

# InnoHEALTH

India's First Magazine of Healthcare Innovations

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**COVID-19 Caregivers  
Burnout and  
Compassion fatigue**

**Recent pandemic  
situation  
and its effects**

**COVID-19 and  
Virtual existence**

**Epilepsy is a curse  
Myth or Reality**



# Readers Feedback

## A Brief Review on InnoHEALTH

Most liked article of the last Issue....

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### GUEST COLUMN

## Shakespeare, COVID, and the Plague

Written by Dr. Deepak Chopra

Social isolation goes as far as to quarantine our lives in a new light, suddenly, faced with economic collapse, empty streets, current panic and future uncertainty and death appearing out of nowhere—in other words, the conditions that confronted every person on a daily basis during the lifetime of Shakespeare. What, look, how horrible abnormal in us as we routinely normal for that ordinary number of the human race in the 16th century.

In statistical terms, Shakespeare is just another survivor. Unlike his son, Hamlet, who died at 11, Shakespeare didn't die as a child, nor did his mother die giving birth to him. He also escaped the plague. Ever since the Black Death swept across the globe in the 14th century, bubonic plague remained a threat, killing on average one to three people in every house where it struck. In Shakespeare's lifetime, there were four plague years, 1562, 1563, 1567, and 1593, when London, including its houses, shut down because of the disease. Sybillic had arrived in Europe from the New World in 1492, first appearing in a French port, outside Naples, and it quickly infected every level of society, but Shakespeare didn't die of it, either, or of smallpox. It wasn't considered in the street when though there was no London police force. He couldn't have been executed as a witch, not being a woman, although the practice was not only current but growing. Finally, unlike his father, John Shakespeare, with his and reputation weren't ruined overnight due to charges brought against him by Queen Elizabeth's huge network of internal spies.

As a survivor, Shakespeare stands out because of his genius, but the horrible

conditions surrounding him paralleled more or less unchanged until the middle of the 16th century. The causes of plague, syphilis, and death in children started to emerge, and more medicine but equally life-saving advances occurred in public health, like the first sewer system in America, which was built in Chicago in the late 18th.

If bacteria were simply higher primates with very big brains, survival would be the beginning and end of our story. The Darwinian model for survival requires only getting enough food and finding a willing mate so that you don't starve before you're able to pass on your genes to the next generation. Nothing much mattered after that momentous event.

Evolutionists point to seeing those species through the lens of basic survival, but we do all kinds of things to deliberately impair our survival, from taking care of our wounds and sick instead of abandoning them, to stockpiling medicine, working, just to make sure that our life can be saved if we feel like it. War, crime, and violence do nothing to improve human genes and in fact work against simple survival.

Had it just got Shakespeare and the plague together, creating epidemic outbreaks. Despite every form of disease and death, crime, poverty, political oppression, and religious persecution like Puritans in Shakespeare's day rained against the London theater as sinfully, but luckily they didn't shut them down until 1642, 26 years after his death), not to mention widespread literacy, no public sanitation, and the police force. These horrendous circumstances didn't wipe out creativity, discovery, love, compassion, and a vision

of a higher ideal.

These options is the only species that liberated itself from natural evolution, and this unprecedented achievement involved one thing only, going beyond. Not our higher brain but human nature overrode the independent of physical circumstances. Miraculously, if you peer at the oldest cave paintings in Europe, such as those in Chauvet-Pont d'Aud, France, you don't see pictures anything from 30,000 years ago.

The secret: The animals depicted are done with confidence, artistic flair that we also scientifically admire, depicting a wide range of identifiable emotions precisely enough that they can be identified by species. No one knows why sophisticated cave paintings suddenly appeared. The Chauvet depictions do sleep in the darkest lair of the cavern. No sunlight penetrated, so the painters worked by the guttering light of torches. In addition, since the animals were not right before them, they worked from memory of how each one looked.

This act of going beyond acceptance is a trait that belongs to the human condition, the trait of creativity for its own sake. In fact, even though the modern world owns everything to discoveries that improved life, the rise of technology and all the practical benefits it has brought, going beyond has always happened "in here" before anything could happen "out there." Before the first primitive fire blades could be hacked out, the concept of "tool" and "weapon" had to come first. And before a concept can be born, there has to be a mind capable of concepts.

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My point is that you and I, like our ancestors, are the product not of genetic evolution but the evolution of consciousness. We were liberated from the Darwinian scheme by self-awareness. In other words, we said to ourselves, "I just thought of what I'd like to do" and with the combination of awareness, vision, and desire, we stepped into the human condition. The Greek word for beyond is *trans*, and we should apply it to ourselves more often. To be human is an expression of the miraculous. Shakespeare was a multi-genius, but everyday people are just as much in their own way. Parents sacrifice

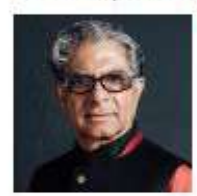
for their children, even die for them, because they go beyond their own selfish needs. Any creative hobby is extra, because it has nothing to do with surviving.

The higher your vision, the more risks you see. Buddha was extraordinarily risk, but his followers, using the words of his vision, had to be made or Buddha would have preached to the wilderness. Likewise, without institutions among Jewish disciples, Christianity would have perished on the cross.

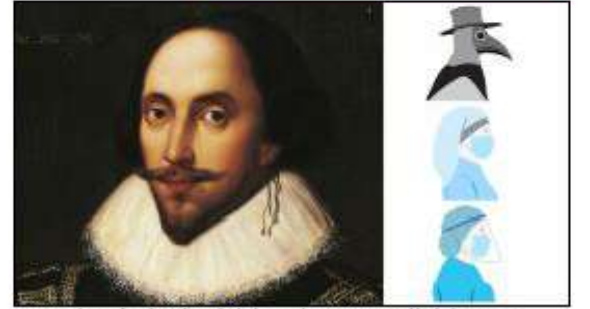
The COVID virus has just everyday life

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to part for countless people, but it has actually raise the level of self-sacrifice, service sharing, cooperating for the common good. Loving, giving, political engagement, seeking a global solution, and reflecting upon what really matters. Those are all noble qualities, they are perfect examples of going beyond. The fact that we can see a future past the devastation of the pandemic is a real triumph of huge importance. We must human without being idealistic. For me, this is fascinating lesson and the deeper meaning to be taken away from a terrible time.



Dr. Deepak Chopra, M.D., F.A.C.P., founder of The Chopra Foundation, a non-profit entity for research on well-being and consciousness, and Chopra Global, a custom-fit health company at the intersection of science and spirituality, is a world-renowned speaker in integrative medicine and personal transformation. Chopra is a Clinical Professor of Family Medicine and Public Health at the University of California, San Diego and serves as a senior scientist with Gallup Organization. He is the author of over 80 books translated into over fifty-five languages, including numerous New York Times bestsellers. His 2008 book, *Consciousness: The Science of Mind*, ranked in the science in ranking beyond any previous book in the history of science. He is also a member of the National Academy of Sciences. Dr. Chopra is one of the top 100 leaders and icons of the century.



Evolution of pandemic from Elizabethan era to the Gregorian era and lastly the present era

## “ 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

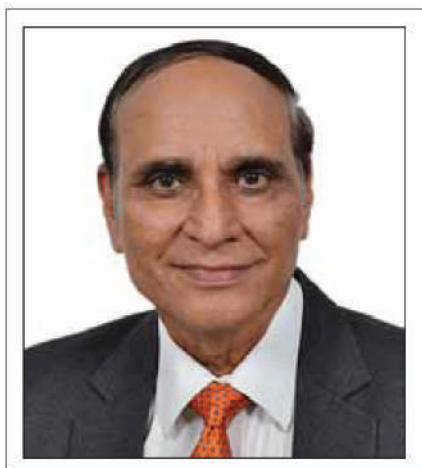
### Solving Diabetic Retinopathy diagnosis through Artificial Intelligence webinar

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 Prabakaran**  
Assistant Professor  
Vinayaka Missions College of Nursing, India



**Dr. V K Singh**

Editor-in-Chief & MD,  
InnovatioCuris

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“We have accepted out of compulsion that one can survive without travel, business meetings, social functions and extravagance however every adversity brings opportunity to change as it is a necessity for survival.”

## EXECUTIVE OPINION

# COVID-19: A lesson to mankind

The pandemic of COVID-19 has ambiguously put us in dark as we have very limited knowledge of handling it, everyone has something to suggest about its diagnosis and treatment with every sort of permutations and combinations. WhatsApp nowadays has full of reading material to share irrespective of the content being right or wrong and this activity has kept everyone busy. Can we draw inferences from past epidemics such as Plague, Smallpox, Cholera and last one was Spanish Flu in 1918-1920 almost hundred years back caused by a virus which has already been synthesised and evaluated. It is estimated that almost one third of the world's population then that is 500 million got infected with a death estimate of 50 million. There were no vaccines for treatment and deaths were due to respiratory infarction like Pneumonia. One catastrophe was not enough as it was coupled with World War I.

COVID-19 also after 100 years has the same story to repeat, disease by various mutated variants of virus with no vaccine and treatment. Its similarity of respiratory complications and also coupled with many associated disasters like skirmishes at the northern borders, floods and earthquakes gave a déjà vu of 100 years back. We are still having the same old dictum to follow disinfection, quarantine and personal hygiene. With all the scientific knowledge can we overcome disease or come to the conclusion that it is self limiting disease and would take two years to control as in the past. The race for vaccine and drug development is in full swing in many countries but ultimately theory of herd immunity is likely to prevail as no vaccine presumably would be available before the year 2021. What is the learning of Covid, is its phenomena of population stabilisation of nature and rule of survival of fittest would apply is a very bold statement and would not appeal to many in the scientific community. Did it happen due to Climatic changes, pollution or the change in lifestyle. The immunity is lowered due to all these factors and our resistance to fight such disease has deteriorated.

There is a change in behaviour due to the onset of pandemic. We have accepted out of compulsion that one can survive without travel, business meetings, social functions and extravagance however every adversity brings opportunity to change as it is a necessity for survival. We are already innovating and there are mega hackathons conducted by the government to tinkle young minds to find solutions to resolve the menace. For every good idea, the resources are made available by many agencies. The things not happening for decades are now happening in months to help the mankind. A lot can be done with limited resources as showcased by the entrepreneurs and NGOs. Mass media and mobile phones convey the message of alternate solutions. The overburdened health infrastructure has overnight sprung to create facilities of additional hospital beds for thousands and many places turned into makeshift hospitals.

The cost of pandemic would be mind boggling, development of the vaccine itself has been estimated to be Rs 80,000 crores by few. Business, education and many initiatives became online and digitalisation came into practice which would have taken years to adopt. Would cost be an offset by new world order by bringing many new initiatives, tools and techniques. I was conversing with one of the scientist, who mentioned that thinking of pandemic experience and premonitions of the worst with its second wave brought goosebumps in me which has never happened earlier. Many of us would have the same feeling in future whenever we think of this past.

Nature has its own way to handle issues and reach its objectives. Would the world be different after this pandemic?

## GUEST COLUMN

# Recent pandemic situation and its effects

■ Written by Dr. Rakesh K Mishra

The world is going through unprecedented healthcare crisis never seen for a many decades - more than a century. This extraordinary situation has also given us many lessons and many insights into the strength and shortcomings in our social structure. Here, I would just like to mention some of the lessons that we learnt from this crisis, which also indicate what we need to do with immediate effect to face such situation in future.

We need a much better and improved government hospitals as they are the main service providers for the public. Private hospitals, typically are more expensive, with limited capacity as well as affordability factor and this is the prime reason they cater to the need of only 10 to 15% of the population. Remaining people need to depend on government hospitals and, therefore, our focus should be to strengthen our health care system in near future.

Second important point is that we should be prepared for the diagnostics and quick response to such eventuality. This requires capacity and platforms where we can quickly adopt and modify or develop methods and techniques for new situations like new infections and, more importantly, we should have the capacity to scale them up both in terms of production and service providing. Strong and resourceful foundation is needed to meet such challenges in the future. It is important that the system cares and nurtures the R&D specially in the Healthcare sector.

Other lesson we learnt from this pandemic is significance of academic and Research organisations in such situation. It turns out

that in addition to the hospitals and other regular Health Care organisations, the role of academic and Research institution is very important, in fact, it carve an eminent niche to face such pandemic challenges. One simple reasons for this is that such institutions are naturally better placed in terms of brightest of young minds - the young students. In fact they are the premium asset of our society and they are concentrated in the academic and Research organisations in the country. It is only expected that when something unknown comes it becomes obvious for the society and the system of the government to turn towards such organisations. Therefore, the responsibility of academic institutions becomes very obvious.

I'm going to take example of CCMB, one of the 38 constituent laboratories of CSIR, mandated to do basic research and find potential applications of this research and produce trained manpower for modern biology. The current pandemic prompted a spontaneous response from the entire CCMB community. In particular, the student community was convinced that we should be able to contribute towards handling this pandemic. It is extremely touching because these are the students who come to do their PhD and are already very busy with their own challenges that they are facing during this pandemic time still they endeavored to provide solution for the nation.

With the help of the students and the staff, first step was to reorganize our Biosafety level (BSL 2/3) and other facilities to carry out the testing of COVID-19 and handling the virus. We interacted, after the request from the State Health Department, with the medical institutions that were declared at the time as the testing centre for COVID-19. We trained their staff for handling the viral sample as well as made them confident to deal with the infected samples and also edifying the modern Molecular Biology techniques used for testing. We still continue to train the technicians from public/private medical schools and other academic organisations as and when required.

While carrying out large scale testing, we also brought several modifications and improvements in the process, like pooling of samples and dry swab RNA extraction free RTqPCR testing. These small changes have potential for big impact in managing this pandemic, some of these findings/protocols are available in public domain. These simple changes make the process much safer, convenient, cheaper and easily scalable.

We are also developing a very high throughput method which requires Next Generation Sequencing (NGS) setup in collaboration with Bangalore based Biotech company, Syngene International. Once in place, this technology will allow processing of upto 50,000 sample in one go. That will make the whole testing

**Second important point is that we should be prepared for the diagnostics and quick response to such eventuality.**





approach very different because such a large number of samples can be handled with a fraction of current per sample cost.

More recently, we started testing for virus traces in the sewage system. It was extremely rewarding exercise as we could quickly establish technology to detect viral trace in the sewage, and not only that, we could calculate back the viral load in the catchment area of sewage system. This will be very useful as surveillance system which can provide very economical, convenient and safe way of estimating the viral load and the proportion of infected population in the city. This is not only useful for the COVID-19, rather it is an important technology to monitor load/prevalence of infection agents in the cities.

One of the major challenges we confronted was to grow the virus in the lab. It was an important decision to go for it as it opens up several avenues to understand the biology of the virus and find potential interventions viz., vaccines/immune-therapeutics development, drug screening, etc. We are currently interacting with large number of companies and academic institutions in area of antiviral drugs/preparations/equipment development.

One of the important aspect of this pandemic is the dynamics of the virus, how fast it is mutating and there are new avatars of the virus emerging with

novel clinical consequences. We started genome analysis of coronavirus and in the process discovered a unique clade of the virus which we named as A3i, which had Southeast Asian origin and was largely confined to the Southeast Asian region. In India, it was more prevalent in southern part of the country and some parts in the north. More recently, A3i is almost completely replaced by A2a, a clade prevalent all over the world. Such analyses also indicate that the virus is mutating but not beyond the anticipated, which means that the drugs and vaccines will be useful for larger proportion of the people across the world.

One thing that is needed and has been demonstrated during this pandemic, is the role of academic institutions mandated for fundamental research can contribute in a significant way to the problems that are of unprecedented nature with unknown factors/organisms.

The experience of fighting the pandemic has given us many other positives. For example, the unparalleled response during such an unprecedented crisis has been clear and impactful. There has been a number of examples of innovation, out of box thinking, cooperation and collaboration among public-private organisations that have expedited the process of making Diagnostics accessible to large numbers, quick initiatives on repurposing of drugs, making devices with anti-viral purpose and many other things. One example is diagnostic kits and PPE shortage during the early phase of this pandemic. It is amazing to see that for many of such items we are not only self-sufficient but is also in a position to help other countries.

One more important experience that emerges from this crisis is that there is a big responsibility on academic and research Institutions to communicate to people. People should know from informed

**One of the major challenges we confronted was to grow the virus in the lab. It was an important decision to go for it as it opens up several avenues to understand the biology of the virus and find potential interventions viz., vaccines/immune-therapeutics development, drug screening, etc.**



sources and, more importantly, what is not known so that wrong information that mislead or frighten people don't gain prominence. When we're talking about unknown and new disease, it is the responsibility of scientists to read, discuss, think and come out and explain to public, politicians, policymakers and administrators. It is necessary so that correct message is displayed and rumours don't misguide people. This is extremely important because if academic institutions don't come forward and take initiative, the news will come from wrong sources and that can lead to avoidable disasters.

I would like to point out that people have suffered, the economy has suffered, there have been social constraints, lots of loss to classroom academic activities, etc., etc., but we also learnt a lot from this crisis, a lesson that can prepare us better in future. It is very obvious that we need to be better prepared for such pandemic in terms of self-sufficiency of Diagnostic and therapeutic supplies, technical

competence to adopt/establish new tests and interventions. We need policy and financial facilitation that may be required to put such options in place. We also need to put in place the zoonotic and other surveillance setup as a regular component of our system. This is important because there is an obvious increase in the human-wildlife interaction which brings in new kinds of parasites which are otherwise confined to the wild life. It is separate matter that we need to restrict such encroachments to the wildlife and respect the nature as such. We also need to put in place surveillance systems for sewage and air using modern technologies that are efficient and affordable. It is obvious that preparedness for new situation comes with the strong foundation of Science and Technology in the country. It is not only for the crisis situation but also for the normal situation where the better scientific base, the better we are positioned to meet the requirement of the people and keep the country strategically more assured and self-sufficient. It is

absolutely necessary that the expenditure on science to gain new knowledge will significantly enhance the generation by several fold and also make it sustainable to meet the future requirements. It will be a good strategy to make us more resilient to face the crisis of this kind in future.

In conclusion, we can certainly see that India has emerged, so far, very strong Nation in fighting this crisis in terms of improving its immediate response of protection gear needed for health care worker as well as handling of the disease by providing medical care, enhancing Hospital facilities at a much larger scale and improving the diagnostics significantly in very short time. At present, we will in much better situation in terms of capabilities, to manage the pandemic as compared to what we were only few months back. It will be useful to take this good work forward and strive to develop our Science and Technology to a acceptable readiness level to deliver to the need of the people.



**Dr. Rakesh Mishra** is presently the Director of CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad. He received his Ph.D (Organic Chemistry) degree from University of Allahabad in 1986. Subsequently, he started his career in biology at Indian Institute of Science, Bangalore. He has several years of research experience at the University of Bordeaux (France), Saint Louise University (USA) and University of Geneva (Switzerland).

