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Nightmare COVID variant……

Dear Readers,

Thank you for your continuous support. Double Helical has been making a difference in the lives of the socially and economically disadvantaged groups through raising awareness as well making voluntary contributions in the areas of education, health, human rights and social services.

The magazine provides a platform to recognize innovation, people, products and services that are helping to transform the healthcare sector in the country and ushering in affordable, high quality and inclusive healthcare for masses.

In the current issue, we focus on "Nightmare COVID variant". In India, the omicron version of SARS-CoV-2 has three unique novel sub-variants identified as BF.7, XBB, and BQ.1. The fifth variant of concern has started to dominate in various regions through a number of lineages. The mutations are shown to be highly immune evasive due to the potential growth accretion that allows them to replace previous sub-variants such as BA.5.Yet, little is known about the pathogen that causes this disease. However, as winter draws closer, cases are expected to soar in India and around the world.

As of October 23, 2022, India recorded 1,994 fresh cases with an active caseload of 25,968 are declined to 23,432. In this time frame, more than 200,000 tests were performed according to the ministry of health.

"Corona new waves will come again and again for 4-6 months so booster doses are mandatory," Disorder which is very popular; at least one person plays video games in two-thirds of American households, according to the Entertainment Software Association. Roughly 160 million American adults play internet-based games, one recent study estimates.

Observation on the mode of spread of the new variant Omicron of Covid and the effectiveness of vaccines against it are being examined. Genetic variations and structural changes have been observed in many other countries regarding this new type. Will these changes increase the spread of the virus? Does it have an effect on how well the performance of vaccines works? To face this situation we should further advocate for strengthening the nation's ongoing immunization program. Rivera cautions that while these new boosters will improve our protection against the virus, they are not a silver bullet to ending the pandemic. The purpose of boosters and variant-specific boosters is not intended to chase the variant.

In this we also highlights on "Smoking Burden in India" as exclusive report. Cigarette smoking is rampant across India, with 14% of the population reported to smoke cigarettes, and a study has reported that 28.5% of Indians are ever-smokers. India has over 100 million adult smokers, which is the highest in the world after China.

Nearly a quarter of the male population smokes cigarettes, with a higher prevalence among the elderly, widowed, alcohol consumers, manual labourers and those with lower education end economic status. Similarly, the Global Adults Tobacco Survey-India (GATS-India) reported a higher prevalence of smoking among males, illiterate individuals, those from poor households and rural areas. The average number of cigarettes smoked per day is reported to be 7 per day among women and 6.1 per day among men.

It is alarming to note that 14% of ever-smokers in India show some form of respiratory illness. The burden of tobacco-related cancers in India was estimated 366,000 in 2015 and is estimated to increase by nearly 40% by the year 2050, with an estimated burden of 508,000.There is also significant cardiovascular disease (CVD) burden due to smoking, with most CVD deaths attributed to tobacco smoking. Five percent of deaths among Indian women and 20% of deaths among Indian men are attributed to smoking.

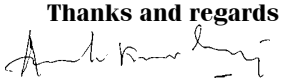
In comparison to never smokers, current smokers had an age adjusted relative risk (RR) of 4.6 for myocardial infarction. In addition, persons consuming more than 10 cigarettes per day (median 15 cigarettes/day) had an RR of 7.3 in comparison to never smokers.

According to the World Health Organization (WHO), over 5 million people die each year due to diseases associated with smoking, such as cancer, heart disease, liver disease, and stroke. In fact, nearly 16% of all NCD deaths and 1-0-30% of all cardiovascular deaths are linked to smoking. It is estimated that by the year 2030, there would be 8 million deaths attributable to tobacco smoking. Even exposure to second-hand smoke (SHS) increases the risk of developing and progression of atherosclerosis.

The health risks of tobacco smoking have been demonstrated in several studies, indicating a 2-3 fold higher relative risk of coronary heart disease (CHD), 1.5 times for stroke, 1.4 times for chronic obstructive pulmonary disease (COPD) and 12 fold risks for lung cancer. The risks are similar in men and women, but are higher for younger individuals.

There is more such interesting and thought-provoking stuff to savour in this issue. So, happy reading!

Thanks and regards



Amresh K Tiwary,
Editor-in-Chief

Free Health Check Up Camp

Double Helical, a leading national health magazine, in association with SPARSH, recently organised Free Health Check Up Camp at Hanuman temple premise in Sector 1, Vaishali (Ghaziabad) with renowned doctors of reputed hospitals. SPARSH is a non-profitable, selfless, voluntary organization dedicated to the education and health of people especially children

The free health check up camp was inaugurated by chief guest, Dr Arun Kumar Agarwal, Professor of Excellence, Former Dean, Maulana Azad Medical College, New Delhi and Presently, Medical Advisor, Innovation and Clinical Research, Apollo Hospital, New Delhi, along with Prof. Ramesh K. Goyal, Vice Chancellor, Delhi Pharmaceutical Sciences and Research University, New Delhi and Dr Suneela Garg, Chair, Programme Advisory Committee, National Institute of Health & Family Welfare and Member Lancet Commission.

According to Dr Sachin Bhargav, Senior Child Specialist and Convener, SPARSH, a free health check up camp was set up with a sacred aim to bring awareness and provide completely free medical checkup including all medical services which are available nowadays in hospitals like ECG, OPD, MRI, CT Scan, Diagnosis, Blood Test, Gastroenterology, Gynecology, Maternity, Nephrology, Oncology, Radiotherapy, Radiology, Physiotherapy, Urology amongst the deprived population and poor people of the country who have no access to basic healthcare services or knowledge about the diseases they are suffering from.

The free health checks up camp provided free medical advice, medicine to the people and refer for specialized treatment or surgery whenever it is required. These camps make sure people are getting healthcare at the right time, and seeing the doctor early enough before a small health problem turns serious.

Dr Arun Kumar Agarwal, explained about objective of health camp. He said, “We are driven by strong ethics of medicine who believe that it is the moral responsibility and obligation to treat each patient regardless of their income, race or social status. The main objective of a medical camp is to provide initial care to people in life-threatening conditions which reflect the unique strengths and goals of medical ethics.”

Dr Suneela Garg,\said, “I am happy to know that Double Helical, a leading national health magazine, in association with SPARSH has undertaken a major initiative of organizing free health check camps dedicated to ensuring the health of expecting mothers. Following the pledge of scores of doctors from renowned hospitals to dedicate to provide healthcare services and completely free medical health checkup to poor people urban, semi-urban and rural areas of India, free medical camps are conducted in every year on the occasion of Durga Puja. Whenever a preventive service is offered to a defined group of people there will be those who are the professionals who will naturally seek reasons for this.”.

for more photos please go to page 56-58

Perils in Practice: Prevention of Violence Against Healthcare Professionals

The book "Perils in Practice" was launched by Preeti Sudan, former Union Health Secretary, recently. The book is based on prevention of violence against healthcare professionals on Dr Archana Sharma's death by suicide after constant harassment eight months ago.

Preeti Sudan commended the editors for providing a comprehensive and holistic view of the subject in the publication, and recommended that the first step in rectifying the situation be the appointment of an Ombudsman to mediate between doctor and patient in cases of dispute.

The Association of Healthcare Providers - India (AHPI), and the Indian Medical Association (IMA), the country's two largest associations of healthcare providers (institutional and individual) jointly representing over 10,000 healthcare institutions and 3,75,000 individual healthcare professionals, have come together to tackle the healthcare sector's most pressing problem — violence against healthcare professionals. After the distressing tragedy of Dr Archana Sharma's death the AHPI and IMA have worked together on a publication to bring a spotlight on this difficult issue titled "Perils in Practice.

The book aims to empower healthcare workers in facing the challenges of violence at healthcare institutions, providing guidance on their protection (including more effective communication), and examining the role of the health sector, the media, policymakers, law enforcement, regulators, and the community.

Speaking at the release of the book the AHPI and IMA Presidents, Dr Alexander Thomas and Dr. Sahajanand Prasad Singh expressed their apprehension at the state of healthcare workers in India today and emphasized the urgent need for change. With the publication of this book cementing the relationship between the organizations, they hoped this would be the beginning of a national movement towards sensitization and empowerment.

On this occasion several eminent contributing chapter authors also spoke at the release, including Dr. R. V. Asokan (President-Elect of the IMA), Dr. K. K. Talwar (former Chair, Medical Council of India), D. V. Guruprasad (Former DGP, Karnataka), and Dr Girdhar Gyani (DG, AHPI) among others.

What experts say

K. R. Balasubramanyam Senior Journalist, Bengaluru, said, "Being a doctor is not easy. In rural India, where public healthcare infrastructure is decrepit, doctors face a heightened risk at work, more so if one is a government doctor. In emergency situations, a patient brought to such a centre might die for want of facilities. Emotions can run high in such circumstances, even leading to physical assaults… Nothing can justify using foul language or physical attacks on a health worker. This book aims to throw light on the perils of the profession from the practitioner's eyes."

Gauri Kumar, IAS (Retd.), Former Secretary (Border Management), Ministry of Home Affairs, said, "Increasing instances of violence against healthcare workers and institutions are being witnessed across India, resulting in devastating effects on the morale of healthcare workers and also adversely affecting society. Equipping the healthcare workers and sensitizing the community will go a long way in effectively combating this menace. This book admirably fulfils this requirement by way of analyzing the challenges and providing workable solutions to the problem." –

Dr. Kiran Mazumdar-Shaw, Executive Chairperson Biocon and Biocon Biologics, said, "Women are easy targets and extremely vulnerable during violence against healthcare workers. This book analyses the causative factors and offers implementable solutions to healthcare providers and related agencies. This menace can only be overcome through collaborative initiatives between key stakeholders in the healthcare system for the overall well-being of the community at large."

Air Marshal (Dr.) Pawan Kapoor AVSM, VSM, Bar (Retd.), said, "One of the most valuable book that equips healthcare professionals with the necessary knowledge and skills to deal with violence in the workplace which is now assuming pandemic proportions. The book is a compilation of years of wisdom, experience and knowledge from several experts and renowned professionals in the field of medical practice, and addresses almost all aspects of preventing violence against healthcare professionals in an open, objective, impartial and transparent manner. The book provides an in-depth understanding of the subject and is a must-read not only for healthcare professionals but for every member of society who is even remotely connected with the medical profession— that truly means everyone."

Dr. Mohan Lal Swarankar, Chairperson Emeritus Mahatma Gandhi University of Medical Sciences and Technology, Jaipur, said, "This exemplary work titled Perils in Practice: The Prevention of Violence against Healthcare Professionals shall be of immense benefit to every single person involved in healthcare delivery, from policy makers to caregivers to healthcare facility managers. This would certainly enable the healthcare workers to keep abreast of matters relating to healthcare delivery and to better equip themselves to handle situations of violence in the workplace. This all-inclusive book, with each chapter being admirably handled by experts in the field, will certainly be of great value to healthcare workers."

Justice K. T. Thomas, Former Judge of the Supreme Court of India, said, "I very much appreciate the suggestions made in this book to protect healthcare professionals from violence while performing their medical duties. It is not something peculiar to India; the world over, healthcare professionals are at peril of being attacked whenever their efforts fail to yield positive results. The provisions in the Indian Penal Code are not sufficient to protect them. I feel that a new statute containing specific provisions for measures to protect them is absolutely necessary."

Hardin Harghar Ayurveda Celebration at DPSRU

At the day of the Inauguration

Delhi Pharmaceutical Sciences and Research University recently organized a week long programme on the theme "Hardin Harghar Ayurveda" to celebrate "Aurveda @ 2047 – Azadi ka Amrit Kaal".

This series of events highlighted the contribution of Ayurveda in dealing with the management of chronic lifestyle related diseases and non communicable diseases, with a special focus on the elderly.

On the very first day, an inauguration ceremony was held to kickstart the grand celebrations. The inauguration was done by Prof. Ramesh K. Goyal, Vice Chancellor, along with the Chief Guest Prof. (Dr.) Rabinarayan Acharya, Director General, Central Council for Research in Ayurvedic Sciences, New Delhi, Special Guest of the event Prof. (Dr.) P.K. Prajapati Director, PCIM & H and Head, Department of RS & BK, All India Institute of Ayurveda, New Delhi and BOG Member Dr. Arun Kumar Agarwal, Former Dean, Maulana Azad Medical College, New Delhi.

In this event, the student and community stakeholders learnt about Ayurveda and especially for old age people. Prof. Ajay Sharma, HOD, Department of Pharmacognosy and Photochemistry, DPSRU and the Organizing Secretary for this event series, welcomed all the delegates and briefed on the one week programme schedule to the guest and other senior citizens invitees present over there.

In his address, Honourable Vice-Chancellor, Prof. R. K. Goyal explained the modern perspectives of Ayurveda and also gave overview on the development of the Ayurveda programme in DPSR University.

Prof.(Dr.) P.K. Prajapati delivered a keynote address and share to everyone about the aim of Ayurveda and branches of Ayurveda in which sir give more emphasis on Jara Chikitsa which is one of the branch of AshtangaAyurveda. Prof. Prajapati suggested about the how to delay or prevents various disorder associated with age and their treatment also. Prof. (Dr.) Rabinarayan Acharya explained Ayurveda and treatment related to it on different body systems. He also highlighted the scope of Pharma students in Pharmacokinetic and Pharmacodynamics studies of Ayurvedic formulations.

The guests were felicitated with

Honourable Vice Chancellor of DPSRU Prof. Ramesh K. Goyal along with other dignitaries at the health camp

bouquet and Lord Dhanvantari Idol.

