about some of the challenges in adoption it can be broadly

portrayed in terms of:

1. Technical issues
2. Healthcare worker readiness
3. Healthcare system readiness

Technical issues:

Technical issues are one of the major deterrents that can lead to the failure in the whole system further leading to less or no adoption towards these online platforms. Complex designing of these health platforms that may influence them to take a back step towards the usage. Other issues may depend upon the features, how it is operated and up to what extent it is easier for them to update the fields in the system. There may be several other concerns like the phone getting heated up, or the phone freezing up, technical presentation (mobile friendly), touch screen etc.

Healthcare worker readiness:

This may be understood well in terms of the perceived usefulness and perceived ease of use with some of the examples.

Perceived usefulness: They usually think that what is the purpose of updating the same field electronically while they are already doing by writing in the paper? Will it be beneficial for them in improving their service delivery if yes then how? And how much do they believe that using these systems would require less comfort and up to what extent?

Perceived ease of use: Due to the complex functionality of the device or system they may not appreciate using it. Is the device developed in alignment with their workflow? Or this may be the result of technical issues also they are facing while using it.

Apart from this lack of understanding, education, attitude towards the technology proficiency and self-efficacy in utilizing these tools. While working in rural and confined settings, they can suffer from low self-confidence and motivation and equally the perception of target communities towards them can
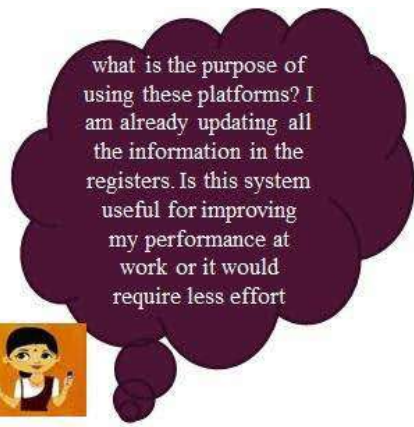
also have an impact towards adoption.

Healthcare system readiness:

This comes as an overall backend support for the FHWs in adopting these tools. Current health care policies and various health care institutions are not into the enforcement of these mhealth interventions. This may be due to the lack of standardised protocols for the usage of these tools. On the other hand, the poor network access in remote areas, poor access to electricity and lack of proper infrastructure or maintenance cost of the online platforms comes under the impoverished healthcare system. For example, the majority of FHWs also faced problems with the network, internet when it came towards synchronizing the data entered with the servers. Further, most did not have access to electricity sources in their centres to charge their phones. One of the studies stated that the AWWS usually work in AWCs and reported they don't have ports or electricity sources from where they can charge their mobile phones.

Solution towards adoption

point in addition in creating a sustained digital initiative on a large scale. Like the top leaders can be identified among them in terms of the beneficiaries they have updated so as to keep constantly engaged and motivated. Monitoring and evaluating their work outputs in terms of creating a daily scoreboard. Making them realize the scope, should be made clear to the Healthcare workers. When the users witness that online intervention can be taken as an encouraging means to accelerate the administrative processes, it is usually welcomed by them and easily adopted.

Delivery of services to citizens through "online mode" is at the core of the overall electronic health ecosystem being talked about.

Major I.T. Initiatives by the Ministry include various health initiatives for improving efficiency and efficacy of public health care across the country under the Digital India Program. For example- Govt of India has initiated "The Integrated Government Online Training (I GOT) -Diksha platform is being used to conduct seamless training sessions for healthcare professionals across the country. ECHO India has partnered with premier government healthcare institutions in its efforts to strengthen the emergency response to COVID-19 with consistent capacity building programs for healthcare professionals, including doctors, nurses, ASHA workers and paramedics by conducting virtual training sessions with their partners. Thus, there are still limitations, despite the existence of theories on technology usage in the workplace, the evidence regarding these interventions in terms of how they usually affect performance of FWHs and the evaluation of efficiency of services delivered through this is still missing.

Heading Towards Solution

Now the discussion lands up towards the solution on how we can make FHWs geared up with the revolutionary digital health practices. If we talk about the solutions we need to think accordingly and specifically at each level.

1. Strategic level (at the time of planning)
2. Operational level (requirements before the implementation)
3. Frontline level (during implementation)

Strategic level: It is the first step that must be taken into consideration while implementing any of the interventions into the field. This usually includes planning and organizing of all the tasks and resources accordingly. Prerequisites during the planning must be clear in terms of value and workflow. Value usually encompasses the scope and how the usage of health intervention will benefit them. The aim of the overall process must be well communicated with the users as well. In terms of workflow the interventions that are being subjected to the users must align with what they usually undergo in providing services to the population. Healthcare policy acts as a lever in forming overall strategies.

Therefore, standardised policy and regulations must be followed to maintain the main aspects of digital ecosystem i.e.; interoperability, data privacy and data management. Various other factors must also be considered like demographic, social, economic, etc. while formulating out the strategies.

Operational level: Before the intervention gets implemented at the ground level some of the key operational factors must be taken into the concern. For example, while implementing the mHealth intervention in any low-resource setting one must have adequate resources at the backend. Proper infrastructure, adequate supply of electricity, internet coverage with sufficient speedy networks and resources for providing training and technical support. We should also look into the fact that the tool they will be using should be user friendly and with not very complex functionality.

Frontline level: It becomes a very compelling factor in terms of adoption. One is directly in-contact with the healthcare workers. Continuous hand holding, motivating them through behaviour change communication (BCC), developing trust around the users act as the most important action

Tamanna Sachdeva is presently associated with Tech Care for All as Business Analyst Healthcare. Her areas of interest are mainly in healthcare research and program management.

Polypharmacy in the Elderly -
Role of the Family Physician

■ **Dr. Krithika Ganesh**

Over the past two decades with increasing life expectancy and better access to healthcare, there has been a rise in the population of adults above age 65 years in India. There has also been a significant increase in speciality and super speciality doctors. Many elderly persons suffer from a myriad of health conditions that require consults with many specialists. Also, access to over the counter (OTC) medications and supplements has never been easier with online pharmacies and home delivery of pills. Multiple prescriptions from different practitioners along with self medication by patients themselves has created a problem of polypharmacy or too many drugs taken by patients. In the current COVID 19 scenario, with elderly persons missing their regular appointments this problem has compounded.

There is no strict definition for polypharmacy. Some studies have arbitrarily defined it as four or more medications. But patients with multiple serious conditions may genuinely require them. A better way to define polypharmacy would be the use of more drugs than which are medically necessary. This can be seen in patients of all ages but is commonly encountered in the elderly. There are many consequences of this on the health of older adults. Some of them are:

Adverse drug reactions

With advancing age, there is a decline in the function and reserve of organs like liver and kidneys. These organs are important for the breakdown and elimination of drugs. The gastrointestinal motility may be reduced in old age affecting the absorption of oral drugs. Thus the higher chance of adverse drug reactions in the elderly. In a recent study it was found that nearly 10% of emergency room visits by elderly was attributed to adverse drug events.

Drug Interactions

People may suffer from minor illnesses from time to time. This increases in old age. These may not be related to the area of expertise of the specialist they may be consulting already and thereby they are forced to meet a different doctor. Even though it might be just a minor illness, the drugs prescribed for it can have a serious drug interaction with the patient's regular medications resulting in dangerous consequences.

One common example of this is with the drug warfarin which is given for prevention of blood clots in patients who have had a heart valve surgery, stroke or venous thrombosis in the past. This drug can interact with many medicines. To quote a few, cotrimoxazole a common antibiotic, fluconazole given for fungal infections or even over the counter pain medications can increase the effect of warfarin putting the patient under high risk of bleeding.

Some other common drugs implicated in drug interactions in the elderly are NSAIDs, antibiotics like fluoroquinolones, anti-epileptic drugs, anti-diabetic drugs,

> **Polypharmacy means taking multiple drugs. This includes prescription drugs, supplements and over the counter (OTC) pills by an individual.**

sildenafil, anti-arrhythmics and diuretics.

Cognitive impairment

Several studies have found polypharmacy to be associated with cognitive decline in elderly . Anticholinergics are notorious for this. These are used in urinary incontinence, prostate enlargement and Parkinson's disease which are all diseases of the elderly.

Frequent Falls

Elderly patients have a high risk of falls. A fall can cause significant distress by hip fracture, head injury or blood loss in the already frail individual. Use of 4 or more medications has been found to be a risk factor in older patients for falls.

Apart from these other consequences of polypharmacy are worsening dementia, poor drug adherence and increasing healthcare costs. Elderly patients with many co-morbid health conditions,

older adults living alone, the uneducated and those living in old age homes are particularly at high risk for the negative consequences of polypharmacy.

We have elderly people running to multiple specialists often in different hospitals and clinics. Patients are in dire need of a medical contact who can filter through and manage their multiple medications on a regular basis. One who is within the community, easily accessible and relatively light on the pocket. The Family Physician or General Practitioner (GP) can fill this need.

About two decades ago the concept of the friendly neighbourhood family doctor was commonplace in India. Every family had their own doctor. He/She would know the medical history including any adverse health events which have happened over the years and have an idea about the medications taken by each family member. They would be consulted regularly and their words were considered

trustworthy by the patients. The family doctor was more like a family friend, invited for family events and part of the family's joys and sorrows.

Today this concept has diminished. Various factors are responsible for this. Firstly, the commercialisation of healthcare with multiple private hospitals,. New advances in healthcare, high end diagnostics and treatment options with growth of many specialists and super specialist doctors. The failure of government policies and medical education system in strengthening grassroot level healthcare personnel and lack of awareness among the patients themselves about the benefits of having regular follow up with a qualified primary care physician.

So, how does a family physician help in avoiding the problems of polypharmacy?

- *Intimate knowledge about the patient lifestyle and medical history.* Sometimes medications may require adjustment during festivals, family functions or other life events in the older patients. For example, a diabetic patient may require guidance and drug adjustment during festivals like Diwali where his diet will change

drastically or during travel. What about a diabetic who chooses to fast during the month of Ramadan? An elderly patient on treatment for dementia, Parkinson's disease or a cardiac illness may need extra attention and change of drugs in times of bereavement or other stress. A family physician is in a position to do this because he/she has an intimate knowledge about the patient's lifestyle. It saves the patient visits to multiple doctors and gives him the opportunity to clarify all his doubts and concerns in a single visit.

- **Accessible and Inexpensive**

  A family physician usually has his clinic within the community. He sees patients of all ages. His fees are lesser than that of a specialist and does not need prior appointments.