His research interest is in genome organization and epigenetic regulations during development, evolution of complexity in biological systems and genome interaction with environmental factors.

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# PERSONA

## The recent Global unprecedented situation due to COVID-19 and measures taken to control them



Dr. Anil Koul is currently Vice President for Global Public Health and Infectious Diseases Discovery unit at Johnson & Johnson (J&J) Pharmaceuticals. He also currently serves as a member of the Executive Board of Directors at Janssen Pharmaceuticals NV, European unit of J&J. From 2016-2020, he was the Director of CSIR-IMTech (Institute of Microbial Technology). His biggest career milestone was as a key scientist at J&J in the discovery and clinical development of Bedaquiline – the first drug to be approved in the last 45 years for treatment of drug-resistant tuberculosis. He has more than 20 years of experience in drug discovery, development and scientific innovation and is bestowed with many prestigious accolades and the latest been the annual Heroes of Chemistry award from the American Chemical Society in 2020.

Dr. Debleena Bhattacharya, Associate editor, InnoHEALTH interviewed him in August, 2020, for his valuable scientific insights.

**Q. You have been a scientific leader in the field of public health and infectious diseases. We are sure you might have faced this question already many times but from our readers perspective we need your view point on COVID-19? What is the end game here? Does infection remain for a year or will we soon get over it by developing herd immunity or a vaccine saves us in the next six months?**

**A.** COVID-19 belongs to a group of viruses called coronaviruses that attack the respiratory system. Developing an effective vaccine will be critical if we are to protect people against the novel coronavirus and combat future outbreaks.

Since the early days of the outbreak, Johnson & Johnson has been working with industry partners, governments and health authorities to help end the fast-moving COVID-19 pandemic through the development of a preventive vaccine candidate against SARS-CoV-2. The first batches of a SARS-CoV-2 vaccine are expected to be available for emergency use in early 2021—a substantially accelerated timeframe in comparison to the typical vaccine development process. Our goal is to provide a global supply of more than one billion vaccine doses through the course of 2021, provided the vaccine is safe and effective.

At this stage, we cannot comment on whether herd immunity against COVID-19 will happen. What we do know is herd immunity is dependent on a significant proportion of a population being vaccinated. The higher vaccination rates are, the harder it is (and the longer it takes) for a disease to spread. To

ensure protection within a population or community, vaccination rates must achieve a certain threshold. So, our single focus right now should be on developing a safe and effective vaccine that can be made available to as many people as possible around the world.

**Q. How does coronavirus compare with other outbreaks and how the solutions provided for tropical diseases earlier have similar effects on coronavirus?**

**A.** Coronaviruses (CoV) are a large family of viruses that can cause illnesses ranging from the common cold to more severe diseases, such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans, which is what the current outbreak is.

Thanks to prior SARS and MERS viruses, we understand coronavirus biology relatively well. However, there remain some important gaps in our collective understanding. The spike protein of the virus that causes COVID-19, SARS-CoV-2, and that of the SARS virus we saw in 2003 are very similar. This spike protein helps the coronavirus attach to and enter human cells by binding to receptors on the cells surface, called ACE2 receptors, which help regulate blood pressure.

The biological implications of viral attachment or binding to ACE2 receptors are not fully understood in COVID-19 cases. We do know that patients with hypertension or diabetes are at an increased risk for developing more severe cases of COVID-19. But we don't

understand very well the way that anti-spike protein antibodies that block the attachment of the virus to cells in the body.

This latest outbreak of a novel pathogen once again reinforces the importance of investing in preparedness, surveillance and response to ensure the world remains ahead of potential pandemic threats. For our part, Johnson & Johnson began working on a vaccine for COVID-19 the moment the sequence was announced and recently announced the selection of a lead COVID-19 vaccine candidate.

We are accelerating our research & development and in parallel rapidly expanding our manufacturing capacity globally with a goal to supply more than one billion doses of a safe, effective and affordable COVID-19 vaccine on a not-for-profit basis for emergency pandemic use.

The Company's vaccine program is leveraging Janssen's AdVac® technology that provides the ability to rapidly develop new vaccine candidates. This technology was used in the development of our investigational Ebola vaccine, which has been deployed in the Democratic Republic of the Congo (DRC) and Rwanda, and was also used to construct our HIV, RSV and Zika vaccine candidates.

**Q. India's disease burden has been shifting from communicable to Non Communicable. Hence, resources as well. When it comes to infectious diseases, can you identify the thrust areas where we need to invest to be a more resilient society like rapid diagnostics, PPE, in general infection prevention and control, surveillance mechanisms and vaccine development etc.**

A. Infectious diseases have long posted a grave threat to public health in India – even before COVID-19. One of the longest-standing and most insidious epidemics we have faced is tuberculosis (TB) - a disease as old as humankind.

In 2018, TB claimed more than 1.5 million lives globally. India shares a disproportionate burden of this disease with 79,144 deaths reported in 2018. This problem is compounded with the high incidence of drug-resistant tuberculosis in the country. Currently, India has around 130,000 multi-drug resistant TB cases, and only around 50% of these patients are diagnosed. This gap is the biggest barrier

to treatment access and must be urgently addressed if India is to reach its ambitious goal of ending TB by 2025.

The COVID-19 pandemic has further aggravated the situation and exposed the vulnerabilities of the already overburdened public health systems. The lockdown restriction is a major hurdle to TB patients seeking healthcare and may cause delay in diagnosis, treatment interruptions and disease transmission. Greater efforts are urgently needed to address this serious threat.

For the past 15 years, our team of scientists at Johnson & Johnson has been working tirelessly to discover new TB drugs. Several years ago, we succeeded in launching bedaquiline, the first TB drug in nearly 50 years. In addition to this, we have been working with state governments and non-governmental organizations for the past four years to provide over 50,000 X-ray tests, approx. 32,000 molecular tests, and 4,600 pre-evaluation tests to enhance early diagnosis. We have also trained more than 15,000 physicians on the clinical management of TB and MDR-TB and supported community awareness programs.

These efforts are part of our company's longstanding commitment to tackle TB and the growing challenge of antimicrobial resistance (AMR) globally. AMR claims more than 700,000 lives per year – and approximately one-third of these deaths are the result of DR-TB. In July 2020, J&J joined committed \$100 million to the Global AMR Action Fund, which will collectively invest \$1 billion to bring new drugs to fight superbugs. The fund aims to bring 2-4 new antibiotics to patients by the end of this decade. The fund will help pool the scientific resources of the industry while working with governments, NGOs, biotech, and other laboratories to discover new drugs and implement sustainable R&D innovation policies. This is the largest collective venture ever created to address AMR - a piece of great news for India and other AMR high-burden countries.

**Q. The ever changing molecular profile of the corona virus will make it more adaptable for longer sustainability or there are other modes for its survival in the environment?**

A. More than 50,000 genomes of the SARS-CoV2 have been uploaded by scientists on a shared database across the world. In

the analysis of these genetic and sequence databases, about 70 percent were found to carry the mutation on the spike protein, which helps the virus to attach to receptors on respiratory cells called ACE2. This research published recently in prestigious journal Cell (Korber B et al, Cell, 2020) suggests that the mutation D614G may provide a better chance for the virus to infect or enter host cells due to increased spike protein on the surface. However, very preliminary data suggest that this may not worsen the patient outcomes, which are critical to controlling this pandemic. From the evolutionary and viral population dynamics perspective, G614 variation in spike protein may have a fitness advantage. But we need to continue sequencing of viral isolates for the changes in the spike and other proteins so that it helps us understand viral spread, infectivity, and pathogenesis, and help us develop better antibodies, vaccines, or small molecules therapeutics.

**Q. Does BCG/polio vaccination has any relevance to prevent COVID-19?**

A. At this stage, there is no evidence that the BCG vaccine protects people against infection with COVID-19 virus. We understand that some clinical trials are underway to address this question. So, we should wait for the scientific results and evidence when it is available. In the absence of evidence, WHO does not recommend BCG vaccination for the prevention of COVID-19.

**Q. As a scientific leader, what inspires you on a daily basis? Your advice for young readers on what India needs and how can we do better scientific research that has sustainable impact?**

A. My advice to the next-generation scientists is that never compromise on the pursuit of excellence – please don't take shortcuts. Science and innovation are a tough journey, but in the end, success and satisfaction will be yours. Always see what you are leaving for the next generation – a product, an ethos, and an opportunity. It is important to remember that real science and discoveries need some level of stubbornness, never to be afraid at the face of failure. As someone said, "My courage always rises at every attempt to intimidate me." This holds true for everyday science we do as long as our pursuits and intents are honest.

PERSONA  
THEME  
TRENDS  
WELL-BEING  
ISSUES  
RESEARCH  
NEWSCOPE

# ► THEME

## Transforming Healthcare System in India

### Learnings from the COVID-19 Pandemic

■ Written by Dr. Ram Babu Roy

The global pandemic due to the novel Coronavirus disease COVID-19 has been considered as the deadliest of all the viruses witnessed so far. The spread of the COVID-19 pandemic originating in Wuhan (China) to almost all the countries of the world, may have a lasting impact on the way we live and the way we work. Globally, there have been 21,989,366 confirmed cases of COVID-19, including 775,893 deaths till 19 August 2020. In India alone, there have been 2,767,273 confirmed cases of COVID-19 with 52,889 deaths from Jan 30 to 19 August 2020. There have been several occurrences of virus pandemics in the past such as Spanish Flu, Severe Acute Respiratory Syndrome (SARS), Middle Eastern Respiratory Syndrome (MERS), H1N1 (swine flu), but the scale of government interventions and the pandemic of fear observed in the case of COVID-19 across the world are unprecedented. The situation has been more or less similar across the globe. I had a conversation with one of my collaborators from Finland around mid-May 2020. He described the situation as "... in near-complete lockdown. I can't go to my office without permission that needs to be granted the previous day... may not stay more than two hours, no meetings, no corridor chatting, only one person at a time in a room...". The regular academic work such as teaching, examinations, meetings have been forced to go online. He opined that though online mode is seemingly efficient in executing the day to day business, unplanned face-to-face live



interaction in pre-COVID-19 scenarios used to be more conducive for generating new ideas, inspiration, and value addition. The pandemic has affected the individual and group behaviour that, in turn, has impacted the economic activities and the demand. We have been experiencing the manifestation and inter-play of three key factors: inherent nature of the virus spread, policy interventions by the government and administration, and the behavioural response of people. We can only do a post-mortem on which one of these

three factors had the most devastating impact in terms of real outcomes in the future. It requires capturing reliable data from different sources and a detailed data analytics.

Globalization and international travels have led to the pandemic spreading quickly across the world leading to unprecedented burden of morbidity and mortality. The spread has two components: seeding infection in a community from some foreign patient through migration

**In India alone, there have been 2,767,273 confirmed cases of COVID-19 with 52,889 deaths from Jan 30 to 19 August 2020.**





**The pandemic has affected the individual and group behaviour that, in turn, has impacted the economic activities and the demand.**

and subsequent spread in the community through social interaction. Since the disease was of foreign origin, efforts were made to contain it and avoid community spread. Government has tried to control the seeding by screening people at the entry points such as airports and railway stations. But due to some inefficiency in the screening process and carelessness of such migrants, the disease could enter into the community. Further, high rate of infectivity of COVID-19 and different types of social gathering helped in rapid spread to different parts of the country. A massive hunt to trace the contacts started by the government and it appeared to give dividends in terms of identification, quarantine, and hospitalization of suspected/infected persons. But some people took the risk of Coronavirus very casually resulting in spread of infection to sizable number of people. These people subsequently spread across the country creating several hotspots in different part of the country. Medical professional and police had tough time convincing people to volunteer for testing and observing social distancing. Gradually, people have started following the guidelines. But it has already delayed and it could spread to several parts of the country. Fortunately, the fatality rate turned out to be relatively

less in India compared to that in other countries.

India government had imposed a national wide lockdown and social distancing norms to check the spread as it won't be able to provide healthcare services if there be a surge in demand with its high population density and relatively weak health infrastructure. Most of the shops have been closed during the lockdown barring few shops selling essential items. Though the shops have been notified to strictly follow social distancing with circles made on the floor to keep a safe distance, but how many people actually follow it remains a question. Many companies have adopted work from home policy to reduce the risk to their employees. The sudden imposition of lockdown created another dimension of problem with migrant labours stranded in different parts of the country. It appears there was huge communication gap or lack of coordination between the central and state governments in implementing the lockdown policy at the ground level. That led to migrant labours assembling at railway stations and bus terminal in a hope to return to their native place. Such incidents have increased burden on the administration to manage these

crowds. These migrant labours really faced a tough time relocating themselves in the lockdown scenario. The spread of COVID-19 has led to significant economic, social, and political consequences. Daily wage workers are the most affected due to prolonged lockdown. Government has taken several measures to reduce the impact of COVID on the livelihood of common people. The effectiveness of such measures is to be seen in the future. Food supply network also got disrupted and we are not sure if everyone is getting proper supply of food in this trying time. Layoffs and reduced social gathering has also increased the level of mental health issues.

COVID-19 has dented almost all the businesses worldwide. Healthcare businesses are not immune to it and faced a huge impact due to lockdowns. The hospitals become less crowded compared to the pre-COVID time as patients are refraining from visiting hospitals for the fear of infection. Some private hospital facilities were closed, while healthcare professionals at other hospitals were strained due to increased workload and increased risk of infection. The healthcare system had to provide medical care to individuals and community in the wake of the surge in the number of COVID patients. There had been a severe shortage of diagnostic kits, respiratory aids, ventilators, Personal Protective Equipment (PPE), and Intensive Care Unit (ICU) beds that created a sudden surge in the global demand of these items for both patients

and frontline workers. The supply chain faced a major disruption. With most of the PPE kits imported from China found defective, there had been a nationwide call for indigenous, high-quality products. This led to several entrepreneurial efforts to meet the demands with indigenous products. Healthcare sector is facing a twin-burden: It has to incur fixed costs by investing in additional manpower, equipment and other resources to ensure preparedness for safety and treatment of patients, but there is a sharp drop in the cash flow due to decrease in the out-patient footfalls, elective surgeries and international patients (medical tourism). However, the pandemic has also brought in entrepreneurial opportunities in the healthcare businesses. There are several business opportunities in healthcare sector that need to be pursued to ensure the safety and timely treatment of patients.

Though the curve for new COVID cases is flattening at several places, growth in the number of cases is getting reported from other locations. The situation is going to persist for a longer duration and is likely to bring a paradigm shift in the daily life of people in the post COVID era. Many measures such as nationwide lockdowns were effective in reducing the spread, but have devastating impact on the economy. Even many developed countries failed to anticipate the scale of the devastating impact the COVID-19 virus could make. The responsibility and accountability of World Health Organization (WHO) has increased to monitor such outbreaks and share timely and reliable information to all the countries in the world. We need a proactive global participation for a collective and holistic approach rather than the reactive mechanisms that we have witnessed in the event of the outbreak. There is a need for the healthcare system to have better preparedness and adaptation to deal with the situation with urgency.

**The spread has two components: seeding infection in a community from some foreign patient through migration and subsequent spread in the community through social interaction.**

**We should analyse and learn from the healthcare systems in Taiwan, Finland, New Zealand, and Sri Lanka where there have been very less number of cases.**

The testing capacity and other healthcare facility is getting scaled up as the number of cases detected per day is increasing. Technology scale up with human centric approach is required to deal with quality and safety issues in healthcare. Preventive care has suddenly become extremely important and inevitable. Policy related to preventive care must be critically evaluated and a roadmap needs to be prepared to implement it in a holistic manner. Ambulatory care may be required as it's difficult to accommodate huge number of patients in the existing hospital infrastructure. Patients are being advised to stay in home quarantine and follow the guidelines. Educating people about the dos and don'ts is a challenge. Making reliable information available to people in their native language would be more effective. Effective communication to patient and their caretakers are extremely important to contain the spread of COVID-19.

With increases customer expectations, patients are no more passive subjects before a doctor. Patients are becoming tech savvy and expect their active engagement in healthcare decisions. It is important to engage patients and their care takers in the entire care process, data management to deal with billions of people. They should be encouraged to share the healthcare data that may be anonymised for data privacy and used for research purposes. Real-time data acquisition plan, cleaning, visualization and other analytical processes are required to extract insights and present them in a dashboard for end

users. Data analytics can help at three levels: prediction of outbreak and tracking of spread, tools to help government and administrators in policy decisions, effective and efficient dissemination of information to the people for better compliance. It may also help in designing novel home care and ambulatory care services. There is a need to reduce the risk of infection to healthcare workers and increase the strength of healthcare workers. Healthcare professionals also need to be trained to handle such novel virus as it requires behavioural change to deal with the situation. Healthcare professionals need to wear the PPE kit for a long period that might reduce the supply of oxygen to them and create other health issues. So, innovative design and selection of materials for producing the PPE kit needs more attention.

Healthcare system is facing several challenges to provide healthcare services to a diverse Indian demography. There is a lack of adequate human resources in healthcare sector to handle sudden surge in the number of patients. The situation is further aggravated with a few health workers resigning from their jobs for the fear of infection or burnouts. We must take lessons from the past and chart out our journey for the future. We have to think differently to deal with the new normal evolving in the post COVID era. It requires new ways of delivering healthcare and effective management of processes that we can't change. We should analyse and learn from the healthcare systems in Taiwan, Finland, New Zealand, and Sri Lanka where there have been very less number of cases. There is a need to create a repository of learnings from the COVID experience to develop technology roadmap and education plan to handle such situations arising in the future. Digitization of healthcare system would increase the preparedness of the system to cope with future pandemics. Building virtual care capabilities using telehealth



and telemedicine and improved triage system would help to reduce hospital visits that in turn will reduce the risk of hospital-associated infections. Hospitals would need adequate health workers to deal with increase in the cases of depression, anxiety, and stress. There is also a need for keeping a reserved pool of cross-trained work force that can be deployed to help in such situations.

Proper tracking of bed occupancy, equipment utilization, and medication inventory is required for hospital resource optimization and better facility utilization. Innovative and sustainable business model should be developed to have a scalable and decentralized testing and treatment facility to reduce the crowding of a centralized facility. Entrepreneurs can play a significant role in transforming the healthcare in India. They can leverage digital technology to improve the preparedness, accessibility, affordability, accountability, and agility of the healthcare system. They can create a knowledge and analytics driven culture for adapting to change and improve the responsiveness and resilience of the healthcare system. It may lead to minimize patient readmissions, improving patient engagement and empowerment, reduce costs, and ensure necessary compliance for the safety of patient and healthcare professionals. There is a need for the

## Acceleration of telehealth and telemedicine infrastructures and Artificial Intelligence-assisted clinical practices is the need of hour in healthcare.

database of potential blood donors for plasma therapy and mechanism to contact them and facilitate the plasma therapy process. Acceleration of telehealth and telemedicine infrastructures and Artificial Intelligence-assisted clinical practices is the need of hour in healthcare. A knowledge-driven solution for spreading reliable information and awareness about the situation through social and other media is required to avoid a pandemic of fear which might lead to unanticipated collective behaviour.

