

Corona War Requires New Formation At The Health Frontier

Ever since the corona pandemic started last December from China, our world has changed in many ways. Now the air is fresher and the grass is greener though human civilization longing for these changes are in a troubled water. In containing the COVID-19 outbreak, China imposed a harsh lockdown quickly bringing situation under control, though rest of the world is struggling to replicate that feat. Freedom is innate to humanity and to get locked down for whatever reason appears anti-freedom hence non-compatible. Presently, its efficacy is also questionable, as COVID-19 is back to Wuhan through emergence a cluster of new infection. Consequently, World Health Organization (WHO) says, this may not be a plateau of pandemic having stiff ascent and descent. Rather a pandemic procession of wave is ahead requiring long term calculative navigation to sail safe.

The wave pattern of this pandemic has been typically observed in Japan, since confirmation of the first case on 16 January. Initially, the country didn't plan for any outright shutdown ahead of the 2020 Olympics. Hence the number of daily positive cases were kept under check through tight measures, though loosening of the grip resulted in an upward rebound. The pattern continued until April, when there was a sharp rise in per day positive cases and Prime Minister of Japan was left with no choice but to declare a nationwide emergency on 16 April, which may be in effect until end of May. A recent Kyodo News survey has revealed that more than half of the population is dissatisfied with this strict regulation to stay home and shut down business. Consequently, authorities in Osaka Prefecture, the nation's second largest economic region, set its own numerical targets in an attempt to lift up the emergency earlier. The three numerical targets are; i) the positive rate among people tested for the virus be under 7 percent ii) the number of new cases with unclear infection routes comes down to below 10 per day and iii) the occupancy rate of hospital beds for severe symptom patients stays under 60 percent. If all of these targets are attained for seven consecutive days, the emergency may be lifted.

Frustration has been building worldwide out of inability to effectively contain this pandemic. United States announced to halt funding to WHO accusing that it has "failed in its basic duty" in its response to the coronavirus outbreak.

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America's allies now appear reluctant to fill the gap left by U.S. decision. The rest of the world stood beside WHO with China making a generous donation, though the decision of the U.S. and its allies to stay away has made prospect grim. On December 31, 2019 China first informed WHO about the outbreak of SARS-Cov-2 virus but refused to allow scientific observers to visit the location of outbreak. Later, a WHO 'Joint Mission' consisting of 25 national and international experts was permitted a visit the location only for 9 days starting from 16 February 2020. The visit was timed three weeks after locking down 16 cities of Hubei province including the Wuhan city. The mission completed with publication of a report that described the symptoms of COVID-19 to be mostly non-specific, where disease presentation could range from no symptoms (asymptomatic) to severe pneumonia. Postmortem report of a single case from Wuhan was taken into consideration that revealed histopathological findings consistent with of acute respiratory distress syndrome (ARDS). Only the lungs findings were described without elaboration of the cardiac, liver, kidney or other organ pathology.

As the pandemic started to engulf the European countries and U.S., medical journals were flooded with reports describing that COVID-19 pathology is not only that of ARDS, and the mortality rate is higher than previously reported, having significant correlation with a condition collectively termed the 'cytokine storm'. Lung autopsies revealed notable lymphocytic aggregates around thrombosed blood vessels, associated with hemorrhage in the surrounding tissue. Meanwhile, a non peer-reviewed publication from Sichuan University of Science & Engineering of China has been circulating in the social media with unusually high frequency, offering that the hypercoagulability and clot formation phenomena is due to SARS-CoV-2 attacking blood hemoglobin. Later, the claim was refuted by researchers around the world, since red blood corpuscles (that contain the hemoglobin) neither bears ACE-2 receptor which is the gateway for the virus to enter into a cell, nor has any nucleus where the virus would replicate through incorporation into DNA.

According to the WHO Joint Mission estimate, SARS-CoV-2 is a virus with an R0 of 2 to 2.5. For seasonal strains of flu, R0 lies between 0.9 and 2.1, whereas for measles it is a whopping 12 to 18. According to epidemiology, R0 (R nought or basic reproduction number) of an infection is the expected number of cases directly generated by one case in a population where all individuals are

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susceptible to infection. The 2 to 2.5 R_0 of SARS-CoV-2 indicates that at initial stage the virus has the potential to be transmitted from a single person to 2 or 3 persons. The R_0 also determines the herd immunity threshold and therefore the immunization coverage required to achieve elimination of an infectious disease. The WHO estimate of R_0 for SARS-CoV-2 at 2 to 2.5 thus indicate that the herd immunity for the virus would be 60%, which is rather close to that of seasonal influenza. Herd immunity is the form of collective protection from an infectious disease, that can happen in two ways. Either people may get infected naturally in time to build up collective protection or people may get themselves vaccinated against the disease to achieve it. A 60 percent herd immunity for SARS-CoV-2 would mean that if 60 out of 100 persons get the immunity either by natural infection or through planned vaccination, the disease would be eliminated.