On the second day, DPSRU organized free health check up for senior citizens. This ocassion was graced by Prof. Ramesh K. Goyal, Honourable Vice Chancellor, DPSRU, and Chief Guest Dr. Raj K. Manchanda, Director, Ayush, and Ayurveda consultants, Dr. Ashish Sharma, Dr. Rejanshu and Dr. Rahul Gupta, and Mr. H. S. Chawla from Hope, Ek Asha.

At this event, Honourable Vice Chancellor, Prof. Ramesh K. Goyal spoke of inculcating the knowledge of all kinds of medicine disciplines in the course curriculum of the university. He said that with the research tools available at the university, this would help in reaching innovative outcomes and give the drug disciplines a new direction. He said that furthermore, currently DPSRU conducts most of the tests regarding standardization of drugs, and medicine such efficacy study, toxicity study. There's an increasing need to go beyond it. DPSRU has signed MoUs with hospital; this sheds light on the clinical research aspect.

Dr. Raj K. Manchanda said that Ayurveda is successfully imbibed in every Indian household that device home made Ayurvedic remedies as first aid to the daily health issues. DPSRU must embrace the vision of Ayush, as it is successfully doing right now.

The evening session included a session taken by Dr. Ritu Sethi, Consultant Gynaecologist who graced the ocassion, and spoke on the emerging issue of women's sanitization and health. She was introduced by Director, SPS, Prof. Harvinder Popli, who spoke on women issue, and requirement of adequate health service in this area.

The third day, October 5, 2022, DPSRU celebrated Dussehra with an online session, on Ayurvedic Practices for Senior Citizens.

Dr. Sumeet Goel (Technical Officer, CCRAS, Ministry of AYUSH) and OSD to Secretary, Ministry of Ayush was invited for an online session. Dr. Goel spoke about best ayurvedic practices for senior citizens. He talked about ayurvedic diet and how we can incorporate these practices in daily lives. He said different AYUSH schemes and various initiatives by Govt. of India to improve the lifestyle of geriatrics which is important as the proportion of elderly people is continuously increasing. His talk was followed by lecture taken by Dr. Devesh Tiwari Assistant professor, Dept. of Pharmacognosy and Phytochemistry, DPSRU. He spoke on different ethnopharmacological aspects to improve the lifestyle of geriatrics. discussed the importance of plantation.

Honourable Vice Chancellors and Deans at the Morning Rally to Promote Ayurveda

The role of different ayurvedic plants in alleviating diseases and improving health.

DPSRU conducts online session on the ocassion of Dussehra

Celebrations continued on the 4th day of " Har Din Har Ghar Ayurveda". On this day (October 6, 2022), DPSRU comprising morning rally led by Honourable Vice Chancellor Prof. Ramesh K. Goyal, comprising of Directors, Deans, Organizing Secretary, faculty, students and other staff members. On this ocassion, 43 students, and 30 teaching and non teaching staff participated to travel a distance of 5 km. The participants raised slogans of " Har Ghar Ayurveda, Ghar Ghar Ayurveda", "Jai Dhanwnatari, Jai Ayurveda", and "Amla Khao Bhudapa Bhagao". This rally was organized to raise awareness among common citizens and promote Ayurveda in every household.

The rally was followed by an expert talk session. In this session, the welcome address was given by Honourable Vice Chancellor, Prof. Ramesh K. Goyal. Prof. Goyal connected the significance of Hindu Shlokas and related them with Ayurveda and how to lead a balanced life on daily basis. The session was also attended by Dr. Harvinder Popli, Director, SPS, and Dr. Jaseela Majid, Head, School of Allied Health Sciences and Management.

Mr. Anil Khandelwal, MD, Yogicsecrets Healthcare Private Limited was the invited guest who spoke on " The way to Manage Common Health Problems in Elderly Society".

In this talk, Mr. Khandelwal spoke about how to maintain balanced lifestyle that is stress free. He spoke on following a healthy diet routine. According to him, aging is a natural process, so a healthy diet leads to happy aging.

He encouraged the audience to have medicine free and disease free life. Furthermore, he opined that whoever manages kitchen must endeavour to follow the principles of Ayurveda.

On the 5th day (October 7, 2022) of celebration of "Har Din Har Ghar Ayurveda" celebrations of DPSRU, a visit was made to the old-age home " Mann Ka Tilak". This visit was organized by DPSRU in association with AIIA.

The team was flagged off by Honourable Vice Chancellor Prof. Ramesh K. Goyal at 10:00 AM in the morning.

The team reached the venue at 10.30 am and and introductory address was carried out by Dr Jaseela Majid, the chairperson and the Head of School of Allied Health Sciences and Management, DPSRU.

At the venue, Dr K.C. George carried out a wonderful counselling session for the elderly with live examples from daily life.

DPSRU Physiotherapy faculty Dr Varsha Chorsiya and Dr Jitender Munjal carried out a group Physiotherapy exercise session as a part of healthy well being drive conducted at the venue. An individualised custom made Physiotherapy sessions were done for all the residents.

Dr Priyanka Chauhan gave consultation for Ayurveda to all the old-age home occupants .

This was followed by a session taken by Dr. Majid to discuss the individual problems of all the elderly and provide suitable solutions.

The University also distributed clothes donated by DPSRU family members over the last week. The Ayurvedic immunity booster kits, fruits ,biscuits and rusks were also donated as a part of Healthy Nutrition Drive.The team had refreshments with the participants and thereafter spent a few happy hours with them. Pulse oxy meters were also donated to all the

DPSRU's visit at the old age home "Mann ka Tilak"

elderly keep a track of their health .

The program ended with a valedictory session by Dr Jitender Munjal. The guests who were the part of the team to the old age home were felicitated by honourable Vice Chancellor sir for their support.

On the final day of this week-long celebration, a symposium was held on October 8, 2022 on GK Narayan Auditorium at DPSRU that was graced by the presence of Honourable Chancellor LG Shri Vinai Kumar Saxena, Honourable Vice Chancellor Prof. Ramesh K. Goyal, Director, AIIA, Prof. Tanuja Nesari, BOG Chairman Dr. Shridhar Dwivedi, Ms. Alice Vaz R., Secretary, Government of NCT of Delhi, and other dignitaries, along with faculty members, students and staff.

The event began with the lamp lightning ceremony and the Kul Geet of DPSRU. Following this, Prof. Ajay Sharma, HOD, Department of Pharmacognosy gave a glimpse of the past week's events.

The guests were then felicitated by Honourable Vice Chancellors and Deans. Each guest was presented with Shawl, and a statue of Lord Dhanwantari.

The guests were invited at the dais to say a few words. In his address, LG, Shri Vinai Kumar Saxena spoke of the relevance of Ayurveda in India since ages. He said people practiced the Ayurveda in their daily routine without knowing the science that goes behind it. Giving an example of honey, Shri Saxena said that having it regularly keeps you away from many diseases.

Similarly, there are food, herb, spices whose consumption benefits all age groups.

In his address, Honourable Vice Chancellor of DPSRU Prof. Ramesh K. Goyal promoted the concept of "Health for All". He said benefits of Ayurveda could be found in scriptures such as Ramayana as well. He opined that Ayurveda must be promoted at global level.

Dr. Nesari elaborated the 6 week program launched by AIIA to promote Ayurveda. She elaborated that the programme has seen participation from various ministries of the Government of India with the aim of 3Js – Jan Sandesh, Jan Bhagidari, and Jan Aandolan. She also highlighted the role of Ayurveda to fight Covid in India.

In his address, Dr. Shridhar Dwivedi, eminent cardiologist and medical educationist stressed on the historical significance of Ayurveda, and recited several Sanskrit Shlokas from ancient literature to explain their significance in fighting heart diseases.

The programme ended with the inauguration of DPSRU's annual magazine, Pharmannual 2021-2022.

This above session was followed by a technical session in the first of which, Prof. C.R. Babu took an Expert Lecture. Prof. Babu spoke on "Bio-Diversity as a source of future drugs".

In the second session, Mr. D.C. Katoch gave the key address, while several other speakers - namely, Dr. N. Shrikanth, Deputy DG, CCRAS, Dr. Anil Kumar Sharma, Vice President,

NIGHTMARE COVID VARIANT

Dr N. K. Prasanna

Dr S. K. Varshney

Some alarming headlines are circulated regarding the newest Omicrons generated from the omicron family. Immune-evasive is a strategy used by pathogenic organisms and tumors to evade host immune responses to maximize their chances of being transferred to new hosts or continuing to grow.

Hence developing vaccines against them is important and it is inevitable. In an interview, the CEO, the Serum Institute of India revealed that the vaccine will be made available soon and the company is going to bring a vaccine to prevent the variant.

In India, the omicron version of SARS-CoV-2 has three unique novel sub-variants identified as BF.7, XBB, and BQ.1. The fifth variant of concern has started to dominate in various regions through a number of lineages. The mutations are shown to be highly immune evasive due to the potential growth accretion that allows them to replace previous sub-variants such as BA.5.Yet, little is known about the pathogen that causes this disease. However, as winter draws closer, cases are expected to soar in India and around the world.

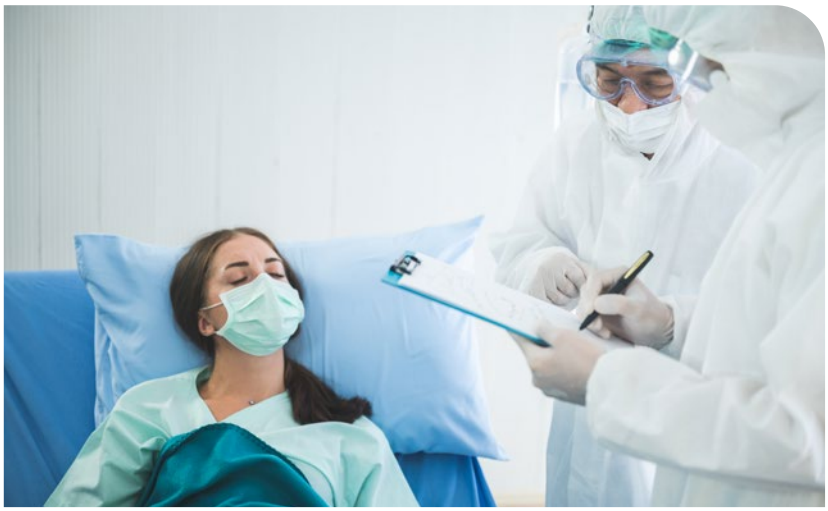
As of October 23, 2022, India recorded 1,994 fresh cases with an active caseload of 25,968 are declined to 23,432. In this time frame, more than 200,000 tests were performed according to the ministry of health.

"Corona new waves will come again and again for 4-6 months so booster doses are mandatory," said Dr. Soumya Swaminathan, Chief Scientist of the World Health Organization (WHO). For weak individuals, a third dose is essential, and "Taking a booster shot is vital to strengthen the diminishing immunity, especially for people who are weak." This is high time that the government should encourage people to take booster doses, and it is important to inform them that three doses are required for robust, long-lasting immunity and advised them to wear masks.

According to Swaminathan, high prevalence BA.4 and BA.5 omicron sub-variants (descendants of BQ.1 and BQ.1.1) are also spreading along with a decline in immunity. She claimed that "people's behaviour" of not wearing masks is still another important factor contributing to the rise in cases. The percentage of those who have taken three doses is lower in India. People over 60 years old are given booster doses with high priority, but only 15% of them have done so to date. Among

Even though the global Coronavirus outbreak appears to be under control, the virus continues to exist by occasionally altering its form and giving twists and turns...

BY DR N. K. PRASANNA/ DR S. K. VARSHNEY



OMICRON'S XBB VARIANT, A RECOMBINANT OF BA.2.75 AND BJ.1, WAS IDENTIFIED IN INDIA AND IS CURRENTLY RESPONSIBLE FOR AN IN-CREASE IN COVID CASES IN MAHARASHTRA

"Over 70 cases of the Covid-19 virus in 5 states of India have been attributed. Initially, The new strain, known as the XBB variant, was found in the US in August and within a week caused more than a doubling of positive cases in Singapore (from 4700 to 11,700 in one day)

people ages 18 to 59, only 1% received a third dose.

The new variants: Rising cases of Omicron's XBB variant in India

As India prepared to celebrate one of its major festivals, Diwali, a fresh wave of Omicron sub-variants has invaded the country, sparking fears. Omicron's XBB variant, a recombinant of BA.2.75 and BJ.1, was identified in India and is currently responsible for an increase in Covid cases in Maharashtra. This variant is also a cause of an unexpected spike in Covid cases in Singapore. According to the Gujarat Biotechnology Research Centre, BF.7 has also declared its presence in India. Experts in infectious disease claim that the symptoms of Omicron's XBB variation are similar to those of its other siblings: they are mild and not particularly harmful. The major mutation, or abrupt qualitative genetic alterations in its structure, may, nevertheless, result in a rise in a number of cases, which could lead to an increase in hospitalizations.

Over 70 cases of the Covid-19 virus in 5 states of India have been attributed. Initially, The new strain, known as the XBB variant, was found in the US in August and within a week caused more than a doubling of positive cases in Singapore (from 4700 to 11,700 in one day), says in an interview Dr. Charu Dutt Arora, Consultant Physician , and Infectious Disease Specialist Head, Ameri Health, Asian Hospital, Faridabad.

XBB VARIANT: WHAT IS IT?

Similar to other viruses, Covid-19 is constantly evolving into new, more dangerous, transmittable, and evasive strains. XBB variant belongs to the Omicron lineage, scientifically known as BA.2.10, and is a combination of BJ.1 and BA.2.75. It was discovered in the US in August 2022 and since then, it has begun to replace other Omicron variants just like Omicron replaced the Delta variant worldwide," according to Dr. Arora.