Government of India has launched an ambitious National Digital Health Mission (NDHM) to facilitate the access to medical services. Under this scheme, it is envisaged to create a personal health IDs for every Indian citizen that would help in creating digital personal health records. It also aims to create a complete digital health ecosystem integrating information on doctors, hospitals, diagnostic laboratories and pharmacies that may be extended later to include information on e-pharmacy and telemedicine services.

NDHM and Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (AB-PMJA, if implemented properly, might be a game changer in addressing the healthcare needs of majority of Indian population. Further, it would lead to creation of Personal Health Record (PHR) and Electronic Medical Record (EMR) that can help in data-driven policy decisions and developing new healthcare services. The healthcare system in India is definitely transforming, but still it has a long way to go.

**Dr. Ram Babu Roy** is an Assistant Professor in Rajendra Mishra School of Engineering Entrepreneurship, IIT Kharagpur. He is a doctorate in Management from Indian Institute of Management Calcutta. His research interests include business analytics, modelling and simulation of complex networked systems, and healthcare operations management.

## Telemedicine Practice Guidelines

The Telemedicine Practice Guidelines is an integral part of the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002, popularly known as the Code of Medical Ethics.

Hence, the principles enunciated therein are ipso facto applicable to the practice of Telemedicine. FAQs are indicative only, not exhaustive.

[www.tsitn.org/wp-content/uploads/2020/04/Final\\_FAQ-TELEMEDICINE.pdf](http://www.tsitn.org/wp-content/uploads/2020/04/Final_FAQ-TELEMEDICINE.pdf)





# TRENDS

## HEALTHCARE TRENDS

### VIVEKANANDA YOGA UNIVERSITY - WORLD'S FIRST YOGA UNIVERSITY OUTSIDE INDIA LAUNCHED IN THE US

Yoga that consists of a group of mental, physical and spiritual practices in the form of postures or asanas originated in ancient India has now been widely adapted by the western world as a posture-based physical fitness, stress relief and relaxation technique.



To commemorate the sixth International Yoga Day on 21st June 2020, the world's first yoga university outside India has been launched in Los Angeles, USA that is offering programmes which combine scientific principles and modern research approaches to the ancient practice of yoga. In the recent pandemic situation, the launch of the Institute was jointly done by the Department of External Affairs, India and Consulate General of India, New York on a virtual platform.

An eminent yoga Guru Dr. H R Nagendra who presently is the chancellor of Swami Vivekananda Yoga Anusandhana Samsthana (SVYASA) has been appointed

as the first chairman of Vivekananda Yoga University (VaYU), Los Angeles.



SOURCE: ETHEALTH WORLD

### COVID MANAGEMENT DONE THROUGH HIGH FLOW NASAL OXYGEN (HFNO) METHOD PROVES TO BE SIMPLE, ECONOMICAL AND EFFECTIVE WAY FOR DETECTION OF RESPIRATORY DISTRESS



to high-flow nasal oxygen (HFNO) method to treat respiratory distress in such patients instead of straight away putting them on mechanical ventilation which is invasive in nature. HFNO method is a simple bridge between the oxygen mask and the ventilator.

Out of the three oxygen therapy methods given are done via normal oxygen masks, the HFNO and mechanical ventilator. HFNO method is a popular method amongst the doctors as it is simple, cheaper and less invasive than a ventilator and gives better results in selected patients as expressed by the Association

of Physicians of India, Pune branch

SOURCE: ETHEALTH WORLD

Pune, India has a high patient load suffering from covid-19 and in order to manage these large number of patients, doctors in Pune are resorting

## FIRST DOCUMENTED CORONAVIRUS RE-INFECTION REPORTED BY HONG KONG RESEARCHERS

A 33 years old male residing in Hong Kong who had recovered from COVID-19 infection and discharged from the hospital in the month of April 2020, was again tested corona positive on August 15,2020 after

returning back to Hong Kong from Spain via Britain. The findings of the research conducted by researchers at the University of Hong Kong indicated that coronavirus which has already claimed more than 800,000 people world over may continue

to spread amongst the global population despite herd immunity. This case is the first documented instance of human re-infection with coronavirus.

SOURCE: ETHEALTH WORLD

## BLOOD TEST TO DETECT CANCER UPTO 4 YEARS BEFORE SYMPTOMS APPEAR

Team of researchers and bioengineers at the University of California, San Diego have tried to create the ultimate cancer-screening test that has never been done before where one can detect early malignancy, before tumour cells spread.



The blood sample collection began in 2007 wherein the researchers started recruiting more than 123,000 healthy individuals in Taizhou, China for annual health check-ups. Eventually they were able to collect more than 1.6 million samples which are efficiently stored. Nearly 1000 participants developed cancer over the next 10 years. The team then focused on developing a test for the most common types of cancer like stomach, oesophageal, colorectal, liver and lung. They named the test as PanSeer test which detects methylation patterns in which a chemical group is added to DNA to alter genetic activity. Abnormal methylation can signal various types of cancer including colon and pancreatic. In PanSeer test DNA is isolated from a blood sample and it measures DNA methylation at 500 locations which have the greatest chance of signalling the presence of cancer. Then a machine learning algorithm compiles the findings into a single score which indicates the likelihood of a person



to have cancer.

Blood samples from 191 participants were tested, who eventually developed cancer and they were paired with the same number of matching healthy individuals. The team was able to detect cancer upto 4 years before symptoms appeared with nearly 90% accuracy and 5% false positive rate.

This test has certain limitations like the assay can detect only five forms of cancer i.e stomach, oesophageal, colorectal, liver and lung. Also the critics are of the opinion that this test will not be able to detect all cancers before they become symptomatic. The malignant cancer which grows very rapidly cannot be tested in time even if the person is undergoing annual check-ups. It is also possible that certain malignancies will never be detected by blood tests because they do not produce a measurable

signal in blood plasma.

We are still steps away from having an accurate blood-based pan-cancer screening test though it is not impossible. We are getting closer to our needs by the efforts of such researchers who are working relentlessly towards achieving timely diagnostic tools to achieve optimum healthcare.

Presently the test cannot be used clinically at this stage as it further requires to be worked upon. But as per the researchers the PanSeer test is definitely a step towards developing a robust, preliminary baseline test towards cancer screening product and also for early detection of multiple cancer types (four years prior to conventional diagnosis).

SOURCE: [www.inshorts.com](http://www.inshorts.com)

# QURE.AI AND PHARMEASY MAKE IT TO THE WORLD'S MOST PROMISING DIGITAL HEALTH STARTUPS 2020

# ROBOTIC GUIDE DOG FOR THE VISUALLY IMPAIRED



As per the Digital Health 150 ranking by CB Insights, US-based market and business analytics platform has two Indian firms Pharmeasy and Qure.ai that have featured amongst the world's most promising digital health start-ups. In August 2020 these 150 startups have raised more than \$20 billion in total from more than 900 investors. These start-ups are working on software enabled solutions across 12 core categories and have shortlisted almost 8000 startups based on various activities like business relations, patient activity, competitive landscape, team strength, tech novelty, market potential, investor profile, news sentiment analysis and proprietary Mosaic scores.

minds to give way to emerging health-tech start-ups. Another step towards an attempt to improve healthcare in India is the recent launch of National Digital Health Mission on India's Independence Day where digital health ID, e-pharmacy and Telemedicine are the key building blocks.

Mumbai-based Qure.ai which was founded in 2016, has developed artificial intelligence (AI)-enabled medical imaging solutions especially to identify abnormalities in CT scans of head.

Pharmeasy is India's most trusted online medical supply store which delivers medicines at ones' doorsteps in 1000+ cities and towns across 22000+ pin codes. Pharmeasy enables the user to choose from 1 lakh+ healthcare products on discounted prices and purchase medicines online by connecting the user to registered retail pharmacies and getting them delivered to a person's home. It also sends a reminder to its users' every month for their medicine refill and aims at not letting the users run out of their medicine stock at any moment.



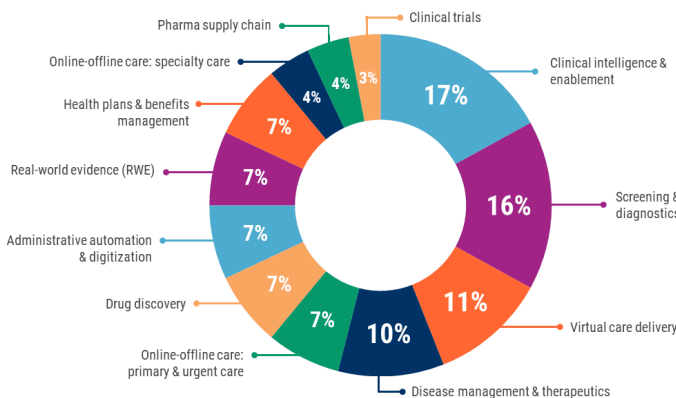
Anthony Camu, student at Loughborough University has designed a device in the form of a robotic hand dog named 'Theia' to help support people with visual impairments who are unable to house a real animal.

Camu, a final year student of Industrial Design and Technology was inspired by virtual reality gaming consoles to create the prototype. Not only Theia replicates the role of a guide dog but is also programmed to find quicker and safer routes to destinations using real-time data. The prototype features control moment gyroscope (CMG) technology. Theia is a portable and concealable device to be held in hand that guides its users through outdoor environments and large indoor spaces. It moves users' hands and physically leads them to move around which is similar to holding a dog with its leash. Theia will also be able to aid its user to tackle specific interactions like stairs, elevators and shops. It guides movement of its user in real time space keeping in mind the traffic density of cars and pedestrians both and weather. It also has a safety feature for high risk scenarios like crossing busy roads pushing the user back into a manual mode which is similar to using a cane. It is voice activated with onboard sensors.

Definitely this device would have a positive effect on the lives of visually impaired people who restrict themselves to certain spaces due to fear and anxiety issues as well as partial understanding of the surroundings. Theia intends to broaden the horizons of their users' and allow them to think less about walking and more about what is waiting for them at the end of the route.

## CLINICAL INTELLIGENCE & ENABLEMENT IS A LEADING CATEGORY IN THIS YEAR'S COHORT

2020 Digital Health 150 companies by category



CBINSIGHTS

Source: cbinsights.com

Sudden onset of coronavirus pandemic in India has stimulated many thoughtful

SOURCE: [www.moneycontrol.com](http://www.moneycontrol.com)

SOURCE: [www.dailymail.co.uk](http://www.dailymail.co.uk)



## PROMISING 'BREATHALYSER' DEVELOPED TO TEST COVID POSITIVE CASES

Presently covid-19 testing is done by collecting samples using swabs used on the back of the throat and also inside the nose with long cotton buds that are presently stated as uncomfortable to many people. Then the sample undergoes reverse-transcription polymerase chain reaction (RT-PCR) which is very time consuming, sometimes the results of which also gets delayed due to the backlog of samples. Need of the hour is to have access to cheap and fast testing. Working in this direction a team of researchers in Israel at Technion-Israel Institute of Technology have developed a nanomaterial-based sensor which could detect covid-19 in exhaled breath. This sensor's usage is similar to a breathalyser which can detect covid positivity in a non-invasive manner.

Earlier studies have shown that viruses and

the cells they infect emit volatile organic compounds (VOCs) which can be exhaled in breath. Making a note of this, the team made an array of gold nanoparticles linked to molecules that are sensitive to many VOCs which in turn causes a small change in electrical resistance. Machine learning was used to compare the patterns of electrical resistance signals.

The testing of this device was done in March 2020 as the team obtained data from the breath of 58 healthy control patients, 49 confirmed covid-19 patients and 33 patients with lung infections unrelated to covid-19. The participants blew into the device for 2-3 seconds from a distance of 1-2 cm. Once a potential covid-19 'signature' was obtained, they tested the accuracy of the device on a subset of participants. Firstly, it showed an accuracy of 76% in differentiating covid-19

cases from healthy controls, secondly 95% accuracy in differentiating covid-19 cases from lung infections and lastly 88% accuracy in differentiating between sick and recovered covid-19 patients.

Though further validation is needed for this device but the researchers say that atleast for now the device can be useful for quickly screening large number of people to determine which ones may require further testing.

Another effort in this direction is being made in Lyons, France which is engaged in the second trial phase of a similar kind of breathalyser that could make a diagnosis in a matter of seconds.

SOURCE: E & T NEWS



## TOKYO'S TRANSPARENT TOILETS

The Japanese have been known for their hygiene and washroom behaviour. For them bathroom culture has been a top priority which is evident from their high-tech toilet museum to airport dog toilets. The latest edition in this direction is the newly introduced high-design public restrooms in Shibuya district of Tokyo, Japan. This effort is made by The Nippon Foundation's Tokyo Toilet Project under

been installed in local parks with the aim of changing people perception of public restrooms as there are two main concerns when it comes to public toilets, first is cleanliness and second is it's occupancy or vacancy.



from the outside through colourful tinted windows when they are unoccupied. But when someone steps inside the restroom and locks the door then the walls becomes opaque. This seems to be an example of super engineering. The walls of both these restrooms are in the hues of teal, green, blue, orange, pink and purple and at night these restrooms light up the park premises like a beautiful lantern. Each location has a Women, Men and Multiuse toilet.

These new restrooms are surely going to raise the hygiene standards in Japan to a newer level.

SOURCE: [www.inshorts.com](http://www.inshorts.com)



which two sets of transparent toilets have

This installation is the first in the line of planned 17 new high-design restrooms. Another six of these washrooms will be installed in different locations by this year end and the remaining ten are tentatively slated for 2021.

The Architect of these smart toilets has tried to cater to both these concerns by making these restrooms completely visible

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

## Building Mental Health

■ Written by Dr. Shalini Kukreti

**M**ental health is all about how we feel, think and behave, it refers to cognitive, behavioral, and emotional well-being. It can affect our daily life, relationships and overall health.

We always think that absence of mental disorders means we are mentally healthy, but mental health is way beyond that. Preserving our mental health is utmost important in order to enjoy life.

As per **World Health Organization (WHO)**:

“Mental health is a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.” WHO focuses that mental health is “more than just the absence of mental disorders or disabilities.” Peak mental health is about not only avoiding active conditions but also looking after ongoing wellness and happiness. Restoring mental health is crucial. As per a study by WHO, every 40 seconds, someone loses their life to suicide. Suicide is the second leading cause of death among 15-29 year olds globally. Can you imagine at such young age of 15-29 years someone is so affected internally that they want to end their suffering by ending their lives. They feel that it's the easiest and the only solution to all their sorrows and unhappiness. Poor mental health has a deleterious effect on a person's life.

The most common mental disorders are depression and anxiety. In depression you feel down, sad, or upset, you start losing interest in everything, while in anxiety you experience a feeling of fear or worry, and it can happen to anyone. It's not unusual to experience anxiety before a big event or

**Absence of mental disorders means we are mentally healthy but mental health is way beyond that.**

important decision but experiencing it on a daily basis without a reason is something that requires attention.

There are several ways of managing mental health problems and the treatment is highly customised, it's not necessary that what works for one may work for another. It's always better to talk about what you're feeling and experiencing. It's normal to feel sad and depressed, but not acknowledging it is a problem. Try to read and educate yourself about mental disorders; don't confuse it with daily life challenges and stress. In order to treat something we must first know the severity of it, the damage it can cause to our life. Don't only rely on medications also seek social help, talk to the people, and professionals, do exercise, do meditation, do whatever you feel comfortable with.

Try to notice good things around you, nurture yourself, nurture your thoughts, be with the ones who make you feel good, avoid negativity and have patience. I know it seems difficult but it will all be worthy, keep your will strong and you can conquer everything. To conclude, I would like to mention that it is rightly said “*A strong body is a good asset but a strong mind is the ultimate strength.*”

**Dr. Shalini Kukreti** is a Nutritionist and a Clinical Dietician (Gold Medalist). A certified Dietary Supplement Advisor with an experience of more than 7 years in Diet Therapy, Counseling, Therapeutic diet planning, healthcare product development and lifestyle management. She is skilled in conducting healthcare training and developing training modules.





# Impact of Medication error on Patient Safety and Universal Health Coverage

■ Written by Dr. Nupur Garg



## INTRODUCTION

Medicines constitute an integral part of any healthcare system. However with growing advancement and increasing health needs, our dependency on medications has also been rising. Medicines or drugs contain an active ingredient which is responsible for causing reaction in the body that leads to cure. But in some cases, it may cause adverse or unintended reaction that may harm the patient. The beneficial outcomes should always outweigh the adverse outcomes provided the adverse outcomes are tolerable otherwise the medicine should be discontinued.

Undesirable or unintended outcomes may include adverse drug reaction, treatment failure, drug-drug interaction, or in extreme cases patient death. This has significant social and economic ramifications for the patient and the

society at large like suboptimal patient adherence, lack of efficacy of medicines, poor quality of life, increased use of health services, preventable medication related hospital admission and many more. This is particularly true and a grave situation for developing countries where lack of quality assurance leads to rampant usage of substandard and counterfeit medicines.

## DEFINITION

As per United States National Coordinating Council for Medication Error Reporting and Prevention, Medication error is defined as “any

preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing, order communication, product labeling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use”

The above definition indicates that the medication errors can happen anywhere

**Undesirable or unintended outcomes may include adverse drug reaction, treatment failure, drug-drug interaction, or in extreme cases patient death.**





along the chain of process and hence are preventable at various levels. It also means that with due caution and vigilance, we can reduce the incidence of medication error and reduce the risk of patient harm.

### CHALLENGES OF MEDICATION ERROR

1. The prevalence estimation of medication error is difficult due to under reporting, varying definition and different classification system being employed in different regions across the world.
2. Due to lack of better indicators for healthcare delivery, medication errors, and patient reported cases of negligence, it is difficult to monitor and evaluate policy interventions
3. Pharmacovigilance practice which is to be done to identify cases of previously unreported adverse reaction after the drug is licensed to use is inadequate.
4. Over the counter prescriptions of drugs i.e. dispensing medicines without the prescription of licensed medical practitioner or healthcare provider. This is particularly a pertinent issue in developing countries giving rise to new forms of diseases like multi drug resistant

bacteria which are difficult to manage.

5. Poor enforcement of law regarding safe drug practices.
6. Substandard and counterfeit medicines- those medicines whose active ingredient or composition is not at par with the standard guidelines laid down by regulatory authorities. As they are relatively cheap it is often seen that they flood the markets of developing countries and harm the patient.

### SAFE MEDICINES AND UNIVERSAL HEALTH COVERAGE

World Health Organization says that “Universal health coverage (UHC) means that all people and communities can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship.”