Report of the WHO joint commission that SARS-CoV-2 is essentially a respiratory illness with R_0 close to that of influenza imparted a benign character of the virus. This might have influenced the western countries to take a casual stance against this pandemic initially. But when it reached those countries, spreading amazingly fast and inflicting heavy casualties, some re-assessment revealed that the R_0 of SARS-CoV-2 may be as high as 6 to 7 requiring 80 to 90 percent of the people to get infected for attaining natural herd immunity. Thus, the plan of attaining natural herd immunity was discarded outright. The mortality rate was also higher than 3.5 percent as reported by WHO, owing to the 'cytokine storm'. Cytokines are a group of signaling proteins that are produced on cellular activation, playing important role in normal immune response. The term 'cytokine storm' refers to an abrupt release of large quantity of cytokines in an unregulated way, which is extremely harmful. A cytokine storm can occur because of an infection such as COVID-19, autoimmune condition, or some other diseases. The cytokine storm devastated western countries, as hospitals were overflowed, morgues were overloaded and health care systems were on the brink of collapse. Healthcare experts as well as policy makers realized that this pandemic is way serious than seasonal influenza and had to impose an indefinite strict lockdown.

Bangladesh has been watching this pandemic all the way, from its outbreak from China up to its wreaking havoc across west. In February, a large number of expatriates returned home from Italy, the then epicenter of the

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pandemic. Institute of Epidemiology, Disease Control and Research (IEDCR) of Bangladesh is the designated government organization to handle any new infectious disease entering the country. Accordingly, the institute started setting up screening points at all air, water, and land port entries, though dissatisfaction was voiced in the media about its adequacy and efficacy. The first COVID-19 case was identified in Bangladesh on 8 March and the first death was confirmed on 18 March. Then IEDCR informed news media that community transmission of the disease started. To contain rapid spread, a virtual lockdown was announced by the Prime Minister on 26 March. Till that date, there were only 48 known positive cases and 1 reported death. Despite the lockdown, the number of positive cases kept rising gradually. The number of daily positive cases crossed thousand mark on 11 April and the number of deaths per day reached a double digit. Meanwhile IEDCR stepped aside from its key role apparently being replaced by directorate of disease Control, the conventional wing under Directorate General of Health Services (DGHS). Meanwhile, handling of the pandemic by IEDCR in a very restrictive way rather contributed to the social stigma that COVID-19 is a forbidden disease. Patients visiting private clinics and hospitals for non-specific fever or other similar symptoms were refused treatment and referred to IEDCR for testing, thus creating a bottle neck situation causing huge public suffering. Frustration built up among public health experts because the situation was contrary to the track record of Bangladesh which received global recognition in successfully attaining the millennium development goals (MDGs), where health targets were essentially containment of such communicable diseases.

There are several reasons as to why Bangladesh has been struggling to confront the COVID-19 despite an excellent track record. The MDGs expired in 2015 with concomitant launching of Sustainable Development Goals (SDGs) by United Nations (UN). One of the main health related goals of SDGs is to reduce premature mortality from non-communicable diseases (NCDs) by the year 2030. Presently, 70 percent of the mortality in Bangladesh are due to NCDs, the top five being coronary heart disease, cerebrovascular disease (Stroke), diabetes related complications, chronic respiratory diseases and cancer. To attain the SDGs health goals within predetermined time target, health care delivery system across the world, Bangladesh alike, was re-structured from tertiary to primary levels. A NCDs corner was opened at every upazila health complex, whereas the communicable

disease control was reduced to the extended program of vaccination (EPI) as communicable diseases were on the wane. So, when the COVID-19 pandemic started the assault, healthcare formation was caught totally off guard.

Bangladesh was further on backfoot as the Non Profit Organizations (NPOs), the important development partner of government in achieving MDGs, struggled to adapt with the UN policy favoring business organizations to achieve SDGs. UN has been patronizing its SDG Business forum through various events and activities constantly. A number of NPOs has been restructuring themselves to cope up with the UN policy. However, as Bangladesh moved above from the group of least developed country (LDC) to the group of developing countries, NPOs faced a general downturn in receiving overseas funding. As per data from NGO Affairs Bureau of Bangladesh (NGOAB), the donor aid commitment fell by 20 percent over a three-years period from FY 2014 to 2017. Consequently, those long-trusted partners are mostly unavailable at this time of serious health crisis.

According to WHO, allocation in the health sector has to be at least 15% of the total budget of a country. In Bangladesh in FY 2019-20, health sector allocation was 1.02 percent of GDP and 5.6 percent of total budget. The situation looks gloomy though it may be interpreted as a silent government strategy to allow the private sector to grow and shoulder more healthcare burden. Though that was too silent probably because many of the private sector stakeholders were the policy makers themselves. At present, approximately 70 percent of the healthcare provider organizations (hospitals, clinics and diagnostic centers) are under private ownership. Whereas out-of-pocket (OOP) health expenditure by patients is 64 percent, which is much higher than that of the world average of 32 percent. With the rise of per capita income, people continued to endure this burden accepting the harsh reality that healthcare is more a commodity than basic right. On this context, the overall situation emerging out of COVID-19 crisis is, private healthcare organizations are there, people are willing to pay, but the bottle neck strategy made the private sector nonfunctional.