According to reports, the XBB variant has significantly have more mutations than the previous Omicron sub-variants and has changed in such a way that protection gained via prior infections and vaccinations may no longer be effective or may not work. Additionally, this is leading to an increase in hospitalizations in Singapore.

The variant has a lot of mutations, especially in the receptor binding domain, the outer surface protein of this Covid virus leading to the immune invasion which means the common existing antibodies against the Coronavirus that is being acquired by either vaccination or through natural infection (won't work). This variant has mutated in such a way that can evade this immunity and cause this infection says Dr Ankita Baidya, Consultant - Infectious Disease, HCMCT Manipal Hospital, Dwarka.

SYMPTOMS OF OMICRON XBB VARIANT:

The majority of cases in this variant are also mild, with symptoms of the upper respiratory tract including a sore throat, cough, and nasal congestion. A few patients also present with a lot of myalgia, (Soreness and achiness in the muscles that can range from mild to severe.) loose stools, or gastrointestinal issues. Even while the severity is not often severe, there are cases,

particularly in older individuals, who have diabetics, and people with weekend immune systems, where the infection is serious enough having the chances of hospitalization are possible. This has been confirmed by various other nations.

The structural modification in the virus makes it more contagious and able to infect huge numbers of people quickly within a short span of time, making it highly contagious as a result of its capacity to elude host immunological reactions. Dr. Baidya explains current ongoing vaccines may not be very effective at protecting against this strain, and the antibody cocktail that is used to prevent severe infection may not be very beneficial in this circumstance.

OMICRON BF. 7: WHAT IS IT?

Omicron BF. 7, also known as Omicron spawn, is the most recent sub variant of the Omicron Covid variant, which was first found in China. The new variant's quickly spread has already had an impact in the US, UK, Australia, and Belgium. The first case of BF.7 has been found in India as detected by Gujarat Biotechnology Research Center.

BQ.1 AND BQ.1.1:

BQ.1 and BQ 1.1 Sub variants are descendants of omicron BA.5 have

> **Omicron BF. 7, also known as Omicron spawn, is the most recent sub variant of the Omicron Covid variant, which was first found in China**

been responsible for causing huge spike in the number of cases. In India the first case of BQ.1 was reported in Pune, Maharashtra. The two variants, which accounted up more than 28% of new infections as of the week ending October 22, are currently receiving a lot of attention in the US due to how quickly they have been increasing.

BA.4.6

This sub variant differs from its parent BA.4 due to two extra spike protein mutations. Since many weeks ago, BA.4.6 has maintained its position as the second-most prevalent strain in the country. Despite a rise in its proportion of cases during that period, BA.4.6's growth on a national level has not been particularly rapid. After circling about 12 percent for a few weeks, the CDC assessed that BA.4.6 was responsible for little more over 11 percent of new cases in the United States as of the week ending October 22. According to previous research, BA.4.6 is more capable than BA.5 to evading neutralizing antibodies produced by prior infection or vaccination.

BA.2.75 AND BA.2.75.2

Early study indicates that this sub variant lineage initially caused concern over the summer due to its possible immunological evasiveness. However, they haven't really taken off yet. The two types have been progressively expanding in the US. As of the week ending October 22, the CDC estimated that BA.2.75.2 accounted for 1.3 percent of cases and BA.2.75 for 1.6 percent.

Immune evasion: is a strategy used by pathogenic organisms and tumours to evade a host's immune response to maximize their probability of being transmitted to a fresh host or to continue growing, respectively.

BOOSTER DOSES:

Observation on the mode of spread of the new variant Omicron of Covid and the effectiveness of vaccines against it are being examined. Genetic variations

and structural changes have been observed in many other countries regarding this new type. Will these changes increase the spread of the virus? Does it have an effect on how well the performance of vaccines works? To face this situation we should further advocate for strengthening the nation's ongoing immunization program. Rivera cautions that while these new boosters will improve our protection against the virus, they are not a silver bullet to ending the pandemic. The purpose of boosters and variant-specific boosters is not intended to chase the variant. We will never be going to win that rat race," said Jetelina.

DID THE OMICRON VARIANT INFECT US VIA ANIMALS?

Corona appears to be spreading less widely than before, but it actually continues to mutate and create new forms every day. According to the most recent studies the Omicron variant, which was found last year, is thought to have originated from animals, They might have spread the infection to humans.

The genesis of the Coronavirus, which rocked the nations of the world, is still a mystery. The process of how humans are infected is still not understood. According to the recent research and report published in an international science journal on the above subject animals are where the Omicron variation first appeared. They might have spread their disease to humans.

THE COVID-19 VIRUS, HAS THE ABILITY TO INFECT A WIDE VARIETY OF ANIMALS. THIS IS ONE OF THE PRIME REASONS FOR THE BIRTH OF NOVEL VARIANTS.

American researchers conducted a study on the origins of the Omicron variant, which is widespread in many countries. As part of this, a structural biology analysis of Omicron was carried out. Most of the mutations inthe omicron spike protein was found to be absorbed by the receptors in mice. They were found to antagonize human receptors. Through these, it was estimated that the origins of the omicron variant may have come from other animal species than humans

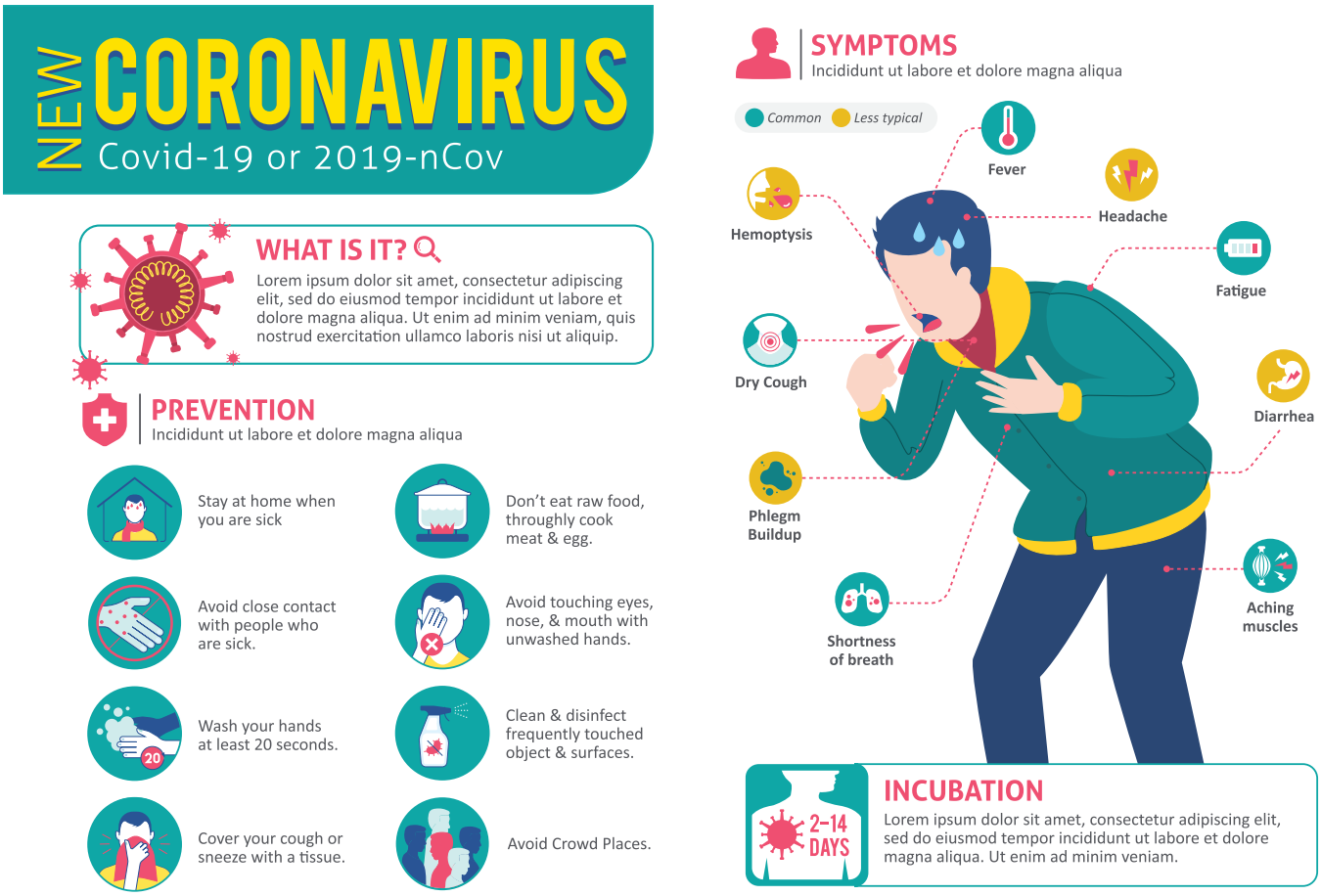
The transmission of corona viruses from animals to humans is constantly under threat to global health. According to Fang Lee, an expert from the University of Minnesota in the United States and researcher of the most recent study, "the current analysis confirms that all corona viruses that have been circulating in people so far have come from animals." According to him, The Covid-19 virus, has the ability to infect a wide variety of animals. This is one of the prime reasons for the birth of novel variants. Fang Lee revealed that the target is the coronavirus in humans and animals. Currently, Fang Lee, developing new treatment methods to face the potential future corona epidemics.

CONCLUSION

The stressful circumstances of corona forced us to rethink again. A veritable roller coaster ride full of ups and downs. It has been tough and challenging, but equally unforgettable. Instead of worrying about what happened yesterday, the challenging conditions of Corona forced us to reflect more, think more, and be more ready to create a new tomorrow. We remained committed and moved forward with unflinching optimism and a rekindled vigour, staying dedicated with unwavering hope and doing what needed to be done while facing challenges is important. We also kept India's flag flying high marching ahead in the face of adversity. Starting from scratch in vaccine manufacturing to the distribution of vaccines a lot of learning and unlearning had taken place.

During those trying times and despite all the odds we have come out victorious. Again a fresh effort was still required to face this ongoing pandemic. We need to accept the new normal. Accepting that it's ok to be not ok," is a little tough and uncomfortable but, as citizens of India we should be self-reliant to face the current situation.

SARS-CoV-2 variants are constantly



evolving. When a new variant of concern arises what precautions need to be taken, and how can the scientific community proactively anticipate, prepare and respond to reduce the disaster risk? Recommendations for investments in pathogen surveillance, systematic, standardized variant characterization, real-time variant identification in point-of-care diagnostics, and international data exchanges are the important steps on where one needs to focus. Finding immunity gaps can help in the development of new vaccines, treatments, and diagnostics.

These strategies help to create a more resilient system capable of responding to the COVID-19 pandemic and other pathogens. If we want to prevent variants like omicron, it's vital to make ensure that everyone on the planet has access to vaccines. In continents like Africa, and other least-developed countries it is estimated that only about 7% of the population is fully vaccinated. As a result, when there is a sizable population that is unvaccinated, the virus has a chance to mutate and develop a new variant. Therefore, it's really crucial and extremely important that wealthy countries like the US may provide and make vaccines accessible to countries in Africa and other regions where vaccination rates are very poor.

With the holiday season going in full swing, there are a lot of gatherings and many parties are happening with no travel restrictions in effect. There is a high chance and the probability of a rise in the positive cases during next 3-4 weeks is considerably high.

According to Dr. Arora, there are no specific preventive guidelines against this variant. Following Covid appropriate behaviour, maintaining cough etiquette, and frequently using hand sanitizer. Immuno-compromised individuals like the elderly, or those suffering from heart renal, and cancer issues should strictly follow all safety measures. To stop the further spread in the community, one must remain isolated and seek medical advice whenever they experience any symptoms, advises the specialist.

(The authors are Senior Scientist at CSIR-National Institute of Science Communication and Policy Research, New Delhi/ Head, International Cooperation, Department of Science and Technology, New Delhi.)

CHASING A DEER

The Covid-19 pandemic triggered by the novel coronavirus, in its third year now, has some common themes running throughout its course. The foremost of these has been the uncertainty about almost all aspects of the novel coronavirus, SARS-CoV-2.

BY DR AMITAV BANERJEE

Right from its origins, whether naturally from animal reservoir, or from a laboratory as a result of "gain of function research" gone astray, to the mode of its transmission, the benefits of lockdowns and physical distancing and efficacy and safety of vaccines and many other issues, including handling of dead bodies of those who succumbed to the infection, have been subjects of claims and counterclaims polarizing scientists and society.

Serious science and scientists took a back seat as brought out in an editorial in the British Medical Journal by Abbasi titled, "Covid-19: politicisation, corruption and suppression of Science," dated 13 November 2020. In this editorial

IN THE FOREST

Abbasi poignantly comments, "When good science is suppressed by the medical-political complex, people die."

NEED OF THE HOUR: BALANCED NARRATIVE FOR RESTORING CONFIDENCE IN SCIENCE AMONG THE MASSES.

While the tug-of-war between the proponents of lockdowns, masking, mass vaccination and vaccine mandates and those opposed to these measures continue the latest uncertainty and panic revolves around Omicron sub variants. The daily news on these sub variants with attention grabbing statements by various experts, without any evidence, warning that these sub variants can trigger fresh waves of infection and hospitalization are alarming. And most of these experts persuade people to take their boosters, again without any evidence or logic, as these are made from earlier variants.

Science without attention to basics has a tendency to regress to ritualism. While rituals in religion are mostly benign and provide solace to the soul, ritualism in science is not always benign as intervention involves introducing active ingredients with occasional short term side-effects and uncertain long term harms.