Above stated definition of Universal

Health Coverage encompasses three broad and related objectives:

1. Equity in accessibility implying that sufficient quality healthcare services should be accessible to everyone without any regard to caste, creed, sex, religion, geography or income group.
2. Equity in affordability: The services available should be such that it does not expose the user to financial burden.
3. Comprehensive approach to healthcare: this means the entire spectrum of health and disease needs to be addressed instead of focusing on one aspect implying the importance of systematic and multidimensional approach in the health sector.

The concept of Universal Health Coverage traces its roots from WHO constitution of 1948 declaring health as a fundamental right and further strengthened after the Alma Ata declaration in 1978.

**It also means that with due caution and vigilance, we can reduce the incidence of medication error and reduce the risk of patient harm.**

Medicines forms one of the major component of UHC as it accounts for over a quarter of total healthcare expenditures while in some low and middle income countries it comprises up to 67% of total healthcare expenditure. It has also been observed that more than half and sometimes up to 90% of expenditure incurred on medicines is out of pocket risking low and vulnerable group of people to the financial hardship on account of catastrophic health expenditure as per WHO's The World Medicine Situation Report 2011.

Hence in order to effectively realize the goal of UHC, there is a need to explicitly recognize the issues related to safe medication like counterfeit medicines, substandard drugs, growing and unregulated market for branded drugs, adverse reaction following medication error and drug safety. This will help the policymakers in realizing health benefits of medicines while maintaining financial viability of UHC at the same time.

**Eight Rights OF MEDICINES' SAFETY**

As most of medication errors are preventable at some or other level, Eight Rights of Medication administration were laid down to ensure drug safety and patient's benefits. These are:

1. Right Patient: Check whether the medicine is being administered

**The concept of Universal Health Coverage traces its roots from WHO constitution of 1948 declaring health as a fundamental right and further strengthened after the Alma Ata declaration in 1978.**

to the patient it is intended for by asking the patient's name and date of birth while matching with the unique identification number that has been allotted to the patient. Then to be doubly sure, some academicians emphasize to ask for the patient's history and match it with the record too.

- 2. Right Medication: this needs to be checked due to look alike sound alike nature of some medicines. It is done by checking that the medicines being administered are correct with the one being prescribed and ordered.
- 3. Right Dose: Too much or too little of dose of medicine can harm or cause no effect to the patient. Hence it needs to be checked that appropriate dose of medicine should be administered.
- 4. Right Route: Each medicine has a correct route for administration. If not administered via the correct route it may harm the patient. Hence if an injection needs to be given intramuscular then it should be given in the muscles only, intravenous

administration can prove to be lethal to the patient.

- 5. Right Time: this is to ensure efficacy of medicines and that no two medications prove inimical to each other. Some medicines have a particular time when they are most effective; hence they should be given at correct time and in correct order.
- 6. Right Documentation: Due to the changing shifts of doctors and nurses it is essential that the medicines are documented to ensure the continuity of care. Also it helps physician to record/observe if any bad reaction to drug occurs.
- 7. Right Reason: To ensure that the medicine is being given for sufficient reason that warrants the action of active ingredient for the disease to cure.
- 8. Right Response: Check whether the patient is responding to the medicine administered and the response is correct and intended without any signs and symptoms of unknown side effects.



**STRATEGIES TO PROMOTE SAFE MEDICATION**

1. There is a need to develop Information Management system to track medicine utilization, medicine inventory and stock keeping, medicine dispensing and medicines quality.
2. Indicator needs to be developed for Medicine availability, accessibility, affordability, quality and usage and their regular monitoring.
3. Developing participative policies and programs for the purpose of appropriate medicine use by patients, prescribers, dispensers and administrators.
4. Involvement of multiple stakeholders to identify and prevent medication error and ensure patient safety.
5. Developing and implementing standard operating procedures (SOPs) for medicines dosage and timing so that people who are engaged in administrating can remember them, check them and crosscheck if need be.
6. There should be standard rules for prescription writing to prevent errors related to illegible handwriting or misinterpretation by dispensers. Digitization of prescription process

and use of Electronic Health Records should be promoted and used as far as possible.

7. The most unused resource in healthcare sector is patient. There is a need to harness such potential by empowering patients. They should be informed about the medicines they are taking, reasons for taking them, its potential benefits and possible complications. They should be involve in their treatment procedure and be made aware what medicines look like and how often they are to take them. It is the right of the patient to know about their medications and make an informed decision at every step of their treatment.
8. For high risk medicines and look alike sound alike medicines there should be special procedures and written protocols to warn the personnel.

**WAY FORWARD**

Healthcare organizations and persons involved in providing healthcare needs to work in tandem with the civil society in order to make patient safety their

aim. There should be involvement of non-governmental organizations to spread awareness about patient's rights, patient's safety and medication error. They should work with government in

policy formulation, implementation and monitoring. Measures should be taken to encourage reporting and analysis of medication errors with development of well understood safety plans and interdisciplinary training programs.

**CONCLUSION**

It has been confirmed time and again that major brunt of unsafe medicines are borne by the poor and vulnerable group. Due to unavailability, high cost and inaccessibility of quality medicines, such groups has to resort to low quality unsafe medicines. Hence there is a need of active involvement of all stakeholders: payers, facility providers, dispensers, administrators, local and multinational pharmaceutical industries, prescribers, consumers and regulators, while keeping their converging and competing interests in consideration. By the use of evidence-based and such multidimensional approach we can be able to achieve effective, equitable and affordable pharmaceutical outcomes and reach towards our common goal of Health for All.

**Dr. Nupur Garg** has done her graduation in Homeopathy and her Post graduation in Health Management. She is an advocator of patient safety and has keen interest in Research and Public Health.

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# India's navigation towards automated healthcare

■ Written by Dr. Geetika Ahuja



Coronavirus has invaded our lives, and we have suddenly realized that we need every essential service at our doorstep, the very fundamental being the healthcare services. We badly need less people in the hospitals primarily to follow the social distancing norms; furthermore preventing unnecessary exposures to already admitted/ visiting patients with severe health conditions, people with general illnesses and more so, frontline healthcare workers be it doctors, nurses, ambulance drivers, hospital cleaning staff etc. Large scale community transmission in India has made us contemplate about the scarcity of healthcare professionals, medical equipment for life and death situations, quarantine facilities and a robust healthcare system for rural/ remote areas. To combat this situation, a futuristic approach which is now a reality has emerged as a life-saver, Virtual Healthcare. It is a convenient and safe system for patients who are home quarantined because of coronavirus, or other immunocompromised patients and those who need a regular follow up with the doctors.

Theoretically, Virtual Healthcare can be understood as the interaction between patient and doctor through the integration of electronically collected, compiled and transferred health information/ data, facilitated by decision support analysis. This is achieved through various forms of communication and information technologies, with the final aim of delivering maximum quality of patient care for prevention, diagnosis and treatment of a health condition. WHO termed this process Telemedicine, which later evolved into Digital Healthcare and now Virtual Healthcare. One step forward to this is Automated Healthcare, but discussing it is out of scope of this article.

Indian digital healthcare has been visualized as a prime candidate for investment since 2015. With government

initiatives such as Digital India, Aadhar, Ayushman Bharat Pradhan Mantri Jan Arogya Yojana, along with innovation of the private sector in creation of mobile apps, telemedicine and innovation centers, have largely carved path for virtual healthcare startups. In fact, in 2018-19 alone Indian medical technology corporations attracted \$571 million in investment. The two major factors responsible for the transformation of the existing healthcare system in India are primarily the doctor patient ratio which is as low as 1:1404 and secondly, the increase in the use of smartphones and technology-friendly population.

Virtual healthcare facilitated by digitalization has emerged mostly via mHealth (mobile health) platforms. The concept of mHealth is being accepted

**To combat this situation, a futuristic approach which is now a reality has emerged as a life-saver, Virtual Healthcare.**



by and large in India, with 68% doctors recommending it and 59% patients using it. Various medtech corporates such as mfine, DoctorInsta, DayToDay Health to name a few, have evolved as user friendly apps with systematic/ sophisticated steps for doctor consultation. The patient needs to go to the particular app, enter his/her symptoms and choose the doctor according to their specific requirement. Depending on the availability of the doctor, the patient could either have a video chat at the same time or book an appointment for later. Prescriptions are prepared simultaneously and are available right after the call. These apps use Artificial Intelligence to assist human doctors. The algorithms collect patient's medical history, lifestyle and other relevant information. Assembling all this data, a case sheet is prepared for the doctor, even suggesting options for diagnosis and templates for treatment plans. Furthermore, reminders or alarms can also be set for follow-ups, adherence to the medicine routine by the patient etc. On the other hand, if the symptoms are severe and the doctor feels an urgent need to physically examine the patient, the app suggests to do that as well. In addition to General Physicians, the "health apps" have

## WHO termed this process Telemedicine, which later evolved into Digital Healthcare and now Virtual Healthcare.

a provision for specialists as well such as cardiology, gastroenterology, fertility etc. Considering the success of virtual healthcare system during the pandemic, several medical institutions such as Fortis hopes to continue with them in the post COVID era as well.

With ~65% Indian population being rural, and the doctor patient ratio there being 1:10926 (National Health Profile 2019) makes it all the more urgent to expand health outreach and set up virtual e-clinics. To test the feasibility and acceptance of virtual primary health care, a 2019 study was conducted with a set up of 20 such centers in Uttar Pradesh, where 800 consultations were made in 6 months with mean patient age of 56 +/- 1.56 years. Such results are promising and depict an overall acceptance of the concept. In dire times of the current pandemic, many such centers have been established all through the country, and are providing mildly-symptomatic corona positive patients

with primary care.

Expanding on the Indian government's initiatives for systematic, smooth and citizen-friendly schemes, in June 2020, the Insurance Regulatory and Development Authority of India (IRDAI) has advised the insurers to allow claim settlement for telemedicine wherever medical consultation is allowed. This is supremely beneficial for medical insurance policy holders who may prefer consulting their physicians online or telephonically to avoid going out of their homes to high-risk areas as medical institutions, or are home quarantined.

Another very important area of virtual healthcare is Mental Health. Amid the pandemic, there has been a rise in depression, panic attacks and suicides due to financial and personal burdens. As the numbers of coronavirus positive cases in India are increasing at an exponential speed reaching the 4 million mark, so are

**Expanding on the Indian government's initiatives for systematic, smooth and citizen-friendly schemes, in June 2020, the Insurance Regulatory and Development Authority of India (IRDAI) has advised the insurers to allow claim settlement for telemedicine wherever medical consultation is allowed.**

anxiety, stress and fear. Ministry of Family Health & Welfare shared an article stating how it is most important to keep ourselves stress-free. Easier said than done, by April alone, Institute of Mental Health in Chennai had counseled over 3000 people over telephone and video chats, suffering from mental issues which were aggravated by the lockdown.

Virtual Healthcare is a symbiotic relationship between Medicine and Information and Communication Technologies. Various laws related to each are clearly defined by the Indian government, but a combined legislation is missing. Virtual healthcare/ telemedicine requires exchange of Sensitive Personal Data or Information (SPDI), and the IT Act contains provisions safeguarding the security and privacy of information exchanged using 'means' recognized under the IT Act. Hence all the medtech companies registered as technology providers are governed by the IT Act. Now, when a corporate body collects, stores and shares this data with a medical institution for further processing, The Data Protection Rules come into action. One of the primary requirements of the Data Protection Rules is "informed consent" of the patient that his/her medical history or sensitive reports will be transferred directly to the

doctor/ medical institution/ hospital. If circumstances are such that the SPDI has to be shared with a third party, which could be a diagnostic lab or another doctor of same or different specialty etc., the owner of the SPDI (i.e. the patient) needs to give permission. In most of the cases of MedTech corporations, they only act as an intermediary body which collects, stores, processes and transfers information, all through computer based algorithms without adding any personal bias or judgements. They act as service providers for interaction between patients and doctors. Such corporate bodies which act out of contractual obligations, are not required to obtain consent every single time as directed by Ministry of Communications and Information Technology (2013). In certain cases where there has been a negligence on part of the intermediary, breach in the contractual obligation such as leaking of patient information to a third party without knowledge of the patient or the concerned doctor, does the Indian Penal Code 1860 (IPC) come into action. Since virtual healthcare and telemedicine are becoming the new normal, there is need for regular monitoring on the privacy policies and the quality of healthcare being provided. Moreover, India needs defined legislations for the practice of virtual healthcare.

Pandemic preparedness of a country is measured by Global Health Security Index, where US tops the list, followed by UK, Brazil, Italy and India at 57th position! Furthermore, only 1.6% of India's GDP is dedicated to the health sector, which contrasts to a whopping 10.9% in Japan, 8.5% in US, 8.1% in South Korea followed by developing nations between 2% to about 7%. Strategically we are lagging behind many nations, but we have an added advantage of being better prepared intrinsically. Most of our population lives in natural conditions in villages; the food we consume throughout the year is locally produced and seasonally consumed in most areas; we are exposed to diverse climatic conditions during the six 'ritus' or seasons. All these factors have unknowingly made us more resistant to novel circumstances such as COVID-19. But this does not mean that we can be carefree nation in regard to coronavirus. Pandemic like coronavirus does not differentiate between countries and can damage the healthcare and economic of the country for years. Virtual healthcare is a promising stepping stone for advanced automated healthcare.

**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.



# ISSUES

## COVID-19 Caregivers Burnout and Compassion Fatigue

■ Written by Kashish Behl



Dr XYZ, Professor and Head of Department of Infectious Diseases, Government Medical College, Kottayam shared in one of the recent interviews that how his time at work is unpredictable. “After the Corona pandemic, there are days I have gone home at midnight. But that does not mean that I am not working when I am not in the hospital. I get calls from my juniors asking doubts or to update me on the condition of my patients.”

To add perspective to this doctor’s experience, an article in the European Respiratory Journal mentioned how doctors are subjected to various competing

- a) duty to treat patients
- b) duty to take care of themselves from the risk
- c) duty towards one’s own family
- d) duty towards fellow colleagues who need to be supported and lastly
- e) duty towards larger society and nation

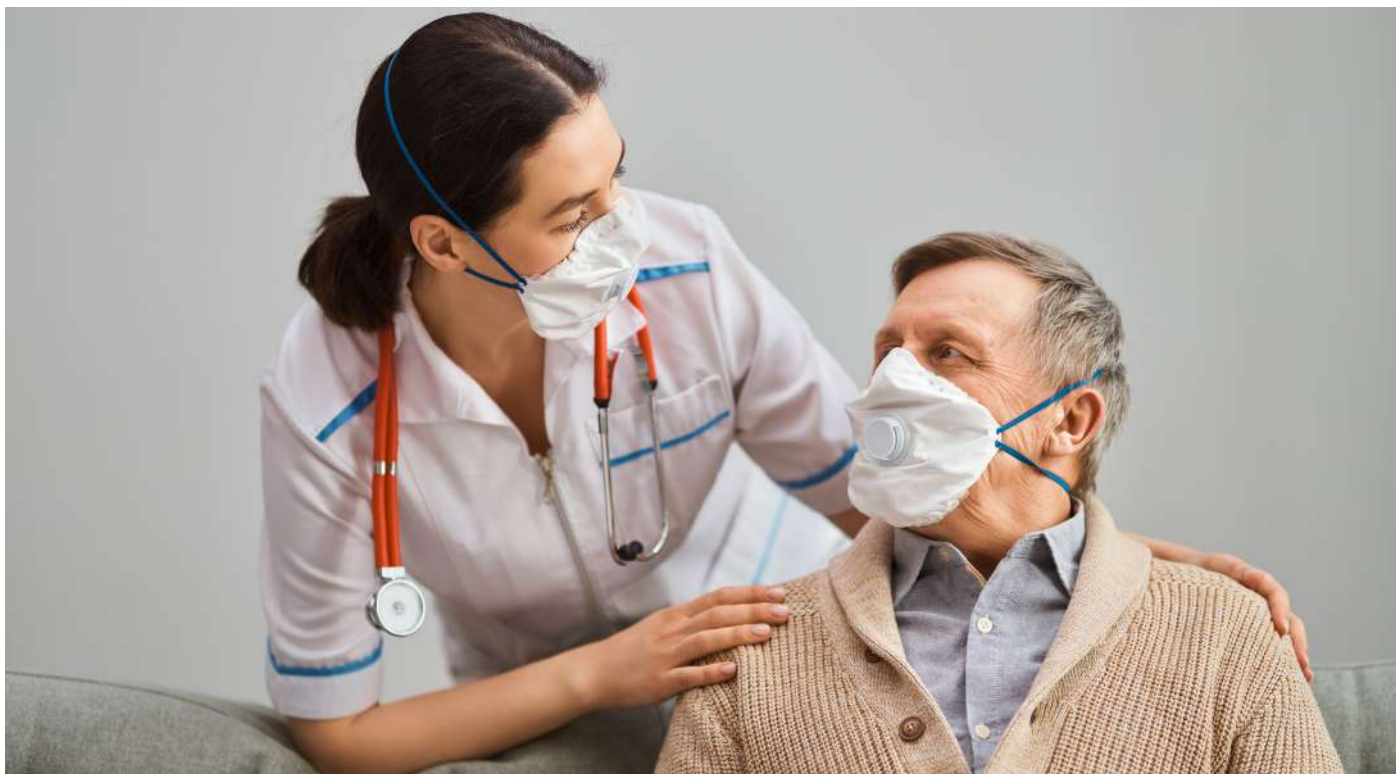
There’s a reason why these doctors are called warriors. COVID-19 pandemic has left the world to face an unprecedented crisis. Medical frontline warriors such as nursing staff and doctors are already receiving endless appreciation and gratitude from the citizens. No doubt, their role as caregivers is crucial and of

utmost importance to win this battle against corona virus.

Any medical attention requires full cooperation and dedication of caregivers. Caregivers aren’t just doctors here, but everyone who is involved in the process of taking care of the patients. Along with dedication and expertise, one which improves the quality of caregiving is: empathy. Empathy put in simpler words mean ‘putting yourself in someone else’s shoes’. This is also called as perspective provider can feel what the other person is going through.

Expression of empathy by the caregiver becomes a crucial factor in the relationship of the caregiver and cared. Presence and expression of empathy helps the patient feel understood and cared for. Research has shown that high empathetic feelings in caregivers have contributed to speedy

**Medical frontline warriors such as nursing staff and doctors are already receiving endless appreciation and gratitude from the citizens.**



recovery for the patients. Additionally, there are numerous studies which talk about the importance of empathy in nursing practice. Given the nature of COVID-19, which has become a dreaded disease today, anyone suffering through this would appreciate and welcome some bit of empathy wherein they feel understood and cared for.

