



The Tsunami of a Killer Virus (SARS-CoV2) Ravages India: Call for Action. Viewpoint (Short Communication)

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Abstract

Desperate times needs desperate measures. According to health experts in India, the country recorded the highest COVID-related deaths per day exceeding 4500 this week. India the largest democracy, managed the first COVID surge very well by initiating a complete lockdown even though the number of COVID infected individuals were not very large. The leaders declared that they had won the war against the killer virus. However, the second wave of the virus spread like a forest fire without giving any time to get prepared for this tsunami, exposing the vulnerabilities of an inadequate healthcare system. This unprecedented pandemic has created a nightmare for public health workers, critical care workers, clinicians, nurses, medical supply chain and services. The country has realized the magnitude of the problem and has not found a way to get out of this health care crisis. It is high time that the country should put together an 'expert committee' and develop a robust prevention and management strategy. In the absence of such a task force the public health issues are left to the officials of various States and Districts. The leadership went from 'it is not a problem anymore' to 'it has gone too far to do anything.' India cannot afford another lockdown as the low-income and resource poor individuals will suffer. They can follow limited lockdown and initiate strict public health best practices immediately. They also should accelerate vaccine production and vaccination of all eligible adults. What is certain is that India, will vaccinate far more people than any other nation by the end of the year. India will come out of this crisis with an improved healthcare infrastructure.

Keywords: Coronavirus; COVID-19; Killer Virus; Call for Action

In the previous issue of this journal, I mentioned that these are challenging times, and we need to use the scientific knowledge and all the resources available to get through this tsunami and be prepared to face any future pandemics [1]. At the time of this writing the USA, India, and Brazil are still the top-ranking countries with the highest COVID-19 positive individuals. According to the COVID-tracking website of Johns Hopkins University (coronavirus.jhu.edu May 7, 2021), the USA is still leading with over 32.6 million COVID positive individuals and India has over 21 million COVID positive individuals. Major difference between conditions

in these countries being the population and available healthcare resources. As far as COVID-related deaths, the USA ranks number one with 580,120 deaths, Brazil following closely with 416,949 deaths, compared to India with 234,083 COVID-deaths. Even though India is still not the number one country leading in these metrics, the COVID-19 pandemic in India has become the major news item for the devastation caused by the tsunami of coronavirus-2019 (COVID-19). If one looks at COVID-deaths worldwide per one million population, Brazil is ranked 11th and the United Kingdom is ranked at 13th position. The USA and India with 500K and 200K deaths are

not even in the list of top ten countries. The USA is in the 15th position and India is not listed even in the list of top 50 countries. Then why is this panic around the world about the ravages of the coronavirus in India? In January of 2021, the leaders had declared India's victory over this pandemic. Entire world was looking at India as a model country. The second deadly wave of the virus was not anticipated by anyone. The country and the people of India went into a relaxed mode and ignored warnings by the experts about the possibilities of a second wave of the deadly virus. In less than 100 days the second wave of the virus has hit the nation with new variants (B.1.617.2) and has caused unprecedented havoc.

The pandemic has created panic at all levels. The suddenness of such a great wave of infection and deaths, has had a devastating effect on existing healthcare delivery. This tsunami of COVID has exposed the unpreparedness of healthcare facilities. Suddenly the country has realized deficiencies in healthcare infrastructure, human and material resources to handle such an unprecedented tsunami of COVID. There were not enough hospital beds, trained critical care workers, pulmonologists, doctors, nurses, ICU units, ventilators, medical supplies, medical-grade oxygen for therapeutic purposes, and general guidelines for public safety. Added to this, as seen in other populist countries, political leaders, public health specialists and healthcare workers have ignored the scientific advice, mismanaged the pandemic, and created this chaotic condition. Since the beginning of April, India has reported over 2 million new cases. In the last two weeks, there are over 300,000 positive cases reported per day reaching at times over 400,000. World news media speculates that the actual number may be 10-to-20-fold greater. The speculation is that by October of this year India may see as high as million COVID-related deaths. Prestigious Indian Institute of Science, Bengaluru, predicts a whopping 4,04,000 deaths by June 11th of this year. These are preventable deaths. To reverse this tragic public health crisis, we must move quickly and develop appropriate strategies for the prevention of new infections and introduce robust management practices for COVID-positive individuals. Furthermore, this unprecedented pandemic should serve as a guide to develop appropriate preventive measures for the management of future pandemics. There is a general belief in the public that coronavirus is like the common cold virus and not at all lethal as described by the public health experts. It is time, that they learn more about this killer virus and learn to respect public health advisories.

