Shakespeare, COVID, and the Plague

By Dr. Deepak Chopra
Celebrity Author

The Key Strategies to Control the Pandemic by CSIR

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DG, CSIR

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and
Kavita Narayan

The Challenges and Possible Solutions of COVID-19

By Dr. Kanuparthi Prasanna Laxmi

InnoHEALTH

Readers Feedback

A Brief Review on InnoHEALTH

Most liked article of the last Issue....

" Feedback and Testimonials

Fight Corona IDEAthon & Mega Online Challenge SAMADHAN

It is a huge crowd and immense responses ...u 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

Thank you all of you. This journey was amazing and found new friends. This is a memorable event.

Atul Bengeri
Director
AcumenToday, India

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

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

Supporting Nurses & Midwives webinar

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

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

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

Manju Chhugani
Professor & Dean
Jamia Hamdard, India

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

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

Solving Diabetic Retinopathy diagnosis through Artificial Intelligence webinar

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

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

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

Hemapriya Prabakarane
Assistant Professor
Vinayaka Missions College of Nursing, India

EXECUTIVE OPINION

COVID-19: Challenges and Opportunities
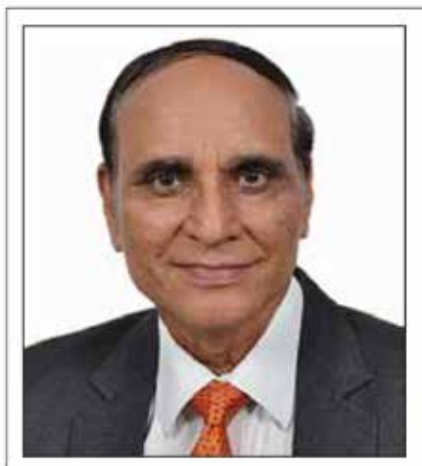
Dr. V K Singh

Editor-in-Chief & MD,
InnovatioCuris

vksingh@innovatiocuris.com

> *India now produce 4.5 lakh PPE per day and would be a 60 billion US dollar industry by 2025.We are now second largest producers of PPE and have augmented from importer to exporter in just 60 days.*

COVID-19 has thrown a big challenge to mankind but it has also unmasked equally good opportunities. The weaknesses of our system have been unrevealed for us to transform and make it into an efficient system. It has woken up people from slumber and has made them realize their vast potential.

The man made calamities like war bring out many developments and economic opportunities. Japan and Germany flourished after the Second World War, which has brought many newer management principles and development of industries during and after the war. Similarly, challenges due to COVID-19 like importing personal protection equipment (PPE) had led to many textile industries to produce PPE in 60 days and we now produce 4.5 lakh PPE per day and would be a 60 billion US dollar industry by 2025.We are now second largest producers of PPE and have augmented from importer to exporter in just 60 days.

The tribals brewing Mahua flowers in central India has been taken as an innovative step to initiate production of alcohol for making sanitisers. The government also realises that there is scope of tremendous growth in many ideas and these potential prospects must be explored by various economic incentives and schemes.

The gigantic problem of migrant labourers was never perceived until now but their predicament in the dire situations of nationwide lockdown has forced them to sought solace by traversing the treacherous journey of returning to their hometown in the most inhuman conditions. The unemployment and famished folklore's situation has drawn the attention of the government and the pledge to uplift the livelihood of the labourers has opened the corridors for various schemes in industrial development and create a platform for their sustainability in their native. This development would have not been possible if not exposed by pandemic. But do we have to face catastrophe to improve our systems, many things not happened for decades are happening now.

Research and innovations have taken quantum jump to produce healthcare devices by industries, manufacturing of drugs, testing kits and ventilators. It is a big boost to 'Make in India' projects. The health system was always neglected but it has now drawn the attention of policy makers to impart integral, qualitative, and affordable healthcare to every individual. It implies improved quality of life, public health and preventive health systems that should be in every one's mind and is dealt with utmost priority. There's also positive behaviour change that people are following like hand washing due to awareness created for COVID-19.

We have not taken environment issues, pollution and climatic changes seriously for causing epidemiological hotspots. Our knowledge about COVID-19 is very limited, as there was no treatment and vaccines made available to us for this pandemic. Many conjectures are being analysed. As per WHO, the worst situation is yet to come, are we really prepared though we have done better than many developed countries.

Amidst this unprecedented time, it gives an immense sense of pride for our medical fraternity who took the frontline charge against the novel coronavirus or COVID-19 and treated the infected patients without giving a second thought about the risk assigned to such efforts. We commemorate their efforts and hope that the revolutionary phase of medicine will bring us out from our present precarious situation.

Ideathon and Hackathon have been organised online for the first time in India to resolve problems and provide solutions to handle the COVID-19 pandemic. Many issues that did not attract attention for many years had become reality overnight like Telemedicine guidelines. According to a report by a research company, the e-health sector is expected to become a 16 billion dollar industry by 2020. It also brings side by side issues of Cybersecurity in the health sector whose unpretentious repercussions are still unknown to the healthcare fraternity.

Shakespeare, COVID, and the Plague

■ **Written by Dr. Deepak Chopra**

Social isolation gives us time to examine 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 feels horribly abnormal to us was routinely normal for him and every member of the human race in the 16th century.

In statistical terms, Shakespeare is just another survivor. Unlike his son, Hamnet, 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, 1582, 1592, 1603, and 1607, when London, including its theaters, shut down because of the disease. Syphilis had arrived in Europe from the New World in 1495, first appearing in a French garrison outside Naples, and it quickly infected every level of society. But Shakespeare didn't die of it, either, or of smallpox. He wasn't murdered in the street even 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, Will's life 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 persisted more or less unchanged until the middle of the 19th century. The causes of plague syphilis, and deaths in childbirth started to emerge, and more mundane but equally life-saving advances occurred in public health, like the first sewer system in America, which was built in Chicago in the late 1850s.

If humans 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 didn't starve before you were able to pass on your genes to the next generation. Nothing much mattered after that momentous event.

Evolutionists persist in seeing *Homo sapiens* through the lens of basic survival, but we do all kinds of things to deliberately imperil our survival, from taking care of our weak and sick instead of abandoning them, to stockpiling nuclear warheads, just to make sure that total war can erupt if we feel like it. War, crime, and violence do nothing to improve human genes and in fact work against simple survival.

But if you put Shakespeare and the plague together, something mysterious emerges. Despite every threat of disease and death, crime, poverty, political oppression, and religious fanaticism (the Puritans in Shakespeare's day railed against the London theaters as ungodly, but luckily they didn't shut them down until 1642, 26 years after his death), not to mention widespread illiteracy, no public sanitation, and no police force, these horrendous circumstances didn't wipe out creativity, discovery, love, compassion, and a vision of a higher ideals.

Homo sapiens 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 envisioned life independent of physical circumstances. Miraculously, if you peer at the oldest cave paintings in Europe, such as those in Chauvet-Pont d'Arc, France, you don't see primitive scratching from 30,000 years ago.

You see art. The animals depicted are done with confident, artistic lines that are also scientifically accurate, depicting a wide range of Paleolithic creatures precisely enough that they can be identified by species. No one knows why sophisticated cave paintings suddenly appeared. The Chauvet depictions lie deep in the darkest heart of the caves. No sunlight penetrated, so the painters worked by the quavering 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 exemplifies a trait that belongs to the human condition, the trait of creativity for its own sake. In fact, even though the modern world owes 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 flint 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.

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 evolved into the human condition. The Greek word for beyond is meta, and we should apply it to ourselves more often. To be human is an expression of the metahuman. Shakespeare was a meta-genius, but everyday people are just as meta 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 meta, because it has nothing to do with surviving.

The higher your vision, the more meta you are. Buddha was extraordinarily meta, but his followers, seeing the worth of his vision, had to be meta or Buddha would have preached in the wilderness. Likewise, without metahumans among Jesus's disciples, Christianity would have perished on the cross.

The COVID virus has put everyday life in peril for countless people, but it has actually risen the level of self-sacrifice, service, sharing, cooperating for the common good, laying down political antagonisms, seeking a global solution, and reflecting upon what really matters. Those are all meta qualities; they are perfect examples of going beyond. The fact that we can see a future past the devastation of the pandemic is a meta trait of huge importance. We aren't human without being metahuman. For me, this is the lasting lesson and the deeper meaning to be taken away from a terrible time.

Dr. Deepak Chopra, MD, FACP, founder of The Chopra Foundation, a non-profit entity for research on well-being and humanitarianism, and Chopra Global, a modern-day health company at the intersection of science and spirituality, is a world-renowned pioneer 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 89 books translated into over forty-three languages, including numerous New York Times bestsellers. His 90th book, Metahuman: Unleashing Your Infinite Potential, unlocks the secrets to moving beyond our present limitations to access a field of infinite possibilities. TIME magazine has described Dr. Chopra as "one of the top 100 heroes and icons of the century."
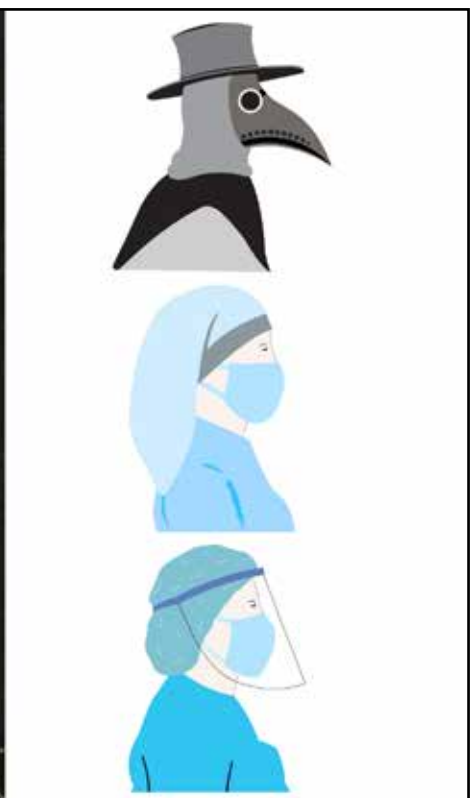
Evolution of pandemic from Elizabeth era to the Gregorian era and lastly the present era

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The Key Strategies to Control the Pandemic by CSIR

Dr. Shekhar C. Mande, currently the Director General of Council for Scientific and Industrial Research (CSIR) and Secretary, Department of Scientific and Industrial Research (DSIR), Govt. of India. He holds Doctor of philosophy in Molecular Biophysics, from the Indian Institute of Science, Bangalore. Following his PhD, he joined as Post-Doctoral Fellow at University of Groningen, Groningen, The Netherlands and thereafter as Senior Fellow, University of Washington, Seattle, USA. Apart from his vast academic experience, he holds a number of prestigious fellowships and awards. The Shanti Swarup Bhatnagar Prize for Science and Technology, the highest science award in India, in the Biological sciences category was conferred on him in the year 2005.

Dr. Debleena Bhattacharya, interviewed Dr. Shekhar C. Mande for his valuable insights on the recent pandemic situations and the innovative resolving steps taken by CSIR institutes for COVID-19.

Q. With a background in life sciences, what was your first reaction to the COVID-19 pandemic? Did you see it coming? Do you foresee a second wave like they are having in China now? What should we do, once we are done with the first wave?

A. Even before WHO declared Covid-19 as a global pandemic, we had initiated discussions in CSIR on the possible mitigation strategies. In fact, we were alarmed as early as February first week, when I mentioned in a talk given at the Firodia Award acceptance, that we live in the SARS-CoV-2 era. We were therefore prepared for the pandemic-like situation in early March. Based on the known facts of SARS viruses, we jointly evolved a strategy to deal with the situation. The strategy included five main pillars: Surveillance, Diagnostics, Interventions; Hospital assistive devices and Supply Chain models. CSIR therefore undertook work on all these five pillars simultaneously. Since the last week of March, the strategy group of CSIR has met every single evening online to discuss the day's developments, and to monitor work on all different fronts.

We do indeed see the disease coming back in different waves, and therefore we are against any complacency in the matter.

It is our considered opinion that contact tracing and monitoring surveillance are the key strategies to control the disease. In the meanwhile, if some therapies can be brought to the market, it will be an added advantage.

Q. How do you see the COVID-19 impact on day to day research at CSIR labs? Has it given a sense of urgency and mission to your office? Please share any relevant projects or interventions in mitigating the crisis?

A. Like all other human endeavors, research has been affected by the lockdowns. However, CSIR has attempted its best to maintain the laboratories with the campus-residing staff regularly working in the laboratories, within the constraints of regulatory norms. This alone has given all the sense of urgency and mission.

Among the many projects and achievements until now, the following deserve special mention:

- Development of two novel diagnostics kits- CRISPR/Cas based FELUDA kit and RT LAMP kit
- Many recommendations on improving efficiency of diagnostics to ICMR and their subsequent implementation
- Initiating clinical trials on Mw, Favipiravir, Arbidol, ACQH- which is the first phytopharmaceutical

to go into clinical trial in India, and four AYUSH formulation
- Development of PPE's and bringing their manufacturing capability to a substantial number
- Development of BiPAP ventilator
- Development of emergency buildings etc.

Q. What are innovative pedagogies taken by CSIR for Covid 19?

A. Several training programs were undertaken. More than 200 people were trained in RT PCR diagnostics. Moreover, recently CSIR has coordinated a large summer research training program, where more than 16000 students have enrolled for online training. Some of the selected students will also undergo live projects mentored by CSIR scientists.

Q. Will the polio/BCG vaccine provide immunity against pandemic virus?

A. That's the hypothesis that needs to be tested. Both these are being tested in clinical trials in the world at different locations.

Q. The recent clarion call by the PM on "Atma Nirbhar Bharat." How do you foresee that CSIR labs can contribute in this direction for a self-reliant India?

A. CSIR has a major role to play in making India import-independent. In the many sectors- steel, pharmaceuticals, biomedical instrumentation, petroleum etc. CSIR labs can evolve contemporary technologies which can be implemented towards this goal.

Q. What is your advice to the younger generation of the country in regard to Innovation and Research in the health sector? If any assistance is given to them in this direction.

A. Health sector will remain a dominant sector as long as humanity survives. It will also continue to evolve in many different directions. Therefore the number of opportunities that lie in the health sector are innumerable. For the younger generation, these opportunities are there to grab.

CSIR building in New Delhi, India

Minding Our Minds During COVID-19: Taking Mental Health "HEAD ON"

■ **Written by Preeti Sudan and Kavita Narayan**

SETTING THE CONTEXT

Never in the history of the civilised, modern world of the 21st century has mankind experienced such a collective sense of vulnerability, forcing us to deal with a dual threat; that of body and mind. While the effects of COVID-19 on our physical health are increasingly documented including risk rates, treatment options, survival rates and strategies and tips for self-care, the unprecedented psychosocial health effects presented by COVID-19 still remains a step-siblings for the attention it commands of all the concerned stakeholders.

As Indians, for centuries, we have prided ourselves on our ability to deal with almost equivalent invisible, intangible issues such as "mental health" by our various indigenous ways, the most prevalent and powerful tool of them all being our strong social networks.

We are after all a nation of events; everyone is connected to everything! No other country took to social media as fast as India did, not necessarily to reduce the number or need for physical meetings, celebrations, and gatherings but to provide us with the sources of connections for our steady state of cognitive strength by people and their stories that in many ways helped us to replenish our collective mental energies!

With physical aspect, the implied social distancing which has been being enforced globally acted as one of the most effective ways to deal with the physiological aspect of the pandemic, the social networking sauce to mental well-being seems to have been forcibly taken away overnight! Instead, the majority of information consumed by the people and communities has been infused mostly with fear and dread of an uncertain future in all aspects,

paving the path to collective stress, anxiety and a rapidly-decelerating state of mental health!

The gentle touch of a supportive friend or neighbour, a friendly embrace or a pat on the back for a job well done, the wiping of tears from grieving eyes, these are all strict no-no's in the COVID world! Little wonder then that we are reminded of Mark Twain's ironic quip, "Out of all the things I have lost, I miss my mind the most".

INDIA'S MENTAL HEALTH LANDSCAPE

It is important to understand the prevailing context for psychiatric and psychological issues present in India even before the pandemic was upon us and to fully acknowledge and deeply internalise the situation. It's indeed

The National Institute of Mental Health and Neuro-Sciences (NIMHANS) launched a national helpline (080)-46110007) on March 30, 2020 to provide counselling on mental health and psychosocial issues related to the pandemic and lockdown, available in several vernacular languages, with a dedicated helpline for COVID-19 healthcare warriors on the frontline.

time we spoke about Mental Health, or the lack thereof, as a society; just as we would empathetically exchange stories of diabetes or hypertension or cardiac disease with friends and loved ones! We do not need any more stories of celebrity suicides or other horrific tales of self-destruction as a result of poor mental health to motivate us into speaking openly about this issue and taking positive action.

The #1 reason why, unlike physical health disorders, there continues to be utter denial and iron-clad resistance to acceptance of a less-than-perfect-state-of-mental-health is an appended judgment and stigma received from society for such cases.

In most western societies, chemical/ neural imbalances, genetics, endocrine system functioning and external stress factors that trigger such responses are well-understood to be the root-cause of

several major mental health disorders. Sadly, even the large majority of qualified, well-read Indians, have mostly had a hard time accepting that they/their loved ones may need professional clinical help.

The connotation of the word "mental" is often used derogatorily in parlance for generations has most definitely not helped the cause. Somehow, even uttering words like "depression" or "schizophrenia" feel like anathema to most, as if it's a deep character flaw. It is scoffed at by loved ones as being "weak in mind", often leading to finger pointing at negligent parents for failing to raise their kids with resilience or worse still, attribute this to bad karma or ancestral unatoned sins.

A state level report by Indian Council of Medical Research (ICMR), published in 2017, noted that about one in seven persons in India suffers from mental disorders of varying severity, with depression and

anxiety disorders being the most common disorders affecting 45.7 million and 44.9 million people respectively. The estimate of the global burden of disease (GBD 2017) also predicts that depression would be the second-leading cause of disability worldwide by 2020. Further, the findings of a countrywide National Mental Health Survey 2015-16 by NIMHANS revealed that nearly 150 million Indians needed active mental healthcare intervention while fewer than 30 million were seeking it.

COVID-19 has inadvertently fast-tracked our attention to the ever ticking mental health time bomb. Healthcare workers and COVID-19 suspects have truly borne the brunt of this more than others. The stigma associated with COVID-19 patients is indeed a hapless reflection of the un-informed judgments their family are subjected to, every day!
The doctors and caregivers, working round the clock and staying away from their families, risking their very lives for others are being ostracised from their own communities. This instance is sufficient enough to discourage and cause stress even to the most resilient minds.

The role played by collective religious and spiritual awareness, particularly in times of adversity cannot be overstated. A study conducted in March 2020, in the Journal of American Medical Association indicated that absence from weekly religious service participation could result in almost a five-fold increase in suicidal attempts. In the initial days of the current pandemic, temples, churches, mosques and other places of solace or worship remained closed to ensure physical distancing. Many of the avenues that we as a society, young or old, have had at our disposal to deal with the pressures of the external world, seem to be less accessible during this pandemic period.

The weeks, months and possibly years ahead, are going to test our resilience, grit, adaptability, leadership, compassion and generosity of spirit as humankind, all in equally high measures. In the hindsight into the future linked to the "new normal" there is a fear of increasing mental health issues where issues will be reluctant adaption to "COVID appropriate" social behaviours, and adjusting to the unlocking of economic activities may weigh people

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down more than ever before and possibly weaken already-fragile minds.

WHAT CAN WE DO TOGETHER AS A SOCIETY

As a society, we have come up with many creative ways to deal with the inevitability of loneliness and its sequel.

The extensive use of digital technologies from places of worship, gym, yoga studios to conducting online activities through virtual workspaces and classrooms have majorly helped in maintaining the physical distance without being socially isolated. Social media networks have ensured check-ins with millions of individuals across the globe, including COVID-19 patients who are recovering alone in hospital beds or in confined home quarantine.

From a system standpoint, we as a country have been able to successfully complete several lakh training of health workers across the country by using the boons of digital learning. Training and capacity building resources on COVID-19 appropriate behaviours, anti-stigma and psychosocial health is a mandatory module on the Integrated Government Online Training platform (iGOT), where special response groups such as police, defence personnel, volunteers and students are learning via online training content, alongside healthcare workers. Coordination of psychosocial professionals and volunteers has made it accessible to all districts all over the nation. The National Institute of Mental Health and Neuro-Sciences (NIMHANS) launched a national helpline (080)-46110007) on March 30, 2020 to provide counselling on mental health and psychosocial issues related to the pandemic and lockdown, available in several vernacular languages, with a dedicated helpline for COVID-19 healthcare warriors on the frontline. A separate online platform https://psychcare-nimhans.in/ has also been set up for mental health support professionals providing counselling services. Several webinars and videos including stress management, social stigma during COVID-19, addressing psychosocial concerns of healthcare workers and dealing with issues of children and senior citizens, among others, have been created

and are being uploaded and updated regularly by NIMHANS and the All India Institute of Medical Sciences (AIIMS) on the Ministry of Health website www.mohfw.gov.in accessible at "Behavioural Health-Psychosocial resources".

While the system is committed to doing all it can to strengthen the facilities, create manpower and improve the accessibility to quality clinical services, this call is to the society at large: If judgment is indeed at the core of this issue, we need to stop the never-ending performance-reviews of people for less-than-perfect lives. We need to break the myth that everyone has to be positive all the time! It is perfectly okay to feel sad, angry, annoyed, frustrated, scared and anxious. Having or expressing feelings doesn't make anyone a negative person; it simply makes us human. We need to learn to give ourselves and others a break, forgive our follies and be kind to ourselves.