- **Routine Follow up**

  After the required intervention by a specialist, like an angioplasty by a cardiologist or a prostate removal by a urologist, patients can follow up with a GP at regular intervals. This gives an opportunity for the family doctor to connect with the patient at a personal level and motivate them to follow a healthy lifestyle and other precautions that the specialist may have advised. He can monitor the patient's health closely, thereby deescalating or stopping certain medications as and when necessary.

- **Coordinate with specialists**

  A common reason for polypharmacy is drug duplication. When consulting different specialists, some drugs could overlap. For example a patient consulting a neurologist for peripheral neuropathy and an endocrinologist for diabetes might be prescribed a vitamin supplement by both having different trade names. This could lead to unnecessary extra drug consumed by the patient. The patient probably visits the specialist once a year or even lesser. So lot of times it is years before such a drug duplication is recognised. This could easily be prevented by a family physician who would be able to coordinate professionally with the various specialists that the patient consults, acting as a single point of care. He can consolidate the prescriptions, do a drug review at every visit and avoid such duplication.

In conclusion, polypharmacy is a fairly recent health problem with a greater incidence in the elderly population. A well qualified, dedicated family physician can have a positive impact in the routine care and follow up of elderly persons. Along with monitoring their health and preventing inappropriate drug consumption, He/she can contribute to a safer, healthier and more comfortable life in old age.

Dr. Krithika Ganesh is a doctor by profession and currently runs her own private clinic in Bangalore. She is passionate about the field of family medicine and believe that dedicated family physicians in every community are the need of the hour in India.

► RESEARCH

Health Data Management Policy – Regulating data collection!

■ **Avikshit Moral and Anirudh Jakhotia**

So far, two thousand and twenty has been a year of many "firsts". While COVID-19 pandemic, defined the "new normal", it also led to the introduction of some key policies. Healthcare sector, which hitherto was not on top of the agenda item for many economies, has become a priority sector. Major reforms have been introduced in the healthcare sector across the globe, taking cue from the learnings of the gruesome COVID-19 pandemic. In recent years, India has witnessed a shift towards digitisation in the healthcare sector. Telemedicine was one of the very first steps taken in this regard. With healthcare becoming one of the key focus sectors, the Hon'ble Prime Minister of India announced the National Digital Health Mission ("**NDHM**") on 15th August 2020, to pave way for accessible medical services for all citizens of the country.

Under NDHM, a health ID will be given to every citizen, which will contain details of every test, disease, the doctors consulted, the medicines taken and the diagnosis. The aim is to ensure easy accessibility and portability of information. NDHM intends to integrate medical practitioners, hospitals, pharmacies, insurance companies and other stakeholders to create a digital health infrastructure. NDHM is a step towards digital revolution.

The National Digital Health Blueprint, 2019, recommends a federal structure for the management of health data. The data will be stored across three levels, i.e. at the central, state and health facility level which will ensure privacy and confidentiality. Against this backdrop, the National Health Authority released the draft of the Health Data Management Policy ("**HDM Policy**") and has invited public comments on the same. The HDM Policy provides for minimum standards for the collection and protection of data.

Whom does it apply to?

The provisions of HDM Policy inter alia

PERSONA

THEME

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

> **Under NDHM, a health ID will be given to every citizen, which will contain details of every test, disease, the doctors consulted, the medicines taken and the diagnosis.**

applies to all entities and individuals who have been issued an ID under the HDM Policy, healthcare professionals, hospitals and other entities which act as information providers, any healthcare provider who collects, stores and transmits health data in electronic form, insurers, drug manufacturers, medical device manufacturers and entities involved in relevant supply chain.

Collection of personal or sensitive personal data by data fiduciaries

Under the HDM Policy, "Data Fiduciary" means any person or an entity who determines the purpose and means of processing of personal data ("Data Fiduciaries"). Data Fiduciaries also include health information providers and health information users. The HDM Policy provides for a consent framework for collection and processing of personal or sensitive personal data. It is provided that Data Fiduciaries can collect personal or sensitive personal data only with the consent of the person to whom the data relates ("Data Principal"). Consent may be obtained electronically or physically on paper, either directly from the Data Principal or through an entity or individual which interacts with the Data Principal. The HDM Policy also sets out the parameters for a valid consent.

The HDM Policy further states that the consent framework should inter alia ensure that the Data Principal is given complete control and decision-making power over the manner in which personal or sensitive personal data is collected and processed further.

The HDM Policy mandates Data Fiduciaries to provide a clear, concise and lucid privacy notice to Data Principals prior to the collection of personal or sensitive personal data. The Data Fiduciaries are also under an obligation to provide the privacy notice prior to

the collection or further processing of personal or sensitive personal data for any new or previously unidentified purpose.

Allocation and creation of health ID

- Any person may request for the creation of a health ID which will be required to participate in the national digital health ecosystem ("NDHE"). The personal data of such person will be linked to such person's health ID. Such person shall be able to provide or revoke his/her consent in order to enable or restrict any sharing of personal data linked with such health ID.
- A Data Fiduciary intending to issue a health ID can register with the National Health Authority and obtain an authorisation key to access the services required to create a health ID. A Data Principal may create a health ID on his own or through a Data Fiduciary.
- Health practitioners and health facilities (i.e. a hospital, clinics, diagnostic centres etc.) may also request for creation of a health practitioner ID and health facility ID respectively, which will be required to enable such health practitioner and health facilities to participate in the NDHE. The health practitioner ID may be used to view the electronic health records of a Data Principal subject to the consent provided by the Data Principal.

The NDHM will enable the Data Principal to maintain his personal data efficiently and will assist them in sharing all crucial details with the health practitioners and health facilities. Considering that crucial medical records of patients will be readily available, it will assist the health practitioners and health facilities to study the diagnosis and treatment conducted by other health practitioners and health facilities meticulously. This in turn will

act as a catalyst while diagnosing and treating other patients.

Further, the NDHM will create a data warehouse for health practitioners and health facilities. The health practitioners and health facilities will get first-hand access to data regarding various patients and the complexities faced by them which will enhance their knowledge and offer them ample opportunities in the field of medical research.

Call for Greater Accountability?

1. The HDM Policy provides for creation of a National Health Infrastructure Registry which shall verify whether the services offered by a health facility are authentic.

2. The HDM Policy pins greater responsibilities on Data Fiduciaries. The HDM Policy mandates the Data Fiduciaries to:

- Take necessary steps to maintain transparency in processing any personal data.
- Devise a procedure for exercise of rights by Data Principal and also provide a grievance redressal procedure. The Data Fiduciaries are under an obligation to prepare a comprehensive privacy policy.
- Take necessary steps to ensure that the personal data which is processed is updated, complete, accurate and not misleading.
- Be responsible to implement security practices and standards and have a comprehensive, documented information security programme and information security policy that contains managerial, technical, operational and physical security control measures that are commensurate with the data being protected by them.
- Conduct appropriate due diligence covering data privacy and security prior to engaging with any data processor. The Data Fiduciaries will require their data processors to execute confidentiality agreements and non-disclosure agreements covering data protection and privacy responsibilities.

Sharing of personal data by Data Fiduciaries

- Any personal data processed by a Data Fiduciary may be shared with a health information user ("HIU") in response to a request made by such HIU with the consent of the Data Principal. Anonymised data may also be made available for facilitating health and clinical research, statistical analysis, policy formulation and promotion of diagnostic solutions.
- HIUs are not permitted to disclose any personal data without obtaining the consent of the Data Principal. The liability of HIUs with respect to data protection is akin to that of a Data Fiduciary. Further, HIU shall maintain a record of personal data disclosed to another entity.
- Strict restraints have been imposed on the participants under the NDHE from publishing or posting any personal data or sensitive personal data.

A step in the right direction?

While it is voluntary, the HDM Policy

is the first step towards integration of the healthcare sector with crucial data. The HDM Policy provides for a robust framework for obtaining consent from Data Principals to collect their personal or sensitive personal data and at the same time mandates strict compliance for protection of personal data and sensitive personal data which will boost confidence amongst the participants.

Until now, there were no comprehensive guidelines in relation to collection of personal data and sensitive personal data in the healthcare sector. Further, prior to the introduction of the NDHM regime, the data was not available to all medical practitioners and other stakeholders which proved to be a roadblock in effective treatment and also hampered medical research. Such an integrated database would have been like a silver bullet in the present scenario.

The new regime provides for integration of data which will smoothen the process of data collection and data accessibility by medical practitioners and other stakeholders. This will go a long way in facilitating successful research programs

and will also ensure the provision of quality medical treatment to the Data Principal. While the HDM Policy looks promising, it will be interesting to see how the same is implemented and also the kind of confidence it will be able to manifest to make a common man be a part of this ecosystem.

Avikshit Moral has successfully led several high value mergers & acquisitions for domestic and offshore clients. His expertise in corporate advisory work mainly comprises of deal structuring, negotiations, documentation and execution of transactions. He is leading a mandate with a pharma giant for developing content for one of India's first comprehensive Medico-Legal Application. Presently associated with Juris Corp.

Anirudh Jakhotia has acquired experience in drafting and negotiation of various commercial contracts and transaction documents. He has also advised pharmaceutical companies and hospitals on their medico-legal queries and is currently advising one of the largest pharmaceutical company and developing content for their medico-legal application. Presently associated with Juris Corp.

> **The National Digital Health Blueprint, 2019, recommends a federal structure for the management of health data.**

How to overcome the Pandemic itch?

■ **Dr. Shivani Vakilwala**

COVID 19 virus has become such a nightmare in every individual's life. Everyday media coverage, increasing mortality and now the increasing frustration of being at home has made people wonder what more does this pandemic have in store.

But people have forgotten that it only is physical distancing and not mental distancing. Connecting with your loved ones was never included in social distancing. People realised that quite late in the pandemic and this lead to an increase in anxiety and confusion.

A person's parasympathetic system which is meant for the long term survival acts on the body when it is in the relaxed state. Therefore at the peak of anxiety if one is good at controlling your mind and making your body relaxed then one may easily conquer this anxiety.

There are several ways to do so, some of which are enlisted as follows-

1. Guided relaxation – Only 5 minutes of guided relaxation while watching a video or listening to an audio, helps reduce the stress levels considerably.

2. Cut down on Watching the News- Limit your news intake, yes one does need to know about the current affairs but limiting or fixing a time for it is mandatory.

3. Exercise- No, one does not need to go the gym. Just a 30 minute home workout which include dancing, walking, yoga could help vanish the Pandemic blues.

4. Do an activity you did in childhood – Even if you are not an artist, just take those colours, brushes and paint. It helps your neurons to fire and distract you. Sing your favourite songs or listen to music, anything that makes one happy. Happiness releases endorphins which acts as a stress extinguisher.