During this pandemic, where the number of cases are surging every day, it is natural for medical frontline warriors to feel the fatigue they are feeling. However, this fatigue isn't just the physical exhaustion but also what we call 'caregiver burnout'. This simply means that after about four months of working day in and out, these warriors are likely to experience a state of physical, emotional and mental exhaustion which is the burnout stage.

Prolonged exposure to such a burnout stage could be harmful. One could witness a change in attitude of these caregivers towards the patients wherein positive and caring attitude could change into negative and unconcerned attitude. This also has chances to turn into 'compassion fatigue'. Compassion Fatigue is a state where the person becomes tired and exhausted after expressing prolonged and continuous compassion/empathy towards someone. What is essential to note here is, this could

## Fatigue isn't just the physical exhaustion but also what we call 'caregiver burnout'.

affect all three kinds of empathy: behavioural, cognitive and affective. Hence, expressing empathy, perspective taking and feeling what others are feeling, all of this gets impacted.

Moreover, they could also show other signs of fatigue and burnout such as lack of energy, losing interest, frequent aches, disturbed sleep/appetite, irritability and mood swings amongst others.

This state of compassion fatigue and burnout in frontline medical caregivers calls for attention. Taking care of their mental health and well-being is essential, both for them and us. Some of the techniques which they can adopt to take care of their mental health are as follow-

- Practicing Meditation/Yoga/Mindfulness
- Having a healthy nutritious diet
- Maintain a healthy sleep schedule
- Talking to someone about their feelings
- Take breaks whenever possible

Venting out feelings sometimes does

magic. All the people reading this, if you know a frontline warrior who is working day in and out relentlessly, just talk to them. Ask them 'how are they feeling?' Listen to them talk about their day and emotions. Distract them from COVID related conversations and remind them every single day that they are cared for too.

**Dear COVID-19 warriors,**

*Thank you for all the sacrifices you are making. Thank you for your time, determination and resilience during this time. **You are saving lives! You are making the world a safer place.** We are with you.*

**Kashish Behl**, (M.Sc Clinical Psychology) is a psychologist currently 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.

# Meeting the Demands of Non-COVID Patients Amidst the Surge of COVID-19 Pandemic – A Concept!

■ Written by Hamza Perwaiz

COVID-19 has already taken the world by storm. There are 16.5 million cases worldwide & 1.48 million cases just in India as of 28th July, 2020. The death toll has risen up to 655,000 worldwide & 33,425 in India. As the number of cases is increasing in each and every state of India, the state governments have issued the order of converting every healthcare facility into COVID dedicated facility. During this wave of COVID-19 pandemic, the hospitals across the country are diverting resources from routine inpatient critical care and outpatient clinics to meet the surge in demand. Because of the resulting resource constraints and the fear of infection, non-Covid patients are being referred as non-urgent and hence are excluded from any OP visits, diagnostics, evaluations, surgeries and therapeutics.

## The Problem

Now, the exclusion of non-Covid patients from any diagnosis and treatment is important for the safety of the patients and to minimize cross infections, but this exclusion of non-Covid patients will further lead to later hospitalizations requiring higher levels of care and longer length of stay. It will also lead to increased hospital readmission after the pandemic which will further strain the hospital's inpatient capacity. So, in my opinion it's very important to not overlook the non-Covid patients. A strategy must be prepared such that it would not increase the risk of cross infection while serving both the COVID and non-Covid patients at the same time.



## A Conceptual Solution

Below I will suggest a concept which the state government could implement in its various hospitals so that they can cater to the need of both Covid and non-Covid patients. For this concept to work, all the healthcare facilities in the city such as hospitals, clinics, nursing homes etc should act & work together.

All the healthcare facility present in a city

should be converted into 3 entities:

- OPD centres– with diagnostic services
- Hospitals – with just IP services
- Post-Acute Care facility

Please note that all the above 3 facilities should not be in a single building & they should be as a different identity. The number of these entities can be according to the community need.

**During this wave of COVID-19 pandemic, the hospitals across the country are diverting resources from routine inpatient critical care and outpatient clinics to meet the surge in demand.**

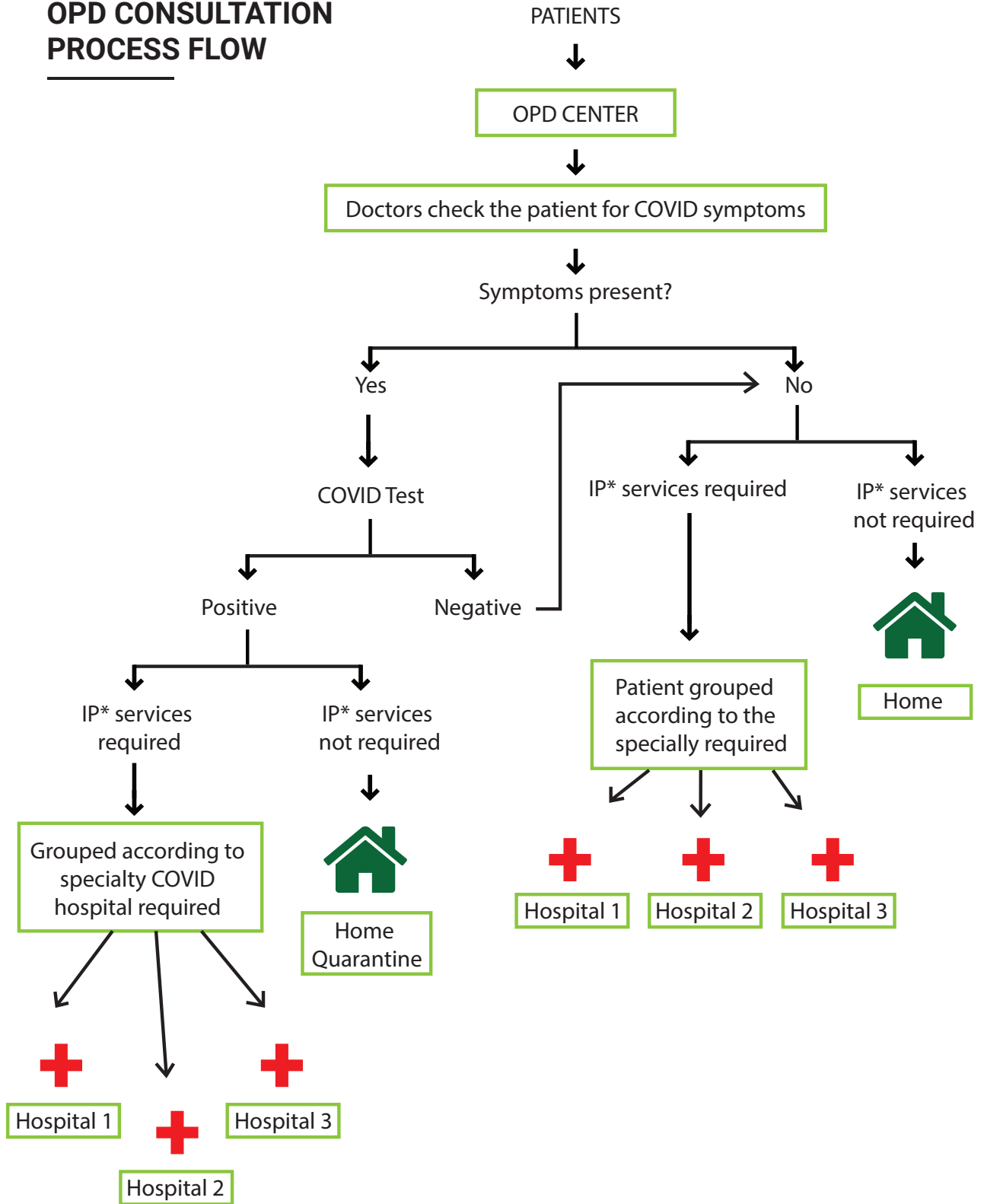


1. **OPD Centres-** The job of OPD centres (Figure 1) will be to triage Covid as well as non-Covid patients according to the need of availing IP services. Only those patients who are need of strict surveillance and IP services will be called for admission in a hospital.

Tele-consultation should be done to minimize the cross infection. If the patient can't access the doctors through tele-communication, then he can visit the OPD centre for consultation where all the protocols related to social distancing & minimizing cross

infection will be followed. A patient will be given an official letter duly signed by the doctor (soft copy/hard copy) at the OPD Centre for availing the IP services. This will prevent the patient to directly get admitted in a hospital without the doctor's consent.

## OPD CONSULTATION PROCESS FLOW



\*IP - In Patient

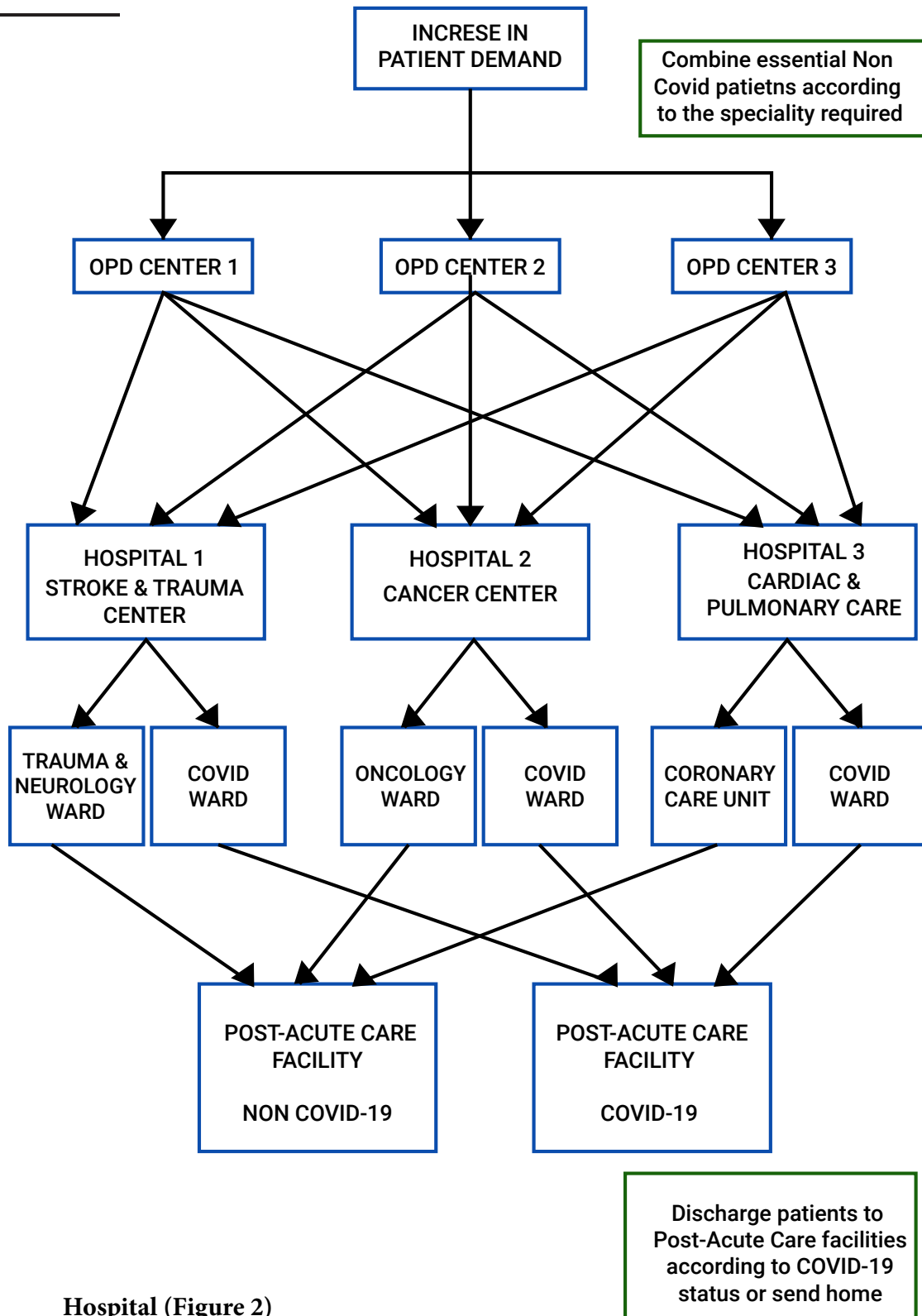
OPD Centre (Figure 1)

2. **Hospitals-** Those who are in need of IP services after getting diagnosed by the OPD centre will be directed to different hospitals (Figure 2) according to the symptoms or disease. Each hospital will be having two types of wards: one for Covid patients & one for non-Covid patients. These wards should be physically well separated.

The traffic flow for these two wards will be completely separated as well. Staffs serving for Covid patients won't be allowed to enter the non-Covid ward zone and vice versa. All the safety protocols to minimize the cross infection should be followed. Suppose there are 3 hospitals in a city. All the three hospitals will be given the status of

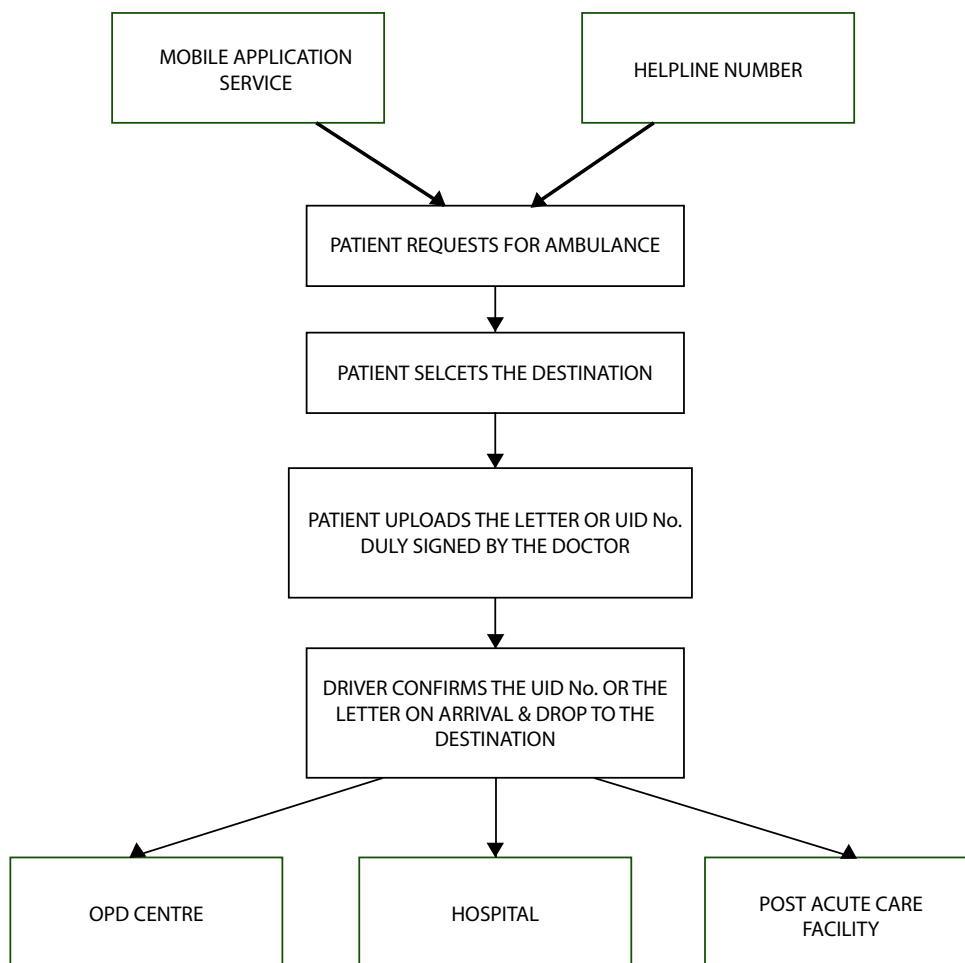
Cancer Centre, Cardiac & Pulmonary Care Centre and Stroke & Trauma Centre respectively. Each hospital will be acting as a super speciality hospital. Now the patients which were triaged at the OPD Centre will be grouped according to the speciality services required and then they will be sent to the respective hospital.

**CONCEPTUAL WORKFLOW DURING THE PANDEMIC**



Hospital (Figure 2)

# AMBULANCE SERVICE



**Ambulance Services (Figure 3)**

**3. Post-acute care facility-** There will be two types of post-acute care facility, one dedicated for the Covid patients & another for non-COVID patients. Patients will be discharged from the hospital to these post-acute care facilities according their stability status, so that more patients can be accommodated to the hospitals who need the IP services. Sending patients to these specialized post-acute care facilities will facilitate discharge planning, improving patient flow out of the hospital for both Covid and non-Covid patients.

**4. Centralized Ambulance Service-** Meanwhile, all the healthcare facilities should collaborate with each other to form a Centralized Ambulance Service (Figure 3) just like the concept of OLA & UBER. There are already centralized ambulance services running in which the users can book an ambulance through a mobile application, such as ‘Siren Ambulance’ & ‘Meddco Ambulance’. This will increase the accessibility of the patients to different OPD Centres

& Hospitals. Also, a central helpline number should be made available to the community in which a person can call and arrange an ambulance, apart from mobile application service. If the demand of the ambulance services couldn't be met with the current number of ambulances, the centralized service can hire different vehicles suitable to be equipped with ambulatory services during the pandemic. The process for running Centralized Ambulance Services should be as follows:

- The user requests the ambulance service through a mobile application or a centralized helpline number.
- The user chooses the destination location for either OPD Centre or a Hospital.
- The user uploads the letter given by the doctor or enters the UID No. stated in the letter. In case of availing ambulance services for OPD Centres, the letter or UID No. is not required.
- When the ambulance arrives, the driver confirms the UID No. in

the letter and drop the user to the desired location.

- Those who can arrange their own transportation services, are free to do so.

So, the idea behind this concept is to group Covid & non-Covid patients according to their clinical conditions. The above concept may be very challenging and may surface many loopholes while implementing. But now its high time to think what should be done to cover the needs of both Covid as well as non-Covid patients to relieve future strains at the Emergency department of the hospital. Implementing such concepts could allow us to be better prepared for future waves of the pandemic.