Stop beating yourself up! Everyone makes mistakes, has setbacks and failures. You don't come with a book on how to get it right all the time. You will fail sometimes, not because you planned to, but simply because you're human. Failure is a part of creating a great life", quotes Les Brown, a famous motivational speaker.

This is a clarion call to open up our hearts for our minds, and speak up without fear or shame for ourselves and for one another about the issues of the mind.

It's a call to stop viewing ourselves and everyone else from a prejudiced lens and stand together as a nation, as a humanity to help us all recover and move forward. Most importantly, it's a call to quieten the chatter, turn inwards and look within rather than externally or at others, for the source of our happiness.

Preeti Sudan is a civil servant and an officer of the Indian Administrative Service who has served federal and state governments at various levels.

At present, Ms Sudan holds the office of Secretary in the Department of Health and Family Welfare in India's Ministry of Health and has been instrumental in planning and implementing some of the biggest health initiatives in India.

She has also served as a consultant to the World Bank in Washington DC.

Kavita Narayan is a Technical Advisor to the Ministry of Health and Family Welfare, Government of India and state Governments, on Health human resource strengthening and policy reform.

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Email: ccaaih@phfi.org and for technical enquiries contact **Mr. Dhruv Kumar Singh (9999108702)**

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► THEME

The International Nurses Day
Praising, Thanking and Protecting Nurses amid COVID-19

■ **Written by Neha Lal**

Every year on May 12, the International Council of Nurses (ICN) celebrates the International Nurses Day in remembrance of birth anniversary of Florence Nightingale's. The celebration conveys the significant role that nurses play in the society by bestowing their benevolent contributions with an empathetic disposition and sincere commitment upon the patients in surge of best health care services.

Nurses are the frontline workers against the pandemic COVID-19. Their earnest efforts to safeguard the health of the patients amidst medical insurgency deserves due recognition. Around the world, the nurses are working incessantly to extend the healthcare services to the pandemic patients.

International Nurses day is the perfect opportunity to give due recognition to the frontline healthcare official we profoundly address as nurses. This day emphasizes the importance of learning, sharing of expertise, and best practice of nursing care to the ailing patient as it is the care that cures the disease apart from the prescribed medicine.

> **International Nurses day is the perfect opportunity to give due recognition to the frontline healthcare official we profoundly address as nurses.**

The International Nurses day is also important for nurses as it is based on a yearly theme on various dimensions of how to achieve the development goals. The goal serves as a time-bound achievable blueprint for reducing poverty and improving lives. In addition, it provides a once in a year/generational chance to define what needs to be done to deliver more efficient healthcare services. Furthermore, this day provides an important role in making nurses well informed, advised, encouraged, and supported to deliver better works.

The theme for International Nurses Day 2020, Nurses: A Voice to Lead – Nursing the World to Health, demonstrates the pivotal role of the nurses in addressing a wide range of health challenges which will inspire fellow nurses and make the aware public of their contribution to healthcare and health management.

On this International Nurses Day, GCS Medical College, Hospital & Research Centre, Ahmedabad in association with AHPI (Association of Healthcare Providers, India) organized a unique program to celebrate the fighting spirit of Nurses & to thank the hard work and contributions of our nurses by exploring some of their daily challenges and especially in the decisive circumstances of COVID-19.

A unique online panel discussion was arranged on where Nursing Heads from leading Hospitals of Ahmedabad joined and interacted with each other and shared their views in the view of Nursing Day on various topics such as Challenges faced by Nurses – Short-staffing in a hospital setting is a top concern for

nurses, untrained staff, mental trauma, no family support to treat the patients during present pandemic scenario, residential societies are imposing restrictions, bereft of psychological support from family and friends. Academic changes in nursing profession – Proper training/ examinations/ online courses required, occupational health hazard, workplace violence like bullying, harassment, odd hours along with double duty, less awareness of infection control practices, facing problems to meet the expectations of patient, proper coordination between personal and professional life, the measures taken by the government and hospitals to support nurses, provide conducive environment with necessary precaution measure, maintaining work-life balance, preparedness to fight COVID-19, etc. need to be inculcated in the due course of time for the nurses.

Eminent Panelists - Sharmistha Nayi (Nursing Superintendent, KD Hospital), Arti Pandya (Nursing Superintendent, Shalby Hospital), Sonal Prajapati (Nursing Superintendent, GCS Hospital), Bhaskar Shirahatti (Sr. Manager, HCG Hospital), Surya Darji (Nursing Superintendent, CIMS Hospital) along with Moderator Neha Lal (Sr. GM Ops & HR - GCS Hospital, Secretary – AHPI, Gujarat Chapter) participated in this discussion. In conclusion, Ms. Neha Lal (Moderator) congratulated as well as applauded the

> **Short-staffing in a hospital setting is a top concern for nurses, untrained staff, mental trauma, no family support to treat the patients during present pandemic scenario, residential societies are imposing restrictions, bereft of psychological support from family and friends.**

skirmishing and combating strength of nurses with a notion of belief that with change in the continuing professional development program offered to practicing nurses many of the key challenges currently faced could be addressed. This, however, would require influencing and negotiating skills at practice, area, and national levels with a desire from practice nurses to engage in leadership and communication skills development. With these inputs, a real change could be achieved which would improve the medical practitioner and patient satisfaction. It creates an avenue for nurses from different part of the world to unite, use the opportunity to make contact with front line staff and keeping the aspect of this year's theme," nurses a force for change – a vital source for health" augments that nurses are the principle force for the change provided for the nursing care and they are responsible, well versed healthcare professionals that is every country around the globe needs.

We take the privilege to salute our nurses for all their hard work and dedication especially at the juncture of unprecedented time due to prominence of corona virus.

Neha Lal is a dynamic professional with 19 years of experience in managing Hospital operations with a focus on quality healthcare delivery, expertise in determining the organization's mission & strategic direction as conveyed through policies & objectives. Awarded with "Mother Teressa Sadbhavna Award" from International Business Council, New Delhi for outstanding achievements in Healthcare. Have received many accolades for her dedication towards her work, the latest was received on October 6,2018 for outstanding achievement as "Certificate of Excellence" from International Institute of Education & Management.

▶ TRENDS

LATEST INNOVATIONS!

IIT ROPAR'S INNOVATION TO SANITISE PAPER CURRENCY, GROCERY ITEMS AND DELIVERY PACKAGES

Amid the coronavirus situation, a team of engineers at IIT Ropar have developed a common sanitising solution for all purpose work i.e. from washing vegetables with warm water to currency notes or wallets.

To tackle this situation, IITians have made a trunk-shaped device fitted with ultraviolet germicidal irradiation technology which works on the same principle as water purifiers.

The team recommends people to place this device at their doorsteps or somewhere close to the entry gate so that all items brought from outside including currency notes, grocery and delivery packages will

be sanitised by them thereby assuring safety from COVID-19. The customers are advised not to look directly towards the light as it can be harmful to the eyes.

As per the developers, one can put all items like notes, vegetables, wrist watch, wallets, mobile phones, any paper/document or any delivery package/courier in the trunk before further use.

The device will take 30 minutes to sanitise the items followed by a cooling off period of 10 minutes before using them.
After the commercialisation of the device, it will be available for less than INR 500 per piece. This device will be an indispensible

medium to safeguard ourselves from COVID-19 infection as the virus has the capability to sustain itself on various surfaces for few hours after initial contact.

SOURCE: www.sciencealert.com

HUMAN TEXTILE- THE GAME CHANGER

A team of researchers at the French National Institute of Health and Medical Research have grown yarn named "human textile" from human skin cells that can be used by surgeons to stitch up wounds or assemble implantable skin grafts. The main advantage of the human textile is that unlike already in use synthetic surgical materials, this does not trigger an immune response which can complicate the process of healing. These yarns represent a whole new generation of completely biological tissue-engineered products and thus offer a unique level of biocompatibility with the human tissues.

The researchers claim to use these human yarns to sew pouches, create tubes, valves and perforated membranes. The yarn can be used in various textile approaches like braiding, knitting, weaving and also

crocheting. To create the human textile, researchers cut sheets of human skin cells into long strips and then wove them into a yarn-like material which can be fabricated into a variety of shapes. So far, this yarn has been used by the researchers to stitch a rat's wounds and the wound healed in two weeks. They also created a skin graft by using a custom-made loom to seal a

sheep's artery and stop it from leaking. The same team of researchers had earlier produced sheets of biomaterial and rolled them into artificial blood vessels.
The paper was published in the Journal Acta Biomaterialis

SOURCE: www.endgadget.com
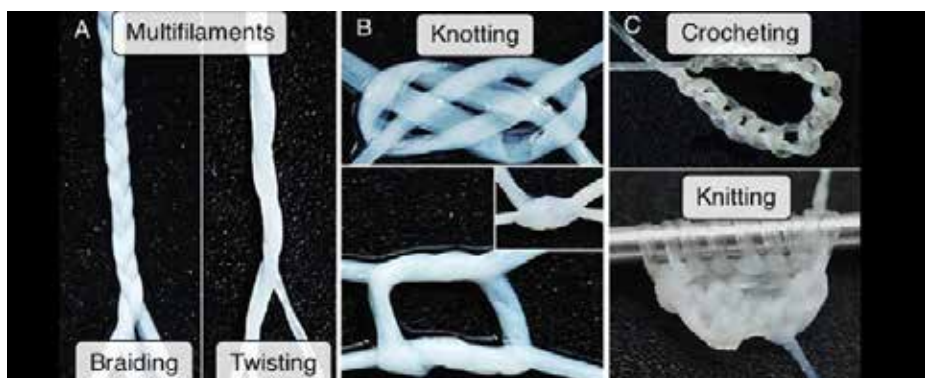
WORLD'S FIRST TRANSPLANT OF LAB-GROWN HEART MUSCLES

At Osaka University, Japan, a team of scientists have carried out World's first transplant using lab-grown heart muscle cells. In the end of January this first-of-its kind of surgery was carried out as the first stage of a clinical trial, which proved to be successful. The pilot surgery was done on a patient suffering from ischemic cardiomyopathy which is a resultant condition by the damage to the heart caused by coronary heart disease or heart attack. As a result not enough blood can reach the heart due to narrowed arteries.

In the surgery, the team transplanted a man-made sheet of heart muscle tissues on the damaged areas of the heart. It is hoped that the heart cells on the degradable sheet will grow and secrete a protein that promotes blood vessel regeneration, eventually promoting cardiac function. To grow the heart muscle in the lab, researchers began with induced pluripotent stem cells (iPS) which are made from an adult's cells either from skin or blood and then reprogrammed back to their embryonic pluripotent state which implies that they have the potential to become many different types of cells. The iPS cells were then encouraged to become the heart muscle cells that were required by the research team. These differentiated heart muscle cells were then placed on small sheets which were a little over 0.1mm thick and ready for transplantation.

The clinical trial will be conducted over the next three years with ten operations slated to be done on patients suffering from heart conditions.

As of now many patients lose their lives due to non-availability of transplants and if this research becomes successful and proves to be safe for the recipients, this approach could be used to ultimately eliminate the need for some heart transplants.

The study appeared in BioNews 1033.

SOURCE: www.inshorts.com

ROBOT FINGERS THAT COOL OFF BY SWEATING

In today's world of Artificial Intelligence and Robotics, who doesn't want a robot which can operate for long hours without reheating? In order to make this dream a reality a group of researchers led by Rob Shepherd, Professor of Mechanical and Aerospace Engineering at Cornell University, USA have taken the first step in creating robots that can work for extended durations without overheating. The research team has developed a 3D printed soft robot muscle which is similar to fingers that can sweat to regulate its temperature.

Overheating of robots is caused due to the inability to control the internal temperature and it has been a challenge since the time robots have been invented and used. To overcome this challenge the research team at Cornell University was inspired by sweating mechanism of mammals and ventured the idea with the Lab of Emmanuel Giannelis, to create nanopolymer materials for sweating by

Walter R Read professor of engineering. A 3D printing technique which uses light to cure resins into shapes was used by the team to create fingers. Then the team created finger like actuators which were made from two hydrosol materials that retain water and react to temperature. The base layer shrinks when it is exposed to temperatures above 86 Fahrenheit squeezing water into the top layer which

is perforated with extremely small sized pores that release the water. The actuators were able to cool off almost six times faster than fan. Therefore it helps the robot fingers to cool off by sweating. The ability to perspire is the Unique Selling Point of these robot fingers and they will revolutionise the change in which robots serve human beings.

SOURCE: www.thebetterindia.com
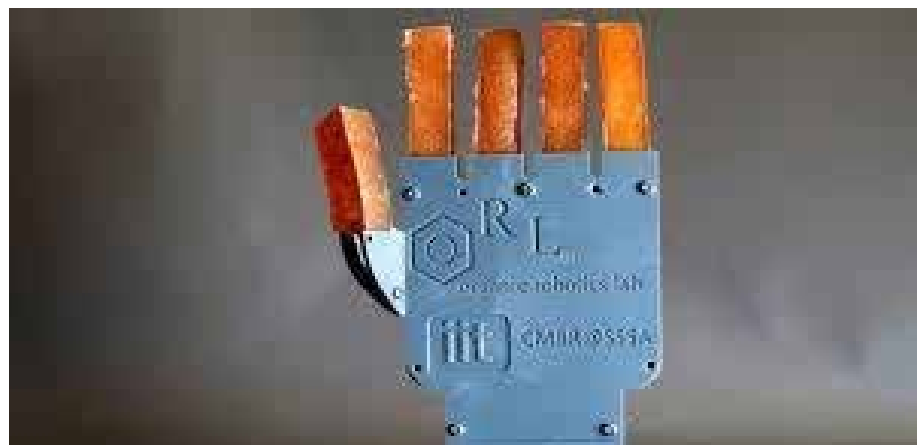
SELF-CLEANING SMART TOILETS – THE KIND OF SANITATION INDIA NEEDS

Sanitation sector in India needs community participation at a very committed level. Taking a note of this and extending the arm of Swachh Bharat Mission, Mayank Midha and Megha Midha started a social enterprise named 'Garv Toilets', which is an endeavour to address the growing issues related to public toilet maintenance in the country.

These intelligent toilets are powered by IOT and Artificial Intelligence. Manufacturing of these toilets is being done in such a way that the capital expenditure in constructing and maintaining them over the years is minimal. These toilets are made from metal enclosures, making them essentially indestructible and are equipped with Radio Frequency Identification System (RFID) and IOT Technology. They are self-sustainable in terms of energy consumption and waste disposal. All toilet units work on solar energy which ensures the availability of electricity at all times enabling the automatic features in the toilet running. These intelligent toilets can self-flush if any of the user has skipped to do so and also the jets are triggered to clean the floors after detecting the number of people who have used these toilets.

Each unit has an LED light, an exhaust fan for ventilation and sanitary pad vending machine. The USP of these prefabricated toilets is that they give real-time updates on the use of these toilets, hygiene behaviour of users, can be customised for the differently-abled to have ramps and handrails and have low operating costs. One cannot overlook the excellent waste management done in these toilets. Each toilet has a bio-digester unit which treats pathogen in sludge and sewer, after disposal the waste can be used as organic fertilisers by farmers.

By far Garv has installed 798 toilets across the contry which are being used at least 1.4 lakh times a day. Garv via their vast network and associations with various NGOs, CSR projects and foundations has been able to install their toilets in schools, rural areas and cities making nearly 18,000 children use these toilets daily. The price of these smart toilets ranges between 2.5 to 4.2 lacs depending on the required features by the users.

SOURCE: www.cnet.com

BATH MAT TO MEASURE YOUR WEIGHT, POSTURE AND EVEN YOUR SHOE SIZE

At Consumer Electronics Show (CES) 2020 an innovative bath mat has been unveiled by the name of "MATEO". The bathroom mat is a smart one as it captures and tracks health data of its user including weight, posture and body composition. Mateo has been named a CES 2020 Innovation Awards Honouree in the Health and Wellness category.

The bathroom mat has two parts, the first, is a machine washable cloth covers which looks like a garden-variety bath mat and the second, and is a slim mat that includes the technology to detect the metrics of the user. The mat has medical grade 7000-dot pressure mapping. The unique feature it holds includes its ability to identify its users by their footprint and create a heat map that studies the contact of the foot with the ground.

The developers have expressed that their patent-pending technology can utilise the pressure mapping to help the users find out the users posture score and even suggest corrective exercises based on expertise from a podiatric medicine panel. The company also claims that the mat can detect certain medical problems like diabetic foot.

The bathroom will capture the above data every time the user stands on it and it can analyse the readings immediately. The Mateo companion application comes along with the mat and it will alert the user when he/she reaches any meaningful numbers regarding weight gain or loss or improved posture.

The demonstrative mats exhibited at CES were early prototypes and the company intends to launch a crowdfunding campaign in the coming months along with the launch of several iterations by the end of 2020 including a high-end mat with conductive thread to

'MAMAROO SLEEP BASSINET' – MIMICS PARENTS' MOVEMENTS TO PUT BABIES TO SLEEP

US-based company '4moms' is dedicated for the innovative, easy to use baby products that make life easier for parents. With this aim in mind 4moms recently exhibited their smart cradle at CES 2020. The cradle can mimic parents' cuddles to lullaby babies to sleep. This technology-enabled sleep bassinet named "mamaROO" is a smart sleep solution which integrates the same proven motions of infant seat which aids the baby to sleep in a safe, secured sleeping environment. The bassinet moves on the commands of parents as the base stays still and the basket glides up and down and also sideways to help babies sleep. The developers claim that this innovative product will help babies sleep faster and for a longer duration.

The cradle comes in five patterns like kangaroo, car ride, rock-a-bye, tree swing and wave wherein each of the five movements has five speeds. The bassinet offers a total of 25 settings. The movements have been programmed on the basis of natural movements or motions that parents make when they are trying to comfort their babies. There are four voice options including ocean, rain, fan and shush and vibration settings alongwith a timer. 4moms application can be connected to this smart baby gear. This bassinet was launched in the market in the month of February 2020 at a price of $330.

detect body composition, body fat percentage and much more at a price of $ 179 per piece. The simpler models will be priced lesser than $ 179.

SOURCE: www.endgadget.com

Compiled by:

Dr. Avantika Batish, working as the Director Strategy and Healthcare at International Health Emergency Learning and Preparedness. She imparts her knowledge as a guest faculty for MBA (HR) and MBA Healthcare Management B-Schools along with training in soft skills.

The Challenges and Possible Solutions of COVID-19

■ Written by Dr. Kanuparthi Prasanna Laxmi

COVID-19 cases in India have seen a dramatic surge in the past 2 weeks following Lockdown 3.0 which has eased restrictions in many zones. In his address to the nation on May 12, 2020, the Prime Minister of India, Mr. Narendra Modi announced an overall economic package worth Rs. 20 lakh crores apart from highlighting the realization of self-sufficiency for the country at a time when the pandemic has brought the economy to a standstill. As of May 13, 2020; 3,604 new cases and 87 deaths were recorded and number of cases rose to 74,281 while the death toll hit 3,225, according to Worldometer. India at present is the 11th most affected among 187 countries with coronavirus cases. Though blistering number of cases are being registered on daily basis, union health minister Dr. Harsha Vardhan claimed our recovery rate is at 31.7% while our Nation's mortality rate is at 3.2%, the lowest in the world when global fatality rate is around 7-7.5%, the minister says.

Globally over 43 lakh cases have been tested positive for this pandemic in as many as 213 countries and in current situation, many countries have taken stringent measures to slow down the spread of SARS-CoV-2, virus responsible for COVID-19. In the Superpower nation, United States of America, the virus has forced significant shut downs across the economy with stock markets plunging and share prices dropping. On March 25, 2020, nine European countries—Italy, France, Belgium, Greece, Portugal, Spain, Ireland, Slovenia and Luxembourg—called for "corona bonds" in order to support their countries to recuperate from the epidemic. According to UNICEF over 19 million children living in displacement within their own countries due to violence and conflict in 2019 which had severely affected due to limited availability of water and food resources amidst the COVID-19 crisis. A modelling group convened by the World Health Organization and UNAIDS has estimated that in sub-Saharan Africa, disruption of antiretroviral therapy for AIDS-related illnesses could lead to more than 500,000 extra deaths in 2020–2021 if efforts are not made to relieve the disturbances in health services and supplies during the pandemic. In 2018, an estimated 470 000 people died of AIDS-related deaths in the region.

According to the categorization of COVID-19 strategic preparedness and response plan by WHO for various countries as updated on May 7, 2020, India stands at level-3 where, the operational readiness index (levels 1-5) was aligned with the WHO SPAR benchmarks capacity levels: Level 1 ≤20%, Level 2 ≤40%, Level 3 ≤60%, Level 4 ≤80%, and Level 5 >80%. This data will be updated periodically through capacity and risk assessments based on the evolving COVID-19 situation. The categorization itself takes into consideration additional factors relevant for managing the risk of COVID-19. Henceforth, it is important for us to focus on containment efforts, ensure we don't reach community transmission stage, says health ministry.

The accessibility of a safe and effective vaccine for COVID-19 is an inevitable tool to contribute to the control of the pandemic. ICMR has teamed up with Bharat Biotech International Limited (BBIL) for developing COVID-19 vaccine and the vaccine will use the virus strain isolated at the National Institute of Virology (NIV), in Pune. The strain has been effectively transferred from NIV to BBIL. Furthermore, the Serum Institute of India (SII), which is the world's largest maker of vaccines by volume, has partnered with Oxford University to produce up to 60 million doses of a potential vaccine. At the same time, the challenges, hard work that need to be promptly developed, assessed and produced are at present scale are enormous. The evaluation of wide range of vaccines will bring a breakthrough in viability. The case-by-case evaluation of COVID-19 vaccines, pre-clinical data, safety profile and immunogenicity of a vaccine along with data on its shelf-life, stability, parenteral administration dosages that would be required along with the availability are the key factors that would be considered. Also, five hospitals, the B. J. Medical College and Civil hospital from Ahmedabad and Apollo Hospital in Chennai, AIIMS in Jodhpur and Bhopal,

> The accessibility of a safe and effective vaccine for COVID-19 is an inevitable tool to contribute to the control of the pandemic.