5. Invest time in online courses- World's very famous universities like Stanford, Harvard to name a few have introduced free courses in multiple streams. Why not learn new things and develop one's personality.

6. Have a game night with your family- Not only will it bring happiness to you but also your family and secretly you will be reducing their anxiety too.

7. Do that little bit – Invest a little in NGO's or other organisations that helping the less privileged during this tough times.

The amount of self -satisfaction one gets by doing their little bit is unmatchable.

8. Practice gratitude- Yes the pandemic has hit everyone hard but all those daily wage workers who are losing out on their wages are fighting a difficult battle to make their ends meet!

Even though the Pandemic has put a sudden brake to your daily activities it also has given you the opportunity to spend time with your family, ponder on things important for your life, give time for self-growth.

So the next time you feel that urge of leaving the house because you are frustrated of being at home, remind yourself that you are a warrior too by being at home and keeping not only yourself but also others safe.

Curb the itch of going outdoors by giving your brain an itch and then you will never feel those blues.

Remember restrictions are being eased gradually but the virus has not left us, so let us be safe at home and enjoy too.
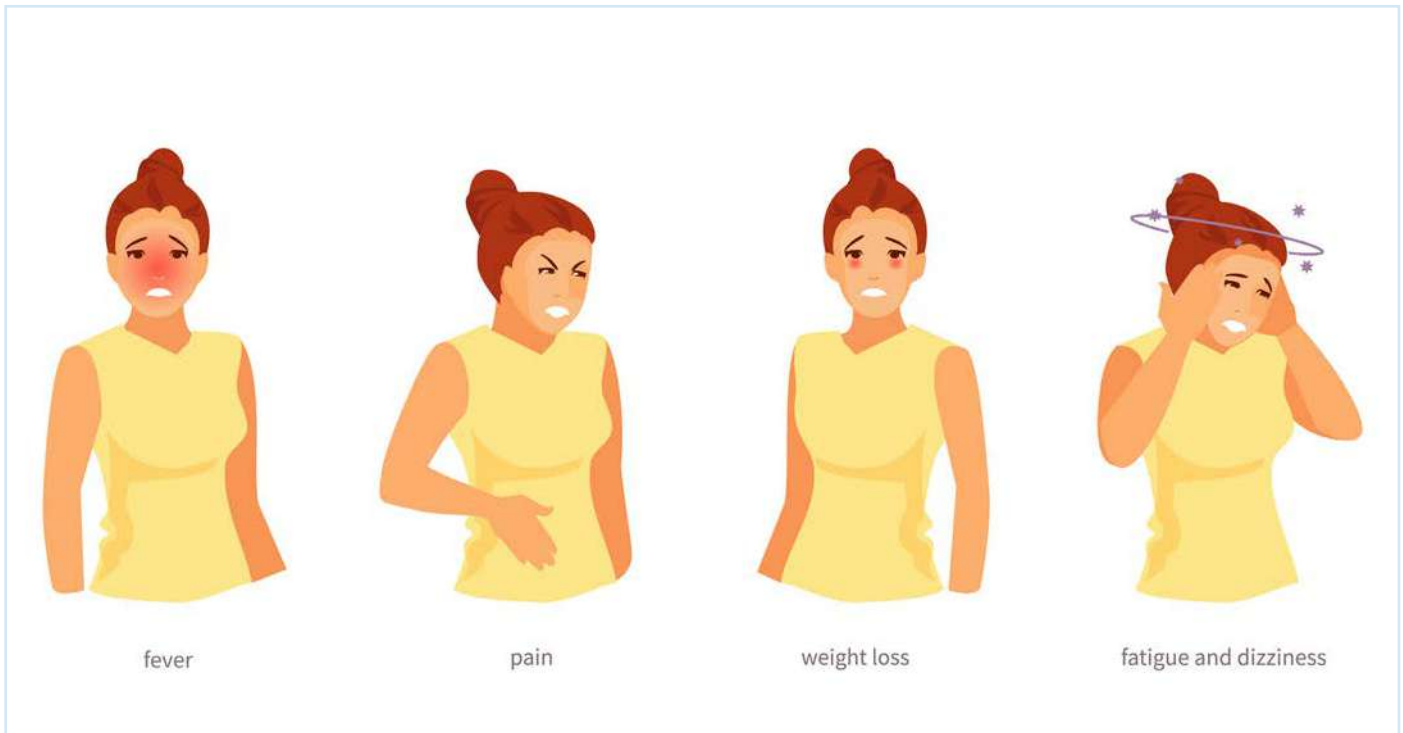
Dr. Shivani Vakilwala, Medical Officer and Diabetes Educator, Currently working as a Medical Officer performing medical examination of sea farers and other candidates that go overseas.
I have a passion for writing especially articles that help others live a healthy lifestyle. I am a writer and Social media manager at the quarterly medical magazine – LEXICON.
My aim is to spread awareness and also improve well being in a more holistic manner.

Signs & symptoms of cancer that need Attention Immediately

■ **Divya Khanna**

fever   pain   weight loss   fatigue and dizziness

PERSONA

THEME

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

The Cancer Fear

The question that immediately crosses our mind when we hear about the dreaded disease called cancer is that what is cancer and what causes it!

Similarly, the next question that torments a mortal soul is that how do we get to know that we have got cancer. Well, to deal with the first answer, we can say in very simple words state that cancer is the abnormal multiplication of defective cells that continue to divide at an unprecedented rate and has the power to invade and destroy normal body tissue. Cancer very often spreads through the whole body if not thwarted or cured.

Cancer is not always fatal

Cancer has a dreaded significance as it is the second most potent cause of death in the planet. When cancer develops, it triggers certain abnormal changes in the day-to-day functioning of the body. These abnormalities act as primary signs and symbols for detecting cancer at its initial stage. If detected at its nascent stage, cancer can be treated effectively and death can be defied.

Main causes and types of cancer

The five major varieties of cancer are carcinoma, sarcoma, melanoma, lymphoma and leukaemia. Most of these cancers are caused by old age, alcoholism, tobacco addiction, dietary indiscipline, hormonal imbalance, infectious germs, exposure to harmful radiation, consumption of carcinogenic substances, obesity and harmful rays of the sun to name a few.

General symptoms aiding cancer detection

Let us keep in mind to be vigilant about any abnormal and sudden change in body appearance or body functioning. The below points focus on some generic signs and symptoms triggered by the body for effective detection of cancerous cells.

- **Nagging feeling of fatigue or weakness:** Feeling tired or out of breath and out of energy level constantly without any supporting reasonable ailment might be a sign of cancer in the body.

- **Pelvic pain or irregularity in periods:** Cervical, uterine or ovarian cancers are detected using these initial symptoms. Cramps and persistent pains should be examined.

> **Drastic change in body weight such as abnormal and abrupt weight loss or gain that is inexplicable needs to be checked for germination of cancer cells in the body.**

- **Chronic cough or headache:** Persistent coughing may be a symptom of lung cancer and never-ending headache might indicate brain tumour and hence both need to be checked.

- **Stomach pain, nausea and indigestion:** Persistent indigestion, bloating or discomfort after eating might indicate the presence of cancerous cells in stomach, oesophagus or throat.

- **Unexplained bleeding or bruising:** Postmenopausal bleeding is an alarming sign for cervical or uterine cancer. Bleeding might denote various types of cancer starting from rectal cancer, cervical cancer, bladder or kidney cancer and even breast cancer depending on which organ is bleeding.

- **Fever and hoarseness:** Difficulty in swallowing, persistent fever, cough or hoarseness might be the signs of larynx cancer, lung cancer or thyroid cancer.

- Lump formation, swelling or thickening under the skin: Any new development of lump or mass that is visible or can be felt under the skin layer, especially in the areas around breast or in lymph nodes, swelling of soft tissues or lump in the testicles might all be indications of cancer.

- **Change in body weight:** Drastic change in body weight such as abnormal and abrupt weight loss or gain that is inexplicable needs to be checked for germination of cancer cells in the body. Various types of cancers such as pancreatic cancer, stomach cancer, oesophageal or lung cancer are generally accompanied by serious weight loss.

- **Painful changes in oral region:** White or sore patches, bleeding or numbness in your oral region or tongue can lead to oral cancer.

- **Persistent body pain:** Persistent muscle or joint pain or fever that remains unexplained is also general signs of cancer.

- **Colour change of skin, changes in existing moles or warts:** Changes in skin colour such as yellowing, darkening or reddening or having sores that do not heal or even changes in moles, freckles or warts that are already present need attention for examining of skin cancer.

- **Toilet habit changes:** Changes in bowel or bladder habits such as diarrhoea or constipation or irritation while passing urine might lead to colorectal cancer, bladder cancer or prostate cancer.

- **Changes in bowel movements or urinary habits:** Any prominent change in body functions such as constipation, diarrhoea, blood in stool; black or tarry stools; frequent urination or blood in urine are indications of colon, prostate, colorectal, rectal or bladder cancer.

You should be vigilant about these symptoms and get examined immediately if they persist. Fatality can be avoided if cancer is detected at an early stage. There are various hospitals located across India specializing in cancer treatment. Here is the list of 10 best cancer hospitals in India.

Divya Khanna lives in New Delhi who is medical freelancer offering quality information related to medicines and health products for different Health conditions and their treatment.

PERSONA
THEME
INNOVATIONS
WELL-BEING
IN FOCUS
RESEARCH
NEWSCOPE

Pandemic Resilient Ecosystem
for Business Continuity

■ **Dr. Geetika Ahuja**

It has been a year since the global fight against COVID-19. The world has travelled through the anxious phase to a new fearless phase of pandemic response. During the initial months, there was fear and panic among the masses. With the awareness of wearing masks, hand hygiene and social distancing, the world population entered a more confident place where the economies slowly rebooted. Although this "new normal" promised low disease transmission, it was challenging in population dense areas with another wave of infection upsurge. It is no illusion that COVID-19 is here to stay for a while. Each country's mitigation response, its preparedness regarding detection, isolation, testing, surveillance and contact tracing will help combat the current pandemic as well as prepare for future unforeseen pandemics.