**Hamza Perwaiz** is an aspiring MBA (Hospital & Health Management) student in Indian Institute of Health Management Research, Jaipur. He has done his internships with reputed hospitals of Kolkata



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# Epilepsy is a curse Myth or Reality

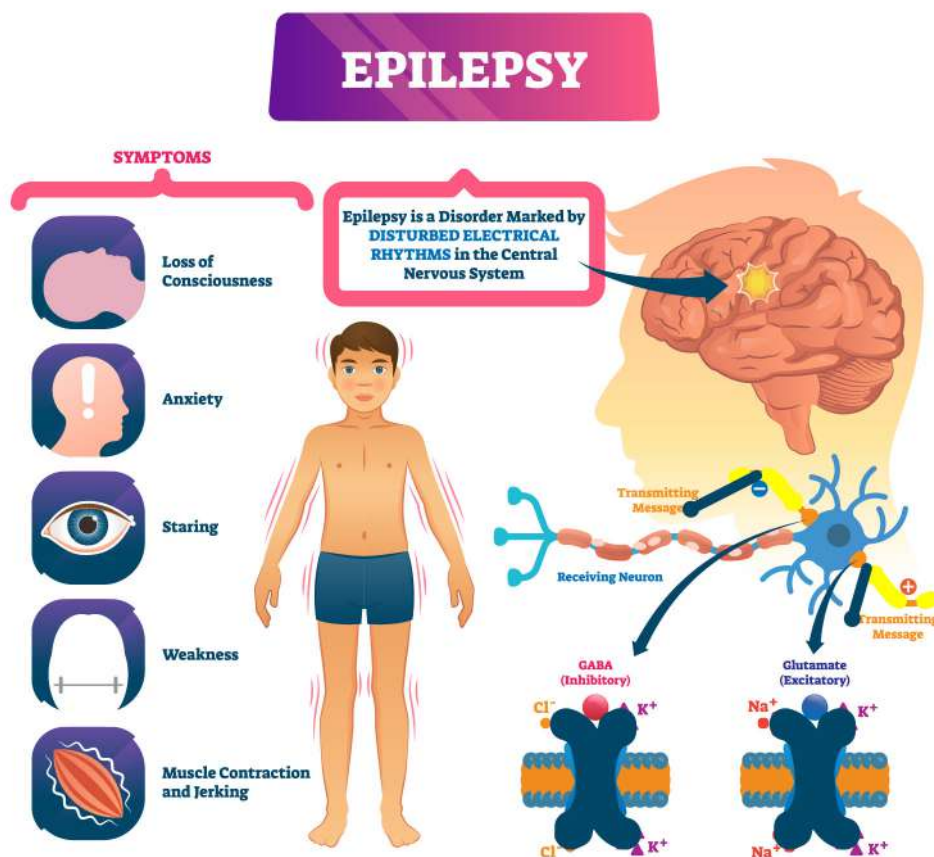
■ Written by Kusumika Krori Dutta

**E**pilepsy commonly known as fits (also known as seizure), is one of the most common (almost 70 million people suffers worldwide) and old disease. Its full description even available in the literature of the oldest (400BC) system of medicine in the world. This is a very unique disorder, as its occurrence or recurrence is highly unpredictable. In Ayurveda it is known as Apasmara: Apa, meaning negation or loss of; Smara, meaning recollection or consciousness. Hence, during the early stage of civilization, epilepsy was attributed to the temporary loss of soul from the body. People used to think, spirit possession is the reason of getting fits. It is considered as curse, so, people with epilepsy were feared and subjected to social stigma, cast out of communities or punished for their

seizure and tried to cure them based on their religious procedure.

It is really very unfortunate that in even 21st century, in spite of so much of advancement in medical diagnosis and treatment, literacy percentage and awareness increased among general public, still the mental block towards this disease exist, not only with villagers but also among well-educated urban class of people. Still people consider this as a curse, marriages are broken if the bride had experienced an episode and doesn't consolidate the fact that it is her first time or may be last time. People feel uncomfortable to talk about it in public because of the fear of social exclusion as a result of negative attitudes of others towards people with epilepsy. So, they try

to hide their history while going for new relationship. Kids feel insecure in school and colleges, in spite being super talented, they denied to be part of many activities, like sports, etc sometimes they themselves prefer to stay alone run away from all activities because of the tension at the back of their mind: What if, they get an attack? How people will react? Will anyone consider them as friend? Everyone might laugh! Regrettably, till date if in public place someone gets attack (as epilepsy resulting from the unpredictability of seizure) then viewers, instead of helping the person, they prefer to take photos and videos to upload in social media, unknown to the fact that, it may happen to anyone, any time, in any age and even to them. Still a group of people think, it is the punishment from God for their



PERSONA  
THEME  
TRENDS  
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bad karma in this birth or previous birth, some categories uses this as their business by saying God possession and can narrate future of anyone.

### Causes of Epilepsy

In this article, the causes of epilepsy, some prevention tips and how to help a person when they are undergoing an attack has been focussed. The causes of epilepsy mainly classified as genetic (idiopathic), unknown (cryptogenic), and symptomatic. Symptomatic again subdivided as infectious and non-infectious as shown below. Seizure are the sequel of many infections. Malnutrition, poor personal and environmental hygiene, and overcrowding are contributing factors which lower the immunity system and provide ample breeding ground for infective agents, particularly among lower socioeconomic groups in developing nations. Malaria, neurocysticercosis and HIV infection with its accompanying opportunistic infections can present as seizures or result in epilepsy as sequelae to the acute condition.

The precaution for infectious causes may not possible but precaution can be taken to prevent in case of non-infective caused seizure. For genetic factors, the most important component is the high prevalence of consanguineous marriages. In medical research, consanguineous marriage is defined as marriage with a person who is biologically related as second cousin or closer. Clinical studies in Asia have shown a significantly higher rate of consanguinity among parents and family members of epilepsy patients for both cryptogenic and idiopathic epilepsies. This type of marriages not only increase risk of epilepsy but it causes many other diseases like diabetes, asthma etc., and can be avoided easily.

The second cause in this category is traumatic brain injuries, where head trauma, head injury and stroke are leading causes of epilepsy. With the recent rapid economic development in many of the developing countries, there is a rapid increase in the traffic volume, often accompanied by a lag in the proper traffic regulatory systems, with a resultant

## In Ayurveda it is known as Apasmara: Apa, meaning negation or loss of Smara, meaning recollection or consciousness.

dramatic increase in traumatic brain injury (TBI) occurrence. Head injury due to accidents very common in two wheelers without helmet, is one of the leading causes of epilepsy. So, wearing seatbelt in case of 4 wheelers, helmet in case of two wheelers, not getting hyper in traffic jams can help to a certain extent to avoid TBI.

The third cause is perinatal trauma including intrauterine infection, birth asphyxia and postnatal problems such as hypoglycaemia, head injury, meningitis and haemorrhagic disease of the newborn are the risk factors in childhood epilepsies. Proper care of mother and following certain restrictions (like stop smoking, avoid consumption of alcohol, eating healthy foods, taking proper timely medicines for pre-existing disease, etc.) during pregnancy and taking care of both mother and child after delivery can control this type to a certain extent.

The fourth cause is cerebrovascular diseases, which is likely related to continuing aging population, and a high prevalence of smoking and hypertension. Young stroke is relatively more common in the non-Western population and in addition to that, some infection-related strokes such as tuberculosis, bacterial endocarditis, pregnancy related stroke such as cerebral venous thrombosis, may be more common.

The fifth cause is heavy consumption of alcohol, which leads to a higher incidence of alcohol related seizures such as alcohol withdrawal seizures and posttraumatic epilepsy.

The sixth cause is external stimulus which is known as reflex epilepsies. Light, reading, some kind of music, some eatable, some visuals, some frequencies provoke this type. A few reflex epilepsies were specific to (e.g. Pokemon epilepsy in Japan) or predominant (e.g. hot water

epilepsy in India). Several tests indicated that Pokemon-related symptoms are both pattern sensitive as well as photic (chromatic) sensitive. In this pandemic situation all over the world, kids are full time with electronic gadgets either to attend classes or to watch something, it should be always they should not watch anything in lower intensity also without background light. Parents should keep an eye on what they are watching. Too much of pressure on studies without any game and exercise can hamper mental and physical health of children. Need to make sure that, children must be relaxed and happy.

Whereas in case of hot water related epilepsy, seizure occurs typically when hot water with a temperature of 40-50°C was poured over the body or head, presented mostly as complex partial seizures with or without secondary generalization, common in southern part of India. Clinically, 60% could be controlled with antiepileptic medication, but some (16% to 38%) continued to have reflex seizures and developed non-reflex seizures. It is very important to do self-experimentations to understand which external stimulus actually are uncomfortable and try to avoid as much possible.

The seventh cause is Mah-jong, which is a traditional Chinese gambling game. Generalized tonic-clonic seizures occurred only after playing mah-jong for 30 minutes to 10 hrs. This type of seizures was not controlled with antiepileptic medications.

These are the major causes of epilepsy.

### Consequences of Epilepsy

In this section, mainly consequences of epilepsy have been discussed, keeping in mind that this can happen to anyone, anytime and any age. They are physical





consequences, Quality of life and the stigma of epilepsy, Neuropsychiatric consequences, Cognitive consequences, Naming epilepsy: Culturally specific perceptions of Epilepsy, Knowledge, attitude and practice towards epilepsy, the economic burden of epilepsy in China, etc.

Physical consequences include developmental disability, mental retardation, intellectual disability, hyperactivity, autism, learning disability, vision loss, hand apraxia, developmental abnormalities (cognitive, behavioural, emotional and motor), effect of epilepsy on pregnancy, mortality and Sudden Unexpected Death (SUDEP). Cerebral palsy is common in children with hypoxic-ischemic encephalopathy (HIE) and neurometabolic disorder, where seizure may be infrequent. Mortality due to epilepsy is a major concern. Patients with epilepsy have a mortality rate significantly higher than that of the general population. SUDEP is common phenomenon which is unexpected, witnessed or unwitnessed, non-traumatic, and non-drowning death of patient with epilepsy with or without evidence of seizure.

Epilepsy interferes with social functioning by limiting employment and educational opportunities and interpersonal relationships, can increase the risk of death. The impact of epilepsy is significant not only for the patients but it acts like curse to the whole family. Studies have suggested that the relations between seizures and depression or suicidal behaviour may be bidirectional, and both major depression and attempt to suicide increase the risk of developing seizures. Forced normalization and postictal psychosis may also contribute to suicidal behaviour.

**Management of Epilepsy**

Towards managing epilepsy, 1st and foremost important is appropriate diagnostic studies. In recent literature 20 different varieties of epilepsy present which are distinguished by the activities done by the patients during the episode of seizure. Electroencephalogram (EEG) is the most commonly used as diagnostic test with video monitoring and photic stimulation. Stereo EEG and magnetic resonance imaging (MRI) are also used in some of the cases. Many of the cases

EEG don't show prominent spikes for outpatient, because patient comes with a history of epilepsy but not suffering presently. So, diagnosis primarily depends on the narration by the attendee who have witnessed the activity during the seizure attack. Some of the cases about those who have experienced frequent seizure episodes mentioned about the use of ambulatory system for its continuous recording of EEG. Researchers worldwide working on EEG signals using different mathematical models, intelligent analysis techniques like machine learning, deep learning etc, aim to aid diagnostic procedure.

Clinician mainly prescribe Anti-Seizure Drugs (ASDs) and surgical intervention is also the treatment of choice in patients with refractory lesioned focal epilepsy. Some of the refractory cases who are not candidate for surgical treatment or are refractory to surgical treatment for then, Vagus Nerve Stimulation (VNS) is used as line of treatment. It is effective in the treatment of epilepsy patients with partial seizure, epileptic encephalopathies, and other type of refractory epilepsy. Because of its high cost, invasiveness, in availability,

this treatment is not widely used. But, research continues for transcutaneous Vagus Nerve Stimulation (tVNS) which is a non-invasive therapeutic alternative. Towards that, prior studies and few clinical trials are on for some models/ proto types.

The ketogenic diet is a good alternative treatment in the management of refractory epilepsy in paediatric as well as adults. Quality of life(QOL) questionnaires are a good tool to conduct population- based assessments in people with epilepsy. QOL questionnaires consider physical function, social function, emotional or mental state, burden of symptoms and sense of wellbeing, among other aspects.

For developing Nations, a team of 20 multidisciplinary professionals and healthcare workers provides the gamut of services including a range of physical, occupational, and psychological therapies as well as counselling and advocacy services. The epilepsy service has its own website, [www.neurokrish.com/epicare](http://www.neurokrish.com/epicare) which provides information and education tailored to the Indian setting.

According to statistics nearly 1 in 3 patients continue to have seizures in spite of ASDs, and others suffer from medication side effects. Ayurvedic

## Ayurveda and Yoga techniques may improve physical and mental health.

management of epilepsy and yoga can be the best alternative for those. But

due to lack of number of patients in Ayurvedic research studies, it is not popular like allopathy treatments. Studies have shown that the practice of yoga acts stimulating the central nervous system of our brain and decrease cortisol level, control blood pressure, promotes sleep by increasing melatonin production and stimulate the immune system. Ayurveda and Yoga techniques may improve physical and mental health. To make it more useful, more epileptic cases can try this alternative along with allopathy medication (to start with), as it may help to reduce the side effects of ASDs.

Last but not the least, let's understand how to help persons who are in our vicinity, suffering from seizure. We should definitely record the activities not to post in social media but to share with the patient such that it can help clinician for

correct diagnosis. Provide some object below head such and make sure no sharp objects should be around the person which can hurt. Normally episode last for

few seconds or few minutes but if it's more than 5 minutes then medical help should be taken. Remember it's a reality and can happen to us as well, because the common causative factors are dietary indiscretions, stressful lifestyle, tension, irregular sleep patten, lowered vitality, etc.

Special thanks to Dr. R. Srinivas, Senior Neurologist, RMC&MH, Bangalore, for his encouragement and support to realize the fact that , Epilepsy is a reality not a curse.

**Kusumika Krori Dutta**, Assistant Professor, Department of Electrical and Electronics Engineering, M. S. Ramaiah Institute of Technology, Bangalore.



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# COVID-19 and Virtual Existence

■ Written by Nishan Chakrabartty



In the times of pandemic, human beings have always found a way to be resilient against the invisible threat. Our biological vulnerability is exposed and we find ourselves in a dire situation calling for extreme caution and radical changes in our lifestyle. We try to adapt to these sudden changes and new indoctrinations that seems to govern our existence. Amidst all of this, we find a way to survive all the while dealing with the ensuing problems of pandemic where we cease to be social animals. Throughout the course of history, humans have lived through many pandemics like the Plague of Justinian (541-549 C.E.), the Black Death(1347-1351), and Spanish flu (1918-1920) which have taken numerous lives. It is important to note here that the historical periods when the pandemics occurred have governed our responses to the threat we faced. In current situation, we face a pandemic in the age of internet. The

global village is damned by a coronavirus that has brought our lives to a sudden and unprecedented standstill.

Come November, it will be a year since the world saw the rise of another pandemic-an attack by a highly infectious virus but with comparatively lower fatality rate. Stringent lockdowns, meticulous hygiene routines seems to be the only way to bear the brunt of the invisible storm. This is a simulation gone real- a mobile game namely Plague Inc. initially released in the year 2012, is a real-time strategy game that enables

the player to create and evolve their own pathogen to infect the world population. The way to win is infect and wipe out the entire population before a vaccine or a cure is developed. After 8 years from its inception, we are actually living in that particular simulation with the only difference being that we are the victims and not the player. This simulated reality has brought forth numerous challenges like coping with the stress, ensuring a stable mental health, maintaining a sustainable financial conditions with the looming threat of job uncertainty. Lack

**Throughout the course of history, humans have lived through many pandemics like the Plague of Justinian (541-549 C.E.), the Black Death(1347-1351), and Spanish flu (1918-1920) which have taken numerous lives.**



of social and physical interaction amidst the pandemic has jeopardised our holistic well-being.

Technology has somewhat alleviated these symptoms as we could actually connect with others albeit virtually. On the other hand, the virtual interactions be it personal or work space, have pushed us deeper into this simulation where society is an interconnection of dots demarcating our position in this virtual web. Confined within the walls of our home, this pandemic has curtailed the boundaries of our social sphere where anxiety, depression and paranoia can conveniently set in. The possible way to maintain oneself in this situation, is to follow a routine, exercise and eat healthy. Many studies have followed up on this aspect of maintaining one's health in these times, such that we come out unscathed once the ordeal is over. As more research is being conducted on the virus, its mode of transmission and effects, we face a bombardment of information having the potential to confuse us in matters of what to believe and what to follow. In this ever changing landscape of information exchange, we need to maintain our personal hygiene because this is the one common factor in all the data we have received and analysed so far in terms of protecting ourselves.

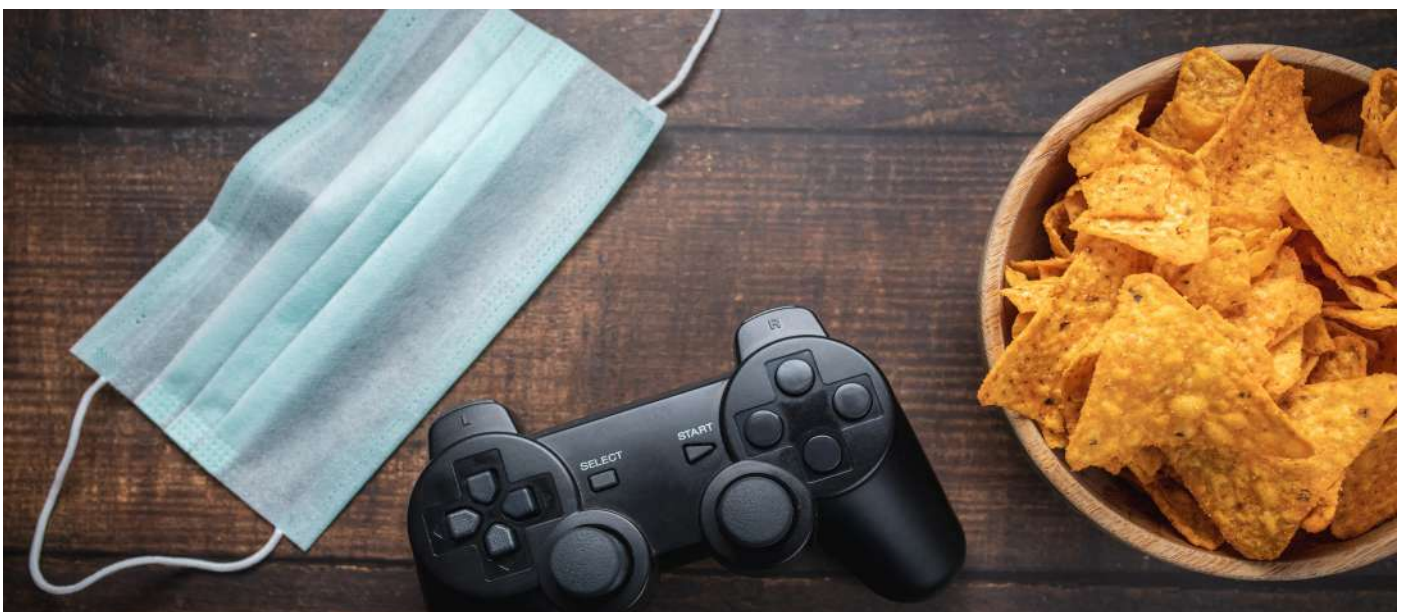
A new term has been doing the rounds especially after the lockdown has been relaxed particularly in the case of India. Behavioural fatigue is something that is on the rise. People are tired of

**On the other hand, the virtual interactions be it personal or work space, have pushed us deeper into this simulation where society is an interconnection of dots demarcating our position in this virtual web.**

maintaining the norms of the 'new normal' and hence tend to get lackadaisical while following the rules of personal hygiene and social distancing. This has dangerous implications as we are currently seeing a surge in the case load of Delhi especially after a month of flattening the growth rate of new cases. This surge has been attributed to behavioural fatigue and a sense of complacency amongst individuals. The pandemic is here to linger on further until a vaccine is developed. The process of vaccine development is extremely rigorous and we shouldn't expect miracles in this particular process. As long as we are in this pandemic era, we have to follow the rules diligently so that we can reduce the risk of infection drastically and actually contribute to the resilience against the virus. This conflict between humans and single celled pathogens have been since time immemorial but with the advancement of scientific knowledge we actually stand a good chance against such contingent moment in the history of mankind. We do not face an existential threat with COVID-19 but surely this pandemic has made us re-think about what it takes to be human in a world dominated by machines. It is rather strange to think

that our conflict with biological enemies actually help us in revising our roles as human beings in the enigma of the virtual world. We need to get a grip on ourselves and navigate conscientiously through the troubles induced by this virus. In this moment, we can actually strive to find out what makes us happy unaltered by the vices of unabashed desire. In this moment, people should be empathetic and be concerned without the filter of social ambitions. After all, as Michel Foucault predicted, we finally realise that we are docile bodies institutionalised in our homes having to go through the process yet again as the pandemic is upon us. The simulation of Plague Inc. is to stay, but as history indicates we can come out stronger than before as always.