THE COMMON COLD IS CAUSED BY FOUR CIRCULATING CORONAVIRUSES, MILDER THAN THE ORIGINAL SARS-COV-2

An important principle of public health is proper risk communication to the masses to avoid adverse psychological and social impact, an aspect neglected throughout the pandemic. Unchecked, population level panic can lead to frantic scramble by mild and asymptomatic cases for hospital beds often depriving those who really need them. This article endeavours to objectively consider the phenomenon of mutation and its implications in a manner understandable to the masses to enable proper risk communication without generating undue panic and anxiety.

SARS-COV-2 MUTATIONS, EXAMPLES OF OTHER CORONAVIRUSES AND THEIR LIKELY IMPACT AT POPULATION LEVEL.

Mutations are common phenomenon among coronaviruses. The common cold is caused by four circulating coronaviruses, milder than the original SARS-CoV-2. Once a person has a cold from any of these viruses, he or she is not permanently immune to future colds. The immunity wears off or the person can encounter other strains of circulating coronaviruses. Moreover, the common cold viruses constantly mutate making it impossible to create an effective vaccine that will protect against all circulating strains. Even if one is created the immunity produced by it would not last.

If the SARS-CoV-2 behaves like other coronaviruses, and there is no reason to believe otherwise, then most probably we will be unable to make an

effective and long lasting vaccine even if many are developed and deployed in record time as was done in unholy haste in the present pandemic.

Strangely, constant mutations among the family of coronaviruses was never highlighted by the media, nor considered by scientists and policy makers in their heady rush to develop and deploy the vaccines at mass scale in record time. The optimism promoted was that there will be only one strain of SARS-CoV-2 or at the most mutant versions will be closely similar and that immunity from the vaccine will be long lasting. Both these assumptions turned out to be incorrect.

THE HOME OF OMICRON AND ITS SUBVARIANTS – THE SOUTH AFRICAN EXPERIENCE.

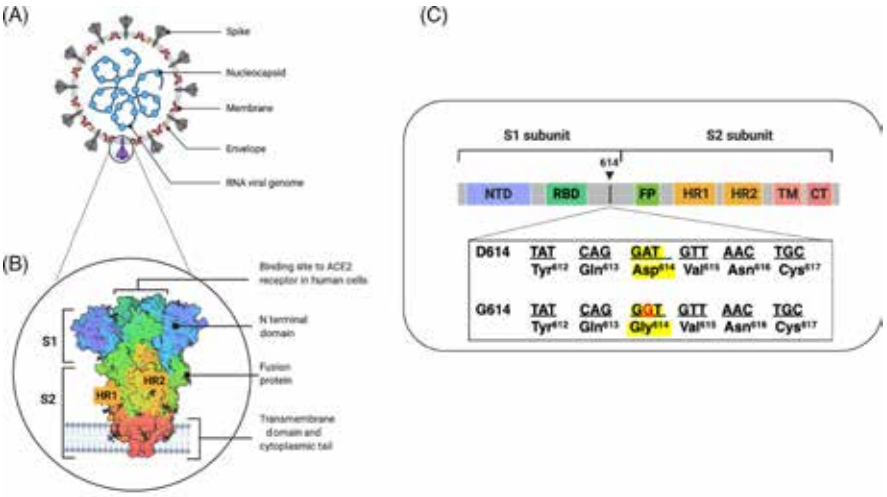
The discovery of Omicron in South Africa was the turning point in the pandemic, for the better. Even the doyen of vaccines, Bill Gates, conceded that Omicron was "sadly" better than vaccines at building immunity against Covid-19! In spite of this, the world media and experts went overboard in sensationalizing the emergence of Omicron pushing for boosters with gusto. As a knee jerk reaction, some countries such as UK and USA banned trade and travel overlooking the evidence of much milder disease and hardly any hospitalization and deaths in South Africa due to this emerging variant.

WHETHER HUMANS, BEING ANTHROPOCENTRIC, LIKE IT OR NOT, NATURE OFFERS EQUAL OPPORTUNITIES FOR SURVIVAL TO ALL BEINGS

The bans failed to prevent the spread of Omicron but harmed the already struggling South African economy. The global medical-political community seemed to overlook the fact that in spite of very modest mass vaccination rollout in South Africa, the Omicron variant hardly caused a ripple over there. Most cases were very mild and few required hospitalization.

ICUs remained deserted. This should have reassured the world community that the subsequent variants were evolving towards milder forms obeying nature's law of peaceful coexistence.

The D614G Mutation in Severe Acute Respiratory Coronavirus 2 (SARS-CoV-2) Spike Protein



"The discovery of Omicron in South Africa was the turning point in the pandemic, for the better. Even the doyen of vaccines, Bill Gates, conceded that Omicron was "sadly" better than vaccines at building immunity against Covid-19! In spite of this, the world media and experts went overboard in sensationalizing the emergence of Omicron pushing for boosters with gusto.

NATURE GRANTS ALL LIVING BEINGS FROM VIRUSES TO HUMANS A FAIR CHANCE OF SURVIVAL

Whether humans, being anthropocentric, like it or not, nature offers equal opportunities for survival to all beings. To survive, all living beings which thrive follow nature's way of adaptation – Darwin's Law. These adaptations are by way of mutations, due to fortuitous errors during replication, and selection pressure perhaps by mass vaccination during a pandemic. According to principles of successful parasitism, such errors are beneficial to both the virus and humans. Errors that make the virus fittest for survival propagate while others lose out in the evolutionary race for natural selection.

A lethal virus does not go far perishing with the unfortunate host leading to a dead end infection. Even a variant which will cause severe symptoms will not go far as such patients will isolate themselves and not mix. The virus in them will phase out due to lack of opportunity for transmission. The strains which will survive and go far will be the less virulent variants, which do not kill the

host, producing very mild to no symptoms. People infected with such strains will mingle and transmit benign progenies of the virus far and wide. High transmissibility is inversely proportional to high lethality.

On the other hand benign variants will induce far more robust population level immunity by mild natural infections with negligible casualties. Studies from Israel have established that natural immunity is 13 to 27 times stronger than vaccine induced immunity. And the added advantage will be that this natural immunity will be provided by the latest strain circulating while the vaccine induced immunity will always be due to a previous strain which the current strain will easily evade.

STATUS UPDATE ON COVID STRAIN – OF ACADEMIC INTEREST ONLY

Currently the XBB strain is the wild horse on which bookies are laying the odds to win in the race for survival. This strain has doubled in the week leading to third week of October 2022 in India. XBB was seen in 71 cases till October 14, 2022 but went up to 136 by October 23, 2022. Eight states have reported XBB. Tamil Nadu leads with 52 cases, followed by Odisha with 35 cases, WB and Maharashtra with 17 cases each, Delhi 5 cases, Karnatka 6 cases, Gujarat 2 cases and Rajasthan 1 case. The previous strain BA.2.75 of Omicron is still trotting in the lead but fast losing ground to the XBB. According to experts, XBB has been detected in 26 countries so far and being claimed to be the most immune evasive sub variant so far to vaccines as well as immunity from prior infection.

Do we have to worry? Do we blindly scale up mass vaccination? In our arrogance should we assume that only human interventions can outperform natural laws of natural selection leading to peaceful coexistence with the virus?

STUDIES FROM ISRAEL HAVE ESTABLISHED THAT NATURAL IMMUNITY IS 13 TO 27 TIMES STRONGER THAN VACCINE INDUCED IMMUNITY

At the start of the pandemic, sterile mathematical models wrongly predicted doomsday leading to draconian measures and

associated collateral harm and economical setbacks. Just when the pandemic is trotting to a halt genomic sequencing and surveillance should not make us trigger panic leading to similar irrational catastrophic interventions. Genomic studies should be academic exercises while policy should be based on ground situations such as how many serious cases land up in hospitals and ICUs.

From data in the field there is no indication that the spread of XBB and other sub variants are overwhelming the hospital services. On the other hand such large scale relatively harmless transmission with benign progenies of the virus will speed up population level immunity with the latest strain beyond the reach of vaccine induced immunity.

What about fallout of highly lethal strains as a result of "gain of function research"?

There are concerning reports that "gain of function" research in Boston, USA has yielded a coronavirus strain with 80% lethality in mice. While such studies should definitely be discouraged by the scientific community, should we worry about a major pandemic with potential to cause large number of deaths in humans? While the lethality of any such "lab generated " virus may lead unfortunately to few deaths in a virgin population, the laws of natural selection as explained above will limit its spread and highly lethal strains will phase out relatively fast.

Tamil Nadu leads with 52 cases, followed by Odisha with 35 cases, WB and Maharashtra with 17 cases each, Delhi 5 cases, Karnatka 6 cases, Gujarat 2 cases and Rajasthan 1 case. The previous strain BA.2.75 of Omicron is still trotting in the lead but fast losing ground to the XBB.

CONCLUSION

Chasing mutants of viruses is like chasing a deer in the jungle. Thousands of mutations take place naturally while only a few get detected by resource intensive measures. Detecting a mutant by genomic surveillance and raising panic leading to restrictive policies is like shutting the stable door after the horse has bolted. Before a new variant is detected, it has spread widely in the community, imperceptibly. Nature achieves ecological balance silently and efficiently unlike humans who do it clumsily and with much propaganda and fanfare most of them to be proved futile later. The prudent policy would be to achieve overall physical and mental health at individual level as the pandemic proved to be a pandemic of comorbidities, and improve our public health infrastructure which got exposed during the second wave in the country. Futile chase of a fast mutating virus with low lethality should be abandoned.

(The author is MD, Clinical Epidemiologist, is currently Professor and Head, Community Medicine at DY Patil Medical College, Pune.)

LIFE BEYOND COVID - 19

The pandemic of Covid-19 which swept across the globe fractured society and traumatized the psyche of large number of people...

BY DR AMITAV BANERJEE

In days to come social pathologies like alcoholism, substance abuse, domestic violence, suicides and homicides, aggravated or precipitated by loss of lives of dear ones, or loss of livelihoods among the survivors, will be the major challenges we have to cope with. The pandemic responses increased social inequities, aggravating racial and class distinctions worldwide. The rich faced fewer disruptions in their work and education as they could afford to work and learn from home. Blue collar workers and those in the unorganized sector faced the brunt of the unprecedented restrictive measures.

Such measures are clearly not egalitarian. While preserving lives and comforts of the rich, they lead to loss of livelihood and deaths in the poor. Life lessons in current times from ancient spiritual texts Spirituality is the solace for the soul and can help in healing a fractured society in the aftermath of the pandemic. Ancient texts from all cultures contain eternal wisdom with potential to calm the troubled soul and provide directions to move beyond catastrophes. One of the best ways to move beyond the pandemic can be applying the Gunas described in Chapter 14, verse 10, of the Bhagwad Gita.

So closely the pandemic evolved through these Gunas as if it had been scripted from this ancient spiritual text! The Gita describes that all beings evolve and interplay through three Gunas or stages, Tamas, Rajas and Sattva. Tamas symbolizes darkness, destruction and chaos; Rajas signifies passion, often blind, misdirected action and self-benefit; while Sattva stands for goodness, beingness, calm and harmony. The course of the pandemic had uncanny resemblance to these gunas!

Evolution of the Pandemic – Three Gunas Tamas – Darkness, Destruction, Chaos & Anarchy In the early stages of the pandemic, there was complete ignorance. Ignorance generated panic and stigmatization of not only those affected but often others suspected to be at high risk of infection such as health care workers and migrants returning to their native places.

EVOLUTION OF THE PANDEMIC – THREE GUNAS TAMAS – DARKNESS, DESTRUCTION, CHAOS & ANARCHY IN THE EARLY STAGES OF THE PANDEMIC, THERE WAS COMPLETE IGNORANCE.

This pandemic of panic, reminiscent of the medieval ages, spread faster globally. China became the pacesetter in this marathon of chaos and anarchy, later to be overtaken by market forces from the West. In this pandemic we had the worst of authoritarian governance from China and worst of capitalism from the West. The dark underbellies of both forms of society got exposed. Career scientists too played their part in this period of darkness and ignorance.

They grossly overestimated the lethality of the virus. An early paper in Lancet pegged the mortality from the novel coronavirus at 20%. Such distorted inputs went into mathematical models which predicted gloom and doom. Bhagwad Gita, Verse 10, Chapter 14. “rajas tama□h chābhibh□ya sattva□ bhavati bh□rata raja□ sattva□ tama□h chaiva tama□ sattva□ rajas tath□” Sometimes goodness (sattva) prevails over passion (rajas) and ignorance (tamas), O scion of Bharat. Sometimes passion (rajas) dominates goodness (sattva) and ignorance (tamas), and at other times ignorance (tamas) overcomes goodness (sattva) and passion (rajas). Rajas – Passion, Action, Selfishness Triggered by Tamas, the pandemic entered the

phase of Rajas.

This was characterized by blind passion with little application of mind, rash action leading to collateral harm and selfishness driving various conflicts of interest. Logic and science were suppressed as brought out in an editorial by K Abbasi in BMJ titled, "Covid-19: Politicisation, corruption, and suppression of science." Blind rage of Rajas chasing the virus at all costs fractured society. Violence against the elderly, women and children increased. Physical contact, social interaction and recreation were interrupted. Sattva – Goodness, Harmony, the key to Life Beyond Covid Sattva holds the key to life after Covid.

By objective look at data we can revive science, logic, and courage to face Covid-19 and other future pandemics. Sattva promotes beingness and awareness akin to a cricketer on the field who never removes the eyes from the ball. Using the Guna of Sattva an objective study of data over the past two years would establish beyond doubt that the infection fatality rates of Covid-19 were grossly overestimated in the early months of the pandemic as these were calculated from admitted cases in hospitals. Later, sero surveys by researchers from Stanford University established a huge proportion of asymptomatic cases in the community.