Biologically, SARS-CoV-2 is different from SARS-CoV and MERS-CoV, which made it difficult to understand its features and transmission pattern. Moreover, its faster spreading capacity created havoc across the globe. Although the mortality rate in India is 1.45%, the severe symptoms such as breathlessness, high fever, excessive body ache, vomiting, amplified by the social stigma attached with the disease has had physical and mental effects on victims. With high transmission rates and low fatality rates, our medical institutions have been able to form an effective mitigation response for the current pandemic. The downside though, is, that the "Pandora box" of notorious options and ideas is now open. The world has to be prepared for worst case scenarios of extreme biological emergencies. For instance, Ebola Viral Disease outbreak of 2014 in Africa had an exuberant fatality rate of 59%, however, it was not easily transmissible. Infected people were not capable of spreading the infection until they started showing symptoms, and even the virus was hard to catch because it spread through direct contact with bodily fluids of infected people, such as blood, sweat, urine or semen. This is fairly contrasting to the coronavirus which is easily transmitted when someone coughs,

sneezes or even speaks! With genetic engineering and notorious mindsets, it is not impossible that novel viruses be developed in the future with extreme traits of high transmissibility and high fatality rate. Moreover, humans are social animals, and human-human interaction cannot be stopped. Further, generating vaccines within a short-span of time is far-fetched owing to the various phases of trials. Considering all these factors, the world needs to be effectively prepared for unpredictable viruses and severe biological emergencies. In addition to building smart cities, the administrative authorities ought to build Pandemic Resilient Cities. The world cannot afford more lockdowns, as the countries need rotational incomes and expenditures. Thus, we need Pandemic Resilient Ecosystems at all levels, be it homes, shops, offices, schools, universities etc. to save human lives and world economics.

Pandemic Resilient Ecosystems rest on three major bases - social distancing, personal protective equipment, and

> **Although this "new normal" promised low disease transmission, it was challenging in population dense areas with another wave of infection upsurge.**

disinfection. Such systems must be self-sustaining with low recurring cost. Considering the current circumstances of escalated infections and decline in businesses, Institute of Nuclear Medicine & Allied Sciences (INMAS), Defence Research & Development Organisation (DRDO) has developed some products to help combat the situation. These technologies have been developed for personal use as well as commercial use. Few of these are discussed herewith.

PPE Suit, Protecton - DRDO developed a body suit using "smart textiles" which is washable and reusable, without compromising on its protective ability. It contains a layer of activated charcoal which wards off infections effectively. The regular PPE kits which are available commercially are generally for single use. This could lead to higher manufacturing rates, high bearing costs to common man as well as greater environmental load.

Tri-netra Hand Sanitization Unit - Tri-netra hand sanitization unit is a portable wall-mounted device which contains an ozone generator cathode maintaining the concentration up to 5 ppm, and converts water into hand sanitization medium. Half-life of ozone is 30 minutes, thus, simple ozonated water would not be suitable to carry while traveling. Thus, a

herbal formulation called "Triyogani" was developed which does not get oxidized with ozone and provides sanitization comparable to alcohol. In fact Triyogani hand sanitizer demonstrated up to > 99.99% reduction in microbial cell count within 15-30 seconds of application, which is equivalent to an alcohol based sanitizer with at least 75% alcohol content. Alcohol based hand sanitizers are associated with some long term side effects viz. (a) skin dryness which results in itching, flaking or cracks, skin irritation on prolonged usage, (b) toxicity by accidental ingestion by children resulting in subsequent hospitalization, (c) fire hazard as they are classified as Class 1 flammable liquid substances due to low flash points, are risky to use near flame or high temperature environments. Moreover production of alcohol sanitizers relies on industry which does not make it self-sustaining compared to zero recurring cost of ozonated water. Also, there is a possibility of growth of new variants of microorganisms resistant to existing disinfecting chemicals. In such situations, ozonated water can be produced and used on site, using air; while alcohol requires complete set up and raw material from agriculture sector.

Ozonated Radical Confined Space (ORCS) Sanitization Unit, Poorn Swachh - ORCS Disinfection Unit is a portable and mobile

machine that generates ozonated fog and penetrates into various parts of room or vehicle (confined space) neutralizing microbes, viruses, bacteria etc. This system also produces ozone on its own with the help of a generator cathode at the bottom of the device. The ORCS unit produces ozone at 0.03 ppm x 10 hours, which is fairly less than the permitted occupational dose of 0.1ppm x 8 hours. To compensate the excess time required to thoroughly sanitize a space, a herbal formulation called Triyogani fumigant is added to this device, which produces ozonated fog. It is a safe option that enhances the impact of ozone in synergistic manner while disinfecting the confined space. Existing UV-C based counterparts are extremely effective in sterilizing the surfaces in their line of path. However any slight deviation or obstacle in path (or shadow areas) significantly reduces the efficacy leading to surface disinfection only. Moreover, the time and energy required to achieve UV-C based room sterilization is higher, including delayed timer for the safety of personnel performing the disinfection. Poorn Swachh with Triyogani on the other hand, performs comprehensive sterilization and is not restricted with obstacles in path.

Safe Passage Patient Transfer System, Taaran - This specialized Patient Transfer System (PTS) is a modified wheel chair with isolation cover and an assembly that absorbs all the exhaled air of the patient, sterilizes it through HEPA filters and UV-C, and re-circulates the cleansed air. It provides safe passage for victim passing through contaminated environment and/or prevention of spread of infection in

health care settings or public areas. PTS can be used in designated hospitals, where suspected persons can pass through the screening process at triage area wherein interaction between doctors and patients, or doctors and patient's attendants, or medical staff and paramedics takes place, thus minimizing the chances of infection transfer. Also, transferring the suspected patients from hospital parking to OPD, or, from home/ office to the ambulance, or, airports/ railway stations which are the first places to encounter suspects with symptoms. Even though N-95 masks provide adequate protection, but they reduce in efficiency after 36 hours. Moreover, patients are continuously rushed between test centers and isolation wards and a closed space for transfer is always better. Inside Taaran, the flow rate of air being sucked from the lower part of PTS and back into two suction apparatus on either side of patient creates a continuous directional flow of exhaled air. As per guidelines for isolation precaution, >12 ACH (air exchanges per hour) or 80-160 liters/ second/ patient is required for isolation in high risk areas. PTS supports 15 air changes per hour, ensuring complete safety. Furthermore, it is rechargeable. So the only recurrent cost is of electricity.

Fruits and Veggies Wash - Majority of the food produce is waxed to increase its shelf life. Also, pesticide residues are present on fruits and vegetables' surfaces, whose prolonged exposure has been associated with increased risk of several autoimmune and degenerative diseases such as cancer and autism. Additionally, washing with plain water will not remove food-borne pathogens which affect people with weaker immune systems such as elderly, infants, pregnant women etc. Therefore, the team of scientists at INMAS, DRDO developed a disinfectant, Triyogani - Fruits and Veggie Wash, which is composed of organic acids and naturally derived plant based compounds especially citrus ingredients, with proven efficacy in killing microbes. They strip off the waxy layer, pesticide residues, and dirt trapped on the surfaces and pathogenic contaminants. All components of Triyogani are food grade and free from alcohol, chlorine or sulphates, thus safe for consumption.

Ultra Swachh Personal Protective Equipment Disinfection - Ultra Swachh PPE Disinfection Unit is an advanced oxidative process based disinfection unit comprising multiple barrier disruption approach. It works using Ozonated SPACE and Aqua-Ozonated SPACE. This technology is based on Tri-netra mechanism, translating to three step sterilization, where the

radical dispenser generates a mist of aqueous ozone as microbial neutralizer (1), UV sterilizes the surface (2), UV further transforms ozone back to oxygen and water (3). Moreover, DRDO has developed multi-layered convertor to absorb residual ozone leftover, if any, after completion of the cycle. This technology has been tested and validated using standard biological indicators having bacterial spores of volcanic origin, which are one of the most resistant micro-flora and used worldwide to obtain Sterility Assurance. The spores were killed instantaneously within an effective contact time of 50 seconds. This ascertained its utility in killing fragile Corona RNA virus, and is also promising for any resilient future bioagent. In case of an unforeseen circumstance where the new bioagent cannot be degraded with this technology, there is a provision of adding Triyogani fumigant making the sterilization process excessively effective. In another situation if there is a need of chemical sterilant, hydrogen peroxide can be added in the radical dispenser. Ultra Swachh can be used to disinfect wide range of material, fabric, PPEs, hard plastic tools, radios, mobile phones, bluetooth devices, watches etc. For hard surface items, only UV-C cycle can be used; for PPEs sterilization Ozonated SPACE cycle can be used and so on. Regarding running cost, there are two models, base model and an advanced version. For both, there is no recurring cost other than operational electric cost at 220V, 50Hz for base model and minimum cost imperative for advanced model.

Ati Swachh Heat Sensitive Medical Device Disinfection Unit - Ati Swachh is a disinfection/ sterilization unit based on advance oxidative process, for multiple barrier disruption. It works on the same Tri-netra principle explained above for Ultra Swachh. The additional feature of this system is that it works on heat-sensitive materials, mostly medical instruments. Presently, single sterilant technologies do exist like Hydrogen Peroxide vaporized sterilization solution, Ethylene Oxide (EtO) or Steam based systems. However, each has a few problems: (a) higher recurring cost; (b) not environment friendly; (c) non-compatibility with range of fabrics; (d) lesser oxidative potential of single sterilants technology as compared to Ati Swachh's dual/ tri-technological combinations and; (e) standardization and development outside the country and generally imported. All these methods are highly specialized, dedicated facilities require special trainings and operational instructions to operators due to their associated hazard. Thus, the present

solution was developed with respect to advent of COVID-19 spread and as technological solution towards "self-reliant Indian mission". Also, the current demand of medical device disinfection has escalated many folds which requires quick, sterilization-in-place (SIP) approach of medical device disinfection. The practice of disinfection is already in place in hospitals for management of patients (including infected ones), they generally follow conservative and conventional methods of disinfection (autoclave) which may not be sufficient and suitable for re-utilization to many of the heat sensitive medical devices such as plastic applicators, lumens, endoscopes, brachytherapy applicators, surgical implants, hydrogel based systems etc. This technology has a promising future in dental operations. DRDO has developed and validated the process of sterilization cycle by using globally accepted biological indicator, Geobacillus stearothermophilus (thermophile with the ability to survive up to 130 degC). Similar to Ultra Swachh, there is no recurring cost other than the operational electric cost at 220V, 50Hz for the basic model; with minimum cost inclusion for advanced model.

In the end, what goes up must come down. The sudden upsurge in the use of sterilants, disinfectants and the compulsive habit of over-sanitization could cause greater problems to human immunity in the future. A study from the University of Ireland in 2010 concluded that Pseudomonas bacteria exposed to disinfectants that were either improperly mixed or excessively used, caused the bacteria to become resistant to the disinfectant, but far more alarmingly, 240 times more resistant to the antibiotics used to treat an infection of the bacteria. There is evidence that misuse of disinfectants may be contributing to bacterial antibiotic resistance. This could be aggravated when dealing with viruses and other bioagents. Thus, all sterilization techniques should be used only in extreme adverse conditions such as the current COVID-19 pandemic. We, as a humanity need enhanced cleaning (sanitization), not sterilization, to keep our immunities high.