**Nishan Chakrabarty** is currently working in NCERT at the Department of Education in Arts and Aesthetics as a Project fellow in developing teacher education books in the pedagogy of Art Integrated Learning. He has a masters degree from JNU in Arts and Aesthetics specialising in cinema and performance studies. His interest lies in the study of social anthropology via the lens of performance studies.



# ► RESEARCH

## Cybersecurity in healthcare industry

■ Written by Soni Pandey



Because of the Ongoing covid-19 pandemic with more than 1.5 million cases, the fast adapting of Information Technology (IT) in the Health Sector combined with developing reports of ransomware, and hacking has focused on cybersecurity in health care services. Cybersecurity episodes are a developing danger to the HealthCare industry when all is said and done and medical devices specifically. Be that as it may, this is actually quite difficult in light of the fact that hospitals are phenomenally innovation immersed, complex associations with top

of the line point intricacy, interior politics, and administrative pressures.

The quick digitization of the healthcare industry has prompted a gigantic increment in the number of ransomware, malware and focused on cyber attacks, which puts private patient information

like personal details, medical history and financial information related data in danger. The healthcare systems are emerging as an attractive organization for hackers to target with each compromised clinical record getting from anyplace \$50 up to \$20,000 as indicated by industry gauges.

**Cybersecurity isn't just a component we can add to the framework, it's really a rising property of an all around structured framework.**

## Security of medical devices

It is built up that 1 out of each 4 clinical devices is presently connected. If you visit the hospital today, you would experience in any event at least 5 clinical devices during your visit. Due to this expanded connectedness of healthcare devices, hackers are beginning to target healthcare and could protect Health data (PHI) or much more terribly, hurt a patient by impairing the working of these gadgets.

### Challenges in providing security

The medicinal services industry is not investing in IT security for long with a primary spotlight just on normal guidelines and not realizing the importance of cybersecurity in hospitals and other healthcare sectors which may lead to situations where the confidential information and other data may get breached and the hackers may take full advantage of it.

At that point, there are notable issues like absence of digital security experts', absence of system backup abilities that are putting healthcare companies under the steady danger of digital misuse.

### What needs to be done?

Cybersecurity isn't just a component we can add to the framework, it's really a rising property of an all around structured framework. In addition, it is critical that makers and organizations managing clinical devices start to execute security techniques directly from the initiation of a device up to its commercialisation. Building cybersecurity into devices from the beginning reduces dangers and the expense of security consistency.

The healthcare industry has lingered

**The quick digitization of the healthcare industry has prompted a gigantic increment in the number of ransomware, malware and focused on cyber attacks, which puts private patient information like personal details, medical history and financial information related data in danger.**

behind different ventures in securing its fundamental partner (for example patients), and now clinics must put impressive capital and exertion in securing their frameworks and systems. This is more difficult than one might expect in light of the fact that medical clinics are remarkably innovation immersed, complex associations with top of the line point unpredictability, interior governmental issues, and administrative weights.

In spite of the fact that security and well-being issues in the clinical space take a wide range of structures there are some prescribed security norms to address the dangers in organized healthcare devices:

- Medical device manufacturers must ensure device security at the starting stage to avoid unnecessary costs and last-minute shortcuts that developers take to push in some form of the security factor.
- Use super strong passwords to protect all external connection points of the hospitals.
- Develop on-time patch management, update IT security policies and vulnerability assessments.
- Increase awareness among physicians, CMIOs (Chief Medical Information Officers) and medical security teams

about present and potential vulnerabilities in medical devices.

- Protect the infrastructure from attacks like malware and ransomware attacks with a trusted security solution.
- Take a backup of confidential information and other important data at regular intervals and also keep a copy of it offline.

The benefit of connected medical devices are always from the risks and the ethical (authorised) hackers are working really hard to make sure that the connected medical devices out there are worthy of our trust. No product is hack-proof, but successful and responsible companies mitigate, and constantly monitor the ever-present threats to critical assets.

**Soni Pandey** is a graduate in Bachelor of pharmacy from Osmania University, Hyderabad. She has a keen interest in research and development sector of public health and pharmacy and highly enthusiastic in improving them. Currently she is working as a health Associate at WIPRO Limited, Hyderabad.



# Data Management in Healthcare

■ Written by Gaurav Sharma



In the field of healthcare, the biggest challenge in implementation of Artificial Intelligence, besides finances, is data management. Well regulated data will instil confidence not only in the patients but also in the healthcare professionals. As the Indian healthcare market steadily grows towards USD 372 Billion by 2022, the march will be largely affected by the way the Indian Healthcare Industry embraces AI and data management. The major factors fuelling this rise is increase in medical insurance covers, lifestyle diseases and medical tourism and AI can act as the biggest catalyst in this. The cost of surgery in India is one-tenth of that in US or Western Europe. The use of AI and Big data analysis is expected to bring down this cost further. However, effective use of AI can only be made with effective Data Management backed by suitable legal framework and law supporting ethical use of personal data. Though as of now a typical Indian patient may not be too much aware of the implications of loss of his medical data, let me remind the readers that the patients expected in the

medical tourism to India are touchy about the privacy of their data and a fast growing number of Indians are now sensitive to privacy of their personal data as well.

India is already encouraging tech startups in the field of healthcare to provide better coverage within the same budget. At present there are 2975 startups in the field of digital healthcare solutions. The numbers are expected to grow at a fast pace as some of these taste success and their stories are read by the others. Also, many hospital chains are becoming increasingly interested in introducing AI. But use of data collection brings with it the vulnerability of personal medical data. The increase in availability of data online increases the susceptibility and thus great care needs to be taken regarding

protection of this data from data breach. According to IBM's cost of data breach highlight report 2019, average size of data breach was 25,575 records with healthcare being the worst affected industry with cost of US USD 6.45 million. As per IBM's report of 2016 also, the cost per breach was highest in healthcare industry at USD 355 as against an average of USD 158 across all industries. The average per capita cost of data breach (as per 2016 report) was USD 221 in the US and USD 213 in Germany and though the cost was lowest in Brazil (USD 100) and India (USD 61), it was merely due to lack of data. In US, 94% of hospitals had at least one security breach between 2013 and 2014 and in most cases the attack were from inside. As the healthcare data increases in our country, so will be the cost per breach, if we do not

**The cost of surgery in India is one-tenth of that in US or Western Europe. The use of AI and Big data analysis is expected to bring down this cost further.**



## As the healthcare data increases in our country, so will be the cost per breach, if we do not ramp up the data security.

ramp up the data security. The healthcare industry is presently witnessing wide range of attacks ranging from stealthy malware to Distributed Denial of Service (DDoS) as healthcare is a data-intensive domain where a large amount of data is created, disseminated stored and accessed daily to leverage data analytics towards better health outcomes.

Even offline data is not safe from theft and sabotage. Robust data protection policy and infrastructure is thus essential to ensure confidence of patients and care providers. The organisations handling such data need to have advanced infrastructure and hire cybersecurity experts to prevent data breach. It may be appreciated that we are talking about not only data theft but also tampering of data (data integrity), which may lead to incorrect inferences by unsuspecting care providers. Any instance of data tampering can play havoc with reliability of data and any decisions made on the basis of such healthcare data would be grossly off the mark.

Can a Doctor rely on this data to take decisions which may affect someone's life

based on this data? Any wrong decision may affect quality of life of patient and in lots of cases may even result in death. With such implications, how do we convince someone to rely on our data? But the flip side is with more and more reliable data available with Doctors, the decision making would be fairly accurate. The condition and situation based data will be available for analysis. Say for example, for a patient is suffering from Diabetes and is now diagnosed with Cancer, data would be available with the Doctor as to effectiveness of specific drugs on such patients in Indian conditions. Reliable data collected directly through wireless Body Area Networks (fitness bands etc) or manually collected data after careful scrutiny of experienced medical professional. We definitely do not want cases like Aadhar Card of Lord Hanuman or a dog named Tommy Singh whose father was mentioned as Sheru Singh.

So many of us will ask then why digitize the health records if one has to invest heavily into IT infrastructure and cyber-security, well we will lose far more money, business and reputation of the organisation if we don't move ahead with the times and

remain grossly inefficient in delivering the healthcare. McKinsey Global Institute has estimated a \$100Billion annual increase in profits in US alone if big data strategies are leveraged properly. The Digitised Health Records and associated analysis tools makes any organisation far more efficient. India is presently ranked 112 as per WHO in terms of healthcare and with high population and limited GDP, can only move up by adequately leveraging use of technology in the field. Big data in healthcare and its analysis may bring down the insurance costs as well, thereby improving its proliferation. Recent popularity of wearable fitness bands which can be classified in Body Sensor Networks (BSN) provide real-time monitoring and can completely change the way healthcare is distributed if the data can be made available to the healthcare professionals in real time. The BSNs can facilitate monitoring of vital parameters, medication effectiveness and predict an epidemic. Also, an Indian doctor could very well be providing consultations anywhere in the world by using real-time online data. In the post COVID world, if patient's data is available to the doctor remotely, it would be a great force multiplier in delivering the healthcare along with telemedicine thus facilitating social distancing. In addition, analysis tools on healthcare data would provide a paradigm shift in the way healthcare industry functions.

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Let us understand the data before we discuss its management aspects. The personal healthcare raw data includes two components namely 'Patient's Personal Data' and 'Patients Health Information'. The personal data would include the patient's personal information that help in identifying him as an individual like name, address, mobile number etc., while the health information would include all documents related to his health like results of medical tests conducted, Doctor's notes,

medical data from his smart devices etc. Additionally, the processed data could include data of numerous patients that have been processed using analytics tools etc. In a patient centric model, the data can include clinical, physical, social, psychological, environmental and genomic data of a patient.

We now discuss the Data Management in two parts, first data reliability (Integrity of data) and then data security (this includes keeping data safe as well as making it available when needed). The 'Data Governance' needs to be adopted if we have to regulate and manage healthcare data. This would include having a common data representation which includes industry as well as regional standards. For example data generated by BSN presently requires normalisation, standardization and governance prior analysis. To provide flexibility to the patient and doctor in terms of national and international mobility (let's take a step ahead and say patient data portability), the multiple stand-alone Electronic Medical Records (EMRs) need to be made interoperable. This would facilitate real-time sharing

of healthcare data among healthcare providers possible. For example, Electronic Health Records (EHRs) are designed to allow patient data to move along with him/ her or made available to healthcare provider as required. The EMRs are richer data structure than EHRs. With the proliferation of personal Wireless Body Area Networks (WBANs) and other smart devices around us, the Personal Health Records (PHRs) are introduced into our world, where the patients are involved in data collection, monitoring of their health conditions etc. by using their smart phones or wearable devices. Data Governance would thus be needed prior collecting the raw data, to tell us how we want the data when it comes to us.

Now that we are prepared to receive data, we need to know how to collect data. Towards ensuring reliability of data (data integrity), the original data should be un-editable (Aadhar database is a sound example of the same) and reliable. The reliability of the data can be ensured if we follow the following in data generation: -

Once we have collected the data, next step is to keep data safely. So how do we define data security? In simple terms, if only authorised people can access the data with a limit on who can access how much and what all fields in the data, we have achieved our goal for data security. The data security can be further divided into physical security of data storage site (sites - as one has to cater for Disaster Recovery Site also) as well as web security using

**India is presently ranked 112 as per WHO in terms of healthcare and with high population and limited GDP, can only move up by adequately leveraging use of technology in the field.**

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firewalls and access control. So basically we have to have a very strict access control both physically and online.

Towards data storage and security, cloud computing is a possible solution in to ensure better availability of data, but has its issues of data security. The most popular solution presently is cloud based Software as a Service (SaaS) solutions hosting Protected Health Information (PHI). This can be used with cryptographic primitives such as those based on public key infrastructure (data may be encrypted prior uploading on cloud). Once the data storage mode has been decided, access control models have to be defined to regulate access to data based on pre-defined access policies. Recent advances in blockchain technology suggest that this option may also be available; however, the same is not yet popular and is still being assessed. In blockchain technology, we are able to build an open and distributed online database, which consist of list of data structures (known as blocks) which are linked to each other (hence the name blockchain). Blockchain technology can be somewhat disruptive and may require radical rethink with significant investment in the entire eco-system and thus return on investment on the same needs to be studied. Further, like other options discussed, the blockchain technology too has its own challenges like immutability of data, non-availability of right to erasure of data to patients etc. Blockchain for healthcare can be designed as follows: -

To achieve this, the country would definitely need new privacy laws to protect patient's privacy as analytics on healthcare data gain popularity, these laws would require to clearly bring out all processes in performing big data analytics on patient data. There has been a gradual shift in healthcare data to cloud due to convenience (of patient data availability) and savings (in managing data security,

## **Blockchain technology can be somewhat disruptive and may require radical rethink with significant investment in the entire eco-system and thus return on investment on the same needs to be studied.**

analytics etc.) and hence such privacy laws need to be implemented soon. Also, with patient themselves involved in collection of data, we need to define the legal aspects regarding who is to be blamed for a wrong diagnosis based on incorrect data collected by the smart devices used by the patient (which may be malfunctioning or intentionally feeding wrong data by patient). The leakage or modification of data may be intentional or otherwise and organisations may be penalized or held criminally accountable for such instances.

One of the desirable goal for the country is to have a national data grid, which would also comprise National Digital Health Footprint. Then National e-Health Authority (Neha) would be empowered as a legal authority and adequate powers. Thankfully as a first step, Niti Aayog has announced formation of National Data and Analytics Platform and it is hoped that a national data grid would be on their agenda. The Personal Data Protection (PDP) Bill 2019 was tabled in Parliament in Dec 19 and is presently being scrutinized by a Joint Parliamentary Committee in consultation with experts and stakeholders and is likely to be tabled in the next session of Parliament - this would be an Indian equivalent of General Data Protection Regulation (GDPR) of the European Union. In addition, Digital Information Security in Healthcare Act (DISHA) is being worked upon by Ministry of Health and Family Welfare is expected soon as the draft was put out to public for comments in 2018 - this

would be similar to Health Information Technology for Economic and Clinical Health (HITECH) Act of the USA. How long it will go in resolving the issue of data privacy is yet to be seen; however, the expectations are that it will be very progressive and will give complete ownership of the data to the individual. Until then, data security and privacy are the responsibility of the entity that holds the data and in case, a data breach happens, the entity could be penalized for the same. As of now, the enterprises in India are not bound to inform their end customers, or other individuals of a data breach as that happens, excluding banks that are compelled to inform the Reserve Bank of India (RBI) within six hours of a data breach. DISHA proposes three main objectives: -

- Setting up digital health authority at national and state levels
- Enforcing privacy and security measures for electronic health data, and
- Regulating storage and exchange of electronic health records

The Government of India is moving forward in the right direction and all healthcare organisations should move in sync too. Time is critical as every day we ignore moving towards AI and Big Data, we lose profitability, business and reputation.

**Gaurav Sharma** is a M.Tech from IIT Delhi and is a keen observer on the effects of Artificial Intelligence in the field of HR. The author has 20 years of varied experience and is presently pursuing part time PhD in the field of Management from IIT Jodhpur.

## **Data security and privacy are the responsibility of the entity that holds the data and in case, a data breach happens, the entity could be penalized for the same.**

**LATEST NEWS IN HEALTHCARE!**
**TECH MAHINDRA STARTS COVID-19 SCREENING SERVICE FOR ₹ 1,200 PER PERSON**

**I**T company Tech Mahindra on Aug 03, 2020, started a coronavirus screening service 'Mhealthy', which can also detect COVID-19 antibodies, said a senior official of the company.

The firm said the platform is clinically tested and compliant with all government-mandated regulations, guidelines, and has been approved by the Central Drugs Standard Control Organisation (CDSCO).

"Mhealthy not only does an instant risk assessment on COVID-19, but also additionally screens multiple factors that may contribute to risk," Tech Mahindra Managing Director and Chief Executive Officer C P Gurnani said in a statement. The company added that the Mhealthy service comprises over 32 screening tests on a single platform and detects antibodies with 96% accuracy.

"Mhealthy can detect antibodies. We have done screening of our employees and results have been 96 per cent accurate. A lot of people were not even aware of other problems like blood glucose and hypertension," Tech Mahindra Global Chief People Officer and Head of Marketing Harshvendra Soin said.

Soin added that once the result is out, the people can follow up with doctor consultation through an app.

The Mhealthy platform will categorise individuals opting for the screening under L1, L2 and L3.

"L1 means that the person is healthy. L2 means the person has had some exposure. If the person is L3 then the person is most likely to be a COVID-19-positive case," Soin said. He also added that just checking

the temperature will not give any result.

"There is no other test like this. Some people do only COVID-19 antibodies test or antigen test but this one is a comprehensive test that takes into account all the comorbidity factors like hypertension and blood glucose," Soin said.

The company will provide this service for ₹ 1,200 per person. The Mhealthy team will visit premises of societies and companies for the screening with portable devices and trained nurses for the service. "People can directly connect with a doctor for consultation through an app. Going to hospital is a big risk. We are equipped for testing a large number of people," Soin said.