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have so far been approved to conduct randomized controlled clinical trials on four treatment protocols — remdesivir, combination of lopinavir and ritonavir, hydroxychloroquine and lopinavir and ritonavir with Interferon beta-1a under WHO's solidarity Trial to find an effective treatment for COVID-19. Over 100 countries are working together to find effective therapeutics as soon as possible, via the Trial, according to the WHO website.

In fight against the COVID-19 various steps taken were already successful. Aarogya Setu app which is currently being used by over 9.85 crore Indians will alert the person using it to recognize potential COVID-19 positive cases once in close proximity along with alerts complemented by instructions on how to self-isolate and to-do list in case the person develop the symptoms. Also guidelines are updated on rational use of "Personal Protective

Equipment". Besides the facility based surveillance, Indian Council for Medical Research and National Centre for Disease Control (ICMR &NCDC) in collaboration with significant participants and state health departments have introduced a population based sero-survey in selected districts representing the case detection across the country. India has successfully strengthened its daily capacity to test COVID-19 samples to over a lakh tests a day. The development was made public by the Union Minister of Health and Family Welfare Dr Harsh Vardhan. He also shared that the total number of government-run laboratories conducting testing activity across the nation has reached over 347, while another 137 private laboratories are also carrying out the testing. The number of Covid-19 tests in India is close to the 20 lakh mark, with the total number of tests already performed having surpassed 17, 62,840. Whereas, the national doubling rate of the total COVID-19 cases in the

past 14 days stands at 10.9 days, while over the past three days, the doubling rate has further increased to 12.2 days.

Further, if lockdown is relaxed in India, places of religious gathering such as temples, mosques and churches can emerge as potential clusters for coronavirus transmission as community gatherings for celebrating festivals and marriages are widely acceptable norms. Coronavirus is expected to present both opportunities and challenges to Indian pharmaceutical manufacturers. Nation's overdependence on China for Active Pharmaceutical Ingredients (APIs) disclosures it to raw material supply disruption and price volatility according to a report from the Ministry of Commerce and Industry (MCI). Further medical challenges include matching Personal Protection Equipment demand and supply, production of reusable anti-viral masks; predicting and identification

> **ICMR has teamed up with Bharat Biotech International Limited (BBIL) for developing COVID-19 vaccine and the vaccine will use the virus strain isolated at the National Institute of Virology (NIV), in Pune.**

of potential hotspots; bed availability and COVID case management solutions for hospitals.

India should further expand the surveillance based on trends of the epidemic besides should extend its laboratory testing capacity. People belonging to higher risk groups should be retested if they have tested negative prior, including community cases with upper respiratory tract infections along with patients exhibiting influenza symptoms to identify suspected cases and keep performing treatment in isolation wards.

Source: The tribune, WHO, UNICEF, India.com

Dr. Kanuparthi Prasanna Laxmi, Ph.D in Biotechnology from CSIR- Indian Institute of Chemical Technology. She has an extensive laboratory research experience in peasts management in plants, plant- insect interactions and their defense strategies, biological control and the impact of bio-nanoparticles on the plant, soil and pest insects. Her effective verbal and written communication skills are well documented in her peer reviewed publications and presentations at various conferences. She is proficient in statistical techniques, editing and proofreading of manuscripts.

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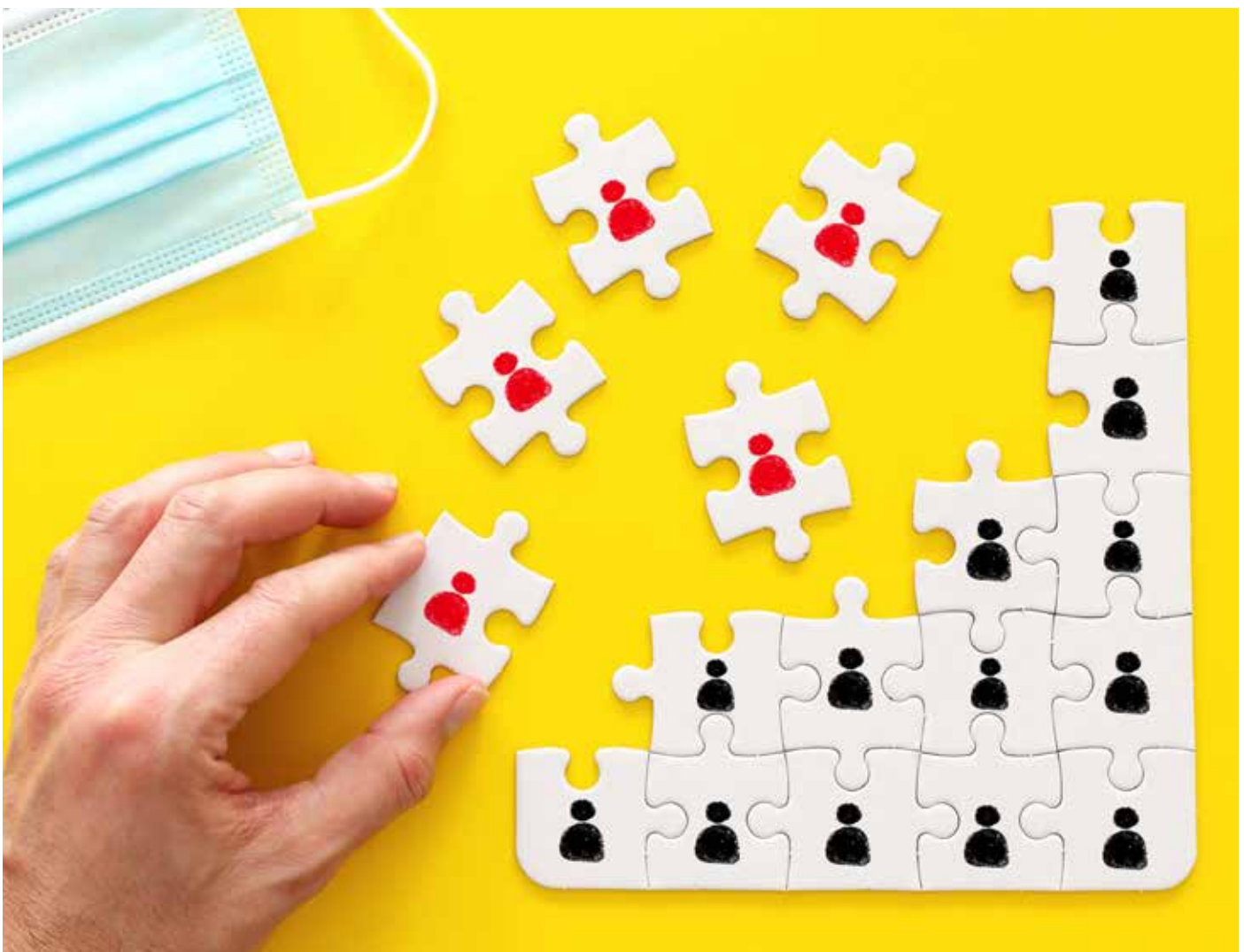
CSIR lab to Reach Out North-East Villages through Entrepreneurship Drive

■ **Written by Umashankar Mishra**

North-East Institute of Science and Technology (NEIST) will make all possible efforts to reach out to about 500 villages of north-east India through its various entrepreneurship and skill development programmes in the aftermath of COVID-19 pandemic. This information has been given by Dr. G Narahari Sastry, Director of the institute.

He was addressing the CSIR-NEIST fraternity on the occasion of the National Technology Day through e-mode.

Some of these programmes include CSIR-AROMA Mission, Rural Women Technology Park, Science and Technology Interventions in the North-East Region (STINER) and other similar societal missions of the institute to facilitate innovation and entrepreneurship in the region. NEIST, based out of Jorhat, Assam, and a constituent laboratory of the Council of Scientific and Industrial Research (CSIR), has taken up this initiative in concurrence with institute's theme "Year of Revitalizing NEIST for Strengthening North East" for the year 2020.

> **'Rebooting the Economy through Science, Technology and Research Translations acronymed as 'RESTART', the institute had lined-up its various activities for the National Technology Day.**

Keeping in tune with the national theme for the day that is 'Rebooting the Economy through Science, Technology and Research Translations acronymed as **'RESTART'**, the institute had lined-up its various activities for the National Technology Day. Notable among these was the entrepreneurship development programme for rural women under

the STINER project. The programme was attended by 10 aspiring women entrepreneurs from CSIR-NEIST colony apart from online participation of other entrepreneurs from all over the state of Assam along with CSIR-NEIST staff members.

"Social entrepreneurship oriented towards the social, cultural and environmental needs of the society will be in great demand in the aftermath of COVID-19 pandemic in the nation", said Dr Danish Tamuly, Director on Board of North-East Agriculture Technology Entrepreneurs Hub (NEATEHUB), Atal Incubator Centre (AIC) of Assam Agriculture University (AAU). He exemplified the importance of innovative ideas in churning out a profitable venture.

CEO, NEATEHUB of AIC-AAU, Dr. Karthikeyan emphasized on the changing scenario in the business ecosystem and assured that NEATEHUB (AIC-AAU) is ready to provide all necessary support in CSIR-NEIST endeavor on societal entrepreneurship. Dr. Mantu Bhuyan, Principal Scientist and Principal Investigator of the STINER project, elucidated on the scope and opportunities available under the project for budding entrepreneurs and underscored the technical facilities such as incubation and training facilities that would be made accessible to the needy.

"The optimal use of technology depends on what use we put it in and accordingly it can be a boon or a bane. Our aim should be to serve the society by positive and constructive intervention of science and technology. In the wake of COVID-19 pandemic, people are looking forward to the scientific community with high expectations and we need to uphold by living up to their expectations", said Dr. Sastry.

Credit: India Science Wire

> **"Social entrepreneurship oriented towards the social, cultural and environmental needs of the society will be in great demand in the aftermath of COVID-19 pandemic in the nation", said Dr Danish Tamuly**

Awareness, Usage of mHealth Apps and Consequent Health-Seeking Behaviour Changes Amongst Smartphone Users in India

■ **Written by Dr. Sanjiv Kumar Dixit and Shikha Gill**

Mobile health (mHealth) solutions have become an integral component of the healthcare landscape. mHealth apps offer health related information and services which are accessible to patients both at home and on-the-go. Increasing smartphone access has catalysed the development and use of smartphone applications (apps). Mobile health interventions have previously relied on voice or text-based short message services (SMS), however, the increasing availability and ease of use of apps has allowed significant growth of smartphone applications that can be used for change in health seeking behaviour. The use of mobile computing has exploded and reached the commercial industry and mainstream consumers via smartphones, mobile phones and tablets. According to Gartner Inc., worldwide mobile connections will grow up to 20.4 billion by 2020 in India. In a recent example, Apple launched new mobile features on the Apple watch 4 that can track the ECG of the person. In this study, the term 'mHealth' refers to public health and clinical activities involving mobile devices like smartphones.

mHealth has attracted researchers from various fields, and the number of research publications has increased. However, to the best of my knowledge, very few literatures have reported on trends, opportunities and challenges of mHealth apps in India. This study investigates the use of mobile health applications on tablets or smartphones for change in

> ## The use of mobile computing has exploded and reached the commercial industry and mainstream consumers via smartphones, mobile phones and tablets.

health-seeking behavior among Indian adults. The number of mHealth Apps has also exploded and most of these Apps have not been evaluated. There is a need to have a repository of mHealth Apps which have been evaluated by an independent organization and found useful and effective.

Recently, due to the outbreak of covid-19 Coronavirus, the government of India launched a mobile app to monitor to help its citizens identify the risk of contracting COVID-19. Aarogya Setu app is also crafted to keep a user informed if in case he or she crosses a path with a positive tested patient. The app tracks the interaction of people with positive cases with the use of a social graph which is location generated and the use of bluetooth technology. It is a self-testing tool which gives the result based on a simple questionnaire with the help of algorithms and Artificial intelligence.

The following are the outlines for the study

Primary Objectives:
- To study the awareness and usage of mHealth apps amongst Indians.
- To study whether the usage of mhealth apps is changing the health seeking behaviour of people.

Secondary Objectives:
- To identify the reason people use mHealth apps, who encouraged them and their continued usage rates.
- To check whether the doctors are encouraging the usage of mHealth apps to patients.
- To find out which services people would be interested in a mhealth app.

The study tool for the aforementioned objective was an online questionnaire for the general public. The questionnaire consisted of open, closed, both single and multiple choice answers and likert-scale-styled questions. The researcher conducted an online population-based survey of 250 people aged 18 or older by using a virtual snowball sampling technique. The survey measured socio demographic information, chronic condition presence, health behaviors, quality of life, awareness of mhealth apps and their usage. Questionnaire is at Appendix 1. Basic demographic-related questions were included, to compare health seeking behaviour as per education, income, gender and so on.

The 250 responses were recorded in google form. 247 responded and 3 people did not give consent to be a part of the study and hence were excluded.

The inclusion criterion was taken from the smartphone users, those who gave voluntary informed consent and are citizen of India. The exclusion criteria were taken as those who were not Indians, do not own/ use a smartphone, did not consent to the study and were below the age of 18.

The study conducted gave a total of 247 individuals who have completed the online population-based nationwide survey and 40.08% (99/247) were women

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> **mHealth Applications, identify new Apps that need to be developed to address the burden of diseases, improve health outcomes, oversee independent evaluation and facilitate scale up of the Apps found successful**

and 59.92% were men. It was found that 96% (237/247) were graduates and above. Most participants were working full-time 83.4% (206/247), 14.2% (35/ 247) were not working and 2.4% (6/247) were retired. 44.9% of people reported to have spent between 1 to 3 hours everyday. 66.8% self-assessed their health conditions as fit. 72% consulted doctors whereas 20.6% is on self-medication. 44% are doing regular exercise/ yoga. 70.4% are using social media and music apps.

Among all those surveyed, 56.3% (139/247) are aware of mhealth apps, however only 31.6% (78/247) are using mHealth apps. 40.9% (101/247) are not using mHealth apps because of lack of awareness. Of the people using mHealth apps, 49% (38/78) and 30%(23/78) use apps for fitness and food / nutrition purposes respectively. Only 6.1%(15/247) are using for mental health. Only 13.8 % (34/247) are using for women's health. 92.7% (229/247) of people say that they will download mHealth apps if it is useful for them. However, only 32.2% (81/247) will download if it is paid. 22.2% (55/247) of people use apps to track their activity / exercise and 26.7% (66/247) are using for diet control. 20.2% (50/247) of people logging into mHealth apps daily. Only 37.2% (92/247) trust that their mHealth app records data accurately. 17.41% (43/247) feel that usage of mHealth apps has definitely improved their health whereas 25.51% (63/247) feel that maybe it has improved health. 36.8% (91/247) feel usage of mHealth has improved their health seeking behavior. Only 5.3% (13/247) people told that doctors recommended them to use mHealth apps. Only 50.6% (125/247) of users are likely to recommend mHealth apps to

others. 30.3% (75/247) of people feel that usage of mHealth has helped them lead a less stressful life.Males between the ages of 31 to 45 spend most of their time approximately 1 to 3 hrs daily on mobile followed by 46 to 59 years old (how much time?). 40% of people who spend 1 to 3 hrs per day on mobile open the mHealth app once in a day. These people spend more time in social media followed by education and news followed by Health and Lifestyle. Overall males use more mHealth apps than females.

Out of the persons who believed that mHealth apps improved their health seeking behaviour (36.8% (91/247)) are not sure if they really improved their health or not [47% (43/91)] remaining 42.9% (39/91) observed that it actually helped their health. It is interesting to know from this survey that those who never used any mHealth apps still want to recommend people to use mHealth apps 24.8% (31/125). 67.2% of people (84/125) who have used the mHealth apps before will recommend people to use mHealth apps. Out of all the participants 1 out 3 is using mHealth apps and more than 40 percent are not aware of mHealth apps therefore a considerable number in not in the technological era. Mental health is a very essential part of a human life but today people are not giving too much importance to this aspect that is the reason behind only 6.1 percent of people are using mHealth apps for betterment of their mental health. Users of mhealth apps differ in their demographic profile as compared to non-users. The users belong to the higher economic status, are more health aware and tend to be younger. There is no difference in the users and non-users depending upon the treatment

undergoing. Health app users are younger and the male respondents are greater for using these apps. The study clearly brings out that awareness of mobile health apps is more among the males than the females. Nowadays doctors are not recommending people for using mHealth apps to monitor and plan their health effectively. Arogyasetu app may be the game changer for recommendation and awareness as the government of India is promoting this app. Although the usage of mhealth apps denotes increasing awareness of health seeking behaviour however the same is not reflective of a corresponding change in health parameters.

Regarding mobile Health app use literature review was done by various researchers. Lancet Innovations, recognised the importance of mHealth apps for healthcare and medicine. All these studies focused on disease self-management and remote monitoring of patients. We found that the usage of health app, person undergoing treatment, and health mindset in our survey was in consonance with these studies. There is a need for awareness for mobile solutions for disease management. Our findings indicate that people undergoing treatment were not using health apps. We found this relationship not only when we were looking at mhealth users but also when we were investigating people undergoing treatment.In another study from England: Awareness and Use of mHealth Apps by Reem Kayyali and his team, identified a lack of awareness and use of health apps by the public. Our findings are consistent with this study, they are unaware about these app's benefits. This is exacerbated by doctors failing to recommend such apps to their clients and patients, despite the benefits.

A Survey on "Trend, Opportunities and Challenges of mHealth Apps" was done by Shaidah Jusoh of Northern Border University, Rafha, Saudi Arabia.The findings showed the critical factor in the success of mHealth apps due to the involvement of all healthcare stakeholders. Another study conducted in four counties (U.S., Brazil, China and India) in 2012, aimed to identify the views of healthcare professionals, patients and customers

regarding mHealth. Through our study we are confirming the usability and its benefit for the public. It can help the policy makers to make decisions for increasing awareness about mHealth and its benefits. The study also confirms that with the right motivation from the doctors to patients for the use of mHealth apps will surely increase awareness among the population.

Exploring the review of literature, a systematic review by Dale and team was found where mHealth is an important contributor to behaviour change intervention and disease management. "Use of Mobile Health Applications for Health-Seeking Behavior Among US Adults" a study by Bhuyan SS explores the use of mHealth apps on smartphones or tablets for health-seeking behavior among US adults. "Evaluating mobile phone applications for health behaviour change: A systematic review" study by Fiona H McKay and team stated the better way to process the effectiveness and the quality of apps by studying the behaviour changes caused due to mobile health apps. In an article published in June 2018 entitled "Health as a Means Towards Profitable Ends: mHealth Apps, User Autonomy, and Unfair Commercial Practices", discussed mHealth apps and their potential to change the behaviour of the user. "Behavior Change Techniques in mHealth Apps for the Mental and Physical Health of Employees: Systematic Assessment" is an article by Elsbeth de Korte published in October 2018. Research on Health apps is very limited. Interventions will be useful if they ensure change in health seeking behavior.

Our study is in accordance with the various studies mentioned above as far as change in health seeking behaviour of individuals in India is concerned. While the usage of mHealth apps is very popular among young people; older people are also increasingly becoming aware of the benefits of mhealth apps. Role of age in usage of mhealth apps underscores the importance of new ways of helping in health topics, and is increasing in future. In our study, we found weight loss, healthy diet and smoking cessation were the most common behaviour change targeted by the apps.Since there are a very large number of mHealth Apps

available, the users get confused about their usefulness and authenticity. There is a need to use a framework (Fig. 1) in developing, evaluating and scaling up the mobile Applications to address the burden of disease. It is also important for public health authorities or health IT industry professional bodies to establish a platform where authentic mHealth Apps can be identified, tested and approved by independent institutions such as health ministry. Such platforms can suggest gaps to software developers as to where mobile Apps are needed to address the burden of disease and interventions. There is a need to establish platforms preferably driven by a government institution such as InnoHealth which brings together mHealth App developers, academicians, public health programme managers and government policy makers to oversee the whole process to help review the available mHealth Applications, identify new Apps that need to be developed to address the burden of diseases, improve health outcomes, oversee independent evaluation and facilitate scale up of the Apps found successful.

This study was an attempt to ascertain the level of awareness and consequent benefits of a positive change in health seeking behaviour amongst 247 Indians. It was heartening to note that the level of awareness was pretty high (x%) however the usage of mHealth apps (y%) needed a lot of improvement. The study paves the way to research on various innovative and novel ways to educate the people on the

positive benefits of the usage of mHealth apps. The study though suffered from the limitation of firstly being conducted online and secondly being conducted only for persons holding a smartphone. The sample size ideally should have been much higher to be representative of a country as vast and varied as India. Another issue is that the survey questions constrained the findings that could be deduced from the results. However, it highlights the importance of the role mHealth plays and the need to enhance its use to educate the public for improving their health behavior.