Such sero surveys across the globe yielded more accurate denominators for calculating the infection fatality rate which got refined to less than 0.3% globally and far less in Asia and Africa. Covid-19 is an infection with high survival at individual level. Severity of the infection is negligible in the younger population with survival rate of 99.9973 in children below 18 years and very gradual increase across the age gradient. At the age bracket of 60 to 69 years the survival rate is around 99.41% which is far higher than any other infection at this age. The fatality is highest in those over 70 years who are frail and bedridden ranging from 2.5% to 5.5%. Another sobering finding is that mass vaccination did not correlate with lowering trends in Covid-19 cases across populations. Partly it can be explained by mutation of the virus and partly by the fact that these vaccines are non-sterilizing and do not interrupt transmission. In the elderly and co morbid it appears to prevent severe disease and deaths while in the young and healthy it is debatable whether vaccines provide any extra benefit.

Against this background we have to review our vaccination strategies. Besides age and co morbidity, studies have established that obesity is a major risk factor for severity and death from Covid-19. Populations of Western countries are two to three times more obese than the Asian and African countries which corresponded to 10 to 20 times higher fatality in the West in spite of higher vaccination coverage particularly when compared to very low vaccination coverage in the African continent. Two outlier countries, Japan and Brazil, suggest the role of obesity in morbidity and mortality from Covid-19.

Japan has very high median age of the population but low obesity rates while Brazil has a younger population

but with obesity rates similar to the Western countries. Mortality from Covid-19 over the course of the pandemic is almost 10 times higher in Brazil compared to Japan. From the ancient to more recent philosophy – the story of human conflicts. To understand present day public health challenges we can take a leaf from the writings of mathematician-philosopher and Nobel laureate, Bertrand Russell. He wrote that humans are continuously engaged in three types of conflict, i.e. Man and Nature (environment, infections); Man and Man (violence, wars, lab origin of virus?): and lastly Man and Self (lifestyle diseases, substance abuse.)

Around 70% of emerging and re-emerging infections, be it the novel coronavirus, monkeypox, and many others, originate from animal reservoirs. Insults to the environment by human activities are leading to ecological imbalances and greater interface between humans and animals. A good batsman reads the fingers of the bowler before the bowl is released to anticipate the spin or swing of the delivery. Similarly, good preventive medicine strategy should have a good interface with veterinary public health to anticipate the zoonoses which have the potential to spill over into humans. While present day all out wars are decreasing or limited (Ukraine being an unfortunate exception), the conflict between Man and Man remains in some form or another.

HUMANS ARE CONTINUOUSLY ENGAGED IN THREE TYPES OF CONFLICT, I.E. MAN AND NATURE (ENVIRONMENT, INFECTIONS); MAN AND MAN (VIOLENCE, WARS, LAB ORIGIN OF VIRUS?)

According to a paper in Lancet , lab origin of the novel coronavirus cannot be ruled out completely. Such "gain of function" research should be prohibited by international treaty. Lastly, Russell's prediction that Man can become enemy of the self is coming true as evident from modern conditions of unhealthy lifestyle, particularly obesity which predisposes to severe disease and deaths from viral infections too, as brought out in the present pandemic. While earlier we used to teach that unhealthy lifestyle is a major risk factor for non-communicable diseases we have to include higher morbidity and mortality from communicable diseases also as its ill effect. Conclusion The present pandemic is not the last one.

There are hundreds of viruses and pathogens waiting in the stands to be discovered by virologists. Will be have hundreds of vaccines to take in the future? The modest impact of the present mass vaccination program against the novel coronavirus should make us take a pause and reflect on future strategies. Vaccine at best can be a piecemeal solution and an addition to the tool kit. A holistic approach towards overall good health by promotion of healthy lifestyle will cushion the impact of future pandemics. As Sun Tzu, the ancient philosopher and military general of Chins (again back to ancient philosophy), wrote, "The Art of War teaches us not on the likelihood of the enemy's not coming, but our readiness to receive him; not on the chance of his not attacking, but rather on the fact that we have made our position unassailable."

Lastly, we have to make our peace with the present and emerging viruses. Over time they have a tendency to mutate to milder forms to coexist with humans in a symbiotic relationship.

(The author is Professor & Head, Community Medicine Clinical Epidemiologist., Dr DY Patil Vidyapeeth, Pune, India)

HEALTH ECONOMICS OF SMOKING CESSATION INTERVENTIONS

Smoking is known to be a key modifiable risk factor for a number of non-communicable diseases (NCDs) such as cancer, cardiovascular disease (CVD) and chronic respiratory conditions. Smoking also reduces life expectancy by 10 years…

BY DR. SUBHROJYOTI BHOWMICK

Cigarette smoking is rampant across India, with 14% of the population reported to smoke cigarettes, and a study has reported that 28.5% of Indians are ever-smokers. India has over 100 million adult smokers, which is the highest in the world after China.

Nearly a quarter of the male population smokes cigarettes, with a higher prevalence among the elderly, widowed, alcohol consumers, manual labourers and those with lower education end economic status. Similarly, the Global Adults Tobacco Survey-India (GATS-India) reported a higher prevalence of smoking among males, illiterate individuals, those from poor households and rural areas. The average number of cigarettes smoked per day is reported to be 7 per day among women and 6.1 per day among men.

DISEASE BURDEN

It is alarming to note that 14% of ever-smokers in India show some form of respiratory illness. The burden of tobacco-related cancers in India was estimated 366,000 in 2015 and is estimated to increase by nearly 40% by the year 2050, with an estimated burden of 508,000.There is also significant cardiovascular disease (CVD) burden due to smoking, with most CVD deaths

attributed to tobacco smoking. Five percent of deaths among Indian women and 20% of deaths among Indian men are attributed to smoking. In comparison to never smokers, current smokers had an age adjusted relative risk (RR) of 4.6 for myocardial infarction. In addition, persons consuming more than 10 cigarettes per day (median 15 cigarettes/day) had an RR of 7.3 in comparison to never smokers.

It is reported that smoking causes ~25% of all cancer deaths, ~80% of deaths from lung cancer, ~80% of deaths from bronchitis and emphysema, ~17% of deaths from heart disease.

DIRECT AND INDIRECT COST IMPACT

Using information from the National Sample Survey and the Global Adult Tobacco Survey, it was determined that the economic costs of tobacco use amount to approximately 1.04% of India's GDP, while direct health expenditure for the treatment of tobacco-related diseases accounted for 5.3% of total private and public health expenditures.

The total economic costs attributable to tobacco use from all diseases and deaths in India in the year 2017-18 for persons aged 35 years or older amounted to INR 1,773.4 billion (US$ 27.5 billion), of which 22% was direct and 78% was indirect cost. Smoking contributed 74% of the total cost. A majority of the costs (93.3%) were borne by those in the age group 35-69, while those aged 70 and above shared the remaining 6.7%.The costs of premature mortality alone were 75% of the total economic cost. The total cost of premature mortality due to tobacco use across all age groups was INR 1324.5 billion as shown in Table 4. Costs from smoking accounted for 76% (INR 1006.6 billion) of the cost of premature mortality attributed to tobacco use.

The estimated total economic costs attributable to tobacco use is about 1.04% of the GDP in the year 2017-18 while the total excise tax collected on tobacco products in the previous year amounted to only about 12.2% of this cost. In other words, for every INR 100 that is received as excise taxes from tobacco products, INR 816 of costs is

imposed on society through the consumption of tobacco.

IMPACT OF SMOKING ON HEALTH

According to the World Health Organization (WHO), over 5 million people die each year due to diseases associated with smoking, such as cancer, heart disease, liver disease, and stroke. In fact, nearly 16% of all NCD deaths and 1-0-30% of all cardiovascular deaths are linked to smoking. It is estimated that by the year 2030, there would be 8 million deaths attributable to tobacco smoking. Even exposure to second-hand smoke (SHS) increases the risk of developing and progression of atherosclerosis.

The health risks of tobacco smoking have been demonstrated in several studies, indicating a 2-3 fold higher relative risk of coronary heart disease (CHD), 1.5 times for stroke, 1.4 times for chronic obstructive pulmonary disease (COPD) and 12 fold risks for lung cancer. The risks are similar in men and women, but are higher for younger individuals.

CURRENT SMOKING CESSATION AIDS

ROLE OF SMOKING CESSATION

Smoking is a leading cause of preventable morbidity and mortality across the globe.The number of smokers is expected to be in excess of 1.6 billion by the year 2030, despite smoking cessation interventions and increasing awareness of the dangers of smoking. Smoking cessation has a major health impact. Smoking cessation is associated with a lower risk of CVD within 5 years of smoking cessation. Smoking cessation is associated with an 18% lower risk of all cancer, 26% lower risk of smoking-related cancer, and 45% lower risk of lung cancer compared to heavy smokers. Furthermore, smokers who quit before the age of 35 years have a life expectancy similar to individuals who have never smoked.

Studies in USA report that 66% of adult smokers express a desire to quit smoking, but only 50% try to quit each year. Alarmingly, less than 10% of smokers who try to quit succeed in quitting for 6 months or longer. Furthermore, 75% of those who attempt to quit smoking by themselves relapse within the first week. There is evidence that receiving medical advice to quit smoking leads to 1-year abstinence rates of 5-10%, which could translate to public health benefits. There is a need for implementation of smoking cessation strategies using a variety of available non-pharmacological (behavioural counselling) and pharmacological means.

NICOTINE REPLACEMENT THERAPY AS PART OF SMOKING CESSATION: RATIONALE

Nicotine replacement therapy (NRT) involves the controlled administration of nicotine, thus partially replacing the nicotine previously obtained from tobacco use. NRT stimulates nicotine receptors leading to immediate removal of the craving to smoke as well as symptoms of withdrawal. Furthermore, a slower effect of NRT that ultimately reduces tobacco dependence is the reduction in the number of nicotine receptors. NRT is delivered at a lower dose and with slower nicotine pharmacokinetics than cigarettes, which allows for lower levels of nicotine, but for prolonged periods of time. This reduces not only the rewarding effects but also withdrawal symptoms. NRT addresses physical nicotine dependence without exposing the person who is trying to quit to the toxic constituents generated by combustion or other additives.

A number of NRT products are available, including nicotine gum, transdermal patches, and nicotine lozenges which are available over-the-counter, and nicotine nasal spray and nicotine inhalers, which are prescription products. All products have demonstrated efficacy as smoking cessation interventions. Nicotine gum and nicotine lozenges deliver nicotine faster than nicotine patches, while the patches can reduce early morning cravings if used overnight. The nicotine inhaler has the fewest side effect, and the nasal spray reduces cravings within a few minutes.

Nicotine chewing gum produces serum nicotine concentrations similar to those that occur during cigarette smoking and thereby to relieve the symptoms of nicotine withdrawal. Nicotine gum is available at doses of 4 mg and 2 mg with higher doses recommended for persons smoking over 15 cigarettes a day. The success rate achieved with nicotine gum at 6 months is 27% which is significantly higher than that achieved with placebo (18%).

The transdermal nicotine patch delivers a steady supply of nicotine to the bloodstream, thereby assisting in reducing the craving of nicotine. Individuals using a nicotine patch are twice as likely to quit as individuals using a placebo patch. Patches are available over the counter in 15- and 21-mg doses. Patches have a 6-month success rate of8-21% compared with 4-14% for placebo, and a 12-month success rate of 10-16% compared with 6-16% for placebo.

Nicotine lozenges are available in two forms. One form is a 2-mg nicotine bitartrate dihydrate sublingual tablet which delivers less nicotine than nicotine gum. It is effective in highly dependent but not in less dependent smokers. The other form is a 1-mg nicotine bitartrate salt lozenge. Compared with 2-mg or 4-mg nicotine gum, the nicotine lozenges deliver 25% to 27% more nicotine, because some nicotine is retained in the gum, whereas the lozenges dissolve completely and deliver their full dose. The 2-mg lozenge has a 6-week success rate of 46% compared with 30% for placebo and a 6-month success rate of 24% compared with 14% for placebo.

The nicotine mouth spray (NMS), delivers 1 mg nicotine per spray, thus enabling rapid nicotine absorption. A single-dose pharmacokinetic study reported a shorter time to maximum plasma nicotine concentration (10–12.5 min post-administration), and significantly higher area under the plasma-concentration time curve

during the first 10 min, with 1 mg or 2 mg than either 4 mg nicotine lozenge or gum. The nicotine spray leads to significantly higher continuous abstinence rates than placebo from week 2 until week 6 (26.1% versus 16.1%).

The nicotine inhaler delivers nicotine in a form that is close to typical intake (inhaled by mouth), thus partially addressing the secondary reinforcement (sensory and ritual phenomena) important to a large subset of smokers. A single puff from the inhaler delivers ~13μg of nicotine at room temperature. To achieve 30% of the venous nicotine concentration achieved with 10 puffs of a cigarette in 5 minutes, it requires 80-100 puffs of the nicotine inhaler. Clinical studies have demonstrated odds ratios of 1.87-3.50 for successful at 6 months, and odds ratios of 1.59-3.04 at 1 year.

NOVEL NICOTINE AND TOBACCO PRODUCTS: CAN THEY BE A COMPLEMENTARY PART OF THE SOLUTION?

Even with relatively low efficacy, therapeutic approaches to smoking cessation are worthwhile given their relative safety: If they help some people stop smoking, thereby incrementally reducing the costs of smoking-related morbidity and premature mortality, they are a sound policy "investment." A number of policymakers have begun to consider if non-therapeutic options to encourage better lifestyle choices could complement the therapeutic approaches. For example, both the United Kingdom and New Zealand encourage smokers who are unable to quit smoking to switch to non-combusted "smoke-free" alternatives to cigarettes. Such products are not treated (or classified or reimbursed) as therapeutic goods but are regulated as tobacco or tobacco-related products, albeit ones that do not burn tobacco. In this section, we consider the health economics of such policies.