*Source: www.livemint.com*

**MODI ANNOUNCES DIGITAL INDIA HEALTH MISSION, HEALTH ID FOR MEDICAL RECORDS**

**P**rime Minister Narendra Modi during his Independence Day (August 15, 2020) speech from Red Fort announced the National Digital Health Mission. As per the mission, every Indian will have a health ID. He said that this will revolutionise the Indian health sector. PM Modi added that the National Digital Health Mission (NDHM) will ensure seamless healthcare services will be provided through the health card.

The NDHM had recently received in-principle approval from the Cabinet. The platform would have health IDs, personal health records, Digi Doctor and a health facility registry. Once it is rolled out, the

platform would also expand to include e-pharmacy and telemedicine services, as stated by earlier reports.

The digital health ecosystem would be a voluntary one and would be up to the user, hospitals and doctors to enrol. Health records of individuals could be accessed but only after authorisation. Users would also be able to link their Aadhaar with the health IDs. The IDs could be put to use at hospitals, pharmacies and labs across the country.

The platform would also allow doctors to sign up and show their details and contact numbers. They would also be assigned a digital signature for prescriptions.

The National Digital Health Mission has been created to improve efficiency, effectiveness and transparency of the health service in India.

The force behind the National Digital Health Mission is the National Health Authority that brought the Ayushman Bharat scheme to fruition.

While the Ministry of Finance has approved a budget of Rs 470 for the National Digital Health Mission, the platform is likely to seek around Rs 400 crore from the government.

*Source: www.businessstoday.in*

## CENTRE CALLS FOR DUAL TB-COVID SCREENING

The Union health ministry on Aug 27, 2020, directed authorities to conduct bidirectional COVID-19 and tuberculosis (TB) screening, citing studies indicating that a history of active and latent TB is a risk factor in SARS CoV-2 infection. This leads to a higher susceptibility and show severe symptoms and disease progression, the government said.

The prevalence of TB among COVID-19 patients has been found to be 0.37% to 4.47% in different studies, said the Union health ministry. "TB is associated with a 2.1-fold increased risk of severe COVID-19 disease. In addition, TB patients tend to have comorbidity or unhygienic living conditions leading to health issues such as malnutrition, diabetes, smoking, HIV, which increase

their vulnerability," the ministry said in a guidance note.

As per the proposed report, there has been an overall decline in TB notification by 26% in January-June 2020 as compared to the previous year due to the pandemic. To address this dual morbidity of TB and COVID-19, the COVID-19 screening was done for all patients diagnosed with TB and TB screening for all COVID-19 positive patients. According to Ministry of Health, TB screening should also be done for influenza-like illness and severe acute respiratory infections.

Cases of COVID-19 continue to rise in India with 75,090 fresh cases. India's case count was at 3,377,404, with 61,636 fatalities. The last 24 hours of August 27, saw a record of 1,005 deaths. India's

fatality rate is 1.83%.

Union cabinet secretary Rajiv Guaba and other officials held a meeting on COVID-19 management and response strategy with chief secretaries and health secretaries of different states like Maharashtra, Tamil Nadu, Karnataka, Telangana, Gujarat, West Bengal, Uttar Pradesh, Punjab, Andhra Pradesh, and Jammu and Kashmir.

As per the verdict of Health Ministry there was 89% of the deaths in last two weeks which were reported in the aforementioned 10 states and Union territories hence, these states and UTs need to have continued and rigorous vigil to restrict the spread of infection.

Source: [www.livemint.com](http://www.livemint.com)

## ABBOTT WINS U.S. APPROVAL FOR RAPID COVID-19 TEST

Abbott Laboratories on Aug 26, affirmed its approval from U.S. government for marketing Covid-19 portable test which claims to deliver results within 15 minutes.

The U.S. Food and Drug Administration granted the approval under its emergency use authorization program.

The portable test, BinaxNOW Covid-19 Ag Card, is for use by healthcare professionals at hospitals and labs, and Abbott plans to sell the tests for \$5 each.

The United States now has more cases of the coronavirus than any other country, and hospitals and labs have struggled to meet the demand to test thousands of people.

Abbott expects to ship tens of millions of test kit in September, ramping to 50 million tests a month from the beginning of October.

Since March, the company has got U.S. authorizations for five coronavirus tests, including one that can deliver results within minutes and is also used by the White House.

Source: [www.health.economicstimes.indiatimes.com](http://www.health.economicstimes.indiatimes.com)

## 'COVID ANTIBODIES MAY LAST JUST 50 DAYS'

COVID-19 antibodies may not last more than a couple of months, according to a study carried out on affected healthcare staff of JJ Group of Hospitals.

*"Our study of 801 people included 28 who had tested positive for Covid (on RT-PCR) seven weeks prior (in late April-early May)," said the study's main author Dr Nishant Kumar. None of them showed any antibodies in a sero survey done in June, says the pre-print of the study that will appear in the September issue of the 'International Journal of Community Medicine and Public Health'.*

The sero survey had 34 others who tested PCR positive three weeks and five weeks prior respectively. "While 90% of those in the three-week group had antibodies, just 38.5% in the five-week group had antibodies," he said.

Covid antibodies are being widely discussed at the moment because of the vaccine trials and the re-infection case in Hong Kong. Antibodies can guard

patients against repeated infections and those vaccinated against first infections. An analysis of the JJ survey's results showed that antibodies decayed quickly.

However, some public health experts were skeptical with the early decay hypothesis. "We don't know if the 28 patients had an asymptomatic form of Covid or if they had symptoms," said epidemiologist Giridhar R Babu. Studies have shown asymptomatic patients don't have the same level of antibodies as patients who have had a prolonged or severe Covid infection. "Patients who had longer symptomatic disease have antibodies for at least 3-4 months," he added.

Another doctor said, "There is emerging evidence that it is not IgG (Immunoglobulin G is the most common type of antibody) but T cells or neutralising antibodies that may help build immunity against Covid." The decay in IgG levels, he added, isn't too worrisome then.

Source: [www.health.economicstimes.indiatimes.com](http://www.health.economicstimes.indiatimes.com)



## EU PAYS 336 MILLION EUROS TO SECURE ASTRAZENECA'S POTENTIAL COVID-19 VACCINE

According to a spokesperson, the European Commission has made a 336 million euro (\$396 million) down payment to British drugmaker AstraZeneca to secure at least 300 million doses of its potential COVID-19 vaccine

The deal covers development, liability and other costs faced by the vaccine maker. The EU has also secured an option to buy 100 million additional doses of the vaccine under development.

The 27 EU states could buy it at a later stage, should the vaccine prove successful.

The overall price they will pay to acquire the doses has not been revealed, but under an earlier deal struck in June with AstraZeneca by Germany, France, Italy and the Netherlands, all members of the EU, AstraZeneca agreed to sell 300 million doses for 750 million euros (\$843 million).

The EU deal completed the preliminary accord reached with the drug maker by the four countries, the Commission said

in a statement.

"We cannot indicate at this stage the specific pricing per dose. However, a significant part of the overall costs are funded by a contribution from the overall ESI funding for vaccines," the commission spokesman said, referring to the 336 million euros paid through the bloc's so-called emergency support instrument.

It is the first contract signed by the EU with a maker of potential COVID-19 vaccines.

AstraZeneca has already agreed the supply of 300 million shots of the same vaccine to the United States for \$1.2 billion, and of up to 30 million doses to Britain for 65.5 million pounds (\$86.5 million).

Brussels has previously said it is also in advanced talks with Johnson & Johnson, Sanofi, Moderna and CureVac for their potential vaccines.

EU officials told Reuters in July the bloc was also talking with Pfizer and BionTech

for the shot they are developing together. The contract with AstraZeneca follows an advance purchase agreement signed by Brussels with the company earlier in August.

Part of the money the EU pays for supply deal covers legal risks faced by vaccine makers if their shots have unexpected side effects. These risks are increased by the hastened process to develop a vaccine in the race against the COVID-19 pandemic.

*"In order to compensate for such high risks taken by manufacturers, the Advanced Purchase Agreements provide for member states to indemnify the manufacturer for liabilities incurred under certain conditions,"* the commission said.

*"Liability still remains with the companies,"* it added.

This issue has been one of the stumbling blocks in talks with other vaccine makers, officials told Reuters, as companies prefer to have a broader shield.

Source: [www.livemint.com](http://www.livemint.com)

## CENTRE FRAMES DRAFT POLICY ON DATA PRIVACY UNDER NATIONAL DIGITAL HEALTH MISSION SCHEME

All necessary data privacy measures will be put in place to safeguard the confidentiality of sensitive health-related information of individuals under the National Digital Health Mission (NDHM) programme that seeks to provide a unique ID to all citizens to map their medical history, the government has said.

As per the draft proposal, everyone enrolled for the mission will get a Health ID free of cost and will have complete control over his or her data.

Any personal data can be collected only after consent from individuals and they will be allowed to revoke their consent to restrict any sharing of personal data.

The government has proposed a framework and a set of minimum standards for data privacy protection to be followed across the board in compliance with applicable laws and regulations.

The National Health Authority (NHA), the central agency responsible for the implementation of Ayushman Bharat Pradhan Mantri Jan Arogya Yojana, which has been mandated to design and roll out NDHM in the country, has released the draft 'Health Data Management Policy' in the public domain.

The document has been put up on the official website of National Digital Health Mission seeking comments and feedback from the public till September 3.

The draft policy mainly seeks to set out a framework for "secure processing of personal and sensitive personal data of individuals" who are a part of the national digital health ecosystem.

Data collected across the National Digital Health Ecosystem (NDHE) will be stored in the central level, the state or Union Territory level and at the health facility level, by adopting the principle of minimality at each point, according to the document.

The federated structure necessitates the development of a framework that can be utilised throughout the NDHE to safeguard the privacy of confidential health data that has been collected from individuals in India, it stated.

Indu Bhushan, the Chief Executive Officer of NHA said, "The Draft Health Data Management Policy is the maiden step in realizing NDHM's guiding principle of 'Security and Privacy by Design' for the protection of individuals' data privacy."

*"It encompasses various aspects of health data like data privacy, consent management, data sharing and protection among others,"* the officer said.

The provisions of this policy shall apply to the entities involved in the NDHM and those who are a part of the NDHE, that includes all entities and individuals who have been issued an ID under this policy, healthcare professionals, governing bodies of the health ministry, the NHA, relevant professional bodies and regulators.

It would also apply to any healthcare

provider who collects, stores and transmits health data in electronic form, insurers, charitable institutions, pharmaceuticals and all individuals, teams, entities who collect or process personal or sensitive data of any individual as part of the NDHE.

The federated design of the NDHE ensures personal data of the data principals will be held at the point of care or at the closest possible location where it was created, with no centralised repository, the draft document said.

As such, data storage shall incorporate privacy control and safeguards right from the foundational levels.

Highlighting the significance of the policy and its potential impact, Bhushan said, "The government is working to ensure

strong privacy of health data and therefore, we are circulating the Draft Health Data Management Policy of NDHM to increase awareness on the importance of data privacy and instil a privacy-oriented mindset among all stakeholders and participants of the ecosystem."

The vision of the mission is to create a national digital health ecosystem which enables timely and efficient access to inclusive, affordable, and safe healthcare to all citizens.

The National Health Authority said the NDHM will significantly improve the efficiency, effectiveness, and transparency of health services in India.

Source: [www.cnbcvt18.com](http://www.cnbcvt18.com)

## NATIONAL HEALTH AUTHORITY LAUNCHES SANDBOX TO TEST PRODUCTS FOR DIGITAL HEALTH MISSION

Indu Bhushan, CEO of Ayushman Bharat and the National Health Authority (NHA), on Thursday, Aug 27, announced on Twitter that the National Digital Health Mission (NDHM) Sandbox was live. "Inviting healthcare providers, software providers, startups to join us in co-developing tech products for one of the largest digital health ecosystems in the world," Bhushan wrote in his tweet.

On August 15, India's 74th Independence Day, Prime Minister Narendra Modi launched the NDHM, envisaged as a digital health ecosystem with personal health IDs for every Indian, digitisation of health records as well as a registry of doctors and health facilities across the country.

The health IDs for citizens would be applicable across states, hospitals, diagnostic laboratories and pharmacies, with plans to bring aboard online pharmacies at a later stage. Further, the scheme would also make provisions for enrolment of 'Digi Doctor', allowing patients to avail online consultation with

doctors.

The recently launched sandbox will allow the NHA, the authority overseeing the NDHM, for testing new products and technologies in a contained environment for a defined period of time to eventually ensure successful full-scale deployment of tried and tested products in the market.

"Because there are boundary conditions – the risk is minimised and the emphasis is on feedback, learning and compliance to defined standards required to become a part of NDHM. This will provide an opportunity to identify, understand, adapt and respond to these disruptive new products and services in a timely and appropriate fashion," read the NDHM Sandbox guidelines. The Sandbox is open to healthcare service providers, hospitals, healthcare software vendors and anyone who wants to build NDHM APIs (application programming interface).

The guidelines mention that the sandbox is open to all upon request. "If your request is approved, you will get access to the sandbox to build or/and expand

your products in the healthcare/health tech industry. This is your chance to partner with NDHM, by enabling and empowering the products with the core building blocks of the Mission. For the government sector as well, APIs and platforms shall be available for integration with the NDHM ecosystem."

The announcement of the NDHM, best understood as the UPI for healthcare in India — digitally encapsulating all records and history of an individual's health and wellness — has inspired confidence among Indian startups already working in the sphere. The mission already has over a dozen companies and organisations working together, including 1mg, Practo, mfine, National Cancer Grid, LiveHealth and DRiefcase, among others.

Source: [www.inc42.com](http://www.inc42.com)

Compiled by:  
Parthvee Jain, Editor, InnoHEALTH Magazine

# BOOK REVIEW

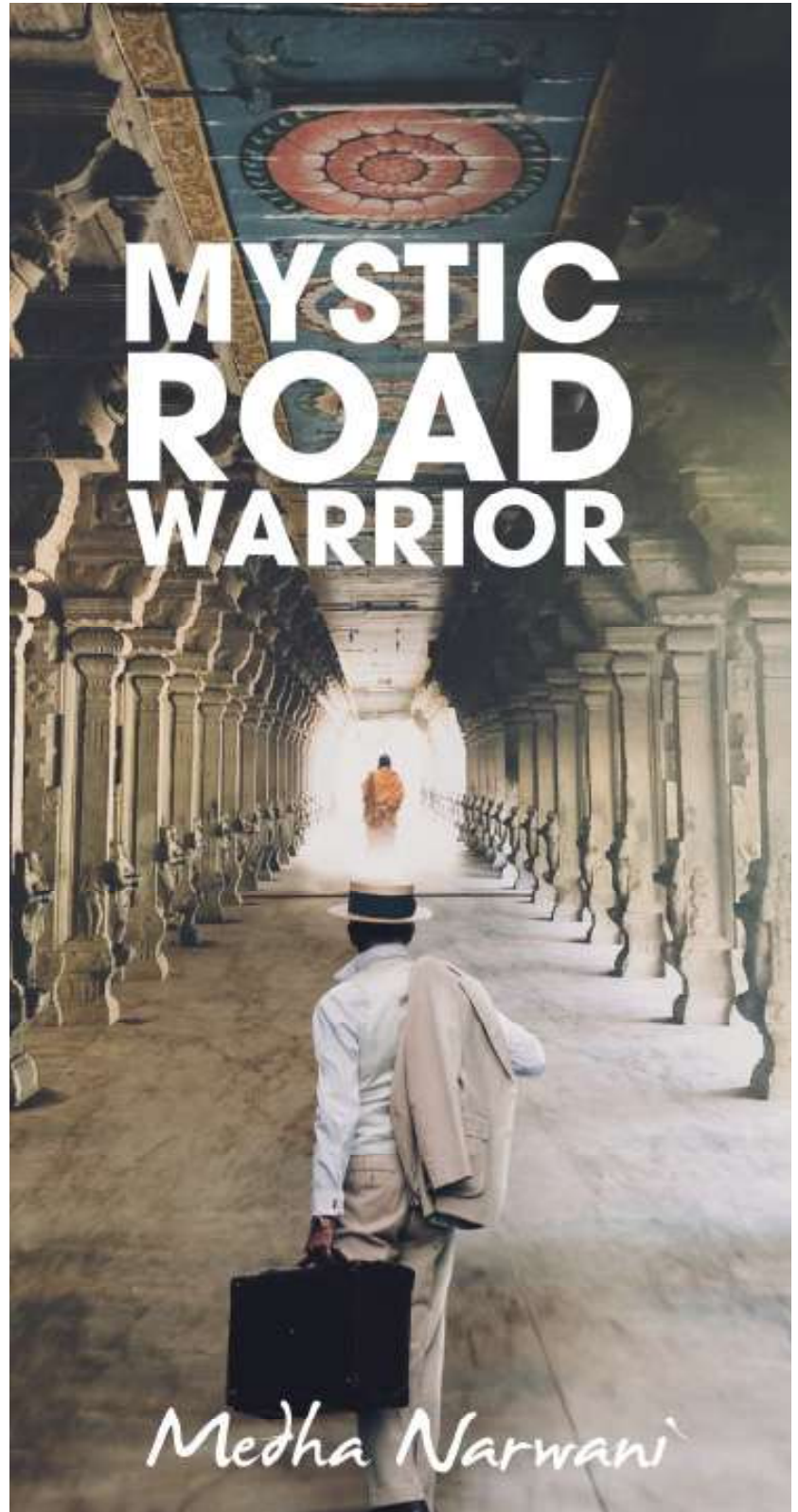
By Dr. Debleena Bhattacharya,  
Associate Editor,  
InnoHEALTH magazine

The introspection journey of a person whose urge to seek the unknown unravels the spiritual quest. The secret behind the Universal knowledge and the interpretation of the unknown premonitions woke his conscience to seek the truth in the holy city of Varanasi.

During World War I, a young English soldier miraculously survives during the air fights with Germany. The near death incident had made a profound impact on him as he had a strange experience where he saw the yogi from another realm whose sight and the sudden restart of ignition engines saved his life.

The invoking of the inner consciousness made him travel to the holy places of India alongwith the glacial Himalayas where his conscience was enlightened spiritually and emotionally.

The journey of a soldier to seek the inner calmness was beautifully penned in this book. 'This is a dystopian world we live in' where author through the soldier showcased the ultimate truth of the world where 'Cowardice overpowers courage in doing the right thing.... What does a person really achieve in this pitiful,pathetic life? Time inevitably destroys everything that one chases and creates!' The soul searching journey of a young clairvoyant soldier takes us to a mystic world transversed through Jnana yoga or a pursuit of realization for our existence.





# 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](http://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



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

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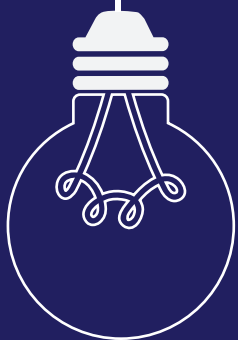
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