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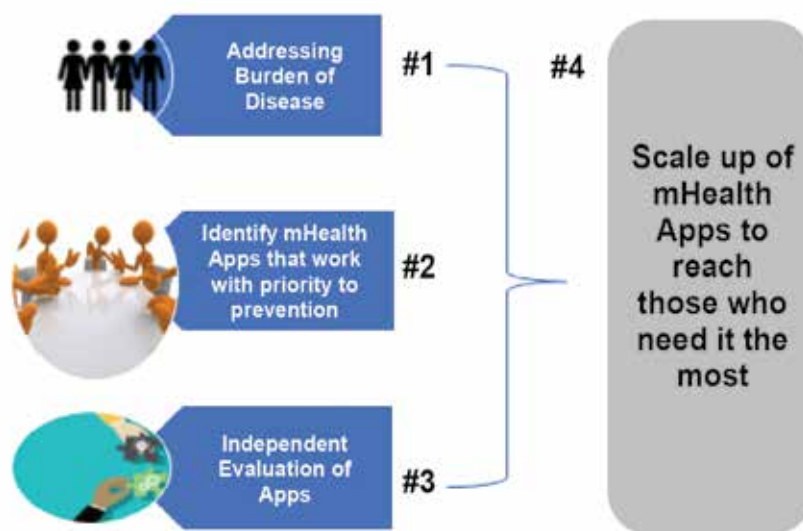
Fig. 1: Steps in development and use of mobile Health Apps

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Telemedicine
Practice Guidelines

Timely clarity by the Govt which helps in Covid

Introduction

The Indian Government has issued the Telemedicine Practice Guidelines ("Guidelines") for enabling the Registered Medical Practitioners ("RMPs") to provide health care services using the various telecommunication and digital communication technologies. RMP is defined to mean a person who is enrolled in the state register or the national register under The Indian Medical Council Act, 1956 ("IMC Act"). Under IMC Act, an RMP has to be an individual, who has completed the "Recognized Medical Qualification".

In India there was no legislation or guidelines on the practice of telemedicine through video, phone, internet-based platforms like web / chat / apps etc. and the issuance of the Guidelines is a major step forward in the healthcare domain in India, especially during Covid situation. Publishing the Guidelines has certainly cleared the air on the legality of telemedicine in India.

The Guideline are detailed and cover various modes of communication that can be used by the RMPs to provide health care services to the patients, such that the RMP shall uphold the same standard of care as in an in-person consultation. While there are advantages of each mode of communication, there are disadvantages as well. The Guidelines require obtaining consent from the patients, the manner in which a prescription is to be issued by the RMP, medicines which can be prescribed by an RMP based on the different modes of communication and the nature of consultation (i.e. first consultation or follow-up consultation or emergencies).

The Guidelines specifically excludes amongst other things the use of digital technology to conduct surgical or invasive procedures remotely. It would have been good if the Guidelines did provide for data management systems etc.

But perhaps, these might be included in draft bill for Digital Information Security in Healthcare Act (DISHA). We had earlier written about DISHA , the future direction of digital health information in India and about the Data Ownership, Security, Consent for health data.

Doctor consultations outside India jurisdiction:

The Guidelines do not permit for consultation outside India. Practically, those consultations will be through the medium of audio, video, text based and hence the aim of the Guidelines is to exclude such consultations. IMC Act, clause 12 also details "Recognition of medical qualifications granted by medical institutions in countries with which there is a scheme of reciprocity".

Tools for Telemedicine

The Guidelines has identified the modes for telemedicine consultation and the primary modes are video, audio and text.

> **The Guideline are detailed and cover various modes of communication that can be used by the RMPs to provide health care services to the patients, such that the RMP shall uphold the same standard of care as in an in-person consultation.**

The modes can include telephones, video devices, chat platforms (like WhatsApp, Facebook messenger) or email, fax or special apps developed for tele-consultation. The RMP should use her best judgement whether tele-consultation or in-person consulting is suitable in a given situation. Specific guidelines have been set out for Technology Platform enabling telemedicine consultations.

Responsibilities of the RMP

Apart from the many responsibilities under the IMC Act and these Guidelines, the RMP should be reasonably comfortable that telemedicine consultation is in the patient's interest. The RMP can also decide on the mode of technology (video, audio, chat) to diagnose and treat a patient.

By way of maintenance of records, the RMP is required to maintain the log or record of telemedicine interaction (e.g. phone logs, email records, chat/ text record, video interaction logs etc.). The RMP is also required to retain patient records, reports, documents, images, diagnostics, data (Digital or non-Digital) etc. utilized in the telemedicine consultation. The time period for which such records have to be maintained are not specified in the Guidelines and it is only mentioned that the records are required to be maintained for the period as prescribed from time to time.

Misconduct by the RMPs

The general requirements under the IMC Act relating to professional misconduct, ethics will be applicable in case of a telemedicine consultation. The Guidelines further provide that all actions that wilfully compromise patient care or privacy and confidentiality or violate any prevailing law are not permissible. Such activities can be in the nature of the RMP misusing the patient images and data (especially private and sensitive data) by uploading any explicit picture of the patient on social media. Further, the RMPs are not permitted to solicit patients for telemedicine consultations through any advertisement or inducements. The penalties for any misconduct by the RMP will be as per the IMC Act and other prevailing laws.

Medicines that can be prescribed in telemedicine

The Guidelines prescribe norms and rules for the issuance of prescriptions by RMPs. If an RMP has prescribed medicines pursuant to telemedicine consultation then the RMP is required to issue a prescription as per the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulation ("IMC Regulations"). The IMC Regulations prescribe that a physician shall write his name and designation in full along with the registration particulars on his prescription letter head and the same rules also apply to prescriptions issued pursuant to a telemedicine consultation. The RMP is authorised to provide a photo, scan, digital copy of a signed prescription or e-prescription to the patient via email

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or through any messaging platform. The Guidelines also allow the RMP to transmit the prescription directly to a pharmacy but in such cases the RMP is required to ensure the explicit consent of the patient that entitle the RMP to get the medicines dispensed from a pharmacy of the choice of the RMP.

However, it is clarified that the RMP may prescribe medicines via telemedicine only when the RMP is satisfied that adequate and relevant information has been gathered about the patient's medical condition and that the prescribed medicines are in the best interest of the patient. For issuing a prescription, the RMP is required to explicitly ask the age of the patient and in case of doubt the RMP should require an age proof of the patient. As in the case of in-person consultations, the RMP is required to maintain a record of the prescriptions issued pursuant to a telemedicine consultation.

A sample format in which the prescription is to be issued is provided as an Annexure to the Guidelines.

First Consult and Follow-up Consult

The Guidelines draw a distinction between a first consultation and a follow-up consultation with an RMP. First Consult means that the patient is consulting with the RMP for the first time or if more than 6 (six) months have elapsed since the previous consultation or if a patient has consulted with the RMP earlier but for a different health condition. Follow-up Consult means the when the patient is consulting with the same RMP within 6 months of his previous in-person consultation and the consultation is for the continuation of care of the same health condition. A consultation will not be considered as a follow-up consult if there are new symptoms and / or the RMP does not recall the context of the previous treatment and advice. The process of consultation and the nature of drugs that can be prescribed by an RMP depends on if the consultation is a first consult or a follow-up consult.

Identity and Consent

The RMP is required to verify and confirm the patient's identity by name, age, address, email address, phone number, registered ID or any other identification as deemed appropriate. The RMP is also required to ensure that there is a mechanism for a patient to verify the credential and the contact details of the RMP.

For the purposes of identification, the RMP is required to begin the consultation by informing the patient about his name and qualifications. The RMP is required to display the registration number accorded by the State Medical Council on prescriptions, website, electronic communication (WhatsApp/ email etc.) and receipts etc. issued by the RMP to the patients.

Consent from a patient is mandatory for any telemedicine consultation and the consent may be implied or explicit. If a patient initiates a telemedicine

> The IMC Regulations prescribe that a physician shall write his name and designation in full along with the registration particulars on his prescription letter head and the same rules also apply to prescriptions issued pursuant to a telemedicine consultation.

> **The Guidelines also prescribe the process for consultation by a Health Worker with an RMP seeking consultation from a patient in a public or private health facility.**

consultation, then consent is implied and an explicit consent if needed if a health worker or an RMP or a caregiver initiates a telemedicine consultation. An explicit consent from a patient can be recorded in any form either by way of an email, text or audio/video message and the patient can state his/her intent on phone/video to the RMP (e.g. "Yes, I consent to avail consultation via telemedicine" or any such communication in simple words). The RMP must record such consent granted by a patient in his patient records.

Emergency Situation

The Guidelines provide for specific rules in case of an emergency situation. In all cases of an emergency, the RMP is required to advice the patient for an in-person interaction with a Registered Medical Practitioner at the earliest. However, in case of an emergency situation, the RMP may, based on his professional discretion, advice first aid, counselling or facilitate referral for an in-person consultation. The FAQ on the Guidelines clarify that in case of an emergency if the RMP asks for immediate referral for in-person consultation but if a patient insists for tele-management, then the RMP should record his statement regarding the advice given regarding referral for an in-person consultation. The FAQ also clarify that in case of an emergency the patient may call an RPM for medical advice but a patient cannot insist for an advice if the RMP chooses not to reply or to give any specific advice.

Tele-consultation Through a Health Worker or a Care Giver

Under the Guidelines, the consultations with an RMP may be facilitated by a Caregiver. A Caregiver could be a family member or any person authorised by the patient to represent him. The Caregiver may either be present with the patient during consolation or the Caregiver may consult the RMP on behalf of the

patient and in the absence of the patient. A Caregiver can consult with the RMP in absence of the patient if the patient is a minor (16 year or less) or if the Caregiver has a formal authorisation or verified document establishing his relationship with the patient and / or has been verified by the patient in a previous in-person consultation.

The Guidelines also prescribe the process for consultation by a Health Worker with an RMP seeking consultation from a patient in a public or private health facility. A Health Worker can be a nurse, an allied health professional, mid-level health practitioner, or any health worker designated by an appropriate authority.

Privacy in telemedicine consultation

The RMP as part of telemedicine consultation are required to abide by the principles of medical ethics. Thus, in keeping with the provisions of the Ethics Regulations, RMPs shall not publish photographs or case reports of the patients without their permission, in any medical or other journal in a manner by which their identity could be made out. The Guidelines makes a reference that the Information Technology Act, 2000, the data protection and privacy laws regarding the handling and transfer of information regarding the patients or any other applicable rules in relation to protecting patient privacy as notified from time to time will have to be complied with by the RMPs. It is to be seen if the proposed DISHA and the proposed Personal Data Protection Bill, will all provide for a cohesive compliance structure. It is clarified that the RMPs will not be held responsible for breach of confidentiality, if there is reasonable evidence to prove that the patient privacy and confidentiality has been compromised by a technology breach or by a person other than the RMP.

Online Course on Practice of Telemedicine

The Guidelines provide that an online course will be developed and made available by the Board of Governors so as to enable all the RMPs intending to practice telemedicine to be familiar with the Guidelines and that the RMP will be required to complete the course within a period of 3 (three) years from the date of notification of these Guidelines. However, the FAQs issued on the Guidelines indicate that all RMPs can tele-consult provided they follow the Guidelines. Thus, the Guidelines create an uncertainty in relation to the online course and further notification in this regard will help introduce clarity on the subject.

COVID-19 and Tele-medicine

With the Covid situation, the Guidelines are published timely and provides an impetus for healthcare industry. The Guidelines may evolve over a period of time based on the actual experiences of RMPs and the patients pursuant to telemedicine communications.

For further queries for Telemedicine Practice Guidelines kindly refer the link given below:-

www.mciindia.org/MCIRest/open/getDocument?path=/Documents/Public/Portal/LatestNews/Final_FAQ-TELEMEDICINE%20%206-4-2020..pdf

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WELL-BEING

Health 2.0
Sustainable healthcare in COVID-19 pandemic

■ **Written by Dr. Kulsaurabh Kaushik and Dr. Yachika**

The detrimental effect of the outbreak of COVID-19[the disease caused by Severe Acute Respiratory Syndrome coronavirus 2 (SARS-COV-2)] was evident not only on global healthcare systems but also on other aspects of human life.

The World Health Organisation (WHO) declared the COVID-19 outbreak as a global emergency on 30th January 2020. According to various scientific literatures, and a response to 'flatten the curve' governments have enforced border shutdowns, travel restrictions and quarantine in countries which constitute the world's largest economies.All these factors have anticipated the fears of an impending economic crisis and recession.

The COVID-19 pandemic has caused an unprecedented challenge for healthcare systems worldwide with healthcare workers as the frontline warriors .

In upcoming times there may be a higher surge in cases reporting critical situations or may be even fatalities due to previously existing illnesses like Chronic Heart Failure , Chronic Renal Failure , COPD etc. getting complicated because of improper or not adequately managed .

Several reports have shown the predicamemt of patients having chronic diseases and those require proper medical maneuveringother than COVID-19 infected patients.The overall revenue generation for hospitals and healthcare

sectors were greatly affected e.g an official data from a 350 bedded hospital in NCR reports more than 50 % reduction in bed occupancy rate and more than 60 % reduction in routine elective procedures thus making the system very fragile .

Maharashtra Govt. has undertaken 80 percent of private hospital beds with capping of treatment costs Another such step has been taken by the Delhi Govt which has directed the private hospitals with capacity of 50 beds or more to provide 20 % of its total capacity for Covid patients .

With the prevalence of such regulations, adequate measures are taken to safeguard the workforce of the organization. With such regulations, it becomes foremost important to take adequate measures to protect our workforce amid this health crisis as they are the only weapons all through this fight . For enabling life towards getting near to normal , first thing that has to be made sustainable is the healthcare system.

THE PROBLEM STATEMENT

- Patients with similar symptoms (influenza like symptoms) with pre-existing conditions like cardiac ailments and respiratory issues, are facing lot of trouble in getting routine management as well as emergency management because of projected COVID-19 stigma.
- Upcoming conditions with similar presentation like Dengue, Malaria in South East Asian countries will make situation more complicated thus pose further challenges in healthcare system .
- Healthcare workers (HCWs) has to embrace the the Quarantine in masses because of accidental exposure from a patient tested positive after routine admission.
- Collapse of health system in terms of providing adequate health services and revenue to sustain hospitals viability.

In short our health system includes both public sector and corporate sector are facing issue at every step whether it is:

1. Containment of disease
2. Proper handling to emergencies due to non Covid chronic illnesses
3. Protection of HCWS (almost 321 HCWs has been tested positive across DELHI)
4. Sustainability

> **For enabling life towards getting near to normal, first thing that has to be made sustainable is the healthcare system**

SUSTAINABLE HEALTHCARE IN COVID-19 PANDEMIC- HEALTH 2.0

OBJECTIVES

- Combat ongoing crisis in best possible and efficient mannerto minimise the incidence of Covid -19 infection among HCWs
- Proper redressal of Patients suffering from chronic illnesses and impending life threatening emergencies related to such illnesses.
- Anticipate upcoming seasonal illness like Dengue and Malaria and take optimum measures to reduce chances of further crisis with these upcoming health threats.
- Develop a sustainable system where both the public health sector and private sector collaborate to fight this Pandemic crisis.
- Develop a system where the corporate health system reaches their maximum capacity in terms of services and also the revenue.

POLICY SUGGESTIONS

- Every center starts functioning in a ZONED MANNER i.e they get divided into zones viz. Red, Yellow and Green
- Functioning of Non-Covid Zoned Hospital (may have reserved bed for covid 19)

INTRAHOSPITAL ZONING

Non Covid ZONED HOSPITAL gets divided in the following :

- **RED zone** : consists of Emergency Room , RED ICU and RED Ward
- **ORANGE or YELLOW zone :** Consists of another ORANGE ICU and an ORANGE WARD .
- **GREEN zone :** consists of GREEN ICU and GREEN Ward

RED Zone

- Every HCW working in Red Zone works with all precautions including PPEs. (LEVEL 4)
- Patient treated as per his condition with all necessary monitoring and investigations thereby making things more clear
- First Covid 19 testing done at Red zone
- If patient is tested positive for Covid 19 then patient is shifted to Covid centre and if report comes out negative then patient is transferred to Yellow zone

YELLOW/ ORANGE Zone

- Only patient once tested negative for Covid Negative gets entry to Yellow / Orange zone
- Health care workers use atleast level 2 PPE adjunct with an antiviral kit
- Patient are treated as per the symptoms with all necessary monitoring .
- Clinical follow up of patient done with investigations like CBC to look for lymphopenia , coagulation profile to look for any derangement, LDH levels and serial Chest X-rays to look for radiological evidences .
- Also any suspected patient to be kept in isolation or cabin with Negative pressure if available .
- Second Covid-19 testing done at Orange/ Yellow zone in case of any suspect either clinically or derangement in any of the significant investigations .
- If patient is unfortunately tested Positive , patient is referred to Covid Unit .
- If Second report also comes out Negative , then patient is transferred to Green zone

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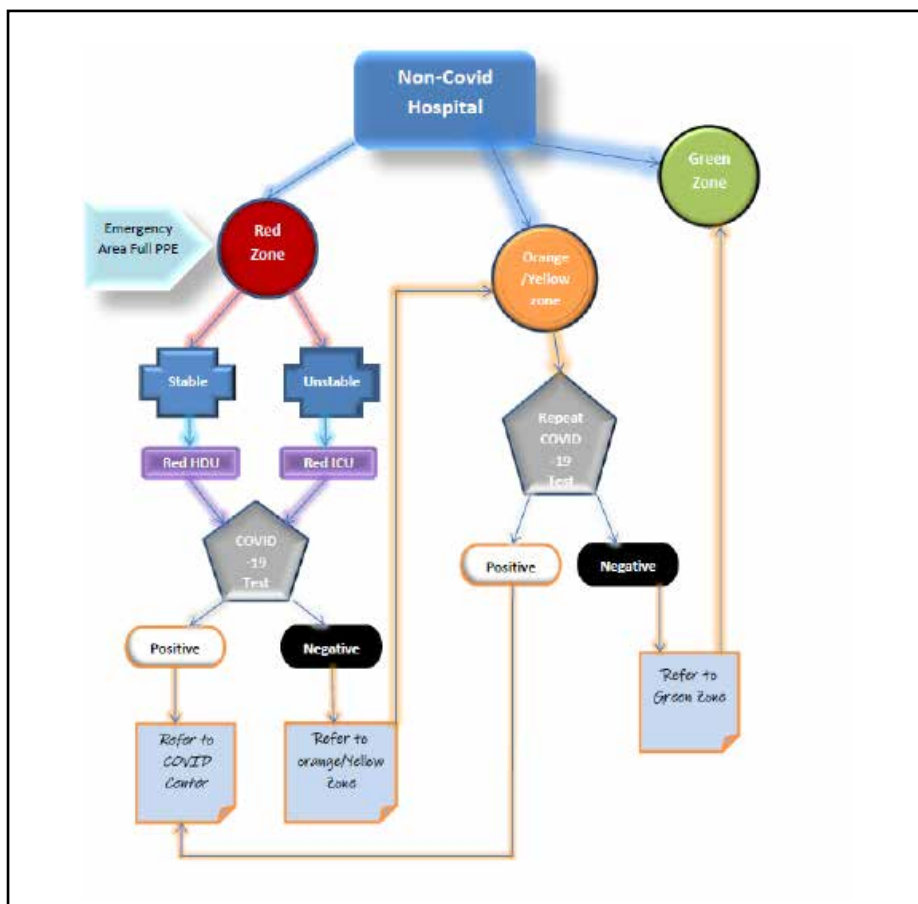
GREEN Zone

- Patient that has been tested as COVID-19 negative twice is admitted in Green Zone .

- HCWs use N95 and Gloves only

- Patients are treated as per his condition including all necessary monitoring and investigations.

- Patients gets discharged from Green zone

ANTICIPATED CHALLENGES

- ZONING of the hospital itself may be a challenge as common AHUs . But this can be managed with little extra efforts and adequate planning and therefore allowing areas into a particular zone so that areas sharing common AHU comprise of either RED zone or Orange zone only .
- Reallocation of healthcare workers in respective areas .
- Rotational duty rosters and Post duty Quarantine followed by Covid testing before rejoining .

- Additional cost of the PPE kits and additional COVID-19 test , this can sum up to around 8k- 10k per patient
- Adjunct Formulations

ANTICIPATED ADVANTAGES

- Protection of healthcare workers - with double testing and proper zoning of hospitals depending upon the risk associated, can achieve a system where minimise of the infection among HCWs by using proper PPEs depending upon the zones .
- We will be able to cater life saving emergencies in an efficient manner , also the routine services can be escalated with such kind of strategies
- The hospitals can achieve a system where they are able to provide their services near to normal (precovid times) there by reaching a sustainable system both in terms of services and revenue generation .

Current article mentions zoning of hospital for handling the emergency admissions, likewise for routine health services as well such zoning can be formulated and adopted. For e.g. an elective surgery can be performed by performing a pre admission COVID-19 test and then admitting patient in ORANGE zone ward isolation rooms and then performing another test if required.

Recently there has been guidelines by Delhi govt suggesting division of NonCovid hospitals into Risk Zones (i.e mild , moderate and severe) addressing the issue of infection among HCWs and thereby suggesting use of different level of PPEs in different zones depending upon risk associated . Also the advisory states formation of Holding area (corresponds to Red zone) for patients with influenza like illness (ILI) in Non Covid hospitals .

We appreciate the authorities for addressing the problem and taking such suggestions into consideration while forming the advisories and formulating the guidelines . Though there can be much more that can be done to achieve a more sustainable system which helps us fight the current pandemic in much more efficient manner as in our consideration achieving a **SUSTAINABLE HEALTH SYSTEM (HEALTH 2.0)** is the only weapon amidst this crisis that can help us reach a safe bank .

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Dr. Yachika, completed MBBS from PGIMS Rohtak . Has secured a respectable rank at NEET PG , soon will be joining a PG course at some of the good institute .

My lockdown days due to pandemic

■ **Written by Dr. Debleena Bhattacharya**

'When the going gets tough, the tough gets going' the inspirational quote reverberates in mind when tough situation abruptly encircle you. The same happened with me when the sudden lockdown was announced in the nation due to coronavirus invasion. I was perplexed whether to stay in my cocoon or go to my relative house. Unaware of the situation I stayed back, decided to face the consequences and be responsible for my actions.

When the nationwide lockdown was announced there was chaotic situation to stock up the essential needs before the shops closed. Have ordered my essentials and was waiting to be delivered. The sanitation process to be incorporated into our daily routine was now the new norm. Initially it was difficult to get accustomed with the frequent handwashing but good habits eventually inculcates.

