

Viruses, bacteria, parasites, fungi, and algae – a layperson’s view

Dr Hirak Sen

FE-467

Introduction

During this extraordinary period of COVID-19 pandemic, the media use the word virus endlessly every day. Among others, the media remind the viewers repetitively how long the virus might remain active on various surfaces. So, the layperson asks: Is a virus a living organism? What is the size of a virus? How are viruses different from bacteria, or parasites, or fungi, or algae? These and similar questions cross a layperson’s mind but are not answered by the media.

This article attempts to address some of these questions. It is not a comprehensive narrative on the subject. Far from it, this article only touches upon a few of the relevant terminologies and tries to demystify those for the layperson. The author wishes to disclose here that he is not a medical doctor, or virologist, or microbiologist. He is a layperson who delved into the subject to satiate his curiosity. He searched reliable sources and collated simple answers to some of the questions and thought it might be of interest to other laypersons.

The naming of pathogens and diseases

Any virus, bacterium, fungus, or another microorganism that can cause a disease is a pathogen. A pathogen may also be referred to as an infectious agent, or merely a germ. (However, this germ is not to be confused with the word germ that is used concerning plants). The term pathogen came into use in the 1880s. A pathogen becomes pathogenic when it has reached a cluster size that is large enough to cause disease.

A pathogen and the associated disease do not necessarily have the same name. Today, the two most used words are COVID-19 and coronavirus. While COVID-19 is the name of the disease, the virus causing the disease is not named ‘coronavirus’. Because there are many different types of coronaviruses, many of which cause disease in mammals and birds. The type of coronavirus that causes COVID-19 is called SARS-CoV-2, which stands for severe acute respiratory syndrome coronavirus- 2. This name is appropriate because the virus is genetically related to an earlier type of coronavirus that caused the SARS outbreak of 2003; that virus was then named SARS-CoV. While these two types of coronaviruses belong to the same family, they are nonetheless different. Hence, they have two separate names.

There are different processes, and purposes, for naming viruses and diseases. Viruses are named based on their genetic structure. This facilitates the development of diagnostic

tests, vaccines, and medicines. Virologists and the broader scientific community do this work. Viruses are named by the International Committee on Taxonomy of Viruses (ICTV). (Taxonomy is the science of naming, describing, and classifying organisms and includes all plants, animals, and microorganisms of the world). Diseases are named to enable discussion on disease prevention, spread, transmissibility, and treatment. Human disease preparedness and response is WHO's role. So diseases are named by WHO in the International Classification of Diseases (ICD) (World Health Organization, 2020).

This article deals with some of the pathogens that cause diseases only in human beings, and not in plants, animals, birds, or any non-human living entity.

Viruses

A virus is an infectious agent of small size and simple composition that can multiply only in living cells of humans, animals, plants, and bacteria as they do not have their own mechanism to multiply. When some disease-causing viruses enter host cells, they start making new copies of themselves very quickly. They often outpace the immune system's production of protective antibodies. Rapid virus multiplication can result in cell death and the spread of the virus to nearby cells.

Viruses are only active while intracellular, i.e., they are inside host cells, taking control of those cells' mechanisms and stealing their energy. In contrast, bacteria and parasites can live on the surface of the host's body or inside the host's organs and tissues. Reproduction is another significant difference between viruses and bacteria and parasites. Viruses can multiply inside host cells but cannot reproduce while bacteria and parasites can reproduce. Thus, viruses are not parasites.

Viruses occupy a unique taxonomic position. They are not plants, animals, or bacteria, and they occupy their separate kingdom. Viruses should not even be considered organisms in the strictest sense because they are not free-living. They cannot reproduce and carry on metabolic processes without a host cell. All viruses contain nucleic acid and protein. The nucleic acid can be either DNA (deoxyribonucleic acid) or RNA (ribonucleic acid). The nucleic acid encodes the genetic information unique for each virus (Wagner, 2020). In SARS-CoV-2, for example, the nucleic acid is RNA (Figure 1). Coronavirus is named so because the spike proteins give it the look of a crown or corona.

As for their size, most viruses vary in diameter from 20 nm (nm = nanometre = 10^{-9} metre, or one billionth of a metre) to 300 nm. SARS-CoV-2 virus that causes COVID-19 is 60-140 nm in size (Bing.com/images). It is roughly 1000 times smaller than the width of a strand of human hair. Electron microscopy is still at the forefront of clinical diagnoses of viruses. In 1939, Ernst Ruska (Nobel Prize 1986) and his colleagues were the first to visualize viruses (tobacco mosaic virus) (Goldsmith, 2009). So the first visualization of viruses is no more than 81 years old.