Dr. Geetika Ahuja is a cereal carbohydrate specialist with R&D experience in genetic and biochemical alterations in cereal grain digestibility and its nutritional implications. She is an active member of scientific societies - American Association of Cereal Chemistry and K. K. Nanda Foundation for advancement of Plant Sciences. She has been awarded with several prestigious international awards and scholarships; has won accolades at Life & Health Science Conferences; and has various international publications to her credit. She has contributed as Research Associate in the Biothreat Mitigation Project at CBRN Defence, DRDO; and is currently a Senior Scientific Consultant at Gel Kraft Healthcare Pvt Ltd.

> ## The world cannot afford more lockdowns, as the countries need rotational incomes and expenditures.

PERSONA

THEME

INNOVATIONS

WELL-BEING

IN FOCUS

RESEARCH

NEWSCOPE

▶ NEWSCOPE

LATEST NEWS IN HEALTHCARE!

ASTRAZENECA SIGNS MOU WITH RSSDI FOR DIABETES AWARENESS

Biopharmaceutical company AstraZeneca India on Thursday signed a memorandum of understanding (MoU) with the Research Society for Study of Diabetes in India (RSSDI) to drive awareness on diabetes care and its associated complications through digital initiatives.

AstraZeneca unveiled a campaign 'Beyond Sugar', a three-year patient awareness program developed to benefit over 1 crore people living with diabetes across the country. This initiative will empower patients/caregivers to have conversations around diabetes and make informed decisions about the management of the disease.

"The purpose of this collaboration between AstraZeneca and RSSDI is to leverage technology to connect the doctor and the patient to provide authentic information. The partnership will go a long way in supporting patient-centric digital awareness campaigns and programs to raise awareness about diabetes and its complications so that they can act early to manage or even prevent the complications," said Dr. Anil Kukreja, Vice President – Medical Affairs & Regulatory, AstraZeneca India.

While speaking on the digital initiative, Dr Kukreja told, "Face-to-face meetings do have their unique advantages of connecting but the kind of reach which we can have through digital medium and the education you can drive through digital have their own advantages. We have seen digital initiatives getting a lot of traction."

"In the COVID era, this digitally-powered initiative will also empower patients/caregivers to have better conversations with their doctors about the disease and make informed decisions in the management of diabetes. All this will culminate towards shifting from the glucose centric management approach towards a holistic and an early Cardio-Renal focused management of type 2 diabetes," said Dr. Banshi Saboo, President- RSSDI and Organising Chairman 2020.

"We are mainly looking from the heart point of view as 2/3rd of our diabetic patients develop cardiovascular and kidney-related complications, which are very much neglected. If patients are well educated and screened early, we can prevent these complications," he concluded.

Source: www.health.economictimes.indiatimes.com

NEW TESTING METHOD CAN DIAGNOSE COVID-19 IN JUST 30 MINUTES, STUDY FINDS

Scientists have developed a new method that allows anyone to easily and quickly detect Covid-19 in just 30 minutes, and is as accurate as the current PCR diagnostic test. The SENSR technology developed by researchers at Pohang University of Science & Technology (POSTECH) in South Korea diagnosis Covid-19 based on the RNA sequence of the virus, reducing the stress on one single testing location and avoiding contact with infected patients as much as possible.

RNA is a nucleic acid that mediates genetic information or is involved in controlling the expression of genes.

The biggest benefit is that a diagnostic kit can be developed within a week even if a new infectious disease appears other than Covid-19, according to the research published in the journal Nature Biomedical Engineering.

The researchers noted that PCR molecular test currently used for Covid-19 diagnosis has very high accuracy but entails a complex preparation process to extract or refine the virus.

The test is not suitable for use in small farming or fishing villages, or airport or drive-thru screening clinics as it requires expensive equipment as well as skilled experts, they said.

The researchers designed the test kit to produce nucleic acid binding reaction to show fluorescence only when Covid-19 RNA is present.

The virus can be detected immediately without any preparation process with high sensitivity in a short time. And it is as accurate as the current PCR diagnostic method.

Using the new technology, they found the SARS-CoV-2 virus RNA, the cause of Covid-19, from an actual patient sample in about 30 minutes.

In addition, five pathogenic viruses and bacterial RNAs were detected which proved the kit's usability in detecting pathogens other than Covid-19, according to the researchers.

Another great advantage of the SENSR technology is the ease of creating the diagnostic device that can be developed into a simple portable and easy-to-use form, the researchers said.

The method not only allows onsite diagnosis before going to the screening clinic or being hospitalised, but also allows for a more proactive response to Covid-19 by supplementing the current centralized diagnostic system.

"This method is a fast and simple diagnostic technology which can accurately analyse the RNA without having to treat a patient's sample," said POSTECH Professor Jeong Wook Lee. "We can better prepare for future epidemics as we can design and produce a diagnostic kit for new infectious diseases within a week," Lee said.

Source: www.health.economictimes. indiatimes.com

PERSONA
THEME
INNOVATIONS
WELL-BEING
IN FOCUS
RESEARCH
NEWSCOPE

ICMR LAUNCHES DEDICATED VACCINE PORTAL AND NATIONAL CLINICAL REGISTRY FOR COVID-19

The India Council of Medical Research (ICMR) on Monday launched a dedicated vaccine portal and national clinical registry of COVID-19 to address queries of the people on vaccine development and unveiled the historical timeline of ICMR since its inception in 1911.

The National Clinical Registry for COVID-19 will collect systematic data on clinical signs and symptoms, laboratory investigations, management protocols, clinical course of COVID-19 disease, disease spectrum and outcomes of patients. The data will serve as an invaluable tool for formulating appropriate patient management strategies, predicting disease severity, patient outcomes etc.

While inaugurating the web portal of the apex medical research body, Union Health Minister Dr Harsh Vardhan said: "To disseminate the vaccine-related information the exclusive portal will be helpful in creating awareness among the masses. The portal provides useful and important information related to vaccine development, ongoing clinical trials and progress made in this area locally and globally at regular intervals."

"The portal on National Clinical Registry for COVID-19 developed by ICMR will be immensely useful. The registry will aim at collecting good quality real-time clinical data to inform evidence-based clinical practice, research, formulating guidelines and policymaking."

Dr Vardhan also launched the Mobile Stroke Unit. He said, "In view of the large burden of stroke and absence of stroke care facilities in Assam, this initiative will go a long way in addressing the needs of the people. The mobile unit, through teleconsultation ensures timely and appropriate treatment to people."

"The vaccine portal consists of all the information regarding the Indian efforts towards vaccine development against various diseases including the most recent COVID-19. Interested people can visit the website on https://vaccine.icmr.org.in to get the latest information on vaccine development," said Dr Lokesh Sharma, scientist at ICMR.

On India's fight against COVID-19, Vardhan said, "India's continuously rising Recovery Rate and progressively falling Case Fatality Rate have proven the success of the Covid-19 containment strategy followed by all States and UTs. From having one lab to over 1,800 labs today, we have come a long way in strengthening our capabilities. We have successfully ramped up our testing capacity which has touched 15 lakh daily tests."

So far, total Covid-19 in India has crossed the 60 lakh mark with 95,542 fatalities.

Source: www.health.economictimes.indiatimes.com

QUEBEC CREATES REGISTRY TO OVERSEE HEALTH-CARE STAFF MOBILITY, LIMIT COVID-19 TRANSMISSION

In order to ensure the stability of the province's health network and limit the transmission of the novel coronavirus, the Quebec government announced Tuesday the implementation of an "exception registry" for staff mobility.

Health Minister Christian Dubé said that the goal is to quantify and monitor the movements of health-care workers having close contact with patients.

The registry is expected to provide an overview of the stabilization of the health network's workforce in living environments such as long-term care homes. It is specifically expected to keep track of staff movement between facilities where there are hot and cold COVID-19 zones.

Dubé said the registry will ensure a manager will have responsibility over staff mobility and to ensure that all other solutions have been considered and that infection prevention and control standards are met.

Dubé believes that thanks to the data collected by the management of schedules, it will be possible to oversee the health-care network and to ensure a stable workforce amid the pandemic.

The establishment of the registry is currently underway in public and private long-term care homes. It is set to be completed next month.

In Quebec, when a health-care employee has to move from a cold zone to a hot one, the authorization of the person in charge of infection prevention and control is necessary. For a reverse movement, from a hot zone to a cold zone, the authorization of the president and CEO of the establishment is required.

Source: www.globalnews.ca

PERSONA
THEME
INNOVATIONS
WELL-BEING
IN FOCUS
RESEARCH
NEWSCOPE

WHEN AND HOW WILL COVID-19 VACCINES BECOME AVAILABLE?

If regulators approve any of the vaccines in coming weeks, the companies have said distribution could begin almost immediately with governments around the world to decide who gets them and in what order. The following is an outline of the process.

Pfizer Inc with partner BioNTech SE and Moderna Inc have released trial data showing their COVID-19 vaccines to be about 95% effective at preventing the illness, while AstraZeneca Plc this week said its vaccine could be up to 90% effective.

If regulators approve any of the vaccines in coming weeks, the companies have said distribution could begin almost immediately with governments around the world to decide who gets them and in what order. The following is an outline of the process:

When will companies roll out a vaccine?

Pfizer, Moderna and AstraZeneca have already started manufacturing their vaccines. This year, Pfizer said it will have enough to inoculate 25 million people, Moderna will have enough for 10 million people and AstraZeneca will have enough for more than 100 million people.

The US Department of Defense and the Centers for Disease Control and Prevention (CDC) will manage distribution in the United States, likely starting in mid-December with an initial release of 6.4 million doses nationwide.

UK health authorities plan to roll out an approved vaccine as quickly as possible, also expected in December.

In the European Union, it is up to each country in the 27-member bloc to start distributing vaccines to their populations.

Who would get an approved vaccine and when in the US?

Upon authorization from the US Food and Drug Administration, the CDC has said first in line for vaccinations would be about 21 million healthcare workers and 3 million residents in long-term care facilities.

Essential workers, a group of 87 million people who do crucial work in jobs that cannot be done from home, are the likely next group. This includes firefighters, police, school employees, transportation workers, food and agriculture workers and food service employees.

Around 100 million adults with high-risk medical conditions and 53 million adults over the age of 65, also considered at higher risk of severe disease, are the next priority.

US public health officials said vaccines will be generally available to most Americans in pharmacies, clinics and doctors offices starting in April so that anyone who wants a shot can have one by the end of June.

It is unclear when a vaccine will be available for children. Pfizer and BioNTech have started testing their vaccine in volunteers as young as 12.

When will a vaccine be available in other countries?