The lockdown for the initial days were laden with online classes for the whole day and the course completion along with exam duties of the University. The end of March 2020 and whole of April was hectic from the normal routine days. In the earlier days it was difficult to customise your biological clock to the new schedule where there are no schedule timings for meetings along with online lectures, course completion responsibility followed by online exams. All these made the life go haywire from normal routine.

Amidst this got the opportunity to mentor three-four teams of the innovative minds from our nation for the online forty-eight hours hackathon conducted by Ministry of Human Resource and Development along with the abled hands of Innovatiocuris. There were many scientific projects that came for expert review to be selected for BIRAC SITARE 2020 awards.

Apart from these, my culinary skills improvised as I get to make different cuisines with limited resources available. The photos of dishes I made are displayed in end to show that I could do it, beyond my imagination. The do-it-yourself mantra has also made me more responsible to figure out solutions from the resources available at hand one such example is the making of embroidery frame from packaged food boxes. The nature with every passing day was becoming more green and serene with life as due to nationwide lockdown the industries, roads and all the pollution contributors has halted their work.

During this lockdown period, a pending dream has carved its path in my life; I got the opportunity to write a book. The dream though was there but the motivation to go ahead was the one that Prof (Dr.) V.K Singh, my co-author for the book gave me. His vast experience (he has already written two books on Healthcare Innovations) and the consent to be under his tutelage instilled in me the hope to forge ahead with the book project entitled 'Climate Change and Epidemiological Hotspots'. The book would be divided into two aspects: concern and sustainable approach. Understanding these aspects along with the other relevant issues help the readers for an insightful journey for the influences of the disease and provide an indispensable guidance to policymakers in designing preventive health measures that are viable for reducing the disease and the costs for the health-care system. With the lockdown days I resolved to open myself through my mind and innovative thoughts. The lockdown days gave the opportunity to make my dream as writer come true and to explore my innovative inner self which has lost its way amidst the daily routine.

The constant fear of death from virus has made me more resilient towards life and these days of my confinement gave me the time for introspection and conviction to raise the hopes when life is surrounded by barricades of unprecedented situations. The lockdown gave me the opportunity to introspect and understand the life in a whole new dimension. The constant siren from the ambulance in the vicinity of my dwelling made me think that the life of human is so delicate yet so precious. We are the creators of our surroundings and also the destroyer. The unseen, unknown novel virus taught a very meaningful lesson to the human that we are perishable as for Mother Nature we are just few atoms joined. We talk about God's particle and in the era of 2020, we are in surge of shielding ourselves from an unforeseen yet dangerous virus. Amidst this pessimistic situation, rays of hope always help the mankind and regain its former self. The lockdown has made a positive impact in my life as I get to believe in the notion that the insignificant change in your habit will have a huge impact in your habitat.

1) Besan ladoo, 2) Pav Bhaji, 3) Mixed vegetable Appe, 4) Mixed veg pizza, 5) Aloo paratha 6) Idli sambhar and coconut chutney, 7) Vegetable Maggi, 8) Parwal ka mithai, 9) Gujarati pudla and bhaaji

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Counterfeiting in the times of Corona: How bad faith actors are exploiting the pandemic to boost fraudulent activities

■ **Written by Sanjay Kaushik**

The adage "Imitation is the sincerest form of flattery" can be interpreted in many ways in so far as one considers this truncated form of the original quote. From a pragmatic viewpoint, however, it doesn't hold as well. In legal terms, unlawful imitation or forgery or counterfeiting can render the defaulter liable to being penalized and even land them in jail. Why? Because counterfeiting or the illegal duplication of a thing to generate profits by deceiving the public is regarded as a criminal offence nearly everywhere and India is certainly no exception.

The criminal aspect of counterfeiting stems from the fact that unauthorised duplication of a thing amounts to IP theft. Various legislations enshrined within the Indian law protect the IP rights of an entity, be it a person or an organisation. These include the Trademarks Act, 1999 with TM rules 2017; Patents Act, 1970; Copyright Act, 1957, etc. Apart from the ethical, moral, and legal repercussions of violating any of these laws, the economic toll of such mala fide activities can be huge.

The counterfeiting industry has historically been one of the major problems within the global business ecosystem. From brand counterfeiting to fake news and currency duplication to the piracy of multimedia, the selling of unauthorised products continues to deal significant damages to legitimate business operations. Last year, industry body of Authentication Solution Provider's association (ASPA) asserted that India incurs losses over INR 1 lakh crore annually on account of counterfeiting activities across various sectors.

Distasteful as it is, counterfeiting has reared its ugly head even amidst the COVID-19 crisis. The news of fraudulent activities seizing on the pandemic to meet their nefarious ends continues to emerge almost every single day. Recently, the Interpol orchestrated a crackdown on the illegal online sale of medical supplies and medication including "substandard hand sanitizers, unauthorised antiviral medication and counterfeit face masks". The operation resulted in the arrest of 121 bad-faith actors and the seizure of fake products worth more than USD 14 million.

How counterfeiters are exploiting the lockdown in India

In India, too, many counterfeit activities have surfaced since the onset of the pandemic and the mandated nationwide lockdown.

According to OECD officials, nearly half

> **The criminal aspect of counterfeiting stems from the fact that unauthorised duplication of a thing amounts to IP theft.**

of the counterfeit pharmaceuticals trade, which is on the rise amid the current situation, originated in India in recent years. In the current scheme of things, when law enforcers are overwhelmed with priority tasks of managing the lockdown and companies are endeavouring to sustain business continuity, counterfeiters are exploiting the situation to the best of their advantage. Therefore, counterfeiters currently have neither the fear of law enforcement – because it is overburdened and cannot execute raids at an adequate efficiency and scale – nor private investigators and agencies because they are not allowed to move amid the lockdown.

On account of the lockdown, on-ground physical investigation has ground to a complete halt. Moreover, the disruption of the background assessment activities also means that insurance companies, too, are

unable to evaluate and award insurance claims.

Against this backdrop, the Association of Private Detectives in India (APDI) recently wrote to the Prime Minister apprising him of this situation and seeking regulatory support in allowing the continuation of investigative activities amid the lockdown. It will not only result in the curbing of unlawful, counterfeiting as well as fraudulent activities that seek to exploit the pandemic for petty monetary gains but also comprise a critical step forward in humanity's struggle against the gravest crisis of this generation.

A step in the right direction can translate into strengthened law enforcement across the country. It will not only result in the curbing of unlawful, counterfeiting as well as fraudulent activities that seek to exploit the pandemic for petty monetary gains but also comprise a critical step forward

in humanity's struggle against the gravest crisis of this generation.

Sanjay Kaushik, ARVP ASIS International Region 13 A, Former Chairman ASIS International, Chapter 207, India and Managing Director, Netrika Consulting India Pvt Ltd, is a recognised expert in Fraud Risk Management, Corporate Security Consulting, Risk Assessment, Investigations, Anti Counterfeit Strategies, with over 26 years of experience including working as Chief Operating Officer of one of the largest Risk Consulting Firm. He was the recipient of "Fraud investigator of the year 2017" by Wealth & Finance International, U K. He is the proud Recipient of Prestigious "Investigation Professional of the year 2012" Award in the 7th Security Leadership Summit. Netrika, under the leadership of Sanjay has also won the "Security Design of the Year" award by Secutech in 2015.

Apart from being an authorised trainer for Certified Fraud Examiner, he is the honorary member various prestigious organisations.

The counterfeiting industry has historically been one of the major problems within the global business ecosystem.

Racial and Ethnic Disparities in Patients with COVID-19

■ Written by Prathayini Paramanathan, Muhammad Abbas, Winifred Iklaki, Priscilla Itua, Mehran Mortazavi, Parastoo Taravati, Ayobamidele Ayisat Tiamiyu.
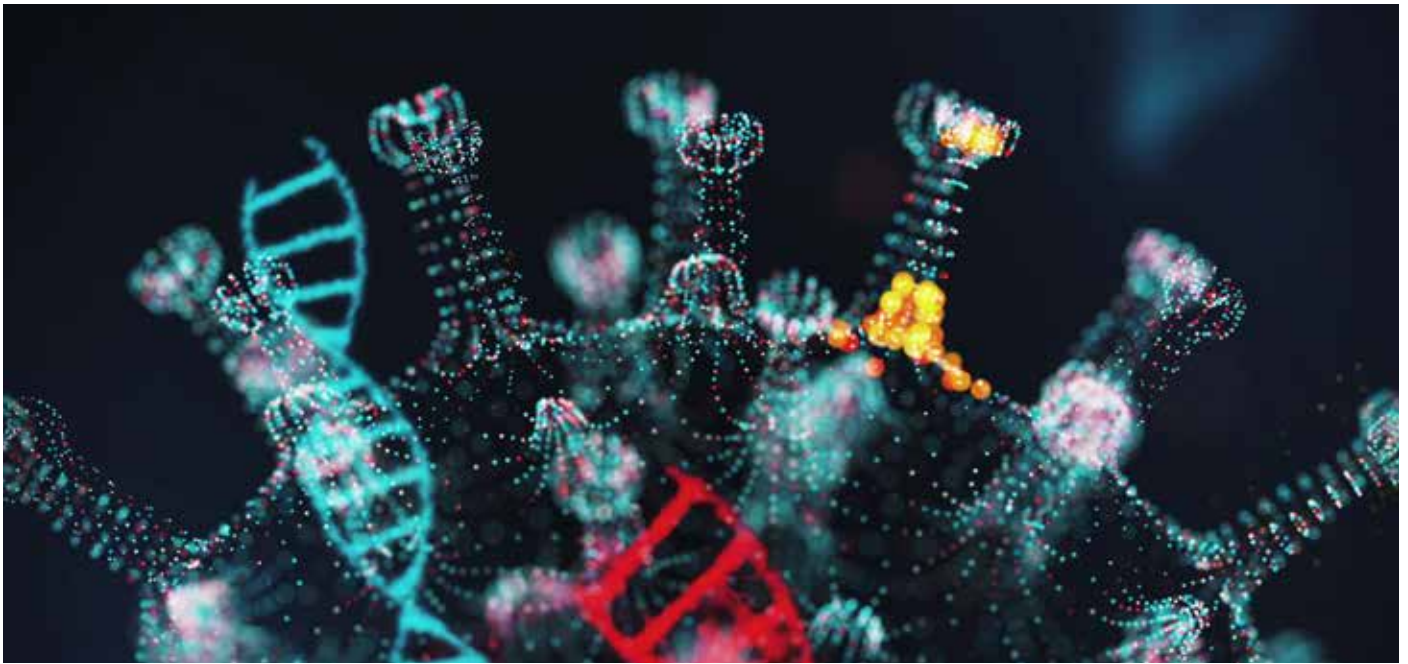
Background

Coronavirus Disease 2019 (COVID-19) is the new public health crisis threatening the globe. It is postulated to have erupted from Wuhan, Hubei, China in December 2019, and to have been transmitted from bats to an intermediate host to humans. The World Health Organization (WHO) announced COVID-19 as a pandemic on January 30th, 2020. It rapidly spread across the entire world, and as of April 29, 2020, 210 countries and territories have been affected with over 3,000,000 positive cases and over 200,000 deaths. As of April 29, 2020, The United States of America (USA) reported 983, 457 positive cases and 50, 492 deaths made it the most affected country in the world. The COVID-19 Associated Hospitalization Surveillance Network (COVID-NET) conducts population-based surveillance for COVID-19 positive patients who are admitted into the hospital across USA. It has been revealed that during the month of March 2020, 59% of the surveillance population was White Americans (WA), 18% were African Americans (AA), and 14% was Hispanic and Latino Americans (HLA); however, amongst the hospitalized patients, 45% was AA, 33% was AA, and 8% was HLA. This clearly indicates a disproportionate burden of the disease amongst racial and ethnic minority groups, specifically AA, possibly due to the genetic, environmental, and socioeconomic variabilities that exist. Currently, healthcare sectors worldwide are facing challenges in the diagnosis, treatment, and prevention of COVID-19. Healthcare professionals including Physicians, Scientists, and Professors are fighting to put an end to this disease. As an effort to aid in this fight, we have put together this review article discussing some of the racial and ethnic disparities and key epidemiological variables that exist in relation to COVID-19.

> **Ultimately, racial and ethnic disparities that arise during public health emergencies like COVID-19 are related to socioeconomic status deprivation and affluence.**

Introduction

The first human coronavirus was identified in the 1960s; since then, some of them have led to major human outbreaks such as severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS). Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the virus strain that causes COVID-19, and it is mainly transmitted through respiratory droplets via infected humans or surfaces. The estimated incubation period of the disease is 2 to 14 days from the time of exposure, and symptoms range from asymptomatic infection to death. The most common presenting symptoms include fever, dry cough, and shortness of breath (SOB); other symptoms include headache, dizziness, confusion, conjunctivitis, rhinorrhea, nasal congestion, anosmia, sore throat, sputum production, dysgeusia, anorexia, nausea, vomiting, abdominal pain, diarrhea, rashes, hives, lesions, myalgia, body chills, body ache, and fatigue. In patients with underlying comorbidities, the disease may progress to pneumonia, respiratory failure, kidney failure, septic shock, and death. Mild symptoms, from which a patient can easily recover, constitute 80% of the disease; severe symptoms such as shortness of breath and pneumonia constitute 14%; critical symptoms such as organ failure and septic shock constitute 5%; and fatal symptoms resulting in death constitute 2%. According to the World Health Organization (WHO), COVID-19

> **According to CDC, members of racial and ethnic minority groups are more likely to live in densely populated areas due to racial and ethnic residential segregation, which is a fundamental factor leading to health disparities.**

infects individuals of all ages; however, the two most vulnerable groups are the elderly (over the age of 60) and immune-compromised.

Currently, COVID-19 positive patients are managed through supportive therapy, and the degree to this therapy is used depends on the severity of the symptoms.

According to the WHO, COVID-19 positive neonates and young children must be admitted into an isolation unit with constant heart rate, respiration, and blood oxygenation monitoring; adults showing mild symptoms must isolate for self-quarantine, intaking sufficient fluids, and using symptom relieving medications. Adults showing severe to critical symptoms must be admitted into an isolation unit with intravenous fluids and corticosteroids, and oxygen therapy. In terms of medical management of COVID-19, there are some medications that deserve recognition. Currently, one of the most promising drugs being

investigated by the National Institute of Allergy and Infectious Diseases is *Remdesivir.* This drug is a broad spectrum antiviral agent that blocks viral replication by interrupting the nascent viral ribonucleic acid chains leading to premature termination; it was earlier used to treat Ebola virus disease and Marburg virus disease. Another drug also showing promising results is Chloroquine, which is an anti-malarial agent that increases late endosomal and lysosomal pH above the level that is required for the virus and cell fusion while interrupting the glycosylation of cellular receptors; it was used to treat SARS. Cancer drugs such as Baricitinib, Ruxolitinib, and Fedratinib are also being investigated. They may work in COVID-19 by inhibiting the Janus kinases, and signal transducers and activators of transcription proteins reducing viral infectivity, viral replication, and the associated host inflammatory response.

Due to pressure from civil rights groups

and public health advocates, many of the states across USA have started reporting demographic data for COVID-19. According to Ronald J Daniels, the President of John Hopkins University, and Marc H Morial, the President and CEO of the National Urban League, COIVD-19 showed prominence in individuals belonging to racial and ethnic minority groups, especially AA, at a dramatically disproportionate rate.

COVID-NET has revealed that during the month of March 2020, 59% of the surveillance population was WA amongst which 45% was hospitalized due to COVID-19, 18% was AA amongst which 45% was hospitalized, and 14% was HLA amongst which 8% was hospitalized. Furthermore, the New York City Health Department has revealed that till April 19, 2020, the COVID-19 death rate amongst AA was 92.3 per 100,000 people and in HLA was 74.3 per 100, 000 people; this was significantly higher than the death rate of WA, which was 45.2 per 100, 000 people. The disproportionate infection rate and death rate amongst racial and ethnic minority groups, especially

AA, may be due to genetic difference such as genetic variations and pre-existing comorbidities, environmental distinction such as habitats, socioeconomic prominence such as occupations, living conditions, and access to healthcare. Ultimately, racial and ethnic disparities that arise during public health emergencies like COVID-19 are related to socioeconomic status deprivation and affluence. In this review article, we discussed some of the disparities to better understand COVID-19 and aid in the fight against it, as well as to inform the general public about skewed population outbreaks and prevent it in the future.

Genetic Variabilities Leading to COVID-19 Disparities

Genetic variations impact certain individuals' predisposition to COVID-19 - genetic polymorphism plays an important role in the likelihood of being infected by the disease, severity of symptoms, and immunological response towards the disease. COVID-19's transmission and dissemination into host cells is mediated by angiotensin-converting

enzyme 2 (ACE2) and transmembrane serine protease 2 (TMPRSS2). ACE2 is an enzyme found on the host cells' surfaces, and is currently postulated to be the primary receptor to which the virus attaches; TMPRSS2 is a protein that facilitates viral fusion through the cell membrane. Researchers at the University of Pittsburgh conducted a study in April 2020 to learn about how genetic variations play a role in COVID-19's epidemiological variability. They assessed the effects of ACE2 and TMPRSS2's genetic expressions in over 2000 individuals from varying populations, and concluded that AA have lower expressions of both. This suggests that genetic variations may lead to lower susceptibility for COVID-19 infection amongst AA, and host genetics may explain the infection rate, severity of symptoms, and death rate on a personal level.

Certain health conditions such as obesity, hypertension (HTN), diabetes mellitus (DM), and cardiovascular disease (CVD) are common amongst AA due to their genetic variations, and such predisposing factors put them at an increased risk for COVID-19.

The Journal of American Medical Association published a study analyzing 5700 COVID-19 positive patients

> **Another barrier to healthcare access faced by AA and HLA is the lack of health insurance.**

hospitalized in various hospitals across New York City during March 2020; this study showed that the most common comorbidities amongst these patients were HTN at 56.5%, obesity at 41.7%, and DM at 33.8%. While information is still limited at this time, recent studies conducted in China point towards a positive correlation between existing comorbidities and COVID-19 mortalities. For example, the European Respiratory Journal published a study that analyzed 1590 COVID-19 positive patients,who were hospitalized across China from December 11, 2019 to January 31, 2020. They stated that 25.1% of them had at-least one comorbidity with HTN, DM, and CVD being the most common. Other health conditions such as hepatitis B, immunodeficiencies, chronic kidney disease (CKD), and malignancies were also presents, but at a lower rate. These patients presented with shortness of breath, loss of consciousness, and chest abnormal x-ray results.

According to the Centers for Disease Control and Prevention (CDC) in 2016, the prevalence of HTN in USA was 29% in which AA contributed to 40.3% and HLA contributed to 27.8%. AA has a T594M variant polymorphism on the beta-subunit of the sodium epithelial channel, which may increase their prevalence to HTN. The increased rate may also be due to various physiological factors such as increased alpha receptor sensitivity, decreased beta receptor sensitivity, increased sympathetic nervous system activity due to stress, increased endothelin, increased transforming growth factor beta, decreased prostaglandin E2, decreased urinary dopamine after salt loading, and decreased atrial natriuretic peptide after salt loading. The American Journal of Hypertension published a study in April 2020 stating that the prevalence of obesity is 51% higher in AA and 21% higher in HLA than WA, and AA have the highest correlation between body mass index and salt retention than any other race. Obesity may lead to sodium and fluid retention as well as vascular damage, which in turn may lead to the exacerbation of HTN. The Cleveland Clinic Journal of Medicine published a study in 2013 stating that AA have a higher rate and an earlier onset of HTN and DM as well as increased complications associated with CKD and CVD. The higher rate of HTN and associated lower rate of blood pressure control contributed to a higher rate of DM; the higher rates of HTN and DM contributed to a higher rate of CKD. Such increased rates in AA were due genetic variations, exposure to air pollution, limited food resources, and limited access to healthcare.

Currently, information regarding the risks of taking antihypertensive medications such as angiotensin-converting enzyme inhibitors (ACEI) or angiotensin II receptor blockers (ARBs) in COVID-19 is limited. As stated earlier, SARS-CoV-2 binds to ACE2 receptors as the initial step in viral infection, and these antihypertensive medications may potentially increase ACE2 receptor expression increasing the risk for COVID-19. However, abrupt withdrawal of these medications may result in adverse outcomes; as a result, they should be continued in patients who are at risk or positive for COVID-19.

In March 2020, the Louisiana State University Health Sciences Center stated that patients with HTN taking ACEI or ARBs may be at a greater risk for COVID-19. On the other hand, the New England Journal of Medicine published a report in April 2020 analyzing ACE2 receptor expression in 617 COVID-19 positive patients, taking antihypertensive medications in Japan.

It concluded that ACE2 receptor expression has increased in patients taking Olmesartan, but not in patients taking other ARBs such as Losartan, Candesartan, Valsartan, or Telmisartan, or ACEI.

Another study published by the Journal of American Heart Association in April 2020

once again stated differing information where COVID-19 positive patients taking antihypertensive medications when hospitalized had a lower risk of all-cause mortality compared to patients who were not taking these medications.

Although the information above is conflicting, it indicates a potential benefit of taking antihypertensive medications in COVID-19. SARS-CoV-2 not only binds to ACE2 receptors initiating the viral infection, but it also down-regulates ACE2 receptor expression therefore preventing it from exerting its protective effects in various organs which may potentially lead to acute respiratory failure and CVD. Furthermore, the down-regulation of ACE2 receptor expression leads to the accumulation of angiotensin II, a peptide hormone in the renin-angiotensin-aldosterone-system (RAAS) causing vasoconstriction and increasing blood pressure, and RAAS activation; it has been postulated that angiotensin II may also play a role in organ injury in COVID-19 positive patients. A report published by the New England Journal of Medicine in April 2020 discussed the results of various studies: 1) In experimental mouse models, exposure to SARS-CoV-1 spike protein resulted in the down-regulation of ACE2 receptor expression, and acute lung injury or acute respiratory distress syndrome (ARDS); 2) In experimental mouse models, exposure to SARS-CoV-1 spike protein induced acute lung injury or ARDS, which was limited by RAAS blockade; 3) In COVID-19

positive patients, elevated levels of plasma angiotensin II induced some degree of lung injury. In all of these studies, the up-regulation of ACE2 receptor expression, restoration of angiotensin II, and RAAS blockade were reversed with antihypertensive medications thereby preventing acute respiratory failure and CVD.