ELECTRONIC NICOTINE DELIVERY SYSTEMS OR E-CIGARETTES

Electronic nicotine delivery systems (ENDS)(also called e-cigarettes or vaping products) consist of a battery that powers a heating element that aerosolizes a liquid that contains nicotine, flavorings and humectants. They produce a sensation that is similar to cigarette smoking. E-cigarettes are considered to be less harmful than conventional cigarette smoking, as they lack the harmful effects of tobacco combustion. Though not free from hazardous effects, the toxicity of e-cigarettes is lower than conventional cigarettes.

A report on e-cigarettes commissioned by Public Health England (PHE) notes that no other product delivers nicotine at a dose and speed that is similar to conventional cigarettes. Furthermore, absorption of the vapour released by e-cigarettes is slower than smoke of a conventional cigarette, and there is a low risk of nicotine overdose and inhalation of toxic doses of nicotine from an e-cigarette.

The composition of e-liquids requires strict regulation. Urine levels of hazardous compounds (PMA, HEMA, CNEMA, 3-HPMA, AAMA) are lower in users of e-cigarettes compared with users of e-cigarettes and conventional cigarettes. However,

The nicotine mouth spray (NMS), delivers 1 mg nicotine per spray, thus enabling rapid nicotine absorption.

studies have also revealed that exposure to e-cigarettes containing nicotine leads to micro vascular endothelial dysfunction, increased oxidative stress and arterial stiffness. E-cigarette vapour also leads to cell death in adenocarcinomic human alveolar basal epithelial cells. Exposure to aerosols frome-liquids with or without nicotine is associated with neurotoxicity in animal studies. Notwithstanding these known hazards, there is a broad consensus that e-cigarettes, as a category, are significantly less hazardous that cigarettes.

TOBACCO HEATING SYSTEMS: A NEW TECHNOLOGY WITH POTENTIAL TO REDUCE HARM

Heated tobacco products or tobacco heating systems (THS) consist of electronic devices that heat processed tobacco rather than conventional burning, leading to the generation of aerosol that has fewer toxic chemicals than conventional cigarette smoke. The reduction in harmful and potentially harmful constituents (HPHC) is 92%. There is also a lower concentration of acetaldehyde, nicotine and other measured parameters over the background concentrations, in simulated settings of "residential", hospitality" and "office". The use of THS reduces the exposure to carboxyhemoglobin (COHb), S-PMA, MHBMA and 3-HPMA.

In a report by the United States Food and Drug Administration (FDA), it was reported that there is a reduction in systemic exposures to 15 biomarkers of exposure in persons switching from conventional cigarettes to THS. COHb was 4.65% to 6.66% at baseline, and reduced to 1.06-2.48% in the group switching from conventional cigarettes to THS group at 5 days. COHb levels were in the range of 4.5-6.07% among persons who continued to smoke, and 0.99-2.5% among those who abstained from smoking. Similar findings were noted for 3-HPMA, S-PMA and MHBMA. The report concluded that this reduced exposure may lead to a reduced likelihood of smoking-related diseases.

Clinical studies have demonstrated that switching from conventional cigarettes to THS led to significant improvement in high-density lipoprotein cholesterol, white blood cell count COHb, forced expiratory volume in 1 second (FEV1) and total NNAL. There is also a down regulation of genes involved in inflammatory responses and a reduced impact on proatherosclerotic markers. Based on extensive review of information, the FDA in its ruling on modified risk tobacco products (MRTP) declared that switching completely to THS significantly reduces your body's exposure to HPHC. Furthermore, the report mentioned that "current evidence demonstrates that a measurable and substantial reduction in morbidity or mortality among individual tobacco users is reasonably likely in subsequent studies".

ECONOMIC COST OF SMOKING

Smoking has a substantial economic burden on society. According to the World Bank,~15% of the aggregate health care expenditure in high-income countries can be attributed to smoking. The WHO notes that tobacco use costs $500 billion each year in health care expenditures, productivity losses, fire damage, and other costs.

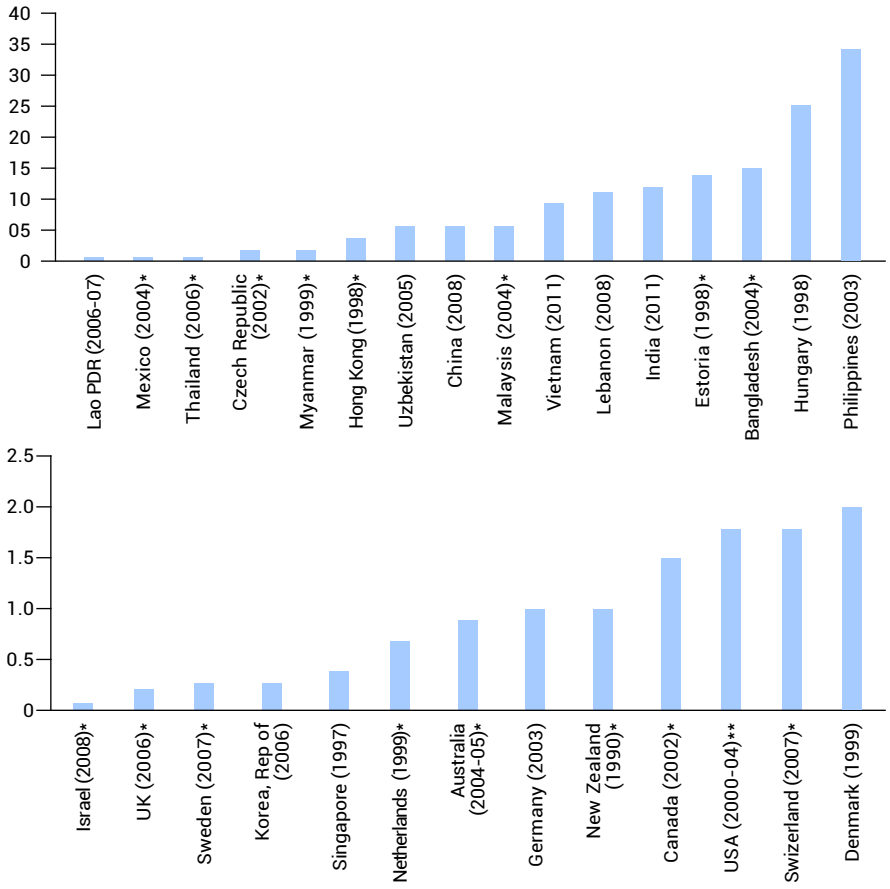
The economic burden of smoking on the national economy is usually expressed as a percentage of gross

domestic product (GDP). The total economic costs of smoking-attributable diseases and deaths in 152 countries, representing 97% of the world's smokers was estimated to be US$ 1436 billion in 2012, accounting for 1.8% of the world's annual Gross Domestic Product (GDP) according to a study by WHO. In another meta-analysis, the economic burden of smoking was elucidated:

- The burden of smoking accounts for 0.22-0.82% of GDP.
- The direct cost attributable to smoking accounts for 1.5-6.8% of the national health care expenditure.
- The cost of smoking among adults is 6-14% of the personal expenditure on health care
- The cost of smoking-related premature mortality accounts for 52.6-90% of the total cost.
- The cost of passive smoking that accounts for 23% of the total cost of smoking.
- One study reported the total cost of smoking without including the cost of smoking-related premature mortality was 16% more than the total tax revenues collected from all tobacco products and many times higher than the total budget on tobacco control activities.

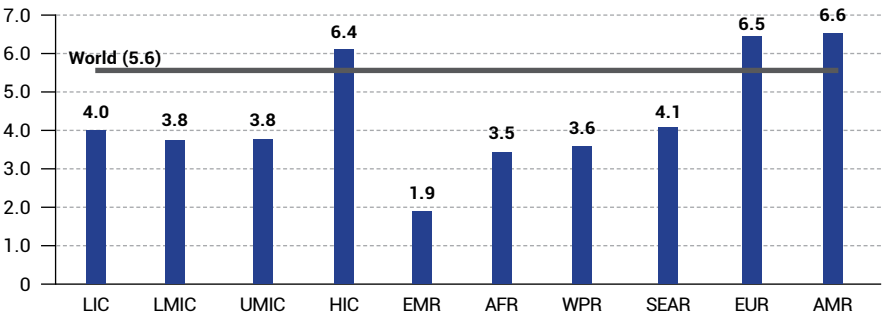
Smoking attributable costs in low- and middle-income countries (LMICs) and high-income countries (HICs) is depicted in Figure 1, and smoking-attributable direct healthcare spending by country income group and WHO region is presented in Figure 2.

Figure 1: Estimates of direct and indirect costs of smoking as a percent of GDP in (A) LMICs (B) HICs



* Estimate includes only direct costs; ** Estimate includes costs attributed to SHS exposure

Figure 2: Smoking-attributable direct healthcare spending by country-income group and WHO region, 2012 (% of total healthcare spending)



DATA FROM INDIA

A report on the economic burden of tobacco use in India in 2004 stated that the total cost of tobacco use was US$1.7 billion, which was nearly 4 times the expenditure on tobacco control. Tobacco-attributable direct costs were US$1.2 billion, which formed 4.7% of India's healthcare expenditure. Smoked tobacco accounted for 77% of costs.

A recent study reported that the economic burden from tobacco accounted for 1% of India's gross domestic product (GDP) in 2017-2018. The total economic costs attributable to tobacco use from all diseases for persons aged over 35 years was INR 1,773.4 billion (US$ 27.5 billion) or INR 3,772.5 per adult per year, of which 74% was attributed to smoking. Seventy-six percent of the cost of

premature mortality is attributed to the use of tobacco. Direct medical costs accounted for 5.3% of total health expenditure. The direct economic costs attributable to second-hand smoke account for 8.1% of the total healthcare expenditure. Considering that nearly 40% of Indian adults are exposed to second-hand smoke, the findings of economic burden are a cause for concern.

DATA FROM USA

In USA, the total annual public and private health care expenditures caused by smoking is US$170 billion, amounting to ~1% of the GDP. The proportion of health care expenditure attributable to smoking ranges between 6% and 18% across different states. As part of the indirect (non-health-related) costs of smoking, the total productivity losses caused by smoking each year in the US have been estimated at US$151 billion. The annual direct medical expenditure for early childhood respiratory illness attributable to maternal smoking is US$661 million for all children under the age of 6 years.

DATA FROM UK

A number of studies have evaluated the cost of smoking in UK:

- Smoking-attributable costs to the NHS in 2006 was estimated at £2.7 billion. This includes smoking attributable hospital admissions (£1 billion), outpatient attendances (£190 million), general practitioner (GP) consultations (£530 million), practice nurse consultations (£50 million), and GP prescriptions (£900 million.
- The costs of smoking-induced ill health to the NHS was £5.2 billion in 2005–2006, representing about 5.5% of the total NHS budget that year.
- Approximately 50 million

Figure 3: Smoking-attributable expenditure in USA

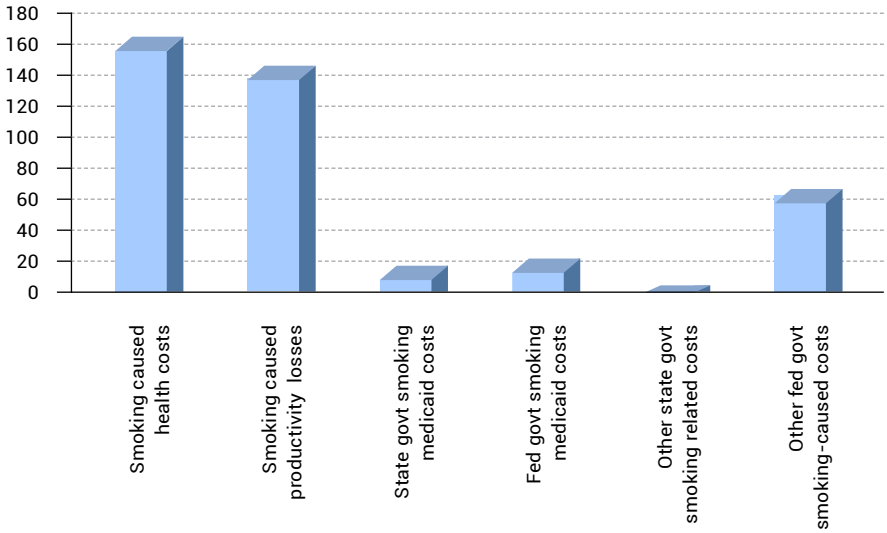


Table 1: Percentage of NHS costs attributable to smoking in 2005-2006 by countries in UK*

Country	Costs attributable to smoking (£ million)	Total NHS costs for smoking related conditions*	Smoking attributable fraction (SAF)
England	4,398.90	19,392.60	0.23
Scotland	409.4	1,805.10	0.23
Wales	234.2	1,032.7	0.23
Northern Ireland	127.9	563.7	0.23
Total	**5,170.40**	**22,794.10**	**0.23**

Reproduced from: Ekpu, et al.

working days are lost in UK annually due to smoking, valued at £1.71 billion.

- The cost of treating childhood illnesses related to smoking is about £410 million per year.

ECONOMIC ANALYSIS OF THERAPEUTIC INTERVENTIONS LIFESTYLE INTERVENTIONS

There are a number of non-pharmacological approaches to smoking cessation. Medical advice to quit produces 1-yr abstinence rates of up to 5–10%, which would have a significant public health impact if it were provided routinely. Self-help interventions, telephone-based counselling, group behaviour therapy and acupuncture are some of the approaches which have been evaluated.