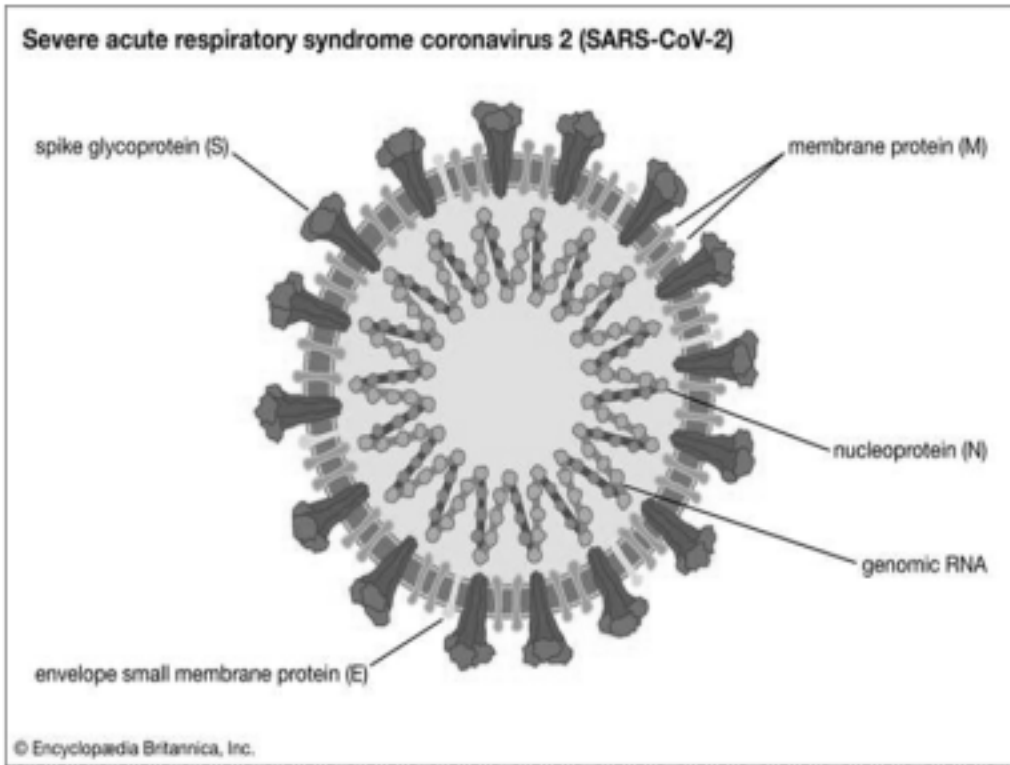


Figure 1 SARS-CoV-2, courtesy Encyclopædia Britannica / Patrick O'Neill Riley

Recently, during COVID-19 attack, in India, the first laboratory-confirmed infection by SARS-CoV-2 was on January 30, 2020. The throat swab specimen had tested positive for SARS-CoV-2 nucleic acid by reverse transmission polymerase chain reaction (RT-PCR) test. The test used transmission electron microscopy (TEM) (Prasad S, 2020). A TEM costs approximately Rs.10 million. However, the PCR test uses a PCR machine. It is a modern high-throughput thermal cycler (also known as a thermocycler, or DNA amplifier). It is a laboratory apparatus that is used commonly to amplify segments of DNA via the polymerase chain reaction (PCR). PCR multiply the virus to millions after which a simple chemical reaction is used to visualize it. Real time PCR test quantitates the virus.

Viral infections and treatments

Some of the common viral diseases are the common cold, smallpox, rabies, infectious hepatitis, measles, poliomyelitis, influenza, viral encephalitis, mumps, herpes simplex, viral conjunctivitis, Ebola, SARS, and the latest COVID-19.

As there is no medicine to treat most of the viral diseases, the first step in treating a viral infection is preventing its occurrence and spread. Vaccines are available to prevent some common viral infections, such as chickenpox, shingles, influenza, HPV, hepatitis B, hepatitis A, measles, and mumps. The feverish race to discover vaccines for COVID-19 is presently ongoing. Treatment of viral infections is symptomatic and generally includes rest, increased fluids, good nutrition, and may require hospitalization and intensive care, mostly if complications occur. Antibiotics treat bacterial infections and are ineffective for the treatment of viral infections. Sometimes drugs called antiviral drugs may be used to help treat certain types of viral infections. Most antiviral drugs can only help to minimize the severity of a viral infection but cannot cure the infection (Diagnosis, 2015). However, there are a few antiviral drugs that can cure the disease as in hepatitis C.

Bacteria

Bacteria, singular bacterium, are a group of microscopic single-celled organisms that occupy a separate kingdom. They live in enormous numbers in almost every environment on Earth everywhere from deep-sea vents, to deep below Earth's surface, to the digestive tracts of humans. Bacterial cells differ from animal cells and plant cells in several ways. One fundamental difference is that bacterial cells lack intracellular organelles, such as mitochondria, chloroplasts (present only in plant cells, not in animal cells), and a nucleus, which are present in both animal cells and plant cells. Bacteria do not have a nucleus, but, instead, generally have a single chromosome: a piece of circular, double-stranded DNA located in an area of the cell called the nucleoid, or more appropriately plasmid (Figure 2).

Bacteria lack a membrane-bound nucleus and other internal structures. Therefore, they rank among the unicellular life-forms called prokaryotes. Prokaryotes are the dominant living creatures on Earth. They have been present for perhaps three-quarters of Earth history and have adapted to almost all available ecological habitats. As a group, they display exceedingly diverse metabolic capabilities. They can use almost any organic compound, and some inorganic compounds, as a food source.

Some bacteria can cause diseases in humans, animals, or plants. Still, most are harmless and are beneficial ecological agents whose metabolic activities sustain higher life-forms. Humans carry more bacteria in their gut than cells in their body. Some can cause diseases, but many serve useful functions. For example, good bacteria in humans prevent infections, provide micronutrients, help in the development of immunity. Other bacteria are symbionts of plants and invertebrates, where they carry out essential functions for the host, such as nitrogen fixation and cellulose degradation. Without prokaryotes, the soil would not be fertile, and dead organic material would decay much more slowly. Some bacteria are widely used in the preparation of foods, chemicals, and antibiotics. Studies of the relationships between different groups of bacteria continue to yield new insights into the origin of life on Earth and mechanisms of evolution (Rogers, 2019).