The European Union, the United Kingdom, Japan, Canada and Australia are all running rapid vaccine regulatory processes.

Many of AstraZeneca's doses this year are expected to go to the United Kingdom, where health officials have said that if approved they could begin vaccinating people in December. At the top of their list is people living and working in care homes.

In Europe, the EU drugs regulator has said it could rule on the safety of a COVID-19 vaccine in December.

Most countries have said the first vaccines will go to the elderly and vulnerable and frontline workers like doctors.

Countries say they are buying vaccines via the European Commission's joint procurement scheme, which has deals for six different vaccines and nearly 2 billion doses.

Delivery timelines vary and most countries are still drawing up plans for distributing and administering shots.

Italy expects to receive the first deliveries of the Pfizer-BioNTech shot and AstraZeneca's shot early next year. Spain plans to give vaccines in January.

In Bulgaria, the country's chief health inspector expects the first shipments in March-April. Hungary's foreign minister said doses will land in the spring at the earliest.

Germany, home to BioNTech, expects to roll out shots in early 2021 with mass vaccination centers in exhibition halls, airport terminals and concert venues. It will also use mobile teams for care homes. Front-line healthcare workers and people at risk for serious COVID-19 are expected to get inoculated first.

When will developing countries have access to vaccines?

COVAX, a program led by the World Health Organization and the GAVI vaccine group to pool funds from wealthier countries and nonprofits to buy and distribute vaccines to dozens of poorer countries, has raised $2 billion.

Its first goal is to vaccinate 3% of the people in these countries with a final goal of reaching 20%. It has signed a provisional agreement to buy AstraZeneca's vaccine, which does not require storage in specialized ultra cold equipment like the Pfizer vaccine.

It is expected but not certain that less wealthy countries in Africa and South East Asia, such as India, will receive vaccines at low or no cost under this program in 2021. Other countries such as those in Latin America may buy vaccines through COVAX. Several are also striking supply deals with drugmakers.

How much will it cost?

Vaccine makers and governments have negotiated varying prices, not all of which are public. Governments have paid from a few dollars per AstraZeneca shot to up to $50 for the two-dose Pfizer regimen. Many countries have said they will cover the cost of inoculating their residents.

Source: www.in.reuters.com

COVID-19: ONE CRORE FRONTLINE HEALTHCARE WORKERS IDENTIFIED TO RECEIVE VACCINE IN FIRST PHASE

An estimated one crore frontline health workers will receive the first dose of Covid-19 vaccine whenever it becomes available, with around 92 percent of government hospitals and 55 percent of private hospitals across all states and UTs providing data identifying the workers, official sources said.

Five vaccine candidates are in advanced stages of development in India, out of which four are in Phase II/III and one is in Phase-I/II trials.

States have been asked to accelerate the process of identifying frontline healthcare workers including doctors, MBBS students, nurses and ASHA workers etc, so that the exercise gets completed in another one week.

It has asked states to do planning and mapping of vaccination sessions where healthcare workers will be vaccinated during the 1st phase and mapping human resources across departments that could be deployed for vaccination sessions for verification of beneficiaries, crowd management and overall coordination.

Prime Minister Narendra Modi will meet with chief ministers and other representatives of states and union territories via video conferencing on Tuesday to discuss the vaccine distribution strategy, sources said.
"Around 92 per cent of all government hospitals and 55 per cent of all private hospitals from across all states and UTs

have provided data. The rest of the details will come in another one week. We have asked the states to accelerate the process," an official source said.

The anti-coronavirus vaccine, once available, would be distributed under a special Covid -19 inoculation programme, using the processes, technology and network of the existing Universal Immunisation Programme (UIP). It would run parallel to the UIP.

The centre, with the help of state and UT governments, has started the process of identifying around 30 crore priority beneficiaries who would be given vaccine dose in the initial phase, sources had said. The government has demarcated four categories which includes around 1 crore healthcare professionals including doctors, MBBS students, nurses and ASHA workers etc, around two crore frontline workers including municipal corporation workers, personnel of the police and armed forces, about 26 crore people aged above 50 and a special category of those below 50 with co-morbidities and requiring specialised care. Health ministry's existing digital platform eVIN which is being used for the UIP is being enhanced for the Covid -18 vaccine distribution and delivery, through which SMSs would be sent to recipients informing the time, date and venue to get the shots and digitally connect them and also track them, sources had earlier said.

Each person in the immunisation list would be linked with their Aadhar cards to avoid

duplication and to track beneficiaries. However, in case a person doesn't have an Aadhar card, a government photo identity can be used, the sources said.

Five vaccines are under different phases of clinical trial in India with the Serum Institute of India conducting phase-3 trial of the Oxford-Astrazeneca Covid -19 vaccine while the indigenously developed Bharat Biotech and ICMR vaccine has already started the phase III clinical trial. Dr Reddy's Laboratories will soon start combined phase 2 and 3 clinical trials of the Russian Covid -19 vaccine Sputnik V in India.Biological E. Ltd has started early phase 1 and 2 human trials of its Covid -19 vaccine candidate.

Union Health Minister Harsh Vardhan had said that a Covid -19 vaccine is likely to be available by the first quarter of 2021.

He had said that the Centre estimates to receive and utilise 40-50 crore doses of Covid -19 vaccine covering around 25 crore people by July next year.

"The prioritisation of groups for Covid -19 vaccine shall be based on two key considerations -- occupational hazard and risk of exposure to infection, and the risk of developing severe disease and increased mortality," he had said.

Source: www.timesofindia.indiatimes. com

INDIAN-AMERICAN SCIENTISTS IDENTIFY POSSIBLE COVID-19 TREATMENT

A team of Indian-origin immunologists in the US has discovered a potential strategy to prevent life-threatening inflammation, lung damage and organ failure in patients with COVID-19.

The scientists led by Thirumala-Devi Kanneganti, vice chair of Immunology at St. Jude Children's Research Hospital in Memphis, Tennessee, identified the drugs after discovering that the hyperinflammatory immune response associated with Covid-19 leads to tissue damage and multi-organ failure in mice by triggering inflammatory cell death pathways.

The researchers detailed in a paper published in the journal "Cell" how the inflammatory cell death signalling pathway worked, which led to potential therapies to disrupt the process.

"Understanding the pathways and mechanism driving this inflammation is critical to develop effective treatment strategies," said Kanneganti who was born in Telangana and earned her undergraduate degree at Kakatiya University in Warangal.

"This research provides that understanding. We also identified the specific cytokines that activate inflammatory cell death pathways and have considerable potential for treatment of Covid-19 and other highly fatal diseases, including sepsis," she informed.

She worked with Bhesh Raj Sharma, Rajendra Karki and others at her lab for the research that helps increase understanding of the pathways and mechanism that drives Covid-19 inflammation so researchers can develop effective treatment strategies.

The infection is marked by increased blood levels of multiple cytokines. These small proteins are secreted primarily by immune cells to ensure a rapid response to restrict the virus. Some cytokines also trigger inflammation.

Kanneganti's team focused on a select set of the most elevated cytokines in Covid-19 patients.

The scientists showed that no single cytokine induced cell death in innate immune cells.

The St. Jude investigators then tried 28 cytokine combinations and found just one duo that, working together, induced a form of inflammatory cell death previously described by Kanneganti as PANoptosis.

The investigators showed that blocking individual cell death pathways was ineffective in stopping cell death caused by TNF-alpha and IFN-gamma.

Because TNF-alpha and IFN-gamma are produced during Covid-19 and cause inflammatory cell death, the investigators questioned whether these cytokines were responsible for the clinical manifestations and deadly effects of the disease.

They found that the TNF-alpha and IFN-gamma combination triggered tissue damage and inflammation that mirror the symptoms of Covid-19 along with rapid death.

Neutralising antibodies against TNF-alpha and IFN-gamma are currently used to treat inflammatory diseases in the clinic.

"The findings link inflammatory cell death induced by TNF-alpha and IFN-gamma to Covid-19," said Kanneganti who received her M.Sc. and Ph.D. from Osmania University in India.

"The results also suggest that therapies that target this cytokine combination are candidates for rapid clinical trials for treatment of not only Covid-19, but several other often fatal disorders associated with cytokine storm."

Co-first author Karki added: "We were excited to connect these dots to understand how TNF-alpha and IFN-gamma trigger PANoptosis."

"Indeed, understanding how PANoptosis contributes to disease and mortality is critical for identifying therapies," Sharma said.

Source: www.health.economictimes. indiatimes.com

WHO SAYS $4.3 BILLION URGENTLY NEEDED FOR VACCINE SHARING SCHEME

WHO chief fears the underprivileged might not be able to access the coronavirus vaccines in an equitable manner

There is a risk that the poor and vulnerable will be trampled on in the stampede for coronavirus vaccines, the head of the World Health Organization said on Monday, adding that $4.3 billion was needed urgently for a world vaccine-sharing scheme.

WHO director-general Tedros Adhanom Ghebreyesus was speaking at a virtual briefing in Geneva.

Dozens of countries have signed up to the global vaccine plan known as COVAX, which was set up by the WHO and the GAVI vaccine group to provide vaccine doses for countries that could not otherwise afford them.

It has so far raised $5 billion, including more than 500 million euros ($600 million) from Germany.

G20 nations must help plug a $4.5 billion funding gap for a WHO-led program to distribute coronavirus vaccines and pave the way for an end to the pandemic, a letter seen by AFP on Friday said.

The letter, sent ahead of this weekend's virtual G20 summit, was signed by Norwegian Prime Minister Erna Solberg, South African President Cyril Ramaphosa, World Health Organization (WHO) chief Tedros Adhanom Ghebreyesus and Ursula von der Leyen, president of the European Commission.

"A commitment by G20 leaders at the G20 Summit in Riyadh to invest substantially in the ACT-Accelerator's immediate funding gap of $4.5 billion will immediately save lives, lay the groundwork for mass procurement and delivery of COVID-19 tools around the world, and provide an exit strategy out of this global economic and human crisis," the letter dated November 16 said.

"With this funding, and a joint commitment to spend a proportion of future stimulus on the COVID-19 tools needed globally, the G20 will build a foundation to end the pandemic," added the letter addressed to King Salman of Saudi Arabia, the current G20 president.

Source: www.livemint.com

Compiled by:
Parthvee Jain, Editor, InnoHEALTH Magazine

Researchers find way to cheaper solar energy

- **Dr. Aravind Kumar Chandiran & Team**

The world will need significantly increased clean energy supply in the future. Solar energy is a viable solution but there are certain limitations. Solar energy conversion to electricity and its storage at a low cost is an integral part of renewable energy research. Indian Institute of Technology Madras (IIT Madras) researchers have discovered a new material to effectively split water into Hydrogen and Oxygen using solar power. This research is expected to create a renewed interest in Solar fuels' domain, for its scope of conversion and storage in a single system. The method can significantly reduce the cost per kilowatthour (kWh) of solar energy.