Group-delivered acceptance and commitment therapy (ACT) and CBT had similar long-term quit rates. The 30-day PPA rates at the 12-month follow-up did not differ between group-delivered ACT and CBT (13.8% ACT vs. 18.1% CBT), thus making group-delivered ACT a viable alternative to CBT. One study has reported that contingency management (CM) along with cognitive behavioural therapy (CBT) has a higher rate of abstinence compared to CBT alone post-therapy (85.3% vs. 59.2%), even at 6 months follow-up (51.2% vs. 28.6%). CM is a form of behavioral treatment that typically provides financial incentives for abstinence.

In another study, a smartphone application was used for smoking cessation. A comparison of I Can Quit (an ACT-based smoking cessation application, which taught acceptance of smoking triggers), and the National Cancer Institute Quit Guide, a USCPG-based smoking cessation application (which taught avoidance of smoking triggers) showed that for the 30-day point prevalence abstinence (PPA) at the 12-month follow-up, I Can Quit participants had 1.49 times higher odds of quitting smoking compared with QuitGuide participants (28.2% vs. 21.1%; odds ratio [OR], 1.49; 95% CI, 1.22-1.83; $p<0.001$). Similar findings were noted for the 7-day PPA, at the 12-month follow-up, prolonged abstinence at the 12-month follow-up, abstinence from all tobacco products (including e-cigarettes) at the 12-month follow-up.

NICOTINE REPLACEMENT THERAPY

NICOTINE PATCHES

In a study by Fiscella, et al., the incremental cost-effectiveness of the addition of the nicotine patch to smoking cessation counselling was evaluated. The use of the patch produced 1 additional lifetime quitter at a cost of $7,332. The incremental cost-effectiveness of the nicotine patch by age group ranged from $4,390 to $10,943 per quality-adjusted life year (QALY) for men and $4,955 to $6,983 per QALY for women. A clinical strategy involving limiting prescription renewals to patients successfully abstaining for the first 2 weeks improved the cost-effectiveness of the patch by 25%.

In another study, Wasley, et al., reported that the average costs per year of life saved range from $965 to $1,585 for men and from $1,634 to $2,360 for women. Incremental costs per year of life saved range from $1,796 to $2,949 for men and from $3,040 to $4,391 for women.

NICOTINE GUM

Nicotine gum has proven efficacy as a cessation intervention in clinical trials. The use of nicotine gum is estimated to increase life expectancy by 5 years for men aged 35-39 years and by ~1.9 years for men aged 60-64 years. In women, the increase in life expectancy was 3.18 years for women aged 35-39 years, and 1.4 years for women aged 60-64 years. The cost per year of life saved with nicotine gum ranges from $4,113 to $6,465 for men and from $6,880 to $9,473 for women, depending on age. Cost-effectiveness was generally highest for patients who are between 45 and 54 years of age. At the time of this study, the findings were comparable to other commonly used medical practices, thus indicating that nicotine gum is a cost-effective strategy for smoking cessation.

E-CIGARETTES

The economic impact of policies that regulate and permit the same of e-cigarettes to smokers has been studied by a number of groups. In a

Table 2: Lifetime healthcare savings or costs for the additional people who took up e-cigarettes instead of cigarette smoking, 2014-2017, and the value of their additional years of life, by age ($millions, 2017 dollars)

	18-24	25-44	Total
Healthcare Savings/Costs	$11,310.0	-$284,471.5	-$273,161.4
Value of additional years of life	$532,563.2	$2,278,899.1	$2,811,462.3
Total	**$543,873.2**	**$1,994,427.6**	**$2,538,300.9**

Table 3: 10-year healthcare and productivity effects of the additional people who took up e-cigarettes instead of cigarette smoking from 2014 to 2017, by age, 2017-2027 ($ millions, 2017 dollars)

	Ages 18-24	Ages 25-44	Total
Healthcare Savings/Costs	$2,634.2	-$15,667.4	-$13,033.3
Productivity Savings	$14,728.4	$29,235.6	$43,964.0
Total	**$17,362.6**	**$13,568.1**	**$30,930.8**

study in UK evaluating the cost-effectiveness of e-cigarettes compared with NRT as a smoking aid, it was noted that the mean cost of treatment was £201 per participant in the NRT arm and £105 in the EC arm. In USA, 70% of the increased decline in cigarette smoking from 2013 to 2017 was associated with the rising use of e-cigarettes. The economic impact of the use of e-cigarettes has been studied, revealing a lowered annual per capita healthcare costs, compared to cigarette smokers and ex-smokers, for all age groups up to age 75.

- For people ages 25 to 44, the annual per capita healthcare costs of cigarette smokers are 9.8% greater than those of e-cigarette users, and the average annual per capita healthcare costs for ex-smokers are 19.8% greater than for e-cigarette users.
- For people ages 45 to 64, annual per capita healthcare spending for cigarette smokers is 8.8% greater than for e-cigarette users, and average per capita healthcare costs for ex-smokers are 34.4% greater than for e-cigarette users.

> **“**
>
> **E-cigarette users are on average $820 more productive per-year than ex-cigarette smokers and $2,371 more productive per-year than current smokers**

The use of e-cigarettes by the 922,301 people ages 18 to 24 in 2017, who otherwise would have started smoking cigarettes, should reduce their lifetime healthcare costs by $11.3 billion. E-cigarette users are on average $820 more productive per-year than ex-cigarette smokers and $2,371 more productive per-year than current smokers, and that ex-smokers who shifted to e-cigarettes are on average $1,554 more productive per-year than current smokers. Table 2 describes the healthcare saving and value of additional years of life for people who use e-cigarettes. Table 3 described the healthcare and productivity effects of e-cigarette use.

A study from USA has highlighted

> **The WHO notes that tobacco use costs $500 billion each year in health care expenditures, productivity losses, fire damage, and other costs.**

the potential of e-cigarettes in reducing deaths. This study used different models, including Status Quo scenario (cigarette use), Optimistic Scenario (published harm reduction of e-cigarettes was considered), Pessimistic Scenario ('worst case 'of suggested harms; e-cigarettes are more harmful than science indicates), and compared it to a Substitution model (switching from cigarettes to e-cigarettes). The study reported that compared with the Status Quo, replacement of cigarette by e-cigarette use over a 10-year period yields 6.6 million fewer premature deaths with 86.7 million fewer life years lost in the Optimistic Scenario. Under the Pessimistic Scenario, 1.6 million premature deaths are averted with 20.8 million fewer life years lost. The study concluded that even with conservative estimates, switching from cigarettes to e-cigarettes can lead to substantial gains in life-years. It has been estimated that the use of vaporized nicotine products could lead to a 21% reduction in smoking-attributable deaths, and a 20% reduction in life years lost.It is important to note that policies regulating the use of e-cigarettes should discourage the use of these products in never smokers, and rather use this product as a smoking cessation intervention.

Table 4: Cost of treatment compared to placebo

Strategy	Cost	Incremental Cost (NOK)	Life years	Incremental ife years	ICER (NOK/ life year)	NHB
No treatment	853977		14.60			
NRT	858118	4141	14.62	0.02	207050	0.012
Bupropion	859706	5729	14.69	0.09	63656	0.079
Varenicline	863650	9672	14.74	0.14	69086	0.121

ICER: Incremental cost-effectiveness ratio; NHB: Net health benefit; NRT: Nicotine replacement therapy

PHARMACOLOGICAL INTERVENTIONS

VARENICLINE

Varenicline is a highly effective smoking cessation aid that competes with nicotine to activate receptors, thus reducing withdrawal symptoms and rewarding effects of smoking. In male smokers in Japan, varenicline reduces medical costs by ¥43,846 and increased QALYs by 0.094 compared with placebo. In female smokers, varenicline increased lifetime medical costs by ¥12,115 and QALY by 0.03. The ICER was ¥346,143 per QALY gained. When analyzed for all patients varenicline reduced lifetime medical costs by ¥29,220 and increased QALY by 0.079. When applied to the whole population that would use varenicline, the initial incremental cost for treatment was ¥14.2 billion, and future saving for treatment cost of tobacco-associated diseases was ¥23.7 billion, leading to overall saving was ¥9.5 billion.

Varenicline is more cost-effective than either NRT or bupropion in the UK and elsewhere. The cost per additional quitter for varenicline is approximately £2,170.31 The ICER of varenicline compared with no pharmacotherapy has been estimated at between £950 and £1,140 per QALY gained. Furthermore, a longer treatment duration of 24 weeks, compared with 12 weeks, is also cost-effective, resulting in an ICER of £622 per QALY.

BUPROPION

Bupropion (an atypical antidepressant) acts on dopamine and noradrenaline pathways and is likely to be a nicotinic antagonist. It reduces symptoms of withdrawal as well as the rewarding effects of smoking, leading to 70% higher smoking cessation rates compared with placebo. Economic analysis revealed that cost per life-time quitter for bupropion users is £964 and £1,799 (as of 2002). The ICER of bupropion is £830 per QALY in USA in 2005 (compared with brief advice), and £316 to £2,212 in the UK.

In a comparison of bupropion with transdermal patches from an employers' perspective, bupropion is more cost-beneficial than either NTP or bupropion/NTP, with a net benefit in the first post-quit year of up to $338 per employee, as compared to $26 for NTP and $178 for NTP plus bupropion.

COMPARISON OF NRT AND PHARMACOLOGICAL INTERVENTIONS: FINDINGS OF THE NORWEGIAN KNOWLEDGE

CENTRE FOR THE HEALTH SERVICES

The evaluation of the cost-effectiveness of drugs for smoking cessation in a Norwegian setting has demonstrated that NRT, bupropion and varenicline are all cost-effective. NRT, bupropion and varenicline yield 0.02, 0.09 and 0.14 additional life-years, at an additional cost of NOK 4,141, NOK 5,729 and NOK 9,672, respectively (Table 4). Compared to no treatment, bupropion gives 0.09 additional life-years at an additional cost of NOK 5,729. Compared to bupropion, varenicline gives 0.05 additional life-years at an additional cost of NOK 3,944.

CONCLUSION

In the current scenario of nicotine addiction, wherein there is a significant health and economic burden across the globe, it is becoming increasingly necessary to focus on smoking cessation interventions that provide individuals the support to quit smoking. The interventions have to be effective in reducing the craving to smoke, while also being cost-effective. The nonpharmacological approaches such as CBT have high rates of abstinence after intervention, which tend to drop at 12 months after the intervention. Novel methods such as the use of smartphone apps have also shown efficacy, with higher odds of abstinence reported from clinical trials. A number of nicotine replacement therapies, pharmacological therapies as well as electronic cigarettes have demonstrated cost-effectiveness. E-cigarettes have shown potential in reducing the number of deaths and life-years lost, while also leading to saving of healthcare costs.

There is an also potential health benefit, such as reduced exposure to nicotine, lower risk of overdose, and lower exposure to hazardous compounds reported for e-cigarettes. Similarly, tobacco heating systems also lead to reduced exposures to hazardous compounds, and a reduced inflammatory response. This lends support to the use of these products as smoking cessation interventions. Similarly, the development of tobacco heating systems, which are known to have lower levels of nicotine and toxic chemicals, could also be expected to have a beneficial economic impact.

(The author is MD (Pharmacology), Certified in Patient Safety (Johns Hopkins University, USA), FISQua (U.K), NABH Assessor for Hospitals and Ethics Committee, Formerly attached to Stanford University School of Medicine, USA)

OVER THINKING DESTROYS YOUR HAPPINESS

It's often the over thinking that leads to mental health conditions. We all tend to overthink, especially when we ruminate, worry, plan something important, or are anxious about the future. This is a widespread problem...

BY BALVINDER KUMAR

The research carried out by the University of Michigan, USA, found that 73% of adults between the age of 25 and 35 over think. It's a substantial proportion of that population. Likewise, people in the age group of 45 to 55 years do overthink about 52%. Interestingly, the study has found that many people who over think believe they are doing the right thing by keep on thinking the same set of thoughts.

However, over thinking can harm our mental health, especially with negative and distressing thoughts. Sometimes, we don't even realize that the impact of overthinking on our health can be more than the problem itself. Invariably, all of us get trapped in the mind's tendency to overthink and keep repeating the same thoughts. As we are generally identified with our minds, we don't know when we overthink. We are unaware and conscious that we are doing an unnecessary and mostly harmful exercise of overthinking.

When we do, it's generally the stream of harmful and distressing thoughts that fill our minds. We hardly overthink positive matters. Ashley Carroll, a psychologist with Parkland Memorial Hospital, says when we ruminate on specific thoughts, it can snowball into bigger, more extreme negative thinking. It is not just thinking too much about something — it is obsessing about something so much that it affects one's ability to function in their life.

Many of us, especially youngsters and women, think excessively about our personal traits relating to our looks/appearance, height, and other physical attributes. We need to keep in mind that no one is perfect. We all come into this world with our unique set of features. Invariably, we have some deficiency or other imperfection in our personality, behavior, physical looks, and other features. Yet most of us pay great attention to such real or imagined shortcomings.

Most of our pain comes from how we churn the negativity over and over again in our minds. The anxious brain is hypervigilant; always on the lookout for anything that it perceives to be dangerous or worrisome. So, when we are depressed and anxious, we overthink. When we keep on thinking most of the waking time, it may lead to mental conditions such as depression and anxiety. These disorders, in turn, reinforce overthinking. Under both situations, we are deeply mired in distressing thoughts.

Studies have shown that overthinking leads to severe emotional distress. When people can't escape from this condition, they often resort to unhealthy methods to cope with it. Many start abusing alcohol, some indulge in smoking, while others overeat or some may even go to the extent of taking drugs. Further,

Most of ourpain comes from how we churn the negativity over and over again in our minds

When a negative thought arises in the mind, it tends to attract more associated distressing thoughts. When we think about harmful, fearful, or destructive thoughts, we are fuelling negative energy

it becomes challenging to enjoy sound sleep when our mind is disturbed. Research studies further confirm this, finding that rumination and worry lead to fewer hours of sleep and poorer sleep quality.