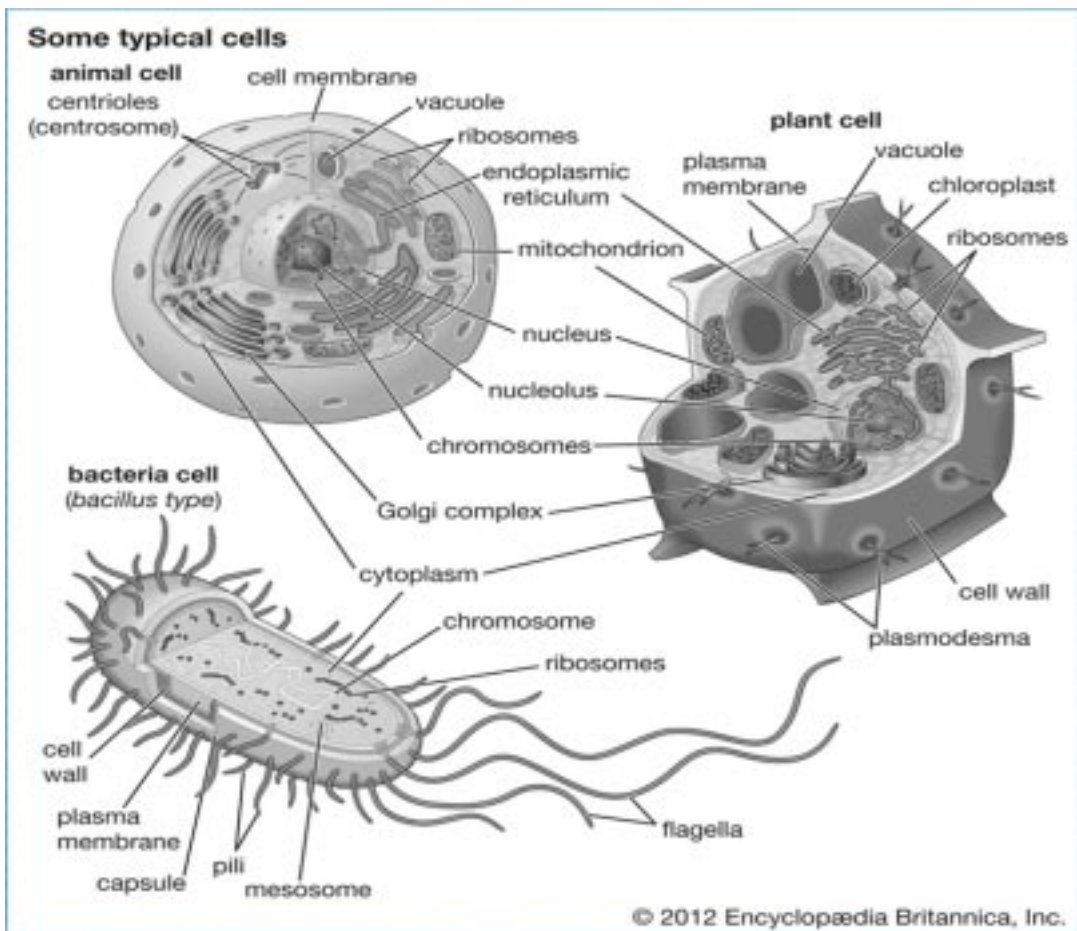


Figure 2 Bacteria cell, animal cell, and plant cell, courtesy Encyclopaedia Britannica

Individual bacteria can assume one of three basic shapes: spherical (coccus), rod-like (bacillus), or curved (vibrio, spirillum, or spirochete).

Bacteria are the smallest living entities. An average-size bacterium—such as the rod-shaped Ecoli, a typical inhabitant of the intestinal tract of humans and animals—is about 2 μm (μm = micrometre = 10^{-6} metre, or one-millionth of a metre) long and 0.5 μm in diameter. The spherical cells of Staphylococcus aureus are up to 1 μm in diameter. A few bacterial types are even smaller. Thus, bacteria are many times bigger in size than viruses.

Antoni van Leeuwenhoek discovered bacteria, in 1676, using a single-lens microscope of his own design. The pathogenic bacteria cause significant human death and disease. They cause infections such as tetanus, typhoid fever, diphtheria, syphilis, cholera, foodborne illness, leprosy, and tuberculosis. Bacterial infections may be treated with antibiotics (Wikipedia, Bacteria, 2020).

Sir Alexander Fleming, a Scottish biologist, defined new horizons for modern antibiotics with his discovery of the antibiotic substance penicillin (1928). The discovery of penicillin (from the fungus *Penicillium notatum*), and subsequent discoveries of other antibiotics and anti-bacterial drugs perfected the treatment of bacterial infections such as syphilis, gangrene, and tuberculosis (Explorable, 2020).

Parasites

Parasites are organisms that live in or on an organism of another species (its host) and benefits by deriving nutrients at the other's expense. Parasites vary in size widely. Around 70 per cent parasites are not visible to the human eye, such as the malarial parasite. Still, some worm parasites can reach over 30 m in length.

Human parasites include various protozoa and worms that may infect humans that cause parasitic diseases. Human parasites are divided into endoparasites, which cause infections inside the body, and ectoparasites, which cause infection superficially within the skin. Malaria, kala-azar, amoebiasis, and giardiasis are some of the common diseases caused by endoparasites. Louse, tick, flea, mosquito, bed bug, mite, are ectoparasites.

Generally, the discovery of parasites in ancient humans relies on the study of faeces and other fossilized material. The earliest known parasite in a human was eggs of the lung fluke found in fossilized faeces in northern Chile and is estimated to be from around 5900 BC. The first written records of parasites date from 3000 to 400 BC in Egyptian papyrus records. They identify parasites such as roundworms, Guinea worms, threadworms, and some tapeworms of unknown varieties. In ancient Greece, Hippocrates and Aristotle documented several parasites in the collection of works *Corpus Hippocraticus* (Wikipedia, Human parasite, 2020).

Malaria has ravaged the population of many countries and killed millions of humans. Malaria parasites were discovered in 1880 in France. Seven years later, in India, Sir Ronald Ross discovered that mosquitoes transmit the malaria parasite. For this discovery, he received his Nobel Prize in 1902 (Archivist, London School of Hygiene & Tropical Medicine, 2015).