The situation is especially critical at Dhaka the epicenter of this pandemic. Recently the government designated a few dedicated COVID-19 hospitals, though that number is inadequate for rapidly growing number of

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patients. Furthermore, healthcare workers are worried about rendering services since availability of safe personal protective equipment (PPE) has become difficult due supply shortage combined with abundance of unsafe PPE in the market. The WHO emergencies chief recently said, COVID-19 could become another endemic like HIV which may never go away. Consequently, in addition to the few dedicated private hospitals, quick decision to involve majority of the private hospitals having ICU support at Dhaka and other large cities would be necessary. Furthermore, some hospitals require to be specifically dedicated to foreigners at areas where the foreigner community resides, such as Gulshan and Baridhara of Dhaka city. For the past couple of months, I received many phone calls from Japanese residents at Dhaka. as their number has been surging due to increased Japanese investment in the country. Major queries were about hospitals in their neighborhood where reliable test and quality treatment could be availed in case of COVID-19 infection. Since they are accustomed to services from private hospitals and none in their neighborhood was a dedicated COVID-19 hospital, they were left with no other choice but to leave the country. Majority would consider returning as soon as the situation is under control with availability of adequate testing and treatment facilities in their neighborhood.

Whether lockdown should be imposed has been a bone of contention between economists and healthcare professionals around the world. Lockdown is easy to implement in a regimented society with state managed economy, but difficult elsewhere, especially in a developing country. We are living in a massively globalized world and a complete lockdown neither can cause the SARS-CoV-2 virus to permanently disappear from any country nor can it be a comfortable lifestyle, especially to the foreigner investors. Obviously, flattening of the curve (wave) through setting numerical targets would be the most appropriate approach.

The Osaka numerical targets partly reflected results of a research publication from Chiba university of Japan. The publication was based on analysis of data collected from 49 countries. The findings revealed that in countries with large PCR test numbers, when the percentage of samples tested positive is under 7, corresponding percentage of death is low. On the contrary, when the percentage of positive sample exceeded 7, the corresponding percentage of death becomes exceedingly high, almost double. One of the reasons behind the

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disproportionate increase in percentage of death could be related to the bed capacity of hospitals for seriously ill patients. Thus the third target of Osaka prefecture requires that the occupancy rate of hospital beds for severe symptom patients to stay under 60 percent.

In elucidating a similar numerical target for Bangladesh, at first adequate number of tests must be done. Even on a modest count that number would be 20 thousand tests per one million people. At present, approximately 7 thousand tests are being done daily, with a 14 percent positive sample rate, though death rate of patients who tested positive remains low at 1.5 percent. This is much lower than the 3.4 percent global death rate reported by WHO. A low death rate has also been reported in other South Asian countries, the most plausible reason being the predominantly young population of the region. Some reports have credited widespread use of tuberculosis vaccination in these countries which could have offered a T lymphocyte mediated immunity supportive to the B lymphocyte mediated antibody formation. A group of Indian researchers observed that global severity maps of ongoing dengue epidemic and COVID-19 pandemic do not overlap. Countries where dengue is highly endemic (>1.5 million cases/year) appear to be less hit by COVID-19 pandemic in terms of infection and transmission. A pre-existing immunity to dengue virus may have a negative impact on transmission, severity or pathogenesis of COVID-19 infections.

In addition to conventional immune booster foods and supplements, I would like to mention here the unique ability of turmeric a household spice, in protecting endothelial cells that line the blood vessels. Researchers observed that supplementation of curcumin the most active compound of turmeric, improves vascular endothelial function in healthy middle-aged and older adults by increasing nitric oxide bioavailability and reducing oxidative stress. As hypercoagulable state and clot formation tendency observed in Covid-19 patients results from endothelial dysfunction caused through the SARS-Cov-2 viral infection, turmeric may have a protective role.

For implementing numerical targets for Bangladesh, epidemiologist and public health experts would require modifying the Osaka parameters in accordance with the situation prevailing and availability of resources in the country. Recently, false negative results of PCR test have become a growing

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concern for case tracing and patient isolation. I mentioned in a previous write up (in Bangla) that containing this pandemic, requires coordinated effort of experts from multiple disciplines, from public health personnel to molecular biologist. Unfortunately, a considerable number of Japan trained molecular biologist remains underutilized at this time of crisis. Recently a professor of molecular biology of Dhaka university with Japanese higher education background, reiterated that the fluorescent probe required for real-time RT-PCR can be constructed in Bangladesh. Obviously, the global scarcity of PCR kits can be overcome through supporting local production, which may also find an international market in future. Alongside PCR testing, the antibody detection program needs to be implemented quickly to check seroconversion and assess herd immunity. Antibody kits are being manufactured in many countries around the world. Japan provided the basic ingredient of antiviral drug fravipiravir to Bangladesh for free. Now as Japan is about to start a nationwide serological survey, Bangladesh may approach this trusted friend regarding support for antibody kit as well. This is the appropriate time for Bangladesh to look east for a trusted ally in this corona war.

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