Touching upon the applied aspects of the research, Dr. Aravind Kumar Chandiran, Assistant Professor, Department of Chemical Engineering, IIT Madras said, "Storing solar energy in batteries is an expensive business for large scale implementation. A single photoelectrochemical (PEC) system that can harness and store solar energy in the form of chemical fuels can potentially reduce the cost per kWh of energy. Ideally, seawater splitting using PEC to generate clean hydrogen should be a serious research, if India should remain committed to green energy and avoid potential consequences of continued carbon emission. In our recent work, we attempted to make a first successful demonstration of water splitting using the best photovoltaic material."

In 2009, research community employed a new class of semiconducting materials, called 'halide perovskites' with formula $CH_3NH_3PbI_3$, for solution processible solar cells. In less than a decade the efficiency of these devices improved from 3% to over 25%. For comparison, the conventional silicon based solar cells took nearly three decades to reach 25%,

One of the laboratory equipment used by Solar Energy Research Group

since the establishment of certification standards by National Renewable Energy Laboratory.

This fast growth of the perovskite based solar cells, however, is significantly limited for commercial scale-up due to the presence of the toxic lead and instability of these devices in ambient conditions. The entire device fabrication has to be carried out in the inert atmosphere, literally under zero oxygen and water to avoid degradation, and they have to be encapsulated to avoid ambient exposure. To take this technology up for commercialization, efforts from research groups across the world have been focused on non-lead and ambient stable halide perovskite absorbers. Several hundreds of research papers have been published on improving the robustness of this material in oxygen and humid conditions, by selectively tuning the constituent atoms. However, only a partial ambient stability is achieved and these state-of-the-art materials still decompose instantly when they come in contact with water.

Another team member of the research group Muhammed Hamdan, while investigating materials for solar cells, discovered a 'halide perovskite' (Cs2PtI6),

which completely absorbs the entire visible light and remains extremely stable in ambient. This material is also found to be stable in strong acids and bases.

Mr. Hamdan combined solar energy conversion and storage in the form of chemical fuels by utilizing this material's record stability. Using sunlight, and with a photoelectrochemical device made with Cs2PtI6, the team was able to successfully split water into hydrogen and oxygen.

The generation of solar fuels is not only restricted to water splitting to generate hydrogen fuel, but the perovskite semiconductors can also be used in carbon dioxide conversion to get useful hydrocarbon fuels. In the long run, the design principles of this material, platinum in Cs2PtI6, can be replaced with other low-cost transition elements to reduce the costs further.

Dr.Chandiran observed, "To date, in the world of halide perovskites, this is the only material that shows such an extraordinary stability in a harsh environment."

Credits: India Science Wire

Year 2020 for InnovatioCuris

It's been an unpredictable journey since the start of March 2020. The stock market has been facing the consequences with a probable recession in vicinity as the world is facing its first major pandemic. Nevertheless, many philosophers and deep thinkers have observed that every crisis cloud has a silver lining.

As we face a pandemic of unprecedented scale due to the COVID-19 (Coronavirus), our day-to-day lives are being affected in a radical way.

"The Chinese used two brush strokes to write the word 'crisis.' One brush stroke stands for danger and the other for opportunity.
'In a crisis, be aware of the danger, but recognize the opportunity' as quoted by John F. Kennedy.
True to the above notion, crisis indeed leads to opportunities and innovations. It is evident that due to the disruptive world events, the coordination in work is severely impaired.

We at InnovatioCuris (IC) are trying to empower businesses by aiding seamless interaction through a set of tools to coordinate, organize, and conduct workforce, activities, and events.
With our efforts we are paving the path to rise together and reform ourselves in this dwindling situation.

At IC, we engaged ourselves with varied new things during the lockdown and hence we improvised our expertise in conducting virtual events seamlessly. Below are some of the events that we conducted where experts, innovators, stakeholders came under one platform to search for innovative ways to control the pandemic.

Fight Corona IDEAthon

When the world was facing the pandemic and lockdown, Estonia started with a 48 hr online hackathon on 15 March to respond to COVID-19, then a few days later

Germany and Finland followed. 42000+ people participated in the German edition ending up crashing the Slack! (software used for the conducting the hackathon).

We also responded to the crisis in a meaningful way by conducting an online hackathon in India, called IDEAthon! The event started at 6:00 P.M. on March 26, 2020 and concluded on March 29, 6:00 P.M. (The original plan was 48 hours but it stretched for 72 hrs because of the overwhelming response).

The three themes of proposals which were solicited are based on:

Saving Lives, Saving Communities and Saving Businesses.

We started with the Ministry of Human Resources, Innovation Cell run under AICTE. Every year they organised the world's largest hackathon. Along with them, we partnered with an incubator based out of Coimbatore, called FORGE. Then we onboarded various national and international agencies like iHub Gujarat, UN Technology Lab to World Startup in Netherlands.

The stipulated time we had (four days to be precise) to do outreach, we had 5400+ teams and 350+ mentors applying for the IDEAthon.
Through a rigorous process, we could shortlist the top 20 out of the 5000+ applications. Seven entries in the student track, six entries in the educator track and seven in the startup track, each faced an international jury. Eighteen out of the twenty received a cash prize and were further eligible for various government grants for their solutions.

For further details, read:
https://innovatiocuris.com/wp-content/uploads/2020/05/IDEAthon-Casestudy-InnovatioCuris.pdf

MHRD - AICTE Mega online challenge "SAMADHAN"

Taking inspiration from the Fight Corona IDEAthon conducted in March 2020, a Mega Online Challenge "SAMADHAN" was launched by MHRD Innovation Cell and AICTE in collaboration with InnovatioCuris and Forge to test the ability of students, educators & individuals/startups to innovate for solutions to fight COVID-19 pandemic. The challenge

commenced on April 8 and ended on April 26, 2020.

The challenge was segmented into 2 tracks:
Track1: Ideate,Simulate,Win
Track2: Validate, Pitch, Deploy

The purpose of this challenge was to Save Lives, Save Communities and Save Businesses. The challenge consisted of design, simulation and development of measures that can be made available to the government agencies, health services, hospitals and other services for immediate solutions pertaining to the pandemic and other such calamities.

Out of more than 3500+ ideas, nine ideas were awarded cash prizes and are now being considered for various government grants and incubation opportunities to further accelerate the solutions.

For further details, read:
http://innovatiocuris.com/wp-content/uploads/2020/05/SAMADHAN-case-study-Final.pdf

Icare webinar series

According to WHO's report 2012, globally, 35.4% of people who are suffering from diabetes mellitus have diabetic retinopathy and 11.7% had sight-threatening disease. In 2017, 73% of the 451 million people with diabetes worldwide (16.2%) lives in India.

Studies carried out in the country over the last decade reported that diabetic retinopathy prevalence were approximately 9.6% in rural areas and 18.0% (255/1414) in urban areas; the rates of sight-threatening retinopathy in the two areas were 3.8% (45/1190) and 6.6% (39/592), respectively.

Risk factors for diabetic retinopathy include longer duration of diabetes, poor diabetes control and hypertension. Evidence from high-income countries indicates that the risk of visual loss from diabetic retinopathy can be reduced by strategies such as better control of blood glucose, hypertension and regular screening to detect individuals with sight-threatening diabetic retinopathy, followed by confirmatory diagnosis and

appropriate management.

IC has always spread awareness and forged ahead to bring valuable innovations into the Indian healthcare ecosystem, we helped a Finnish organisation icare, by conducting a series of webinars to spread awareness on the topics of diabetic retinopathy, which also resulted in sales enquiries for icare, Finland.

Feedback of the study showed that 91% of participants were satisfied with the webinar content. We received overwhelming response from participants wherein they mentioned they had an enriching experience and increased knowledge on diabetes retinopathy.

To view the webinar, visit:
https://youtu.be/D5DG_la01eI & https://youtu.be/_rRpZL3okKg

Smart India Hackathon (SIH)

Considering the COVID-19 pandemic, the Smart India Hackathon 2020 was organized virtually for the first time in the history of SIH building on the expertise of InnovatioCuris, as IC had already conducted two large hackathons, Ideathon and Samadhan for COVID-19 solutions and had a deep understanding of the processes involved in a virtual event.

Under the guidance of Dr Mohit Gambhir, MHRD innovation cell, three different sets of teams remotely collaborated for the organization of SIH 2020 i.e. MHRD Innovation Cell team, i4C team and IC team. The IC team provided the technical expertise and the other two teams provided the managerial and domain expertise, this joint team was 'the organizing team'.

SIH 2020 connected all the participants throughout the nation together over a specially-built advanced SIH platform. Nearly 10,000 members including the delegates, juries, students, nodal center committee and organizers were associated with SIH 2020 including 1080 teams and 705 mentors (6 participants per team, about 6480 participants) who competed

for 36 hours across 40 different centers in India.

70 organizations participated in the Hackathon this year as Problem Statement Owners. Central ministries/ Departments such as Indian Space Research Organisation, Bureau of Police Research & Development, Ministry of Railways, Ministry of Women and Child Development etc., along with State Ministries/Departments, such as Government of Sikkim, Government of Goa, Government of Bihar etc., and other private industries, such as the Amazon Web services, Yamaha motor Services etc. were the partners in the SIH 2020.

Total of 243 problem statements, based on 11 themes were worked upon during this edition of SIH.

For further details, read: https://innovatiocuris.com/ wp-content/uploads/2020/09/ SmartIndiaHackathon2020_case_study. pdf

Application of Artificial Intelligence in Healthcare (CCAAIH)

Artificial Intelligence (AI) in healthcare is being employed in a myriad of settings including hospitals, clinical laboratories, and research facilities. Its approach towards employing technologies and machines to sense and comprehend data like humans has opened up previously unavailable or unrecognised opportunities for clinical practitioners and health service organisations. AI in medicine and healthcare refers to the use of technology / automated processes in the diagnosis and treatment of patients/ communities who require care. Whilst diagnosis and treatment may seem like simple steps, there are many other background processes that must be followed in step wise manner for quality patient care like: gathering of data through patient interviews and tests; processing and analysing results; using multiple sources of data to come to an accurate diagnosis; determining an appropriate treatment method; preparing and administering the chosen treatment method; patient monitoring and aftercare/ follow-up appointments and other healthcare settings etc.