Environmental Variabilities Leading to COVID-19 Disparities

According to the Max Planck Institute for Chemistry and Mainz University Medical Center in 2015, air pollution was responsible for 8.8 million premature deaths worldwide. In USA, air pollution is considered the largest environmental risk factor for disease. Currently, air pollution has decreased across the country as vehicle emissions have reduced due to social distancing and lockdown orders in place. However, decades of air pollution such as particulate matter, ozone, nitrogen dioxide, and sulphur dioxide have had negative impacts on people's health. Millions of Americans are currently diagnosed with asthma and HTN due to air pollution, and these conditions increase their risk for COVID-19. The Harvard TH Chan School of Public Health released a study in April 2020 stating that long-term air pollutions directly linked to an increased COVID-19 death rate.

According to CDC, members of racial and ethnic minority groups are more likely to live in densely populated areas due to

racial and ethnic residential segregation, which is a fundamental factor leading to health disparities. As a result, they may find it hard to practice the social distancing measures required for the prevention of COVID-19. Many of them live in multi-generational households where it is difficult to protect the elderly or immunocompromised individuals from COVID-19 transmission in confined spaces. In addition, grocery stores and medical facilities tend to be placed far away from these areas making it tough for the members to stock up on products in order to prevent going out often and receive treatment for COVID-19 if needed respectively. Also, members of racial and ethnic minority groups are over-represented in detention centres, jails, and prisons where congregate living increases the risk of exposure to COVID-19. These racial and ethnic disparities are evident in Michigan where AA represents 12% of the state population, yet 40% of the state's COVID-19 deaths as of April 2020 according to Metro Times.

In Wisconsin, where AA represent 6% of the population, yet 50% of the deaths as of April 2020 according to The Washington Post; and in Louisiana where AA represent 32% of the population, yet 70% of the deaths as of April 2020 according to Newsweek.

Socioeconomic Variabilities Leading to COVID-19 Disparities

As COVID-19 positive cases continue to

increase across USA, AA and HLA have been affected at a disproportionate rate. According to the Brookings Institute, AA represent 15% of Michigan's population, yet 35% of its COVID-19 positive cases as of April 2020; this shows that they are 133% more likely to be infected by the virus. In addition, the COVID-19 death rate in Michigan is currently 4% in which AA is once again over-represented at 40%. In contrast, WA represents 75% of the population, and only 25% of its positive cases and 26% of deaths. According to the New York Times, AA have COVID-19 death rate of 20 per 100, 000 people and HLA of 22 per 100, 000 people in New York as of April 2020. According to the WBEZ radio station, AA represent 16% of Illinois' population, yet 30% of its COVID-19 positive cases. North Carolina and South Carolina show similar patterns with a slightly smaller gap.

As COVID-19 continues to spread across the nation, it will continue to exacerbate socioeconomic inequalities along the racial and ethnic lines. Firstly, according to the Brookings Institute in April 2020, AA and HLA are more likely to live in areas of with socioeconomic statuses lacking green space, healthy food options, recreational facilities, and safety; these inefficient neighbourhoods are rooted in the historical legacy of redlining. Secondly, according to McKinsey & Company in October 2019, AA and HLA are less likely to work in business and professional sectors, and more likely

to be part of the COVID-19 essential workforce. For example, they represented 20% of the nation's food service workers, stockers, cashiers, and janitors according to McKinsey & Company in October 2019, and 30% of the nation's bus drivers according to DATA USA in 2017. During a pandemic like COVID-19, AA and HLA workers, and consequently their families, are at increased risk of exposure to the disease.

Furthermore, many AA lack access to healthcare due to racial and ethnic residential segregation as mentioned in our **Environmental Variabilities Leading to COVID-19 Disparities** section. As stated above, they live in areas with low socioeconomic statuses where adequate healthcare resources are not available leading to poor health. The Journal of American Medical Association published a study in 2017 analyzing the blood pressure of 2280 AA; it concluded that living in racially and ethnically segregated areas is associated with increased systolic blood pressure. Living in these areas during a pandemic like COVID-19 prevents the residents from being able to protect themselves efficiently from the disease. For example, on April 9, 2020, La Shawn K Ford, a Democratic member of the Illinois House of Representatives, stated that 10 million face masks were retrieved from the federal government, but none of them were provided to Chicago's West side neighbourhoods, which are predominated by AA.

Another barrier to healthcare access faced by AA and HLA is the lack of health insurance. According to a study published by Health Affairs in 2005, AA and HLA are less likely to be insured than WA based on their mortality gaps, which were analyzed from 1960 to 2000. This disparity was largely evident before the advent of Medicaid and Medicare; for example, in the 1960s, AA infant mortality rate was 44.3 per 1000 children and WA was 29.2 per 1000 children. Over the years, the overall American infant mortality rate including the AA rate has decreased; however, the gap between the AA infant mortality rate and WA rate has increased. A study published by Cancer Detection and Prevention in 2002 stated that AA women are 2 times more likely to be diagnosed with uterine cancer than WA women, and 2.5 times more likely to die from it; it also stated that AA women are less likely to be diagnosed with breast cancer than WA women, but 36% more likely to die from it. The death rate is higher amongst AA women because they lack health insurance, and as a result get screened for and diagnosed with cancer at later stages compared to WA women. According to a study published by Urologic Oncology in 2014, having health insurance was associated with decreased racial and ethnic disparities in disease treatment. The study analyzed 70, 006 men, and concluded that uninsured AA men with prostate cancer were 62% less likely to receive treatment compared to WA men while insured AA men were

38% less likely. In 2018, the Affordable Care Act stated that 41.2% of AA was enrolled in public health insurances such as Medicaid or Medicare, which have limited coverages and additional costs; as a result, these individuals' finances were affected, as they had to spend a portion of their income for out of pocket expenses and premiums.

During this COVID-19 pandemic, uninsured or publicly insured individuals are less likely to be tested and therefore treated for the disease due to the perceived costs. Although the Federal government announced that COVID-19 testing and treatment will be free for all American residents regardless of insurance status and type in April 2020, there are gaps in these mandates, which may potentially lead to unexpected medical expenses. As a result, many individuals, specifically members of racial and ethnic minority groups who lack health insurance, may unknowingly be infected by COVID-19 disease, and eventually succumb to is complications or transmit it to other individuals.

Moreover, micro-level factors also enhance COVID-19's racial and ethnic disparities. According to the Brookings Institute in April 2020, racial and ethnic empathy gaps exist in perceived pain tolerance, and racial and ethnic biases exist in medical treatments. This report discusses a study that analyzed 60 million patients who were admitted to the emergency room across USA from 2007 to 2011, and concluded that AA patients had half the odds of being prescribed opioid medications compared to WA patients. In addition, PubMed Central published a study in 2017 analyzing 39 primary care physicians and 227 AA and WA patients with HTN. The study concluded that AA patients' interactions with their Physicians involved greater Physician verbal dominance, less patient-centred care, and shorter visits compared to WA patients; this was because Physicians strongly believed that AA patients will not comply with recommendations. Furthermore, an article published by BBC News in April 2020 stated that Dr Jean-Paul Mira, the Intensive Care Unit Head at Cochin Hospital in France, and Dr Camille Lochthave, the Head of Research at Inserm Health Research Group in France, suggested that COVID-19 vaccines should be tested in Africa. Such incidents have occurred due to existing stereotypes that AA lack education achievement and medical knowledge.

This review article clearly illustrates that COVID-19 involves varying degrees of infection rate, severity, and mortality rate amongst individuals due to racial and ethnic disparities, and members of racial and ethnic minority groups, specifically AA, are disproportionately affected. The underlying environmental, structural, and socioeconomic variabilities have existed for years, and become exacerbated in this pandemic. As COVID-19 continues to spread across USA, the understanding of the disease has increased and more information is now available. We must use this information to manage and eventually end this pandemic. And in the meantime, we must strike a balance between protecting public health and safety, and respecting human rights, equality, and dignity.

Prathayini Paramanathan, based in Illinois, USA, is a final year medical student currently sub-interning in cardiology, and a Clinical Research Assistant working in numerous cardiovascular studies. In addition to medicine and research, she has completed certifications in Public Health at Harvard University in Massachusetts, USA. She also contributes her time to numerous humanitarian organizations such as the American Red Cross and World Vision.
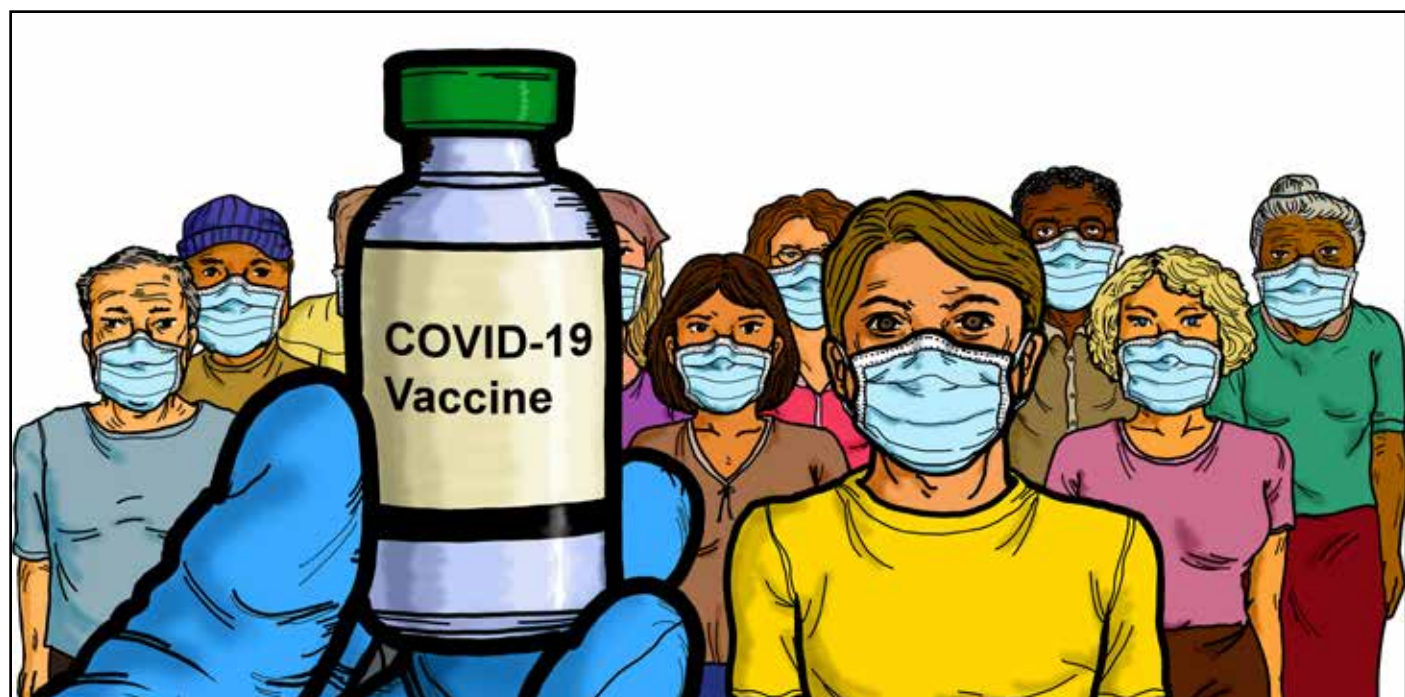
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▶ RESEARCH

IIT Delhi develops Personal Protective Equipment (PPE) coverall to avoid COVID-19 infection

IIT Delhi's Department of Textile and Fibre Engineering has the developed the technology for Personal Protective Equipment (PPE) Coverall (Integrated Body Suit and Shoe Cover) for the protection of doctors, nurses, paramedical staff and others from COVID-19. Researchers at IIT Delhi has been actively involved in the development of highly-functional and innovative textile materials which has gained the market prominence due to the texture and quality.

Dr. S.M. Ishtiaque, Professor

The presence of anti-bacterial properties gives an extra edge to the coverall as it safeguards against the penetration of coronavirus which is the need of the hour due to unprecedented situation apart from the lightweight material that escalates the chances from the other available PPE in the market.

Emeritus, Department of Textile and Fibre Engineering, IIT Delhi, and

his student, Dr. Biswa Ranjan Das, Scientist 'D' and Assistant Director,

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Defence Material and Stores Research and Development Establishment (DMSRDE), Defence Research and Development Organisation (DRDO), Kanpur, has developed an advanced version of PPE coverall, which meets the criteria specified by the Ministry of Health and Family Welfare, Government of India. An innovative coating was applied over the compact polyester woven fabric to maintain the lightweight of PPE.

The presence of anti-bacterial properties gives an extra edge to the coverall as it safeguards against the penetration of coronavirus which is the need of the hour due to unprecedented situation apart from the lightweight material that escalates the chances from the other available PPE in the market.

The use of special-grade polyurethane coating of the coverall augments a smooth texture and the breathable fabric provides comfort to the user. The impermeable membrane on the outer portion of the coveralls acts as a barrier for both oil and water. The PPE suit will be available in four varieties of size ranging from both Body Suit - S, M, L and XL alongwith shoe cover in various sizes from 1-4. The PPE suit can be reused for three consecutive times therefore it reduces the cost aspect also compared to other available PPE suits in market.

For manufacture of the coverall the researchers have collaborated with G. D International company to produce 1,20,000 coveralls per month.

"The advanced version of PPE coverall that we have developed is set to emerge as an improvised product in the national and international markets, bestowing several special functional features along with meeting the requirements for added comfort. Breathability and the comfort of the coverall has been a major challenge and we have ensured that to reach an adequate levels of breathability and a softer feel, to support extended wearability," said Dr. S. M. Ishtiaque, Professor Emeritus, Department of Textile and Fibre Engineering, IIT Delhi.

> **"The advanced version of PPE coverall that we have developed is set to emerge as an improvised product in the national and international markets, bestowing several special functional features along with meeting the requirements for added comfort." -**
>
> **Dr. S. M. Ishtiaque, Professor Emeritus, Department of Textile and FibreEngineering, IIT Delhi.**

In this unprecedented scenario, where COVID-19 the ongoing pandemic, is spreading across the globe and has resulted in the death of over three lakh people, so far, while many infected with the virus are undergoing treatment. This PPE coverall is like a boon that will safeguard the mankind from the indiscernible threat.

Credit: India Science Wire

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Scientists developed a mobile indoor disinfection sprayer

Scientists at CSIR-Central Mechanical Engineering Research Institute (CSIR-CMERI), Durgapur, have developed two mobile indoor Disinfection Sprayer units. These units can be used for cleaning and disinfecting the pathogenic micro-organism effectively, especially in hospitals and diagnostic centres.

Entitled as Battery Powered Disinfectant Sprayer (BPDS) and Pneumatically Operated Mobile Indoor Disinfection (POMID), these units can be used to clean and disinfect frequently touched surfaces such as tables, doorknobs, light switches, countertops, handles, desks, phones, keyboards, toilets, faucets, sinks, and cardboards. Intermittent usage of these disinfecting units can minimize the risk of coronavirus transmission for the people who inadvertently come in contact with those surfaces.

The sprayer systems in both BPDS and POMID are designed with two-stage spraying units with a separate storage tank for each to manoeuvre a hygienic environment in the enclosed areas and they are monitored with fixed numbers of flexible nozzles set in the lower and upper tiers of the unit. There is also an industrial variant of the Disinfectant Sprayer for large scale implementation.

POMID mobile indoor disinfectant unit assembled over a steel frame mounted on four wheels with a system enabled with compressors, pipe-fittings and spray nozzles. The hand-held spray arm has the flexibility to move in any direction as per requirement. Each unit of POMID has two storage tank of capacity 10 litres for smoother operation.

> **POMID mobile indoor disinfectant unit assembled over a steel frame mounted on four wheels with a system enabled with compressors, pipe-fittings and spray nozzles.**

The other unit entitled BPDS has a cordless interface with two-nozzle spray system and an extended arm spray unit. The storage capacity of 20 litres with a battery back-up time of 4 hours in a single charge is vital feature in the system. The gross weight of the system is 25 kg (with an empty tank).

"Most of the disinfectant sprayers prevalent in the market are based either on cleaning or disinfecting using a single chamber storage for the liquid and are pump-based. The droplets produced by a pump sprayer are much larger in size and the effective coverage of surface is lesser. However, the CSIR-CMERI developed indoor sprayer systems consists of dual-chamber storage for disinfectants and cleaning and have better nozzle design, better arrangement of nozzles and lesser droplet sizes. The sprayed disinfectantcan thus cover a greater surface area for the specified volume of liquid", said Prof. Harish Hirani, Director, CSIR-CMERI.

"The particle size and the number of particles of disinfectant disposed are the two important parameters for determining

> **The technology will have relevance even beyond the current COVID-19 crisis, since viruses have been existent throughout and a substantial number of cases of influenza have been spreading throughout the globe every year.**

the effectiveness of the disinfectant sprayer. CSIR-CMERI is consistently focussed upon developing an efficient and effective technology to administer the spread of COVID-19. The next stage of development for the devices would be to incorporate 360-degree coverage for disinfectants and cleaning spray as well as to make it compact and autonomous for usage in schools and homes", added Prof. Hirani.

These sprayers are also equipped with mopping features and extendable arms to reach hidden area and clean comprehensively. The technology will have relevance even beyond the current COVID-19 crisis, since viruses have been existent throughout and a substantial

number of cases of influenza have been spreading throughout the globe every year. Hence, Dr. Hirani has urged the MSMEs of the nation to come forward and invest in this technology, keeping in mind the future orientation of hygiene and healthcare devices. The technology for BPDS is transferred to Power Tech Mining Pvt. Ltd. on the same day for commercialization.

Credit: India Science Wire

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LATEST NEWS IN HEALTHCARE!

DR HARSH VARDHAN LAUNCHES MOBILE APP TO ENABLE PEOPLE EASY ACCESS TO BLOOD

The country has recorded over 14,000 coronavirus cases for the 6th consecutive day since June 20, when 14,516 cases were reported. From June 21-24, there was a hike of cases from 15,413 to 15,968. In total, 92,573 cases have been reported since June 20 and over 2.82 lakh this month since June 1.

A mobile application that would enable people to access "safe blood" easily, especially during the COVID-19 pandemic, was launched by Union Health Minister Harsh Vardhan on Thursday, June 25, 2020.

Developed by the E-Raktkosh, a team of Centre for Development of Advanced Computing (CDAC) under the Digital India scheme, the application will bring transparency and will facilitate single-window access to blood services of the Indian Red Cross Society.

Dr Vardhan said, "In the last few months, I received several complaints from people facing difficulties in accessing safe blood. Many people require blood-related services regularly because of certain medical conditions in their families. Through this app, four units of blood can be requisitioned at a time and the blood bank will wait for 12 hours for the person to collect it."

The Health Ministry informed that from limited COVID-19 tests in January, a cumulative total of 75,60,782 samples have been tested up to June 24 with 2,07,871 samples being tested on Wednesday (June 24,2020). The ministry also said that there are in total 1,007 diagnostic labs, of which 734 are in the government sector and 273 in private.

Source:www.indianexpress.com

SOUTH AFRICA BEGINS FIRST TRIALS FOR COVID-19 VACCINE

The first clinical trial of COVID-19 vaccine developed by Oxford University has begun in South Africa.

The global fight against COVID-19 pandemic is intensifying with medical experts and drug makers from across the world ramping up the efforts to arrive at the potential treatment for coronavirus vaccine.

With nearly 10 million COVID-19 patients across the globe and over 4.8 coronavirus fatalities, the virus has encaptured almost the entire planet under its grip and the need for a Covid-19 antidote had becomes more urgent.

American biopharmaceutical company Gilead Sciences will soon initiate its clinical trials for an inhaled formulation of its antiviral drug Remdesivir used for the treatment of Covid-19. Remdesivir has made great strides in its role in the formulation of a vaccine against the contagion.

According to the World Health Organisation (WHO), presently there are 13 experimental drugs which are being tested on humans, while over 120 others are in the earlier stages of development.

Meanwhile, according to Soumya Swaminathan, Chief Scientist at WHO, around 2 billion doses of COVID-19 vaccine would be ready by the end of 2021.

However, many scientists still anticipate that a safe and effective vaccine to treat coronavirus patients may take 12-18 months to develop.

Biotechnology and pharmaceutical firms comprising Moderna Inc, and AstraZeneca, have been accelerating the pace of their production, promising millions of supplies of their experimental vaccines before the year-end. Last month, global drug firm Pfizer said that a vaccine to treat COVID-19 patients could be ready by October-end.

Some of the latest development on Covid-19 vaccine and treatment:

- The University of Oxford and AstraZeneca Plc.'s experimental vaccine, ChAdOx1 nCoV-19, is the first to enter the final stages of clinical trials. If the trial is successful, the Oxford Vaccine Group expects to launch the Covid-19 vaccine by the end of this year.

- The first clinical trial of COVID-19vaccine is being developed by Oxford University will be initiated in South Africa.

- A Chinese military research institute has been approved to test its second experimental coronavirus vaccine in humans, the eighth Chinese candidate in clinical trials.

- Experts believe that Patanjali Ayurved

Ltd's claim of a breakthrough cure for the coronavirus disease (COVID-19) termed as 'Coronil' will be marketed as immunity booster rather than ultimate cure for coronavirus.