Fungi and algae

Fungi, singular fungus, are plantlike organisms lacking chlorophyll, such as mushrooms, moulds, yeasts, and mildews. Modern biologists tend to place fungi in their own kingdom, not in the plant kingdom because they get their nutrients from other living things (or from the remains of living things that have died) rather than from photosynthesis.

Common diseases caused by fungi are: (a) skin diseases such as ringworm and athlete's foot, (b) inflammation of mucous membranes like mouth, tongue, and vagina (commonly known as thrush), (c) ear infection like otomycosis, and (d) eye diseases like corneal infection called fungal keratitis. Fungal infection is killed naturally with home remedies like antifungal

ointments, coconut oil, apple cider vinegar, and borax. Fungi can also cause serious life-threatening infections in immune-compromised patients.

Algae, singular alga, are in a different group of organism than fungi and belong to their own kingdom. Algae do not directly infect humans, but toxins produced by algae can cause diseases—for example, cell fish poisoning or some drinking water poisoning. Algae may cause the following diseases in humans: auto-immune diseases such as multiple sclerosis (MS), lupus, rheumatoid arthritis, and amnesic shellfish poisoning.

Acknowledgement

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Telemedicine in COVID-19 era

Prof (Dr.) Ahindra Mohan Saha

FE-99

As the coronavirus (COVID-19) pandemic sweeps across the world, it is generating widespread concern, fear, and stress, which many of us are finding it hard to adapt. Overnight lifecame to a grinding halt and what was considered a run-of-the-mill became aspirational, e.g. dining out



at restaurants, watching movies, morning walk amid nature in our own central park. While there exist many conflicting opinions on the origin of the contagious virus and what could have been done in the initial days to prevent the spread, but that is not the objective of this article. Many of us are concerned about how they can protect themselves and their family members from the wrath of this pandemic. This is a global problem and more importantly this pandemic does not discriminate rich or poor, caste, colour, religion, lingual or dietary habits. Worse it affects us all and till date we do

not have a perfect remedy in the form of vaccine which can play the role of a magic wand to cure the infected and protect us from this pandemic.

As a result, we are forced to follow some preventive control mechanism like maintaining social distancing, wearing face mask and head shield, repeated washing of hands with soap water, or using hand sanitizers when washing is not an option and many more advices how on to improve immunity. However, the guidelines are very hard to follow when it comes to healthcare and medical support. People in general are particularly at loss on how to get medical advices for their near and dear ones. Not everyone is getting infected with COVID-19 and there are so many other ailments or diseases which impacts us. In some cases, the symptoms are like COVID-19 which further complicates matter and creates a daunting task for patients to seek in-person consultation with doctors. With majority of private clinics closed in the country, senior experienced doctors not involving in in-person consultation owing to risk of getting self-infected and major hospitals maxed out in dealing with this pandemic, it's not an encouraging situation to be in. Everyone is hoping and praying that they do not fall sick and have the courage to tackle this phase. But what happens when someone does fall sick, what are the other alternatives!!!



As they say, necessity is the mother of all invention. Similarly, this pandemic has completely changed our life and opened the NEW Normal ways of working, from doing business to shopping, to imparting education for schools to social interaction and communication. Technology seems to have been a perfect saviour in providing the much-needed platform required to support virtual ways of working. With smart phones and high-speed internet (4G)



becoming more available and affordable for the people at large, usage of online platform to support necessities of life has become a norm in this unprecedented situation. Here it will be most worthwhile to mention that in our last AGM for Salt Lake FE Block Residents' Association it was observed that within the first five minutes, forty-five members of our block joined the virtual meeting platform. In the past getting such attendance was always a major challenge which further ratifies the acceptance of online digital platform in our daily life. This technology driven solutions to support our daily needs is also reflected in the healthcare and medical

field, where Telemedicine has emerged as another proposition for the suffering mankind seeking firsthand medical consultation.

During the pandemic period MCI (Medical Council of India) and the Central Government legalized the Telemedicine practice with stringent guidelines. There are many governments approved agencies in the market who have developed simple and user-friendly online audio/visual user interface to support doctor-patient interaction. Let us try to understand, what is Telemedicine and what are the Government guidelines regarding this.

Board of Governors in Supersession of the Medical Council of India on 25 March 2020 published Telemedicine Practice Guidelines enabling Registered Medical Practitioners to provide healthcare using telemedicine. Government Notification clearly mentioned the definition, benefits, and purpose of Telemedicine Practice.

Telemedicine may be defined as *“The Delivery of Health Services where distance is a critical factor by all healthcare professionals using information and communication technologies for exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers all in the interest of advancing the health of individuals and their communities.”*

Benefits: This Telemedicine will be practice only by Registered Medical Practitioner who is enrolled in the State Medical Register or in the Indian Medical Register under the Indian Medical Council Act, 1956 [IMC ACT 1956]. in disasters and pandemics pose unique challenges to provide healthcare. Though telemedicine will not solve them all, it is well suited for scenarios in which medical practitioners can evaluate and manage patients. Telemedicine visit can be conducted without exposing staff to viruses/infections at the time of such outbreak. Telemedicine practice can prevent the transmission of infectious diseases reducing the risks of healthcare providers and patients.

Purpose: The purpose of these guidelines is to give practical advice to doctors so that all services and models of care used by doctors and health workers are encouraged to consider the use of telemedicine as a part of normal practice.

Practising: The professional judgment of a Registered Medical Practitioner (RMP) should be the guiding principle for all telemedicine consultations: RMP is well positioned to decide whether a technology-based consultation is sufficient, or an in-person review is needed. Practitioner shall exercise proper discretion and not compromise on the quality of care.

