



## COVID-19 and our DNA

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On December 31<sup>st</sup> 2019, Chinese Health Authorities in Wuhan city of their Hubei province, diagnosed 29 pneumonia cases of unknown etiology and informed WHO (World Health Organization). The unknown virus resembled SARS (severe acute respiratory syndrome), that occurred in China in November 2002, caused by a novel corona virus spilling over from an animal reservoir and transmitted by respiratory droplets. More than 8000 cases and 774 deaths were caused by SARS and circa US\$20 billion coasted for its control (Whitworth, 2020).

### Bionomic Studies:

Professor Chaolin Huang MD, with a team of 30 specialists in the field of epidemiology, clinical evaluation, laboratory testing, radiobiology and molecular-biology characteristics, as well as for treatment and clinical outcomes, started investigations. Researchers communicated directly with the patients or their families to ascertain epidemiological and symptom data.

By January 2<sup>nd</sup>, 2020, 41 isolated hospital admitted patients had been identified and confirmed through laboratory-testing by real-time RT-PCR and next-generation sequencing of having novel virus infection. It was established that these cases were associated with a seafood market where wild animals and live poultry were also sold. Environmental samples obtained from this market were found to be positive for Corona virus, suggesting a possible animal reservoir for this virus and zoonotic transmission, i.e., from animal to human; strengthening the hypothesis that it is a zoonotic virus. (Huang et al., 2020). Within a month it had spread throughout China and beyond. The Public Health Authorities conducted ACD (active case detection) finding and testing, contact tracing and quarantining of cases and contacts.

### New Species of RNA Virus:

The virus was identified as a novel beta-corona virus and the genetic sequence revealed that it is a new RNA virus species, named "SARS-CoV-2" belonging to the family Coronaviridae of the order Nidovirales. Corona viruses are enveloped on-segmented positive-sense RNA viruses. They are broadly distributed in humans and other mammals. The infection is now officially termed COVID-19.

### Outbreak of COVID-19:

The outbreak started moving from person to person - through contact (hand shaking, hugging and kissing), through vehicular transport from place to place, through international air travel, affecting neighboring and distant countries and it spread globally, like a wild fire, causing high morbidity and mortality. On January 30<sup>th</sup> 2020, WHO declared the pandemic a public health emergency of international concern. Thus, the outbreak became an extraordinary event of a public health risk requiring a coordinated international response. The current figures for the world, as on May 12, 2020, were: 4,318,171 infected; 1,569 recovered; 291,354 death. The figures vary from country to country due to ethnicity of the population and socio-cultural environment.

In Pakistan, the first case of COVID-19 was diagnosed in Karachi, on February 26, 2020, in a person came back after pilgrimage. The current figures as on May 12, 2020, were: 34,307 infected; 8776 recovered; 737 death. The scenario of infection rate - morbidity and mortality - is changing on hourly basis and the figures are rising constantly.

### Management of COVID-19:

In the absence of treatment of RNA viruses, management and control the spread of COVID-19, health and administrative authorities in many countries enforced lock-out: educational institutions, local and intercity transport, industrial units, markets, restaurants, etc., were closed; religious and social congregation banned and people advised not to come out from their houses unnecessarily, however, the people are following the safety instruction half-heartedly. This technique slowed down the morbidity and mortality rates but with the passing days simultaneously enhancing the psychological stress and economic burden on the individuals and the state. Print and electronic media presented all sorts of technical and non-technical persons in their columns and talk-shows emphasizing their point of view, which created confusion and panic.

### Health System:

The existing health system in Pakistan is based on “Curative medicine” and the “Preventive medicine” is almost ignored. It appears that Epidemiologist is a very rare specialty in Pakistan, not visible taking part in the management of the pandemic. Perhaps there is none in any public health providing institutions in Pakistan.