- The UK has started immunisation of about 300 people with a new coronavirus vaccine as part of a trial led by experts at Imperial College London.

- The Coalition for Epidemic Preparedness Innovation (CEPI) - an influential foundation focused on preparation and response to epidemics - has been identified by manufacturers with capacity to produce four billion doses of Covid-19 a year. The CEPI is backing nine potential coronavirus vaccines.

Source: www.hindustantimes.com, www.businesstoday.in

INDIA TO HAVE SAY IN COVID VACCINE DISTRIBUTION

India's Covid diplomacy has moved beyond Hydroxychloroquine (HCQ) and paracetamol to ensure that the country can leverage its position as the world's largest vaccine manufacturer to be part of the search and distribution of the Covid vaccine.

After sustained conversations with their counterparts in key countries, the government has zeroed in on the Indo-Pacific group to cooperate for the vaccine. The key players have been foreign minister Shri S Jaishankar and foreign secretary Shri Harsh Shringla as well as the Prime Minister's principal scientific adviser Prof. K Vijayaraghavan and the government's department of biotechnology.

In an exclusive interview, Prof. Vijayaraghavan said, "India will have a voice- even if there is no "Indian" vaccine- in terms of distribution because India's role in providing vaccine to others will be very important"

Shri Shringla has continued a sustained

and regular conversation with his US counterpart Mr.Steve Biegun, as well as officials from Japan, Australia and South Korea, while Shri Jaishankar has added political heft to converse with US, Israel, the Quad countries, Brazil and South Korea. India, officials said that it would work with "like-minded countries" not only for vaccine development, but its production and distribution.

Prof. Vijayaraghavan says, "Globally there are more than 125 vaccine development programmes today, of these, 10 are in the first stage, eight in phase two (animal and limited human trials) and two in phase 3 (larger-scale human trials).We will know the results of the phase 3 trials in a few months' time"

Apart from the Oxford University programme where India has a large presence and which is currently the most advanced, getting into phase 3, "There is a programme in the US called Warp Speed which combines phase 1 and 2. Vaccines in these programmes include those by

Johnson & Johnson and Merck and others. A Chinese one also going into phase 3. There is an Australian one, also going into phase 3, by Murdoch Children's Research Institute in Australia. That's not really a vaccine for COVID-19, but it is new kind of BCG vaccine," Prof. Vijayaraghavan confirmed

Interestingly, while India has a presence in most of the international vaccine development programmes, it has no presence in the two Chinese vaccine programmes.

Prof.Vijayaraghavan gave his observation that "The size and extraordinary capability of the Indian vaccine manufacturing effort in bulk are enormous and well appreciated. Apart from the big multinationals, Brazil, Indonesia, China and India have enormous capabilities. India has the largest. So India will not be ignored no matter who makes the vaccine."

Source: www.timesofindia.india times.com

CORONAVIRUS VACCINE UPDATE: MODERNA, ASTRAZENECA, SANOFI MAKE HEADWAY

While there are multiple pharmaceutical companies across the world that are working towards a coronavirus vaccine, there are only a handful that have reached advanced stages of trials. Moderna, and AstraZeneca that is developing the corona vaccine with Oxford University have

been in the news for making headway in the trials. Johnson and Johnson, Sanofi, Inovio, Sinovac, CanSino are some of the other companies to have made significant progress.

Additionally, a vaccine alliance that is backing at least nine candidates

has identified manufacturers that can produce up to 4 billion doses of vaccine in a year. The Coalition for Epidemic Preparedness Innovation (CEPI) has identified two or three manufacturing plants for each vaccine. They currently produce two billion doses by 2021. The group is planning for eight to 10 regional

distribution sites in order to avoid making everything centrally and trying to ship it around the world.

Moderna: The US-based pharma company is all set for Phase III trial in July. The third phase of the trial will include 30,000 participants in the US. It will be conducted alongside the National Institute of Allergy and Infectious Diseases (NIAID). CEO Stephane Bancel said that the vaccine candidate has an 80-90 percent chance of receiving FDA approval. He further said that "We know our platform. It works on MERS, Zika and CMV and so on. When you have the right sequence... you will get neutralising antibodies.

AstraZeneca: The company has started trials in South Africa and Brazil. University of Witwatersrand in South Africa is working with Oxford University to evaluate the candidate. Meanwhile the Brazil trials are sponsored by the Lemann Foundation. Moreover, AstraZeneca has signed its 10th deal for supply and manufacturing of its vaccine candidate. Symbiosis Pharmaceutical said on Wednesday it agreed to make and supply an unspecified number of units of the vaccine, AZD1222, for AstraZeneca to use in clinical trials.

Johnson and Johnson: J&J has expedited its trials for the COVID vaccine. The final stage of the trial is expected to begin in September and has been further scheduled for second half of the July. Like AstraZeneca, J&J believes this to be a race against time. The company expects to get approval for its candidate by early 2021. Johnson and Johnson have also received funds from US government's Biomedical Advanced Research and Development (BARDA) to speed up its vaccine development programme. The company is also in talks with European Commission to supply its candidate if it succeeds.

Inovio: Inovio began human trials for its coronavirus vaccine candidate in April. It expects to report interim results from the trial later this month, and added that it would begin mid-stage trials this summer. The pharmaceutical company said that it has received $71 million from the US Department of Defence (DoD) to scale up production of the company's devices that are used to administer its experimental COVID-19 vaccine into the skin.

CanSino: The company is developing its corona vaccine with Academy of Military Science (AMS) and People's Liberation Army. The candidate is under Phase II of trials in China and has been approved for

human trials in Canada.

Pfizer: The company aims to make the COVID-19 vaccine candidate ready by October 2020. The CEO of the pharmaceutical company Albert Bourla said, "If things go well, and the stars are aligned, we will have enough evidence of safety and efficacy so that we can... have a vaccine around the end of October." The company is working with German firm BioNTech for possible vaccines.

Sanofi Pasteur: French drugmaker Sanofi expects to get approval for the corona vaccine that it is developing alongwith GlaxoSmithKline Plc by the first half of the next year. If successful, it would be available by April 2021. "We are being guided by our dialogue with regulatory authorities," said Sanofi research Chief John Reed.

Sinovac: Chinese vaccine-maker Sinovac has said that its candidate CoronaVac has witnessed immune response in Phases I and II of the trials. It said that the vaccine has not caused severe side effects and more than 90 per cent of the volunteers have induced neutralising antibodies.

Source: www.businesstoday.in

FIRST ICMR-APPROVED COVID-19 ANTIBODY TESTS LAUNCHED IN INDIA

Chennai-headquartered CPC Diagnostics (CPC), a portfolio company of Everstone-backed healthcare platform Everlife Holdings, has launched Covid-19 antibody tests — SARS COV-2 IgM and SARS COV-2 IgG in India. Both CE-approved tests are the first of their kinds to be approved by the Indian Council of Medical Research (ICMR).

CE marking is a certification mark that indicates conformity with health, safety, and environmental protection standards for products sold within the European Economic Area (EEA). The CE marking is also found on products sold outside the

EEA that have been manufactured to EEA standards.

The Clinical Laboratory Improvement Amendments (CLIA)-based tests are developed by Shenzhen-based YHLO Biotech, and run on the fully automated analysers iFlash 1800/3000, offering sensitivity of 97.3% and 86.1% for IgG and IgM, respectively, with specificity of 96.3% and 99.2%, respectively.

R Kailasnath, MD, CPC Diagnostics, said: "Our government recognises the need for more and better testing, and we are happy to be contributing to India's fight against Covid-19 with these highly sensitive and

specific assays. Our priority now is to work closely with all stakeholders such as the government, the private sector as well as the medical research fraternity to make these tests available to them."

The IgM assay is capable of detecting the disease as early as the seventh day after infection. The iFlash system minimises the human error while being able to handle large volumes. Depending on the analyser model, a lab can report up to 1,000 to 2,000 results per day on a single instrument, with the flexibility for facilities to add further modules to ramp up output substantially, as stated on behalf of Everstone Group.

CPC is also planning to launch another antibody ELISA-based testing solution, which is under the process of ICMR approval. The ELISA tests developed by EUROIMMUN AG in Germany can be programmed on any automated ELISA processor or ELISA reader in addition to the dedicated EUROIMMUN analysers. These tests offer high sensitivity of 93.8% and 100% for IgG and IgA, respectively, with specificity of 99.3% and 90.5% respectively. An enzyme-linked immunosorbent assay, also called ELISA or EIA, is a test that detects and measures antibodies in the blood.

CPC, a manufacturer and marketer of in-vitro diagnostic products, has three decades of experience in the industry. It operates in India, Sri Lanka and Bangladesh.

According to the company statement, the antibody tests are very valuable in community screening and surveillance and they eminently complement the RT-PCR tests.

Unlike qualitative rapid tests, CPC's CLIA and ELISA tests provide semi-quantitative values. This feature is useful to assess the suitability of plasma (from individuals who have recovered) for therapy.
Raman Gandotra, CEO, Everlife, said:

"Everlife is committed to support its portfolio companies to fight COVID-19 in all the countries where it operates, by providing safe and accurate testing. Quantitative serological antibody testing is uniquely suited in the current Covid environment, where countries are not only looking at detecting and controlling the spread but also preparing to re-open their economies."

Source: www.financialexpress.com

GOVT TO ALLOW PPE, VENTILATOR EXPORTS AS INDIAN COMPANIES ARE MASS-PRODUCING THEM NOW

The government is likely to soon allow exports of personal protective equipment (PPE) kits and ventilators, two crucial components in the battle against coronavirus.

Over the past few months, since COVID-19 was first identified as a strengthening threat, the present ruling government has ramped up India's capacities to manufacture PPE kits and ventilators in collaboration with private players. According to government data, India is currently churning out an estimated 6 lakh personal protective equipment (PPE) kits and around 1,000 ventilators daily.

According to two sources, the government is now working on the proposal to allow manufacturers to export surplus equipment after the domestic demand has been taken into account.

"The PPE kit-makers have informed us that they are getting demand orders from several nations, including the US, the UK, Nigeria, Germany, Spain, Russia and Uganda," a senior health ministry officer said.

"Several ministries, including those of commerce and health, and the Empowered Group III are involved in drafting the proposal to allow exports,"

the officer added.

Empowered Group III is one of the high-level panels set up by the government to bolster its response against the pandemic.

Launched by an order of the Ministry of Home Affairs, the group holds the mandate of ensuring the availability of essential medical equipment such as PPE, masks, gloves and ventilators, and oversees each aspect in this regard, from production and procurement to import and distribution.

Source: www.theprint.in

AYUSHMAN BHARAT'S ROLE DURING COVID-19 OUTBREAK IN INDIA

People covered under Ayushman Bharat Scheme would be eligible for free treatment of COVID-19 as per report.

Ayushman Bharat is the flagship health insurance scheme by the Central Government for the poor people. As per National Health Authority's (NHA) direction, the treatment and testing of COVID-19 will be done for free of cost in any of the private hospitals empanelled for the scheme.

The source told that the packages have been finalized for the regions that require multiple tests, and if a person needs isolation it will be covered under the same scheme.

NHA might have also created additional packages in cases where patients are going through respiratory distress and need intensive care in some serious cases.

The Ayushman Bharat Scheme or the Pradhan Mantri Jan Aarogya Yojana is the

flagship scheme of the central government to provide health coverage for the poor segment of the population. Also, it's the world's largest health coverage scheme covering more than 10 crore families.

A cover of Rs 5 lakh is provided per family over 1400 predefined packages across 23 specialties. The source added, approvals for the packages have been sought within two days, once the packages are in place and want to be prepared if there are possibilities of community transmission

being reported.

Managing the call centre for the 1075 helpline of the health ministry, fielding about 30,000 to 40,000 calls every day in terms of providing information. Preparation of a big database of citizens showed high-risk people, the elderly who have co-morbid conditions, etc.

700,000 calls were done to such high-risk people to gather data for follow up with anyone who have COVID-19 like symptoms. Consulting doctors to ensure they get the right information and treatment. If they need testing, treatment, or isolation, all is being managed under Ayushman Bharat, shares Dr. Indu Bhusan, CEO of the National Health Authority (the agency that presides over the scheme).

Then, with Aarogya Setu, all the people who report having COVID-19 like symptoms and are in categories of having been in direct contact with a COVID-19 patient were initial tested for symptoms to ensure the confirmation of the contagion. Connect them with doctors and offer telemedicine to ensure follow-up actions.

He also said that "We have also expanded our empanelment (of private hospitals) because we know that we need more hospitals, not only for COVID-19 but also for non-coronavirus cases. As many hospitals have converted themselves into dedicated COVID-19 hospitals, a lot of critical activities like dialysis and chemotherapy still need to be done and we need more hospitals.

So in the past month-and-a-half, we have actually impanelled more than 1,000 new hospitals to take care of such people."

The pandemic has derailed the whole world. So, it would be unrealistic to expect that all programmes will continue as they were. We have prepared packages and most of the states have started providing testing and treatment under PM-JAY. So far, the caseload was not that much and therefore the response was centered on public health facilities. But as the surge is taking place, we'll need more and more private sector participation.

Source: www.bfsi.economictimes.indiatimes.com, www.qz.com

Compiled by:
Parthvee Jain, Editor, InnoHEALTH Magazine

To be a Nurse/ Nursing is not for everyone/ Beyond the Call of Duty

■ **Written by Dr. Elsa Lycias Joel**

From time immemorial women have been considered to be better caretakers.History has provided us with many examples of women as nurses and their contributions to the societies. Be it 'The lady with the lamp' or 'The angel of the battlefield' or sojourner truth or the first black woman general of USA or the first lady of nursing, there is no dearth of inspiration. All of us, at least when pandemics hit us came to know what the word 'nurse' stands for. The word

is derived from the fifth-century post-classical Latin nūtrīce, a wet-nurse hired to provide an infant with breast milk when the infant's mother would not or could not do so. Etymologically it is related to our modern word nourish.

As Britain prepares to celebrate Florence Nightingale's 200th birthday on May 12, the whole world believes nurses as their saviours and would not let go of them. In today's scenario, despite intensive care

many people have faced the adversity and embraced the death but the utmost resilience and calm professionalism displayed by nurses make them an essential part of the societies.

With a long history, they are everywhere as members of the largest health care profession in diverse settings and fields. Stories of army nurses have reinforced the fact that they do their best withstanding hardships at the front and have been

> **Be it 'The lady with the lamp' or 'The angel of the battlefield' or sojourner truth or the first black woman general of USA or the first lady of nursing, there is no dearth of inspiration.**

awardees of The Purple Heart. We all know how vulnerable they are under the present circumstances as a vital link between the patient and the rest of the healthcare system. Raincoats and helmets in lieu of coveralls and masks, claps and clanging pots instead of PPEs and a pay raise, it's a struggle day in and day out. Relentless working around critically ill patients even when the surge has affected so many lives is itself an act of self denial. A listening ear and a calming touch even as they keep their senses alert for one small subtle change to determine what or who needs to be called reflects their flexibility, innovativeness, patience and adaptability.

Severe shortages of proper protection gear for nurses in the current and post pandemic periods is a result of governments' lethargy and unpreparedness for the current pandemic. Uneven battle with the deadly virus in turn threatens the smooth rendering of health services to the public. Though nursing's image take on an heroic cast during pandemics and wars, the reality for most nurses is that the work is incredibly demanding with few financial rewards and poor working conditions. Nursing fails to keep up economically with other occupations. For the sake of four words -Humanity, Fortitude, Devotion and Sacrifice which describe this profession the best and for these words to ring true, the cracks in the current edifice of healthcare safety should not continually grow. For those thousands who died on duty leaving their colleagues and families shaken, their contributions are acknowledged as essential to victory against this evil called COVID-19. If we think, nurses report for work in the most challenging of circumstances, not just for the sake of duty but their inner conscience that believes in safeguarding the human lives is a fundamental principle of their profession.

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those thousands who died on duty leaving their colleagues and families shaken, their contributions are acknowledged as essential to victory against this evil called COVID-19. If we think, nurses report for work in the most challenging of circumstances, not just for the sake of duty but their inner conscience that believes in safeguarding the human lives is a fundamental principle of their profession.

Due to their long working hours and undulating efforts to keep their patients healthy also concerns about their personal psychosocial well-being. At these times, even behind a mask the nurses are not wholly successful in altering their outward demeanour and the presentation of what they see as their `detached' face does not serve to mask feelings of exhaustion, demoralisation, anger or sorrow". Recently, with too many failings and deaths to handle, however, nurses find themselves having to perform a different kind of emotion management than that prescribed by their profession. They have to present the detached face of the professional career, as fear of losing grips them. Next moment, they also have to handle intense joy on liberating someone from a ventilator, when another one stabilises and could breathe on her/his own again. `Smiling happiest faces' also means they have to work hard on their emotions especially with families of patients whose expectations of a quality service have been raised beyond anything better than the best. An impending doom or an existing gloom, the overall effect is physically and psychologically palpable. ''Wobble rooms" are indeed "rainbow rooms" that offer peace and serenity alongwith a space to have a safe conversation. Above all, nurses need not go home thinking, 'I could have been the kindest to so and so'.

The rendering of a nurse is beyond the words as they are the mediums that extend the support to the patients and their families. With underpayment, under-resourced and overworked, they are barely holding it together in the recent COVID-19 pandemic. Patients who arrive in severe shock, others very sick demanding a high level of nursing care and many others on the verge of death needing a kind look or words of comfort, surrender themselves with 'that' look in their eyes. 'Stoicism' is the ruling word in times of profound upheaval, risk, and strain. Is there anything more traumatic than seeing the one you cared for in the previous shift with lot of hopes and prayers, in a body bag hours later? These soldiers who display courage in the face of duty are more than deserving of a 'Maidstone Medal' or "The Christiane Reimann Prize". What's more, they put the wellness of others before their own, and many accept their fate with incredible dignity. Bold voices with clearly articulate ethical positions and an astute understanding of human rights, careful discernment of human rights violations with a bold acceptance of professional responsibility makes them an important part of the healthcare society.

Forget COVID-19 for a moment. In normal circumstances, to smoothen the often turbulent path of interaction between patient and an over worked health specialist, nurses are well able to tolerate differences, willing to keep aside potential perceptions and whole heartedly contribute to shared care plans even when multiple patient handoffs play foul in establishing a trusting and collegial relationship. Nurses must re-define stressful situations, carry on and do their job in any situation with or without resources. There seems to be no recognition anymore of the collective goodwill involved in providing a service, many a time selfless one. A bad job is definitely not excusable, but others involved with nurses ought to understand and appreciate the struggles or shortcomings. At the end of the day, they don't feel like heroes but rush back home as a daughter, wife, mother, lover or a friend to feel belonged, to care and be cared for.

Dr. Elsa Lycias Joel holds a doctorate degree in biotechnology. Has worked with the new Indian express as sub editor for a year. She is a prominent writer for a number of children's magazines since 2004. She has also contributed to The Delhi Press, I Quote, Women Exclusive (WE), infinithoughts, couples magazine alongwith other national and regional dailies. She has authored a children's book named "Perfect Endings', the author's copy of which was signed by the former President of India Dr. Abdul Kalam.

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The New Normal:
Analysis of challenges posed by COVID-19 on Indian Healthcare Industry

First virtual IC InnovatorCLUB Report

■ **Written by Parthvee Jain**

Perceiving the current unprecedented times, I vehemently make an audacious statement that COVID-19 pandemic is the most clamorous, catastrophic and redefining aeon of our lifetime.

The situation that our generation has faced till date is more disastrous compared to the Spanish flu 1918. The rate of contraction of COVID-19 around the world has expedited from the first cases reported in China in the end of December 2019 till starting of the month May 2020 irrespective of the fact that an approximate of one-third of the world's population is locked inside their homes.

The current unprecedented situation is bereft of following any norms and has perplexed the whole world regarding the economic crisis, lockdown protocols and strategies to come out safe from this virus. The virus has made alteration in its genetic expressions in order to acclimatize itself in diverse geographical regions of Earth. The virus has originated from cross-species transmission (CST), also called interspecies transmission is now an undeniable fact as per the scientific literature any ecological modifications made by microorganisms take nearly 800 years to carve a niche for itself. The spread of this virus is pernicious as it seems to find new ways to hide itself; and now that we can be asymptomatic and yet be a carrier of infection is really deadly and devastating.

The lockdown has given us the opportunity to refurbish our thought and adapt ourselves to accept the "new normal". Amidst the current situations, healthcare sector faced the challenges pertaining to the novel corona virus or COVID-19 and to respite itself from this situation it was in dire need of sustainable innovations to cater to the ever increasing demands of the COVID-19 patients.

To address this situation, we as InnovatioCuris Foundation of Healthcare & Excellence (ICFHE) took the initiative to bring some industrial experts on a single platform to synergize the need of healthcare system and develop solutions towards it. As the world is being digitally collaborated in the present time, we organised a first of its kind virtual ICInnovatorCLUB meeting on May 2,2020.

After welcoming all the experts on board Dr V K Singh, MD of InnovatioCuris (IC), enlightened about the idea behind this virtual platform and the vital role played by IC to fight against the pandemic.

Dr Hem Chandra Pandey, Vice chancellor of Uttarakhand Medical Education University initiated the opening of the session and shared his views regarding the public health issues addressed by the government hospitals prior to the pandemic to safeguard the health of the humans. Given the ordeal of the present situation the government and private hospitals have come together to deal with this situation where the public health activities are jointly being carried out by both.

Dr Hem Chandra also discussed the diversified role undertaken by the private

hospitals in the state of Uttrakhand to collaborate with the state research institutes and government hospitals for better treatment to be imparted to COVID-19 patients.