Seven elements need to be considered before beginning any telemedicine consultation

a. Context.
a. Identification of RMP and Patient
a. Mode of Communication
a. Consent
a. Type of Consultation
a. Patient Evaluation
a. Patient Management



Telemedicine has a great scope to serve the suffering humanity in the COVID-19 era provided both the patients and their doctors are exposed to online virtual ways of working, This may not be a major difficulty as many of us in the urban and semi urban areas have been using social networking and online shopping platforms way before the pandemic started.

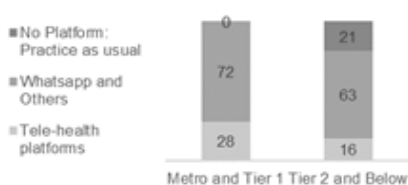
To get the best from telemedicine it is vital for patients and doctors to understand the following:

- a. **Patients** should be conversant with digital platforms for online communication. It is extremely important that they provide the correct and precise information about their complaints with specific date and time of onset of the disease. Any additional supporting references to provide the diagnosis is always desirable. Patients should have confidence and trust in this new way of medical advice, which allows them to consult the doctors of their choice in a virtual environment.
- b. It is never easy for **Doctors**, be it surgeon, physicians, or GP's to provide medical consultancy to patients remotely. To provide support, doctors should be well versed in their profession and have the acumen to understand the patient's problem virtually (audio or video information as proof-points) and then provide appropriate remedy. With the pandemic introducing many different traits of the age-old diseases, it is vital that doctors are well equipped with the recent advancement in the specialty they

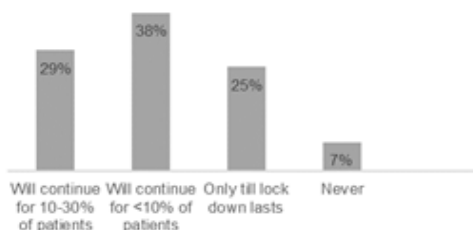
belong. There is no denying the fact that doctors involved in telemedicine should be compassionate, thereby giving enough time and patience to listen to the problem articulated by their patients. This is an important trait for doctors to gain adequate insights for coming to conclusions.

Another supportive observation is also demonstrated in the recent survey conducted by McKenzie Doctor Survey 2020, which shows that during the lockdown there has been almost 28% adoption of telemedicine. Even the trends show that 67% of the doctors believe

Telemedicine adoption during lockdown



Continuation of Teleconsultation post lockdown



Source: McKenzie Doctor Survey 2020

that they will continue to use some form of telemedicine even after the pandemic, given the wider acceptability of this virtual platform.

Virtual telemedicine practice can or will never be the substitute for the physical in-patient consultation in any way but this new approach for providing medical advices to needy patients will be complimentary to our time-tested physical clinic culture. However, telemedicine is a soundoption to deliver medical aids to urban and semi-urban population who have access to smart phones and high-speed telecom infrastructure required to initiate a medical advice especially during COVID-19 era.

How unlikely is it that COVID - 19 is the end of humanity as we know it?

Tathagata Bhattacharya

FE-148

So what exactly is that the coronavirus?

I manage to place a paraphrase of what the physicians are saying...It is believed to possess been created during a lab within the Wuhan China, level 4 lab facility. It's also believed that it absolutely was in animals that the lab in Wuhan sent to the markets to be sold as food. (Unfortunately a standard practice in China). It's quite possible, that's how it jumped from animal to man.

The covid-19 coronavirus aka ... is family to past coronavirus family. It's almost like influenza (flu)..But much deadlier...much contagious.

Unlike the common flu that's an upper respiratory virus...The covid-19 coronavirus droplets extend into the lower level of the lung and bind themselves to the lung receptors.(deep within the lung).....Receptors within the respiratory muscles and within the lung may also affect breathing patterns. These receptors are particularly important when lung function is impaired, since they'll help maintain tidal volume and ventilation at normal levels...There are various variety of receptors within the lung. They assist to protect the lung from irritants. If they compromise severely, it becomes often dangerous and may lead issues that results in death...O.K., let me add up of the receptors. When you have a flu, you cough lots. The coughing helps your body to get rid of the fluids that is collected in your lungs, in this case lung receptors are extremely important.

But, the covid-19 virus sits in your receptors, (no good). It should keep you from coughing out the fluids that is already collected. That produces lots of droplets spreading around and those are extremely dangerous for older people, and people who have weaken system.

The CDC in cooperation with other medical groups are working 24X7 to provide a vaccine.

Covid-19 coronavirus may be fatal to children as well as seniors who's system are compromised as I related earlier, and they are highly contagious, which cannot be stress enough.

CDC recommend 6 feet distance from others. It's believed this sort of virus can last on a surface from 4 hours to 9 days. So ensure you clean all surfaces, and your hands.

If you go outside. Do not touch your face (any part of your face with your hands). Try to not to be recognized. Limit social gatheing for now. Try and stay 6 feet away from everyone. Maintaining distance may only save us from this deadliest virus and may let us see brighter days ahead.

Most coronavirus dissipate when the weather is warm. The CDC isn't sure..(YET) about Covid-19 coronavirus. They're hopeful, the nice and cosy weather will help against it.

If you've got to attend a social occasion, confirm it's well ventilated. The CDC is learning lots about the virus, every day.

On another note, The flu aka influenza kills over 50 thousand people within the USA, yearly. Thus far we've an honest handle on this Covid-19 virus. There'll be death, but most will survive too. Due to what Trump's government with the CDC is doing.

As we all can understand that covid-19 is here to stay with us, so are the things that we should be aware of:

- 1) Plague agents are airborne indoors.
- 2) Corona virus are less transmitted by outdoor wind than in still air, thus causing greater distances from person to person must be observed.
- 3) If people stand too close together, there is a risk of infection, including when unsuitable simple masks are worn.