Cognizant of the importance of Artificial Intelligence in healthcare sector, Public Health Foundation of India (PHFI) collaborated with InnovatioCuris (IC) for jointly developing a Certificate Course in Application of Artificial Intelligence in Healthcare (CCAAIH) with an objective to understand the basic concepts, applications, challenges and opportunities of AI in healthcare.

The course received an overwhelming response and hence it was decided that there will be a second batch for the same as well. A total of fifty participants in each batch from all across the country underwent the training.

Feedback and evaluation are an integrated quality assurance tool to assess the impact and effectiveness of the course. A concurrent session feedback and evaluation were done on all the five days. The pre-test and post-test questionnaire were administered at the beginning and at the end of each module on all the five days and an exit exam of 20 marks with objective questions was conducted after the last session. The exit exam result had an average score of 73% which is well above the passing score (50% of total).

Feedback study shows that 90% of participants were satisfied with the course content. We received overwhelming testimonials from participants wherein they mentioned that they would recommend the course to their organizations.

For further details, visit:
https://drive.google.com/file/d/1kAo6BYZ_ XW3Wi1dfhO53a9p8Amvq8V_L/view

Cyber Security Training for Doctors with PHFI

The healthcare industry is frequently struggling with data breaches and other cybersecurity incidents. That's likely because cybercriminals know the value of medical data. The new wave of digitizing medical records has seen a paradigm shift in the healthcare industry. With increasing digitization in the healthcare industry, we have become more vulnerable to data and identity thefts. In these difficult times, attacks from malicious actors may even rise, which means healthcare cybersecurity must remain a priority in 2020.

Cognizant of the importance of cyber security in healthcare sector, Public Health Foundation of India (PHFI) collaborated with InnovatioCuris (IC) for developing a Certificate Course in Cybersecurity in healthcare (CCCH) with an objective to provide an understanding of healthcare with cyber security aspects and to help participants start security initiatives in their healthcare facility.

A total of forty-two participants from all across the country underwent the training from July 4-7, 2020. For this training, twenty-three participants from six state governments, two PSUs, three government bodies and one private diabetes association received nomination from Lions Club of India through Lions Coordination Committee of India Association (LCCIA) and nineteen participants were enrolled through self-nomination.

Feedback and evaluation are an integrated quality assurance tool to assess the impact and effectiveness of course. A concurrent session feedback and evaluation was done on all 4 days. The questionnaire was administered at the end of each module on all the 4 days along with an end session quiz and an exit exam of 40 marks with objective questions was conducted after the last session. The exit exam result had an average of 79% which is well above the passing score (50% of total); indicating a 100% pass percentage.

Feedback study showed that 97% of participants were satisfied with the course content and provided the speaker rating of 8 on a 10 point scale. We received overwhelming testimonials from participants wherein they mentioned that they would recommend the course to their organizations.

For further details, visit:
https://innohealthmagazine.com/2020/ cybersecurity/report-on-first-certificate-course-in-cyber-security-in-healthcare-ccch

B2B Tool

When we think about an event, be it virtual or physical, the most important value addition that we take away back with us is the connections/ friends we

make, people we meet.

We at InnovatioCuris(IC) built a tool which can assist you in aligning and conducting your B2B meetings seamlessly to give the best and most out of your time and event.

B2meets.com is an event correspondent B2B matchmaking tool to meet peers and prospective business opportunities seamlessly and securely. The tool has been an integral part of three European projects from the time of its inception.

Some of the highlighting features of the tool being:

For organisers
- Host your own B2B meetings
- Schedule custom time slots
- Assign participant categories and subcategories for exhaustive and filtered matchmaking

For participants
- Share your pitch on your profile
- Access your schedule through an interactive calendar
- Search participants from varied categories for domain specific connections
- Share contact and connection details privately

A demo video is available on this link: https://youtu.be/jV5L5kjcqfg

2nd TCGA (Virtual) Conference

The 1st TCGA (The Cancer Genome Atlas)-themed conference was organised in Pune in September 2019. Over 350 delegates consisting of onco-clinicians, basic researchers, bioinformaticians, geneticists, translational researchers, big-data scientists, bioethicists and regulatory experts attended the event.

As a result of the COVID-19 pandemic, even though initially planned, it was not possible to organize a 2nd TCGA-themed conference in Pune in 2020. However, considering the strong interest and several requests from participants and stakeholders alike, the 2nd TCGA themed workshop and conference was organised virtually from December 3-5, 2020.

The conference was co-organised by Centre for Translational Cancer Research (Pune), Persistent Systems Ltd., and TCGA, NCI, NIH, USA where IC was the technology partner for end-to-end technical support. The event saw more than 1500 delegate registrations with countries (and 476 cities). The conference was inaugurated by Honourable Dr. Harsh Vardhan, the current Union Minister of Science and Technology, Government of India.
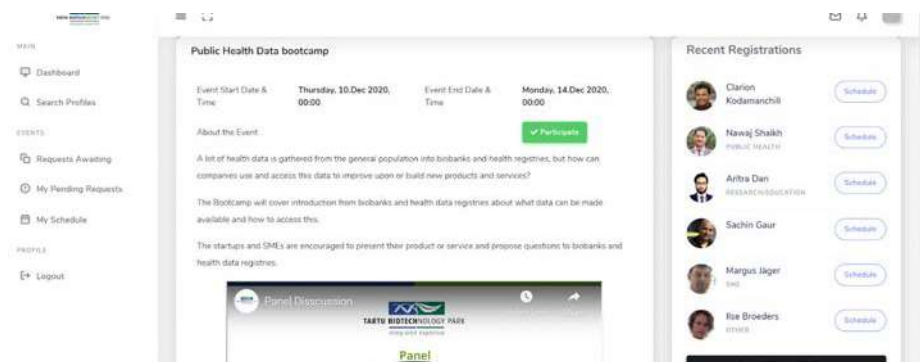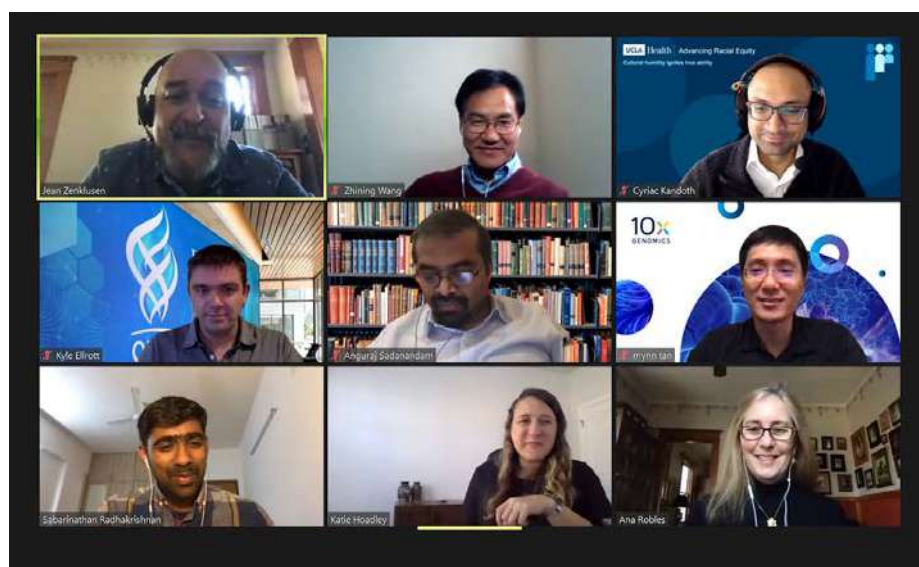
For further details, read: 2nd TCGA (virtual) conference case study

With this, we bid adieu to the most surprising year (2020). As Boris Yeltsin once rightly said, it sure has been hard for everyone, but we cannot give in to the situation... we'll have to draw lessons and explore opportunities from the current crisis and from now on, we'll have to work on overcoming it. Keeping our heads down and working hard, we as IC are super charged and motivated to seek new opportunities, friendships and collaborations for the year 2021 and ahead.

We would be happy to hear from you your thoughts, feedback and ideas for collaboration, because we believe in Ideate, Innovate and Capacitate.

Share your feedback and suggestions with us by writing at info@innovatiocuris.com or call on 0120 427 4630.

Compiled by:
Parthvee Jain, Editor, InnoHEALTH Magazine

IC InnovatorCLUB

A not-for-profit initiative

About

The IC InnovatorCLUB is created for innovators and its mission is to support the growth of its members in their roles as a innovators, mainly through education, local and global networking, and strategic alliances and partnerships.

Membership details

The membership for the IC InnovatorCLUB is open for individuals, organisations and institutions in both **physical** and **virtual formats**. Enthusiasts can fill the form available at **www.bit.ly/ic-club-membership**

Benefits

To encourage the knowledge dissemination within the healthcare community, we are providing the following benefits to the members of the club.

- *Free access to theme based bimonthly club meetings*

- *Upto 50% discount on conference/ master class tickets prices*

- *Complimentary InnoHEALTH magazine digital format yearly subscription*

- *Free access to embassy meeting and foreign delegation visits*

- *Exclusive perks with respect to B2B and B2G meetings*

Associated institutional members

Apollo HOSPITALS   MAX HEALTHCARE   ARTEMIS HOSPITALS   MAHAJAN IMAGING From X-rays to Molecular Imaging   YASHODA Super Speciality Hospitals

Dr Lal PathLabs   onquest laboratories   WISH Transforming Healthcare Through Innovation   IIHMR DELHI INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH   phfi PUBLIC HEALTH FOUNDATION OF INDIA   Akhil Systems Pvt. Ltd.

✉ +91 9711 777 328   📞 club@innovatiocuris.com   🌐 www.icfhe.in/ic-innovatorclub

InnovatioCuris

Finding methods, tools and techniques to deliver qualitative healthcare at optimum cost at all levels

Our activities include

InnoHEALTH Quarterly magazine

innohealthmagazine.com

Market access

innovatiocuris.com/market-access

Training & Consulting

innovatiocuris.com/training-and-consulting

VIRTUAL EVENT as a SERVICE

innovatiocuris.com/veaas

InnovatioCuris Foundation of Healthcare & Excellence (not-for-profit)

Our activities include

InnoHEALTH Annual international healthcare conference
innohealth.in

IC InnovatorCLUB Fostering innovations
icfhe.in/icinnovatorclub

Webinars
icfhe.in/webinars

InnoBRIDGE
icfhe.in/innobridge

Experiments with sugar
experimentswithsugar.in

🌐 www.innovatiocuris.com   ✉ info@innovatiocuris.com   📞 (+91) 120-427-4630

Connect with us

▶ /innovatiocuristeam   f /innovatiocuris   🐦 /innovatiocuris   📷 /innovatiocuris   in /in/innovatiocuris-team