#### **IHPM:**

In 1948, IHPM (Institute of Hygiene and Preventive Medicine) was established, containing M.B.B.S. and Ph.D. experts - Epidemiologist, Entomologist, Parasitologist, Public Health Engineer, Virologist, etc., - who were teaching and doing indigenous research, as well as, offering DPH, after a 2 year course in preventive public health, to students from East and West Pakistan. That was a right step in a country where 82.34% people are dying due to communicative, infectious and vector borne diseases (Khan et al., 1991).

Unfortunately, IHPM was converted into a College of Community Medicine in 1980. As a result of change, some posts were abolished, some never filled, while some were filled with irrelevant person, e.g., Parasitology was given to a Pathologist, Entomology and Epidemiology to simple untrained doctors. That was the end of Preventive Medicine in Pakistan. The existing expertise and infrastructure, capable and trained to manage public health problems and emergencies, disappeared with the passage of time. Since then to date neither Federal nor Provincial health authorities did anything to enhance preventive medicine capabilities in the country except taking isolated control programs, like Tuberculosis, Polio, Dengue, which are still extant.

#### **1976 Epidemic:**

On February 9, 1976, the whole country was shocked by the daily Pakistan Times headline: “Doctors get it from patients” and “6 infected by danger virus”. NHL (National Health Laboratories), now NIH (National Institute of Health) was assigned to investigate the outbreak. Col. M. I. Burny, then Director NHL, assured the nation that there is no danger of epidemic, Virus is Vector borne, vaccine likely, patients progressing, WHO virus expert arriving. However, Surgeon Matin Siddiqui and 2 others died, which created panic through newspapers depressing coverage. Even PMA (Pakistan Medical Association) urged Hazard Allowance for doctors. Government announced Rs 40,000 for the widow (worth 400 *tolas* of gold).

In the meantime, outbreak started moving south. A case reported from Hindu Chak, Gujranwala, alerted Brigadier Khawaja, Secretary Health Government of the Punjab, who asked Prof. Shamim Bukhari, Microbiologist to the Government of the Punjab, to attend an emergent meeting on the status of the unknown virus epidemic, along with relevant experts, for epidemiological investigations of this epidemic. During discussions in the meeting it ensued that the unknown virus clinical picture points towards CHFV (Crimean Haemorrhagic Fever Virus) that is transmitted by ticks, which explain the first case but not its southern movement, unless the patients were in Rawalpindi and had contact with infected ticks. On our request, Brigadier Khawaja instructed all the DHO (District Health Officers) to isolate suspected cases, draw 5 ml blood, cover the needle, put the syringe in a thermos flask containing ice and send it to Birdwood Road with a special messenger. We visited the probable source Takian village, district Rawalpindi, purchased a goat and got permission to draw blood samples from the flock, collected mosquitoes from all the spots, where cases were reported (from Rawalpindi to Multan). On testing, the collected material revealed low or high titer of the “danger virus”. However, as we were exploring, forensic epidemiology pushing the probability of chance occurrence of the epidemic away, particularly as we recovered the danger virus from the Yellow Fever mosquito - *Aedes aegypti*, which is anthropagus, does not normally feed on goat and not a vector of CHFV.

#### **An Unbelievable Association:**

Here we recall a first ever case, internationally, of a tick-borne virus from a mosquito. In 1966 we initiated a study on the bionomics of mosquitoes of CMNF (Changa Manga National Forest) to ascertain the species diversity and their bionomics - anthrophagy (feeding on human), zoophagy (feeding on animals), endophilism (resting in houses), exophilism (resting outside), etc. We found faunal diversity of 29 mosquito species, some rare, some new to Pakistan, while all reported first time from CMNF. Various mosquito species pools were also used for virus isolation as nothing was known about the arboviruses and their vectors in Pakistan. In one pool of *Mansonia uniformis* mosquitoes a virus was isolated, which shocked our virologist Dr. Fatima Begum, who shaking her head in disbelief, said “how come that CHFV is present in a mosquito species while its natural vector is a tick” (Aslamkhan and Salman, 1969). Perhaps the mosquitoes were feeding on migratory bird roasting in CMNF. To verify it further we initiated a sero-epidemiological prevalence study for the presence CHFV antibodies in the resident population of CMNF. We were surprised with the result: circa 30% men possessed CHFV antibodies without any illness history - past or present. We hypothesize that the development of antibodies is the result of sublethal infection through ticks and/or mosquitoes in the forest workers. Final report was submitted to the Secretary Health Government of the Punjab, with the successful control of the outbreak without any further mortality, with the comments that probability of natural occurrence

of CHFV is null percent. To check the validity of COVID-19 our lab developed a PCR method to detect the novel virus, which is an open access article (Chaudhary et al., 2020).