The corona virus can cause slight or severe organic damage such as:

- 4) damage to the lungs
- 5) Damage to the heart
- 6) Damage to the coronary vessels
- 7) Damage to the heart valve
- 8) Damage to the respiratory ways
- 9) Damage to the kidneys
- 10) Damage to the brain
- 11) Damage to the pancreas
- 12) Damage to blood vessels
- 13) Damage to the mucous membranes
- 14) Damage to the limbic system

- 15) Damage can affect all organs at all.
- 16) There is no life-long immunity against the corona virus.
- 17) The corona virus will continue to exist for all time after the end of the pandemic.
- 18) There is no herd immunity.
- 19) Once corona has been diagnosed and recovered, it does not protect against a new infection.
- 20) Once recovered from corona, can be fatal if further infection occurs.
- 21) Even mild corona disease can cause various organic ailments.
- 22) Various organic ailments caused by the corona virus are stored unrecognized in the organs and years or decades after recovery can cause completely different cause of suffering and disease.
- 23) The corona virus in the human body has a long-term effect.
- 24) The corona virus also infects domestic animals and all other mammals, but also some non-mammals.

[Source : Several news bulletins published by WHO, CDC]

None of us know surely what is awaiting for us in future but to ensure that Covid-19 can not change the world as we know it, its upto everyone of us that the spread can be controlled by our efforts an initiatives. We all know there is light at the end of a dark tunnel and now its upto each of us to make sure that we are able to see the light soon.

Reference : Blogpost.com, Wordpress, Wix, Medium.

Corals and Lagoons

Manasi Sen

FE-38

The day was the 14th of December, 2019.

After strict security screening at the Samudrika Cruise Facilitation Centre, Kochi, we went to the Lakshadweep Wharf to board our cruise ship M V Kavaratti for a visit to the islands of Kavaratti, Minicoy and Kalpeni. We were cordially welcomed by the smiling staff of SPORTS Lakshadweep Administration and they guided us to our allotted cabins. We were a team of eight, and our AC cabins were on the 5th (top) deck. Rooms are cosy and comfortable with a window and attached bath, not very luxurious but spacious.

We had barely managed to drop our bags, when the ship's announcement system asked all passengers to assemble on Deck 2 for regulatory safety drill. We learned where the life boats were, where to assemble if emergency alarms sounded, rules and regulations to be followed on board and during island visits and how to put on a life jacket.

The ship left the port around 4.45pm. We were on the upper deck gazing at the vast stretch of the endless Arabian Sea and the magnificence of the changing hues of the evening sky. After sometime the huge red circle touched the horizon of the yon blue wonder and each second the sun was being devoured by the sea little by little. What a splendour!

Next day early morning we reached Kavaratti by 6am and the locals started disembarking. After breakfast we put on our life jackets and queued for disembarkation at Deck 2. We were ferried to the mainland by small boats. Upon reaching we were welcomed with sweet tender coconut water. Kavaratti is the capital of the Union Territory of Lakshadweep. The beautiful lagoon is ideal for swimming, snorkeling, jet skiing and scuba diving. Some adventurous souls went for scuba diving, that includes my son too, but my teammates and I were not brave enough to experiment this thrill. Instead we went for glass bottom boat ride to view the multi-coloured corals.

After lunch we visited the Marine Aquarium to explore the colourful marine world of the Arabian Sea. A huge skeleton of a sperm whale, a live shark and a model of the first motor fishing boat bought in 1959 needs mention. Late afternoon there was a cultural show of songs and dance by the islanders. The local people speak a language called Jeseri which has no written alphabet. It is actually a curious mix of Tamil and Malayalam passed on orally from generation to generation.

Before returning we spent sometime lazing around the island. While ferrying back to the ship the spectacular sight of colourful racing boats called 'Jahadhoni' and the marvellous sunset amidst the Arabian Sea was a feast for the eyes.

Our third day destination was Minicoy, the southernmost atoll of Lakshadweep archipelago. A long drive through the dense coconut groves and winding village roads, we reached the majestic landmark of Minicoy, the 300 feet tall lighthouse built by the British in 1885. From the top we viewed the lush green landscape of the entire island surrounded by different shades of blue waters. On reaching the resort we were thrilled to see the huge lagoon with waist deep turquoise blue waters extending from the white sand beneath our feet to the blue sky in the horizon. The water was so placid and limpid that we could see our shadows in it.

Kayaking here was fun. Until both the passengers synchronize, the boat tends to go left and right. The watersport instructors helped us to manoeuvre this skill. Though it took us a little time to adjust but then the experience was exhilarating. Minicoy is an important centre for tuna fishing and a tuna canning factory processes the catch. We bought tuna fish pickle and also enjoyed delicious tuna curry during lunch.

On the fourth morning we visited our last destination Kalpeni. No words to describe this majestic lagoon. It is a place where you can feel the purity of nature, the magic of God's creation. The watersport instructors took us to Pitti island – the Coral Paradise for snorkelling. Watching living corals of different shapes and colours was absolutely sensational. We saw myriad colourful fishes, star fish, sea cucumbers, and huge sea shells. Sorry to mention that in spite of being aware of the rules, two of our co- passengers collected corals. They were scolded by the staff for this irresponsible act as it would lead them to pay heavy fines and there is also possibility of incarceration.

Late afternoon, after lunch a group of 12 local performers wearing colourful dhoti and shirt entertained us with their singing and dancing using swords and shields as instruments and metal plates for creating music. It was a spectacular show. Later we were driven by battery operated vehicles for a visit to coconut factory and hosiery factory. We bought coconut products and T shirts as souvenirs.