Highlighting the issues of diagnostic challenges the COO of Oncquest Laboratories, Dr Ravi Gaur enlightened about the depth of the distressful situation with an impactful verdict that "the smallest, tiniest strand of RNA (virus) has brought the species humankind to its knees. But we humans have pulled through the crisis earlier, and will pull through this."

He further emphasized that in the past, humans have faced two major infectious diseases i.e TB and HIV and the present scenario of COVID-19 also show higher impact on all the organs of the body therefore leading to a multiple organ failure in the human body. RT-PCR is the molecular diagnosis used for the detection. The serology and antibody assay using ELISA and rapid test cards play a vital role in epidemiological growth.

Some of the biggest challenges in testing/ diagnosing the current situation are:
- Identification of suspected cases and faster diagnosis
- Continuous revision of testing strategies
- Augmenting the testing capacity Limited
- Availability of infrastructure (like Biosafety Level 2 and 3 standards etc.)
- Limited NABL accredited diagnostic labs – Need to fast track accreditation
- Limited skilled workforce
- Safety of manpower
- Limited resources like PPEs - innovators stepped up and helped with some innovative models and was made available with the help of government interventions, but costs are high
- Type of sample for swab collection (nasopharyngeal / oropharyngeal / buccal)
- When to collect samples - time of sample collection (affects the accuracy of the diagnosis)
- Storage and transportation of the samples (special Viral transport media required and cold chain needs to be maintained)

> **The current unprecedented situation is bereft of following any norms and has perplexed the whole world regarding the economic crisis, lockdown protocols and strategies to come out**

- Availability of ICMR approved testing kits
- Logistic and supply chain disruption
- Manpower needed for strong motivation and assurance
- Health being a state subject there is some communication gap in expressing the goals between the centre and the states quality validation
- Catering to India's 1.3 billion population is a huge task and calls for a smoother operational mechanism for the success of this collaborative approach.
- State governments need to step up measures and ensure a hurdle-free procedure and a safe environment for the medical and testing workforce.

Appreciating the level of surveillance that countries like India are able to achieve at this time, Dr Gaur also highlighted the importance and appreciated the support, alertness being extended by the government towards the capacity building. The steps being taken to overcome many of these challenges ensure that the testing is available to the last man out there on the post with an affordable cost.

Dr Gaur, added that COVID-19 virus has exposed the fragile existence of the human race.

The accuracy of the detection and generation of test report in a short span of time (4-6 hours) will impart a major impact on the eradication of COVID-19

There is a strong need to have a near patient and rapid but very accurate test. As COVID-19, has become pandemic, there is an urgent need to invest more in developing state -of-art-laboratories equipped with latest technologies and qualified skilled force. Indian Government has done a very commendable work but to foster development a strong collaboration is needed between government managed labs and private labs. Both public and private entities have their limitations, but

a combined effort can and will definitely make a huge difference.

According to Dr Nagendra Swamy,(Principal Coordinator of Federation of Healthcare Associations, Karnataka) there are approximately 16,00,000 beds in India out of which 8,00,000 are with the public health sector including government hospitals, armed forces etc. Another 8,00,000 are organised with private sector, the corporate hospitals have 62,000 published beds only and 1,00,000 beds available with large and tertiary care hospitals and moving to private medical colleges we have around 2,00,000 beds in this segment. The balance 4,00,000 beds in private healthcare that is virtually handling the common class and serving as the backbone of the Indian healthcare. He further emphasised the unimportance given to the small and medium sized hospitals that can play a major role in safeguarding the health of humungous population of India in the current pandemic interventions.

Since the better healthcare facilities are only available in the metropolitan cities there is an immediate surge for upliftment needed for the small and medium sized healthcare centres as this will cater to the sustainable source for tackling the unprecedented situations caused by pandemic and the epidemics.

He further complemented the efforts and guidelines rolled out by MOHFW and ICMR to segregate the hospitals into COVID and non-COVID hospitals so that all the other healthcare facilities are also available to the patients without any risks of cross contamination with coronavirus. Dr Swamy, also shared his concern about the financial and disease burden challenges that such hospitals are facing today, and highlighted the role of small and mid-sized hospitals to fight the difficult situation by serving people with non-covid health issues keeping in mind the safety of all.

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> **We all are struggling with such a paradoxical setting today, where doctors who are the front line protectors/fighters have their own protection at highest risks, the healthcare staff who are saving millions of lives and families have their own lives and families in the most vulnerable zone.**

In alignment of the aforementioned thoughts and further highlighting the challenges being faced by any mid-sized hospitals today, Ms Upasana Arora, the Director of Yashoda Hospital, Kaushambi and the chairperson of Services Export Promotion Council (SEPC) requested the industrial expert to make amendments in the policies for healthcare sector to combat the pandemic situations in a better way. She also emphasised on how all the safety measures like wearing masks, PPE etc should be considered as a universal precaution.

Moving ahead on the path of analysing the challenges that the healthcare industry is facing, Dr S K Gupta, Director of Cardiology & Medicine, JWM Global Hospital & Research Centre India, talked about one of the most important and least talked aspects to this dreadful situation that is trauma and anxiety that the health workers and people are facing today.

Putting it together, Dr Gupta told that there are three dimensional aspects to one's well being, that is Spirit, Body and Mind.

Whether we talk about insomnia, strange dreams, or even too much sleep, all are types of sleep disturbances that are a part of our body's response to trauma and anxiety.

"*Healthy self*" and "*self awareness*" are the key to good health that we all need to take care of. Mindfulness and relaxation techniques are proven to improve mood and sleep quality by enhancing the control over the body's focus and arousal system as well as in managing anxiety and concerns.

Stress, in such a situation is quite normal and can be healthy (as it motivates one to take necessary actions), but too much sustained stress is not. High and unregulated levels of stress can have various negative consequences on the brain, immunity and also on the vascular system of the body, leading to blood sugar imbalances, high blood pressure, impaired immunity and inflammatory responses – the very precise opposite of what we need to fight the potential impact from this COVID-19 exposure.

Good sleep, healthy diet and meditation are important practices to be taken into consideration. Three dimensional healthy lifestyle can do wonders and everyone should try to follow it, irrespective of one being at home, in a hospital or anywhere else.

Another interesting picture of challenges being faced by the private hospitals was emphasised by Dr Param Hans Mishra, CEO of Kailash hospital.

It is really sad that we all are struggling with such a paradoxical setting today, where doctors who are the front line protectors/fighters have their own protection at highest risks, the healthcare staff who are saving millions of lives and families have their own lives and families in the most vulnerable zone. And to top all this, is the shortage of resources and finances to serve these healthcare workers, organisations and ecosystems. It is a real challenge for the private sector as the reduction in the number of non-covid treatments/surgeries (due to fear of catching cross infection) leads to reduction in cash flow and high number of covid treatments demands more and more per patient inputs (financial as well as human resource).

Trying to find solutions to some of the above challenges, ICFHE under the umbrella of Ministry of Human Resource & Development (MHRD) organised two virtual national level hackathon on Fight Corona IDEAthon and MHRD Mega Online Challenge - SAMADHAN in the month of March and April, to call upon the young innovators.

Fight Corona IDEAthon was organised from March 27-29, 2020 by ICFHE under the aegis of the Ministry of Human Resource Development Innovation Cell, All India Council for Technical Education (AICTE) and FORGE Accelerator. It was a national level 48 hour virtual/online ideation hackathon that extended to 72 hours due to overwhelming response, to discover ideas from thousands of innovators, researchers, scientists, and educators from across India. More than 5400 teams and 300 mentors joined hands as a true community during these uncertain and challenging times to discover solutions that can help the nation

rise and combat COVID-19.

There were nine IDEAthon winners, three in each track of Students, Educators & Researchers and Professionals & Startups. The winners were awarded the cash prizes and also incubation grants upto 40 lakhs. There were also nine motivational cash prizes (three in each category) given out to motivate some of the best ideas from around the country.

Standing tall on a highly impactful Fight Corona IDEAthon, the Ministry of Human Resources & Development, in collaboration with AICTE and InnovatioCuris Foundation of Healthcare & Excellence (ICFHE), again hosted a nation-wide mega online challenge SAMADHAN under two tracks- Track 1:Ideate-Simulate-Win and Track 2: Validate-Pitch-Deploy.Under the SAMADHAN challenge there were three categories namely: student innovators, researchers & educators and startups to share their ideas to solve the challenges posed by COVID-19 pandemic. The SAMADHAN challenge was a 14 days long hackathon from April 14-25, 2020, that witnessed more than 3200 team participation from all over India.

With the initiative of these hackathons, our healthcare ecosystem got some bright solutions catering to some of the challenges posed by this pandemic.

Through an interactive discussion, Mr.Tarak Nagarajan from Abhaytech,

Mr.Muthu Vangaliappan from Katomaran Technologies and Business Solutions and Dr Sachin Sharma from AI joined and shared their personal experiences and innovative solutions that they have developed to fight the crisis.

Working on their innovative solutions like:
1) disposable/ reusable lung and heart monitors that can be worn at home and only require a smartphone which will help to reduce the burden for hospital based monitoring and the bottleneck of available hospital beds. As most of the death are occurring due to comorbidity. The AI Algorithm developed by Abhayatech can act as a temporary doctor and constantly help in monitoring the patients therefore ease the burden on doctors.

2) Autonomous mobile UV-C robot. It's a AI enabled robot that can be used to sanitize hospitals, offices, campuses etc. It could be useful in hospital settings where the room has to be sanitized after each and every patient like MRI room or CT scan room etc.

3) Early detection of COVID-19 using CT scan images and machine learning techniques.

We hope that our Indian healthcare ecosystem will soon be able to implement such innovative solutions to cater some of the challenges mentioned by the experts and also there will be more and more young innovators out there who are eager

to help the community in this time of crisis.

Trying to fast forward this implementation process, ICFHE has taken a step towards creating a Hospital Innovation Screening Committee (HSIC) to get the innovations evaluated and tested on ground to expedite the validation process. A platform was extended to the innovators to demonstrate their inventions that is evaluated by the eminent leaders of the industry.

As it's said, every crisis is an opportunity in disguise. So let's try to grab this opportunity and stand together to fight against this and any such pandemic in future.

Parthvee Jain, Editor, InnoHEALTH, is an engineer with specialization and interests in fields like Biotechnology, Healthcare, Food Processing and Nutraceuticals. Connecting European Healthcare innovation leaders with the Indian healthcare system and pioneers, she heads the market access program and partnerships at InnovatioCuris: impacting organizational performance through expert research, analysis and evaluating market competitive conditions, current and emerging trends, and industry-specific solutions.

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Looking at India's role at containing COVID-19 outbreak and surge in new infection among denizens

■ **Written by Dr. Gautam Kr Ghosh**

Though India has made progress for preparing and migitating the impacts of pandemics still there is an uneven distribution towards International Health Regulations (IHR). The Global Health Security (GHS) Index 2019 assessment reported the fate of India which is shown below-

India over the last three decades has faced many novel diseases in epidemic proportion. For example, in 1984 Human Immunodeficiency Virus (HIV) that caused Acquired Immunodeficiency Syndrome (AIDS) arrived in India unnoticed. Nation's health administrators upheld control measures by setting up the

National AIDS Control Organization and executing preventive intervention. These measures were internationally acclaimed as they demonstrated numerous good practices through community-led efforts.Similarly the outbreak of Nipah virus(2001), the Chikunguya (2002), severe acute respiratory syndrome (SARS in early 2003), the pandemic H1N1(2009) and Crimean-Congo Haemorrhagic fever (2011) were contained without significant morbidity and mortality for the country.

In the case of COVID-19, this has striking resemblance with pandemic H1N1 that persisted as seasonal flu and SARS that caused severe bronchitis. Although

this seasonal flu, spread rapidly but it's deceased impact is less.

In the initial stage, these diseases like H1N1, SARS-Cov-2 or COVID-19 is undetected. Unlike the other diseases, COVID19 or Coronavirus is extremely contagious leading to death in maximum cases. The people who are in their advanced age i.e. above 60 years and those whose immunity is compromised due to certain health ailments are more prone to the fatal consequences of this virus.

Confronted with the current summons rising out of COVID-19 outbreak, it is fascinating to take note of India's

India (IND) *More Prepared*
46.5 Index Score   **57**/195 Rank
View Country Page

Key
● Most Prepared
● More Prepared
● Least Prepared

Select a country to see Overall Score/Rank and access a full country page

Source: GLOBAL HEALTH SECURITY (GHS) Index 2019

projection in the World Bank Group Pandemic Preparedness Funding Status Report of September 2019. India scores as IDA nations on readiness, research facility, reconnaissance and workforce which is anticipated in the figure underneath-

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The states embraced 'Custer Approach' with distinguishing proof to trace the individuals who have interacted with COVID-19 infected individual as a group and afterward focusing on specific hotspots, door to door screening of people infected and those potential age group people likely to get infected. Certain areas were demarcated as "Containment Zones". With the concurrence of the rapid testing facility for COVID-19 there were considerable increases in number of symptomatic as well as asymptomatic

Joint External Evaluation (JEE) Scores - 76 countries

Group	Overall average JEE scores	Selected technical areas—JEE scores			
		Preparedness	Laboratory	Surveillance	Workforce
Global	2.8	2.3	3.2	3.4	3.0
IDA Countries	2.2	1.5	2.6	3.0	2.6
Non-IDA Countries	3.5	3.3	4.0	3.8	3.5

Source: Computed from 76 JEEs using WHO JEE mission reports.

Note- India a member of IDA countries since 2014

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The Government is well aware of its role and anticipation for widespread transmission,therefore the outbreak was declared in India as an epidemic and provisions of the Epidemic Diseases Act, 1897 were invoked. India's reaction to the COVID-19 pandemic has been described as being the most stringent as per the Oxford COVID-19 Government Response Tracker. The nation faced prolonged lockdown since March 24. Given India's deficient health infrastructure, a severe reaction had to be embraced on emergent basis to restrict the spread of the infection.

cases. The migrant labourer from different states in the dire consequences has to take the ultimate judgemental step of returning back to their native states has spiked the spread of the disease. Majority of the migrant workers travelled from high risk areas to the rural native place, increasing the spread of the disease in rural areas which were earlier not exposed to the pandemic.

In response to the biggest economic crisis triggered by the Covid-19 pandemic after 1979 with a subsequent lockdown has led to the Nation Central government's fiscal relief to just about 1.1% of GDP. It has, however, allowed states to increase their borrowing limit unconditionally by 0.5% of their Gross State Domestic Product (GSDP) or Rs. 1.07 lakh crore. A definite portion of the Centre's fiscal relief i.e Rs 40,000 crore or 0.2 per cent of GDP with an additional allocation to MGNREGA has led to a budget estimate of Rs. 61,500 crore for the fifth and final tranche of the packages announced by Finance Minister.

Amidst the lockdown, the Prime Minister of India addressed the nation on May12, 2020 where he allocated Rs. 20 lakh crore

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for "Atmanirbhar" package, stating it to be liquidity driven with little burden on the exchequer. The government reinforced new revenue options from different sector such as agriculture, public sector enterprises.

In the area of healthcare, 17 states reportedly have hospitals dedicated for the treatment of Covid-19 patients with separate areas for suspected and confirmed cases, but these facilities in all likelyhood are to be overwhelmed with the current surge in new infection. Utilizing the available information from National Health Profile–2019, it is noticeable that there are 7,13,986 government hospital beds available in India. This adds up to 0.55 beds per 1000 populace. The older populace (matured 60 or more) is particularly vulnerable for the disease. The accessibility of beds for older populace in India is 5.18 beds per 1000 populace.

Once more, there are between-the-states variations in the number of beds accessible per patient, isolation beds, intensive care units and ventilator facility availability. It very well seen that numerous states i.e Bihar, Jharkhand, Gujarat, Uttar Pradesh, Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Haryana, Maharashtra, Odisha, Assam and Manipur lie below the national level figure (0.55 beds per 1000 populace). These 12 states together recorded for nearly 70% of total population in India. Bihar has an intense lack of government hospital beds, with simply 0.11 beds accessible per 1000 populace. A few states improve on this metric, for example, West Bengal (2.25 government beds per 1000) and Sikkim (2.34 government beds per 1000). The capital city of Delhi has 1.05 beds per 1000 populace and the southern conditions of Kerala (1.05 beds per 1000) and Tamil Nadu (1.1 beds per 1000) likewise have better accessibility of beds. The situation is quite comparable when the examination is accomplished for simply the older populace: North-eastern states show improvement over others; southern states likewise have higher number of beds accessible for elderly population — for instance, Kerala (7.4), Tamil Nadu (7.8), Karnataka (8.6) — while northern and central states have moderately low accessibility of government beds for senior citizen category of people. It is certain that availability of government beds is wretchedly low in India, and a scourge like coronavirus can rapidly convolute the issue much further. An expected 5-10% of all patients require critical care in form of ventilator support.

Presently, Indian Council of Medical Research (ICMR), the apex body, has endorsed private clinics to treat COVID-19 patients. Thus with the inclusion of private hospital in the drive, the bed capacity for COVID-19 patient might see improvement but the situation can be inadequate if there is a surge in patients requiring indoor-based care facility. The infrastructure stress will be especially acute in few high-burden states like Gujarat, Maharashtra and Delhi. Already, as per media reports, two of the highest prevalent states for Covid-19 are Delhi and Tamil Nadu. Due to increasing contagion rate there is an alarm for the requirement of government hospital beds. The Union government instructed health authorities of all major states to reserve at least 20 per cent bed for COVID-19 patients in this scenario.

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Despite the COVID-19 trackers updates, there is still less transparency in the amount of cases reported and treated. Health experts augmented that the non-availability of detailed information, precluding the scientific, clinical and public health community from making any definite estimation about the viral spread. Testing criteria has changed with testing of certain symptomatic patients and their contacts along with asymptomatic patients, migrants workers, and some healthcare workers. The reports varied from district to district in every state. Any robust calculation would require information on the qualities of the testing denominator to make reasonable extrapolations for the remainder of the populace. Health specialists additionally express that the vulnerability profile of at-risk populace in India will be one of a kind, with its blend of malnutrition, stunting, non-communicable diseases and respiratory diseases, as will be the demography a more youthful populace. As observed, most local jurisdictions do not collect data on the age groups and disease profile of hospitalized patients, the length of stay of hospital admissions, the numbers transferred from one level of care to another, all of which hospital administrators would need to plan bed capacity.

Notably, Indian Council of Medical Research (ICMR) recently undertook the first population-based serosurvey in India, to assess the extent of exposure to SARS Cov-2 – the pathogen behind COVID-19. The preliminary findings shared revealed that several containment areas has high caseload districts, 15-30 per cent of the population has been exposed to the infection and quietly recovered.

Scientists ascribed the phenomenon as 'Nature's own way of immunization' that may lead to reaching herd immunity.

Notwithstanding, simultaneously efforts at this stage required is to generate the state and district-wise tally to conclude the number of patients treated, their analysed test reports and data about their segment, socioeconomic and health status, with the goal that state administration can find a way to adjust lives and livelihood. The declaration that generally safe patients can self-confine at home will give some reprieve, yet this may pose potential danger of transmission in the community, as health experts opined stressing that given the conditions, nation's health systems need to bend over endeavours to contain case growth and enlarge health infrastructure as much possible.

Dr. Gautam Kr Ghosh, the writer is Ph.D (sociology) and presently working as a research scientist in ICMR National Institute of Cholera and Enteric Diseases,Kolkata,India.

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BOOK REVIEW

Atomic Habits by James Clear

By Sachin Gaur,
Executive Editor,
InnoHEALTH Magazine

This book for many people might be a turn off if they detest self-help books, as they normally come in a condescending tone with a promise that most fail to realize. And for some who are interested in self-improvement it might be invaluable. While writing this review let me divulge out my initial motivation for selecting this book. For pasteighteen months and more, I have been doing a literature review for the topic of better eating and a healthy lifestyle.

Those who are acquainted with my lifestyle will find relevance to the crucial modification I have to take pertaining to my lifestyle. To achieve success over my old habits and improve my health goals has been a detrimental decision. This book gave me an insightful journey for the conceptual understanding of my behavioral framework.
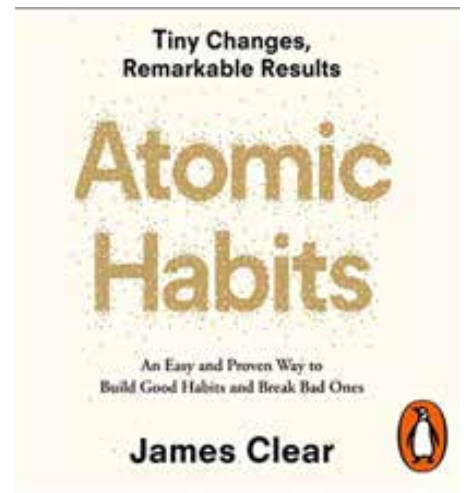
The author begins with a traffic personal incident and his own motivation for building powerful habits over the years, which have yielded results for him. The good news is that the book is not lengthy and it provides some practical tips on acquiring new (desired) habits and helps in breaking old ones.

Reflecting on my own life, I realize, readingbook is something which I cherish as much as doing my daily habit which combines with my daily walks, listening to audio books through a mobile app. Even the journey of this book is covered during one of my daily walks! This small hack was giving me time for two hours of listening every day and an efficiency of completing one book a week. I didn't know this is what we call as **habit stacking!**

Similarly, when I realized that social media was taking lot of my time I uninstalled the application from my mobile phone. I need arises I check my network in the laptop. This has saved a considerable amount of my time. I would recommend this book for those who are looking for small conquests in their daily life or are already in the process but lacking a more clear understanding along with a vocabulary upliftment!

Tiny Changes, Remarkable Results

Atomic Habits

An Easy and Proven Way to Build Good Habits and Break Bad Ones

James Clear

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 **http://bit.ly/ic-club-membership**

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

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