#### DNA:

Life starts with a single cell that contain the complete sequence of our DNA, in the form of 23 pairs of chromosomes, one member of each pair comes from the mother, the other from the father. Chromosomes carry about 29,000 genes, which contain written information about our physical and mental characteristics; this DNA endowment is called genome. Human genome is 97% similar to gorilla and 98% matches with chimpanzee and only 0.5% differs with any other person. This difference is obvious with reference to reaction of corona virus latest novel species and human genome, as found by Prof. Huang results: The onset of infection commonly presented in these patient was as follows: fever 98%, cough 76%, and fatigue 44%. This means that the virus behaved differently with different person of the same ethnic group, all Chinese. Even the fever was not 100%, which points that 1 to 2 % positive cases may be treated as negative by thermal testing. The other common parameters, cough and fatigue, show more difference. RNA viruses cannot duplicate themselves. They require a genetically compatible host for their replication. We tested this hypothesis on HCV (hepatitis C virus) and found that circa 15 to 30 % men were totally resistant to HCV infection, 30 to 60 % patients were mildly susceptible, while 15 to 30 % were highly susceptible. COVID-19 may have the similar reactions with human DNA characteristics, which we are observing. The ultimate mortality rate may be from 0.09% to 2.09%.

COVID-19 is not spreading itself, we human are spreading it through contact and not following the safe hygiene procedures, as we followed in smallpox, which is now eradicated. Some basic research that lead to smallpox eradication, done in Lahore, was the absence of animal reservoir and that every new case lead to a trail of contacts. The cases were completely isolated till the recovery or death (mostly blood groups A or O). We neither know about the primary and/or secondary host of COVID-19 nor its prevalence. These information are important for control and management of an epidemic. To determine mammalian host, Universities can take up this research question. Prevalence can be determined through Cluster testing of 100 normal random persons in different parts of a city. The percentages of high infection could have given the priority areas for action.

Lock-out is not the solution as after lifting it after a week or month, the clean population will be exposed to the pathogen, that is present in "X number ?" of population, which we do not know. Health universities/institutions can do this research. There are many models to predict the persistence of infective agent, which will become ineffective after the population has achieved a herd immunity. Many countries have lost a large number of patients from their genetically susceptible population, and they are moving towards herd immunity.

The whole world is in a state of helplessness - strong or weak, rich or poor. There is no medicine to cure the COVID-19 and no state-of-the-arts hospital, in the most advanced country, can save you. People are praying according to their faith to save them from this "bla". This is not a "bla" but a latest form of life by the almighty Creator.

I am thankful – *Alhamdulillah* - to the Creator of all life that this novel species is not "Air-Borne" otherwise we would have no place to hide ourselves. We Muslim, who claim that *Insan* (human being) are the best of all the creations - "*ashrafumakhlūqat*", are now praying Allah to save us from this unseen creation. Are we the best of all creations - one may ask? The Creator informed us in Al Quran, sura 7. *Al Isra*, verse 70 that *Insan* is better than most of the creations, but we insist that we are best of all. Let us read the translation by PICKTHAL:

*"Verily we have honored the Children of Adam. We carry them on the land and the sea, and have made provision of good things for them, and have preferred them above many of those whom We created with a marked preferment."*

Instead of fighting with COVID-19, we must agree to its supremacy and keep ourselves away from it and plan for future health emergencies: Those who do not plan are planning for failure.

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