While ferrying back to the ship we were planning of visiting the other islands in our next trip. Out of 36 atolls, probably 8 are accessible to tourists. The pristine beauty of crushed coral white sand beaches, shimmering lagoons and amazing shades of blue waters is really alluring. The whirlwind of emotions and feelings swept over my mind. We were in a completely different world with its natural beauty, people, food, traditions and customs dipped in the extraordinary atmosphere of calmness and composure.

Today was our last night on the ship. At the dinner table we were informed that disembarkation will start from 9.30 am. We bid goodbye to our co passengers. Lovely times spent together. It was truly a sad realization of travelling back home the next morning.

Lakshadweep Administration encourages environmental sustainable tourism. High rise structures are banned. It is completely a plastic free zone. Solar Energy is used and Rainwater

Harvesting is practised. All tourism within the islands is controlled by Lakshadweep Administration, Government of India.

My humble salute to the managers and the crew of our ship, catering team, watersport instructors, PADI Team and all the locals and islanders for their discipline and courteous behaviour. Their extra attention for the aged boarders is remarkable.

I will remember the beauty and hospitality of this place forever.

Solution to Sudoku

1	2	3	6	7	8	9	4	5
5	8	4	2	3	9	7	6	1
9	6	7	1	4	5	3	2	8
3	7	2	4	6	1	5	8	9
6	9	1	5	8	3	2	7	4
4	5	8	7	9	2	6	1	3
8	3	6	9	2	4	1	5	7
2	1	9	8	5	7	4	3	6
7	4	5	3	1	6	8	9	2

5	8	1	6	7	2	4	3	9
7	9	2	8	4	3	6	5	1
3	6	4	5	9	1	7	8	2
4	3	8	9	5	7	2	1	6
2	5	6	1	8	4	9	7	3
1	7	9	3	2	6	8	4	5
8	4	5	2	1	9	3	6	7
9	1	3	7	6	8	5	2	4
6	2	7	4	3	5	1	9	8

2	7	6	3	1	4	9	5	8
8	5	4	9	6	2	7	1	3
9	1	3	8	7	5	2	6	4
4	6	8	1	2	7	3	9	5
5	9	7	4	3	8	6	2	1
1	3	2	5	9	6	4	8	7
3	2	5	7	8	9	1	4	6
6	4	1	2	5	3	8	7	9
7	8	9	6	4	1	5	3	2

1	2	6	4	3	7	9	5	8
8	9	5	6	2	1	4	7	3
3	7	4	9	8	5	1	2	6
4	5	7	1	9	3	8	6	2
9	8	3	2	4	6	5	1	7
6	1	2	5	7	8	3	9	4
2	6	9	3	1	4	7	8	5
5	4	8	7	6	9	2	3	1
7	3	1	8	5	2	6	4	9

Sister Nivedita in Ajanta

Subhas Ranjan Mishra

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The pre-monastic name of Sister Nivedita was Miss Margaret Elizabeth Nobel. She was born on 28th October, 1868 in Ireland. At the age of seventeen, after completing her studies, she went to England in 1884. There she started her professional career as a teacher and subsequently she acquired the new methods of teachings and in a short period, she became well known. In 1895 in London, she attended the lectures of Swami Vivekananda on Indian Religion and Philosophy. She was so much impressed with these lectures that she became a disciple of Swamiji. In 1898, she came to India to help Swami Vivekananda in his work of educating Indian Women. On 25th March, 1898, Swamiji initiated her and gave her the name "Nivedita". Swamiji took her on a pilgrimage to different parts of India including Almora in the Himalayas, Kashmir, Amarnath, Lahore, Delhi, Agra, Varanasi and other places. Swamiji introduced her to the history and culture of the cities they visited during the journey. After the passing away of Swamiji, Nivedita extensively travelled throughout India and visited the important places of History, Culture, Art and Religion. As she travelled, she was pained to see "dead India". So she decided to put life in Indian people by imparting them the life and teachings of Swami Vivekananda. She reminded Indian people about their glorious past. She tried to rejuvenate Indian History, Art, Culture and Religion. Sister Nivedita came to Maharashtra thrice. Her third and last visit to Maharashtra is very important as far as renaissance of Indian Art and Culture is concerned. She not only visited Ajanta, but also inspired and guided the people to study Indian Art and Culture seriously.

Ajanta caves are 30 rock-cut Buddhist Cave monuments which date from the 2nd century BC to about 480 or 650 CE. In the year 1819, the Captain of Madras Regiment, Mr. Margon discovered the Ajanta Caves by chance while on tiger hunting expedition. He informed about this discovery to Archaeological Department. In 1821, William Erskine at Bombay Literary Society described his visit to Ajanta and how Captain Margon had discovered the caves.

Nivedita was mesmerised to see Ajanta Caves. She had written very vividly about the caves in her book. "The Ancient Abbey of Ajanta". She writes, "Twenty six caves there are in all, making one long level line, overhung by the rounded ridge of dark-blue stone that was undoubtedly chipped into shape and bareness long long ago, to emphasise that balanced uniformity which gives to this ancient abbey so much of its solemnity and beauty. As we first see the caves, from the boulder-strewn stream, some hundreds of feet away, they appear like

a succession of pillared verandahs, broken once near the middle and culminating in the distance, in the tall arched fronts of great Chaitya Halls. It is thus that we first become aware of Caves Ten and Twenty Six. How lonely and remote is this glen in which we find them. It has crescent shaped among its hills, so that the view from each monastery-cave seems close upon itself. The torrent is run through it enters, as a great cascade, at the northern end and leaves this rocky ravine without giving a hint of a world without, when twisting and windings are to bring it to a wider stream. Such are the sites that have ever seen ideal to the monks. The murmur of the running water and the voices of the waterfalls make to his ear a perpetual plan-song, in unison with the intoning of ancient psalters and the the chanting of texts. A perfect site for a monastery. It is difficult to imagine that amongst the scarped and rugged hill sides of Khandesh there could have been found another vale atonce so lonely and so beautiful.