A recent UK study of more than 30,000 people showed that focusing on adverse events (particularly rumination and self-blame) can be the most significant predictor of some of today's most common mental health problems. When a negative thought arises in the mind, it tends to attract more associated distressing thoughts. When we think about harmful, fearful, or destructive thoughts, we are fuelling negative energy, which

> **When we ruminate on specific thoughts, it can snowball into bigger, more extreme negative thinking. It is not just thinking too much about something — it is obsessing about something so much that it affects one's ability to function in their life.**
>
> Ashley Carroll
> Psychologist with Parkland Memorial Hospital

remains for a far longer time as memory – thus keeping the vicious cycle of overthinking alive. Whenever the same set of thoughts is triggered, we get involved in the same loop of overthinking.

We, therefore, need to allow time to release the negative energy, and for that, we must fully face what arises in our minds. This is achieved by a simple but very effective exercise of "relaxed awareness." We are required to watch the mind and observe the feelings in a non-judgmental, nonreactive, and, in a sense, detached way. Just sitting in a relaxed manner and acknowledging whatever arises in mind is all it takes. After a few moments, the negative energy, not given its usual fuel, will begin dissipating, and we will see the pattern of negative thoughts start to break. As we stay in this space of relaxed awareness, the intensity and frequency of negative thoughts will diminish.

> Practicing mindfulness meditation is indeed an effective technique for controlling overthinking

Practicing mindfulness meditation is indeed an effective technique for controlling overthinking. Sages have often noted that the mind is like a monkey. It jumps from one group of thoughts to another, restless and sometimes even uncontrollable. On such occasions, we must exercise greater awareness in our observation of whatever thoughts are arising in consciousness. Once we become aware that such thoughts disturb our minds, we can better identify the basic reasons and causes of overthinking. When we do this, from that moment on, the intensity and frequency of distressing thoughts will start to decline.

Most of the time, the main problem is that we need to be made aware that we are in overthinking mode due to strong identification with our minds. Unfortunately, we fail to realize that it's the mind that overthinks.

Sometimes we get trapped in the cycle of negativethinking. Negative and distressing thoughts tend to stick in our heads anddon't quickly leave. Even if we try to divert our attention or getbusy with other things, the 'stickiness of thoughts' doesn't allowthose thoughts to loosen their grip on the mind. We then fall intooverthinking mode. We go on repeating the same set of thoughts. The frequencyand intensity of those repeated thoughts will not automatically decrease.

We can, however, break this cycle through awareness. If we only become aware of those negative thoughts that we are repeating and are part of our inner voice, we can limit the recurrence of those thoughts. The best way to overcome overthinking is to learn the art of mindfulness. Our mind oscillates from pure awareness to complete mindlessness or absent-mindedness.

MOST OF THE TIME, THE MAIN PROBLEM IS THAT WE NEED TO BE MADE AWARE THAT WE ARE IN OVER-THINKING MODE DUE TO STRONG IDENTIFICATION WITH OUR MINDS

We experience the highest state of attention when we focus on the moments at hand. This state is known as mindfulness. We often become mindless, impulsive, and reactive when we are not mindful. We become prone to miss valuable experiences because we are, in a sense, not awake during those times. As a result, we are not able to exercise complete control over our inner world, i.e., mind.

Surprisingly, there is a very simple and easy mental exercise through which we can learn and cultivate mindfulness. This mental exercise is meditation. When we are mindful, conscious, and fully awake, we can effectively control the tendency to overthink. We invariably overthink when we are off the present moment. Mindfulness-based meditation is currently one of the most potent wellness trends in the world. It's growing exponentially across many nations, including the USA and India. Since scientific studies have validated the benefits of meditation globally, many people have started adopting this practice. In many countries like the USA, the mindfulness movement has begun as more and more people have started realizing its potential for their physical and mental well-being. Hopefully, India will also witness such an awareness movement about mindfulness.

(The author is retired IAS)

SAVE THE PATIENT TO SAVE THE DOCTOR

Accountability is a must but what is happening in India is persecution and what is not good for medical profession cannot be good for society or the nation in the long run...

DR NEERAJ NAGPAL

With my career straddling a few crucial decades I have been fortunate to have seen the days (before ultrasound became available) when a doctor's clinical decision decided whether or not the patient needed to be operated. Even if later we were proven to be wrong in our diagnosis the grateful patient would still thank us for our efforts. We were bold in our approach to patient care. Even in private sector in small nursing homes we used to operate on gasping patients with hemoglobin less than 3-4 gm unfit for General anesthesia doing laprotomy under local anesthesia to ligate a bleeder or repair a ruptured uterus.

More often than not we succeeded in saving these patients. The fear of "What if the patient dies" was never in our minds when we undertook those risks even though the patient paid less than 5-6 thousand rupees as charges. We did what we could irrespective of the condition of the patient. Those were the days when the doctor , the patient, and the relatives together fought the disease. It was easy to keep cost of treatment low and patient satisfaction was high even though there were no websites, google reviews or digital marketing.

Today's scenario is however totally different and a doctor today has to contend with an array of opponents. He has to fight the disease, the patient, the relatives, the insurers, the accreditation authorities, police, courts, the inspectors and authorities under PCPNDT Act, CEA, BMWMR, Fire Act, Municipal Act, MTP Act, TOHOA, as

well as the disease his patient is suffering from. Besides this he has to fight against the negative perceptions against medical profession in social , print and electronic media. He also needs to fight against IDIOT Syndrome (Internet Derived Information Obstructing Treatment Syndrome) while trying to ethically treat his patients and keeping the costs down. These efforts however are counterproductive and while trying to keep the costs down he is frequently hauled to courts for not doing proper preoperative investigations.

The change started with the Consumer Protection Act which became applicable on doctors in 1995 wherein the fundamental character of a doctor - patient relationship now became that of a purchaser- service provider. Simultaneously the demand for patient autonomy became stringent. Gradually increasing litigations against doctors under CPA resulting in compensations more than 300-500 times what an average patient pays for the procedure in question (compared to 20-30 times in the west) and the rising number of cases of violence against them has shattered the confidence of even the most brave hearted Indian doctor.

DOCTORS ARE TODAY DOING UN-NECESSARY HOSPITALIZATIONS TO BE SAFE RATHER THAN BE SORRY LATER

Asking a service provider or seller to refund the amount paid for the service or product is one thing, but compensation against doctors in India today are bordering on 5-10 years of an average doctors earning (more than 20 years of savings) and sometimes even more. The import of high compensation culture from the west has not been matched by proportionate increase in the charges which doctors in India charge from their patients. Ultimately there are no free lunches in the world. To pay for one compensation in crores many ordinary citizens will have to pay higher treatment costs in future.

High risk procedures and surgeries which were earlier routinely done in Small and medium healthcare establishments earlier now started getting referred to doctors working in tertiary care centers. Same surgeries which were earlier done for a few thousand now started costing few lacs given the fact that cost of extensive preoperative workup and

> **The fear of "What if the patient dies" was never in our minds when we undertook those risks even though the patient paid less than 5-6 thousand rupees as charges.**

glitzy infrastructure and equipment costs now get added. The hands which used to operate in compromised circumstances are now shaky.

Focus shifted from "Save the patient" to "Save the doctor". Defensive Medicine has become firmly entrenched in Indian Healthcare. Excessive Investigations & Excessive specialist referrals are now the norm. The courts have emasculated the MBBS and are promoting a super specialist culture. There is too much dependence by consumer courts on qualification rather than experience. MD Medicine doctors who have treated cardiac patients and diabetes for decades are now equated with quacks because they do not have a super specialty degree. As per a recent judgment A urologist cannot operate on a Gallbladder even though he has done his MS surgery before his MCh urology.

Doctors are today doing unnecessary hospitalizations to be safe rather than be sorry later. For example all patients of acute pancreatitis do not require hospitalization and can be managed on enteral feeds at home under supervision. However today all are admitted to ICU where more often than not they acquire hospital acquired resistant infections and die due to the same. Similarly Unnecessary Invasive Procedures simply to document what is already known clinically eg ; Colonoscopy is not needed in all cases of bleeding with stools. However to avoid allegations of negligence later it is being done.

Doctors have also started displaying a selection Bias in Clinical Practice by Avoiding risky procedures, This results in Loss of golden hour to treat serious patients who could be saved if appropriate steps are taken in this crucial hour despite some risk. Doctors with experience to handle difficult situations today do not want to touch patients if they are not having all infrastructure in their small and medium health care establishments.

No hospital in the world today has all facilities. Even Apollo hospital Chennai has been penalized for not having machine to check methotrexte levels in blood (Chemotherapeutic agent) which at the time was not available anywhere in India. This does not mean PGIMER Chandigarh should not treat a patient who may require a particular equipment (eg Hyperbaric oxygen chamber). In SMHCE this problem is magnified. Crores of surgeries have been performed and lives saved while being operated in hospitals which do not have a fully fledged Intensive Care Unit or Blood bank. The way the trend is going we expect SMHCE not to take cases for normal delivery unless blood is already arranged and ready since any delivery

can result in Post Partum Hemorrhage.

Conforming to the judicial need of documentation the doctors today Focus on Clerical work to the detriment of clinical which leaves patient unsatisfied as there is no eye to eye contact. Demoralization has also set in the medical fraternity and Doctors are leaving the country or the profession. Some take early retirement. In a recent survey Most doctors are no longer encouraging their children to join medicine. The demand for medical education can be gauged from the fact that there is a Persistent lowering of cutoff marks to qualify for admission to MBBS in NEET (16.25 % in 2022). What then will be the quality of doctors who will be treating us tomorrow ?

There is another horrendous aspect of CPA where the principle of restitution in integrum is used to decide the quantum of compensation to be awarded. During covid when dearth of oxygen & ICU beds was acute, this caused a bias towards giving medical resources to rich persons from high income group. Eg; India is a resource poor country and in any large public hospital (which is also covered under the purview of Consumer Protection Act) Emergency it is common to see many patients being ventilated by patient's relatives using ambu bag while waiting for a ventilator / ICU bed. If two patients need a ventilator in a hospital and only one is available what will the doctor do.

One patient is rich belonging to High Income Group and can ask for compensation in crores, the other a pauper whose death will result in a nominal compensation. Is the doctor supposed to choose the rich and hence bring a bias into treatment decisions because of this law. This is a frightening but real prospect not faced earlier by medical men. Are medical treatment and resources in India going to be the prerogative of the rich ? This discrimination against poor patients

IS THE DOCTOR SUPPOSED TO CHOOSE THE RICH AND HENCE BRING A BIAS INTO TREATMENT DECISIONS BECAUSE OF THIS LAW

is violative of Article 14 & Article 21 of Indian Constitution as well as medical ethics.

CPA 2019 has defined the pecuniary jurisdiction as amount paid by consumer for services rendered and not on compensation asked as was the case under CPA 1986; No medical procedure in India barring maybe one in 50 lac hospitalizations would result in a hospital bill of more than 50 lacs. This will require all cases of medical negligence under CPA 2019 will henceforth be tried under District Commissions where the judgments are not reported and hence cannot be audited even for academic purposes obfuscating any attempt at judicial accountability. No limit on compensation asked for (even 2000 crores will be justifiable) and no penalty for frivolous litigation will bring an element of greed and elimination of even a nominal deterrent.

The defensive medicine is having an impact in medical training because doctors have stopped publishing complications and errors which could result in naming and shaming in today's adversarial court procedure. This is not in interest of society as lessons learnt from someone else's mistakes are always better rather than making the same mistake yourself. Availability of a doctor whether in public sector or private becomes an issue when cases are filed before multiple judicial and quasijudicial fora simultaneously on same facts by the same complainant. One incident of alleged negligence leads to weeks of absence of doctor from his workplace since he is busy defending himself before various courts. This deprives the public of medical services sometimes with disastrous consequences.

(The author is Convenor, Medicos Legal Action Group, Managing Director MLAG Indemnity and Ex President IMA, Chandigarh)

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RHINOCON-2022 successfully organised

With planning to move forward in making India as world's strongest democracy and successful celebration of 75 years of Azadi ka Amrit Mahotsav, All India Rhinology Society (AIRS) recently organised its 33rd three days Annual Conference(RHINOCON-2022) at Maulana Azad Medical College, New Delhi.

RHINOCON-2022 was a national conference in which Rhinologists from all over India and abroad participated and

discussed about the diseases related to nose, paranasal sinuses, skull base, orbit and corona related manifestations. Dr Ravi Meher, Director Professor, Department of ENT and Head & Neck Surgery, said, "Rhinology is a branch where we have complex anatomy and disease mechanisms. It's a branch we Indians can take pride in since its inception with the contribution in Atharvaveda as well as "Sushruta" being the first Indian Surgeon."

The organising team of the Department of ENT, MAMC led by Prof. & Head Dr. P K Rathore and dynamic Professor Dr. Ravi Meher has not left any stone unturned in making this conference a great success.

"This conference was successfully organised after a gap of two years as a result of the Corona Pandemic. During this period, the outstanding work has been done by our Rhinologists which was already acknowledged by AIRS. In fact, we were the key players in the management of the Mucormycosis Epidemic. I thank you all from the core of my heart, " Dr Ravi Meher, added.

The excellent scientific programme included Live Surgical Demonstration on day one followed by 2 days of scientific activities which included various scientific sessions, orations and keynote lectures from national and international experts. There were also various activities for residents including free papers, posters, video presentations and Quiz.

It was a very successful conference with more than 350 participants and faculty.

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