Coronavirus disease was first reported in the City of Wuhan, China, in December of 2019. At that time, Wuhan was considered the epicenter of coronavirus disease. Later it was Bergamo in Italy, New York in the USA and currently, India is the epicenter of the coronavirus disease. Coronavirus genetic sequence was shared by Chinese researchers on January 11, 2020. The rapid identification, genomic sequencing helped develop the mRNA-based COVID-19 vaccines by Pfizer BioNTech and Moderna laboratories. The genome of the virus is around 29.8 kilobase, containing six open reading frames. The main mode of transmission is through respiratory particles. Spike (S) proteins of SARS-CoV2 seem to have 10-to-20-fold higher affinity to the human angiotensin enzyme (ACE2) receptor than that of SARS-CoV. The high affinity of S proteins to the ACE2 receptor, the ubiquitous distribution of this enzyme in various tissues, and the additional advantages offered by the transfection facilitators Furin and Neutropilin-1, likely contribute to the rapid spreading of this virus. Since this enzyme is highly expressed on a variety of cells, including vascular endothelial cells and adipose tissues, individuals with compromised function of these tissues drive greater infection and severity in individuals with underlying medical conditions [2-16]. The overall mortality due to COVID-19 seems to be higher in people with underlying health conditions such as chronic lung disease, serious heart conditions, high blood pressure, excess weight, obesity, and type-2 diabetes. Global health experts estimate that 1.7 billion people of the global population have at least one underlying condition that puts them at higher risk for coronavirus disease. According to experts, one in five individuals worldwide could be at risk for severe COVID-19 due to underlying health conditions.

The Atlantic wrote on 05/08/2020, "A virus thousand times smaller than a dust particle has humbled and humiliated the planet's most powerful nation. America has failed to protect its people, leaving them with illness and financial ruin. It has lost its status as a global leader. It has careened between inaction and ineptitude. The breadth and magnitude of its errors are difficult, now, to truly fathom". Six months later we are seeing a repetition of what happened in the USA in India. The difference is the sheer number of the population, lack of hospital beds, ICU units, ventilators, medical-grade oxygen, health care infrastructure, and human resources to cope up with this unprecedented demand. Dr. Devi P Shetty of Narayana Health, -one of the leading health care facilities in Bengaluru-

ru, India, was on a 'panel of experts' recently talking about the current Covid surge. According to him, there is an immediate need for 200,000 nurses and 150,000 young doctors in the next few weeks. Their services are needed for at least one year in anticipation of another third wave of the virus outbreak. He further elaborated that the virus does not discriminate between the Americans or the Indians when it comes to the severity of the diseases and COVID-related mortality. He told the panel that India is the only country that can produce such massive health care providers immediately. Currently, 220,000 students have finished their nursing courses and preparing for their final examinations. Similarly, 130,000 young doctors have finished their medical studies and are preparing for their National Eligibility and Entrance Testing (NEET). The government of India should rope these massive trained young individuals to provide COVID service under the supervision of clinicians. For further information on such panel discussions of the medical experts, readers are urged to search YouTube Videos on this topic.

When I contacted Dr. Devi Shetty recently, he wrote, "Like always I am optimistic, we will come out of this crisis successfully". With 400,000 COVID-19 cases in the state of Karnataka, the State government drew a detailed action plan to combat the pandemic recently. The action plan includes roping in final year students of MBBS, Nursing, Pharmacy, Physiotherapy, Ayush doctors, dentists, and hospital management, for COVID-19 duty. National Medical Commission has recommended that the COVID-19 management duty by the MBBS students be counted towards the compulsory rotating internship. Prime Minister's Office calls for utilizing final year MBBS students for Teleconsultations, monitoring mild Covid cases under faculty supervision. Looks like things are moving in the right direction. Karnataka government also has announced a State-wide total lockdown.

How about the response of international experts to this devastating surge in India? International Health Metrics and Evaluation (IHME) of the University of Washington, professor Dr. Christopher JL Murray has shared insights from the latest COVID-19 model. In this week's IHME analysis of the pandemic, the focus is on the extraordinary surge of COVID in India. He speculates that infections driven by the surge in India, perhaps Bangladesh and Pakistan will drive the number to 15 million a day globally. The huge epidemic is likely to continue at least into the second week of May. Dr. Anthony Fauci, the US White House's chief medical adviser said countries

have failed to provide an adequate global response to prevent the "tragic" coronavirus outbreak from overwhelming India and singled out wealthier nations for failing to provide equitable access to healthcare around the world. He recommended a wartime effort in India to combat the current COVID surge. He suggests a few weeks' lockdown in India, to break the chain of coronavirus transmission. He also suggested that India should look at putting together a crisis group of experts that would meet immediately and start getting things organized.