Here, in the neighbourhood of Ajanta are many features of interest and possible significance. The railway is still 40 miles away, and as not yey had time to depange the commercial relations of the grand old market town called Neri, encircled by its battlemented walls..... From miles to the South on one side, and again from to the North on the other are the towns of Ajanta and Fardapur.

My own favourite amongst the caves is FOUR. But it is unfinished and appears never to have been painted inside. Its properties are wonderful, wide, lofty, vast. But as they stand, it is Cave one that contains the masterpiece.

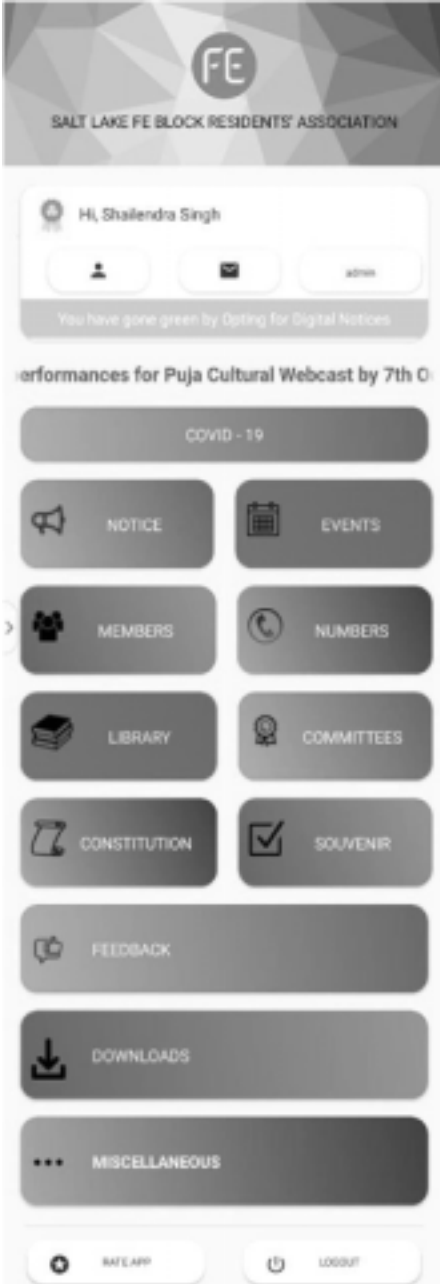
Such was her beautiful, well-studied and well thoughtful description of Ajanta which is not only artistic but geographical, historical and social as well. Whatever she undertook it became a masterpiece.

In conclusion, I and my wife had an opportunity of visiting Aurangabad and adjoining different places of historical significance of which Ajanta, Ellora can be specially mentioned.

Go Green -- Go Digital

Shailendra Singh

FE-330



Salt Lake FE-Block Residents' Association has already launched a Mobile Application (App) to communicate with their residents in real time. Apart from being a digital initiative, this is also a **Go Green** initiative. We will save about 20,000 sheets of A4 paper that we annually consume to distribute paper notices/circulars. This type of App is perhaps first of its kind in Salt Lake City.

You can install the app by searching "*Salt Lake FE Block*" in **Android Play Store**. After installing, you would be prompted to provide your Mobile number to get OTP. Type and Submit the OTP. Then you would be asked to provide your own details such as Name, Plot No, email, DOB etc. After you submit all the details, the App is registered and you will see a home screen like the picture in left. The home screen buttons are self explanatory. Year and Month of date of birth (DOB) is mandatory, Date is optional at all places.

Just below your name, in the top left corner is profile section. Here you can edit your own profile as an App user as well as that of Association member from your family. If you is member then you have to provide your details under My Profile as well as under Member's Profile. Update Member's spouse details in this section.

Here In this section, there is Emergency Contact Section where you can store name and mobile number of you a person who needs to be contacted in your emergency. Here you can also save your doctor's name and number, along with your ailments. Information in this section

is important for senior and aged citizens who live alone or both the couple are elderly. In case of emergency, Association can retrieve this information and call up the contacts you have noted.

Another Sub-Section is SOS – Panic Button Nos. Numbers stored in this section will get automatically dialled and SMS alert sent, as soon as you press the SOS Panic button in when you are in medical, accidental, criminal emergency. This SOS Panic Button will be provided in next version of the App. Very senior residents who cannot operate smart phone can ask their family members to install and update on their behalf. Do Remember to Rate Our App In Play Store

Upcoming Version : Soon we will have iOS (Apple) versions around Puja Holidays.

Upcoming features will include online payment of Subscription & Donation. You can set reminders for renewals of Insurance policy, Driving Licences, Road Taxes, Passport, etc. You can set the reminders even without sharing all the details of these documents. You can use aliases or dummy numbers or names. App Help Desk No. 9830042406

Benefits of this Mobile Application.

You can instantly read Notices and Circulars as soon as Secretary uploads. No risk of Corona through paper notices that reaches your home. No more complaints of “*Notice Paaee Nee*”. Everyone in the family who installs the App will get access to all the communications and events. You can even access old notices. You will get Notifications/reminders for events on the day of the event.

In the Feedback section you can raise complaints about dis- functional street light, dead animal etc. which will get notified to the Association.

Under NUMBERS section you can get important numbers of hospitals, dial the important and emergency nos. such as of hospitals, electric supply, fire, police etc. Long pressing any number will make a call.

E-mail and website of FE Block

e-mail: saltlakefeblockasso@gmail.com

website : www.saltlakefeblock.in