An open letter published (Science: 29th April 2021) with 740 signatories, asks the government to provide access to databases on COVID-19 testing and genomic sequencing. "There are so many hurdles and so much paperwork around accessing these data", says Pratim Majumdar, a genetic epidemiologist at the Office of the Principal Scientific Adviser to the Government of India [17]. In an earlier article on this topic, we had discussed about the low covid-related death rate in the Indian population. Although there was considerable speculation about the probable cause for this observed/ reported low death rate, there was no definitive data available on this topic. In a recent article in Science, Jay Cohen summarizes the recent findings on this issue [18]. Deaths per 100 cases rank as follows: South Africa (3.4), Italy (3.0), Iran (2.9), UK (2.9), Brazil (2.7), USA (1.8) and India (1.1). One of the convincing studies led by Dr. Prabhat Jha, an epidemiologist at the University of Toronto looked at 12 of the most populous cities, including New Delhi, Mumbai, Pune, Kolkata, and Chennai, and found something drastically different in India's first wave. Factoring 30% underreporting of COVID-19 deaths in the major cities, -the worldwide averages about 40 deaths from COVID-19 per 100,000 population. That rate is less than half the corresponding US figure of 91 per 100,000 according to the U.S Centers for Disease Control and prevention. But Dr. Jha says that "The Indian paradox of lots of infection but relatively few deaths, I think, likely continues in this wave also".

Life as we know is sustained by the availability of molecular oxygen. In normal condition the oxygen present in the air that we breath is sufficient. However, when this virus attacks the lungs and causes severe acute respiratory syndrome (SARS), one needs concentrated oxygen for therapeutic purposes. India's COVID crisis shows how oxygen is a vital medicine not everyone can access, National Geographic (May 5, 2021). Express trains are racing across the country in India to deliver this much needed therapeutic drug.

Meanwhile people are forced to watch their family members slowly suffocate and die. This is not a problem that is unique to India, medical oxygen shortages have occurred in Brazil, Peru, Nigeria, Jordan, Italy and even in New York at its peak infection period. Indeed, experts are of the opinion that such pandemics induce oxygen access gap that causes untold number of preventable deaths every year in low-and middle-income countries. According to Mphu Ramatlapeng, executive vice president for implementation at the Clinton Health Access Initiative (CHAI), COVID has exposed how fragile the systems around oxygen have been over the years. This organization (CHAI) has recently been listed as finalists for a \$100 million grant from the MacArthur Foundation to fund its proposal to ensure oxygen access in India, Nigeria, Ethiopia, Kenya, and Uganda. The WHO also has launched a COVID-19 Oxygen Emergency Task Force in February with the goal to secure USD 90 million in immediate funding for oxygen needs in low- and middle-income countries and 1.6 billion in funding for the next year.

Since this is an article with my viewpoints, I would like to include the opinion of the Indian diaspora from the USA. In an opinion article in CNN Newsletter (May 5, 2021), Bhavana Lall, Pooja Gala, Reshma Gupta, Jay Bhatt, Shikha Jain, Ali Khan, Lipi Roy, and Vineet Arora (US Academicians) say, "The pandemic cannot end unless the world helps India immediately". They make three specific comments in support of their statement. First, unmitigated spread in India will enable more dangerous variants to arise (This is true wherever the virus replicates). Second, India is a major supplier of vaccines and medications worldwide and needs to keep and expand this activity to serve the resource-poor countries. Third, America is a direct beneficiary of India's health and economic welfare. India is the largest exporter of doctors and nurses, therefore, investing in India is synonymous with investing in our health care. According to Priyanka Pilla, the COVID-19 pandemic has highlighted hurdles in India's quest to become a leader in translational research. However, this pandemic also has acted as a catalyst in India's quest for self-sufficiency. As Dr. Devi Shetty says, we need to have an optimistic view of this unprecedented crisis. This pandemic has exposed our weaknesses as well as our strengths. It should serve as a calling card for action. It is time to invest in healthcare infrastructure, human resources as well as improvements in pharma capabilities. In an article in Nature Index (March 18, 2021), Priyanka Pilla writes of a pledge of 500 billion rupees (USD 86 Billion) to create a Na-

tional Research Foundation, intended as a central body to spawn interdisciplinary research [17].

In the absence of a cure, the only way to get protection from this killer virus is to hide from it at all costs. This is especially true for those who have underlying medical conditions, such as hypertension, obesity, diabetes, and vascular diseases. It is essential to meticulously follow the public health best practices, use of face coverings including masks, hand washing with soap, social distancing, contact tracing, and quarantining of the COVID-positive individuals. India is a leading producer of vaccines for the world. Yet was not ready for an unprecedented pandemic like this. Moreover, vaccinating all individuals is not an easy task. Currently, it has vaccinated less than ten percent of the population. Apart from the public health best practices the only other way to protect the population from this virus is vaccinations. As we have already mentioned there is no equitable distribution of vaccines. Despite availability of half a dozen authorized vaccines only a handful of countries have started vaccination of their population. The US has vaccinated 58% of the eligible population with at least one dose. More than 170 countries do not have access to COVID vaccines. In an article titled, "After coronavirus vaccine failures, France laments the state of its biomedical R & D". Today, France remains the only nation on the UN Security Council without a viable vaccine [19]. COVAX is one of the three pillars of the Access to COVID-19 Tools (ACT) Accelerator, which was launched in April by the World Health Organization, the European Commission, and France; coordinated by Gavi, the Vaccine Alliance, the Coalition for Epidemic Preparedness Innovations (CEPI) and the WHO. COVAX will support research, development and manufacturing of a wide range of COVID-19 vaccine candidates. For low-income and resource-poor countries, COVAX is a lifeline and the only viable way to get access to COVID-19 vaccines. According to the director of WHO, COVAX needs USD 45 billion to develop vaccines sufficient to vaccinate eligible individuals around the globe.

In the New York Times opinion column (May 6, 2021), David Brooks writes, "In 2020 Americans failed to socially distance, conduct sufficient test for the coronavirus and as result suffered among the highest infection and death rates in the developed world. Millions decided that wearing mask infringed their individual liberty. This week my colleague Apoorva Mandavilli reported that experts

believe that America will not achieve herd immunity soon. A major reason is that about 30 percent of the US population is reluctant to get vaccinated". Despite India being a major vaccine producer, it will be difficult to develop enough doses of vaccine and to vaccinate the major portion of the population at such a short notice. COVID-19 will be with us for some time to come. Therefore, this pandemic should be considered as a global health problem and appropriate measures taken collectively. Without such a global effort it will be difficult to contain future emerging health emergencies. Currently, there is a vacuum in the global leadership. Global platforms such as National Institutes of Health, Center for Disease Control and Prevention, Food and Drug Administration and the World Health Organization have lost their credibility. It is high time the credibility for such professional institutions is restored. We also should create education of public about the value of science and scientific approaches. Furthermore, there is a great need for establishing a global task force to develop preparedness to face any future public health emergencies. Such a task force should also be provided the needed funds and resources.

Center for Global Development (CGD) in its comment and analysis (April 27, 2021) writes, "India needs to focus on three urgent actions to mitigate its COVID-19 humanitarian crisis". According to them the tragedy in India is not because of the surge of the second wave, but the fact that India did not learn from the experience of Brazil, Peru, and the UK nor even from the first wave, and did not prepare adequately when it had the chance. The experts from CGD suggest three urgent action that India can take now to mitigate the disaster, as nationwide lockdowns are unlikely and effective from India's economic context. Action 1) Focus the health service on scalable and essential lifesaving COVID-19 treatments and protect other life-saving essential service. Action 2) Expand and maximize health service capacity by bringing in the military, leveraging home-based care, and mobilizing international support. Action 3) Strengthen the public health response with short local lockdowns, support livelihoods, clearer communication, and sustainable COVID-19 control measures.

Conclusion

In conclusion, immediate action by the experts, therefore, includes immediate lockdown of the country (or local lockdowns) to prevent new infections from spreading and flatten the CO-

ID-19 surge, initiate immediate strict adherence to public health best practices, use of face masks, hand washing, social distancing, contact tracing and quarantine of COVID-19 positive individuals. Recruit young medical doctors and nurses for COVID service under supervision of clinicians. Since less than five percent of COVID positive individuals require hospital care develop a triage system to screen covid patients to home care versus hospital care. Accelerate the vaccination production, procurement and vaccinate all eligible adults. Just to leave a positive note, Dr Vijay Raghavan the top scientist and the Principal Scientific Adviser to the Government of India says, "There may not be a third wave of COVID in the country if strong measures are taken and effectively implemented at the State, district and city level in India". As a part of effective management of current COVID pandemic, India should take advantage of its IT capabilities and develop smooth, seamless, end-to-end, digital healthcare [20]. The IHME estimates that India will see a staggering 1 million deaths from COVID-19 by August 1st, 2021. These deaths are preventable. There is no way everyone could be vaccinated by this deadline. However, public health experts have an essential role in explaining to the public the necessity of masking, social distancing, halting mass gatherings, voluntary quarantine, and testing [21].

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