



SARS-CoV-2 Pandemic: From Despair to Hope

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Abstract

Stepping into the year 2021 is not without burden of inheritance. During the first half of 2020 SARS-CoV-2 rendered the entire human population speechless, motionless and helpless. It exposed the weak public health systems, fragile disaster management mechanisms, complacency of governments and lack of effective leadership in many countries. Globally, these are the unprecedented times, unimagined and unthought-of. The deadly virus around is forcing people all over the world to make unexpected and drastic shifts in their way of life to keep themselves safe. We are living on the edge. Let us work together to preserve, enrich, and enlighten it. The COVID-19 pandemic highlights the need to protect people from health emergencies, as well as to promote universal health coverage and healthier populations to keep people from needing health services through multisectoral interventions like improving basic hygiene and sanitation. Perhaps life will never return to what it was before. We should make it safer by being better prepared for future pandemics. Vaccine is probably the only hope to contain and prevent SARS-CoV-2 virus. What is crucial for the global community is efficacy, safety, affordability and accessibility of vaccine. Equity is of paramount importance. COVID 19 will stay for decades. It has left scars on all humans. Though we can't undo the damage we should build a strong recovery, we must seize the opportunity for change. Let us rise to the responsibilities of the New World – a world our children and their children inherit - a safer, more resilient and more sustainable.

Keywords: COVID 19; SARS-CoV-2; Pandemic; Vaccines; Infectious Diseases

Introduction

Stepping into the year 2021 is not without burden of inheritance. During the first half of 2020 SARS-CoV-2 rendered the entire human population speechless, motionless and helpless. There was a time when every human being that existed on earth was looking into the skies for divine help to escape the assault of coronavirus. The bravery and the continued struggle by the SARS-CoV-2 warriors did at times infuse hope. But most of the times the pandemic frightened most if not all from north to South Pole. While the virus did not discriminate on the basis of race, religion, faith, cast, creed, status etc. the changes it brought on the globe essentially changed the world order. Life may not be same

again as it used to be prior to the pandemic. It is not only health that was under severe threat but also the education of children, business ecosystem and almost every sphere of life. It was certainly a threat to future of human existence. It exposed the weak public health systems, fragile disaster management mechanisms, complacency of governments and lack of effective leadership in many countries. Some countries and its leadership emerged as torch bearers not only protecting their populations but also showing the way to rest of the world, thus, emerging as tigers.

Governments of some countries could not give enough protection to its disadvantaged and vulnerable sections of the society. The story of pain, agony and suffering of weaker

sections of society was pathetic. Migrant workers, daily wagers, manual labourers, and informal workers were left to fend for themselves. Hundreds of thousands had to walk over 400 kilometres to reach their homes in rural areas as they had no job or source of income in locked down metropolitan cities. But most of them showing courage to fight back though penniless with 'nothing in hand' is the real triumph worth description. They won half of the battle then [1,2]. Virus also reached the regions where angels could not otherwise tread, reaching the unreached. Scientists and researchers were in the race to find out cure. Diagnostic and therapeutic tools, a potent drug or an effective and safe vaccine. Experiments to reach the goalpost were not that easy. There wasn't any breakthrough in discovering a drug nor was a vaccine made available to the entire human population. Some claims of vaccine having been developed lacked confidence of being safe and effective. It also raised more questions than answers of scientific scrutiny. On individual basis, humans faced struggle for existence and survival of the fittest. Many lost hopes and many more awaited a divine intervention to see the virus vanish. It left scars on the human psyche, more so on the children and young adults who lost nearly a year without going to educational institutions, play fields, amusement parks, shopping malls, restaurants or paying a visit to pay condolences to the bereaved or attending a marriage ceremony. Was everything lost including hope?.

No, it wasn't. The resilience, the courage, the dedication, commitment, the compassion and generosity, unity in diversity and above all the global solidarity proved useful, transforming the humans. One world, one humanity and one mission. Nothing else on earth could have united the entire human race than the COVID19 Pandemic.

Leaving aside the successes or failures of political systems and leadership, there was some energy, some faith, some premonition and finally a ray of hope that humans are there to stay on earth as it existed before. All wasn't lost. There is whole lot to gain.

An Unprecedented Crisis

Today we are confronted with an unprecedented crisis world has never experienced before. The modern world is becoming a viral superhighway. Left unchecked, today's emerging diseases can become the endemic diseases of tomorrow [1,2]. In the struggle for existence, only those individuals survive which possess the most useful variations. This has been called survival of the fittest by Spencer and natural selection by Darwin. Survival of the fittest, term made famous in the fifth edition (published in 1869) of 'On the Origin of Species' by British naturalist Charles Darwin, which suggested that organisms best adjusted to their environment are the most successful in surviving and reproducing. Darwin

borrowed the term from English sociologist and philosopher Herbert Spencer, who first used it in his 1864 book 'Principles of Biology'. Darwin did not consider the process of evolution as the survival of the fittest; he regarded it as survival of the fitter, because the 'struggle for existence' (a term he took from English economist and demographer Thomas Malthus) is relative and thus not absolute. Instead, the winners with respect to species within ecosystems could become losers with a change of circumstances.

It may be said that natural selection is daily and hourly scrutinizing throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up all that is good; silently and insensibly working, whenever and wherever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life [3]. Taking Science as a paradigm of knowledge, he suggested that ideas and theories struggle against each other for adoption. In the social world a similar struggle for existence should take place, for similar reasons [4].

It was the season of Darkness

The opening paragraph of Charles Dickens' novel 'A Tale of Two Cities' beautifully describes such situations: "it was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair ..., we had nothing before us, we were all going direct to Heaven, we were all going direct the other way ...in short, the period was so far like the present period that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only." Dickens begins this tale with a vision that human prosperity cannot be matched with human despair. He tells of a time of despair and suffering on one hand, and joy and hope on the other. It tells about a time of chaos, conflicts, and despair, as well as happiness. It in fact tells us about the time of extreme opposites without any in-betweens. It just seems like it really applies to the time that we are going through now. It is certainly the best of times and worst of times. It is also an example of how the very best can break the rules the rest of us should wisely try to live by.

Failures outweigh successes

The COVID-19 pandemic is exponentially growing. It is the defining global health crisis of our time and the greatest challenge since World War Two. Countries are racing to slow the spread of the virus by testing and treating patients, carrying out contact tracing, limiting travel, quarantining citizens, and cancelling large gatherings such as sporting

events, concerts, and schools [5,6]. The SARS-CoV-2 is affecting 218 countries and territories around the world and 2 international conveyances with 83,914,883 cases and 1,827,941 deaths reported worldwide during 2020, and the true toll is likely multiples of that figure. Globally, there are over 106,748,528 cases and 2,328,715 deaths (as on 8 February 2021) with the USA, India, Brazil, UK and France on top. Mistakes and errors are part of the journey, and show the path to success ahead. A mind set of resilience, reflection and resolve is key to rise from ashes like phoenix. This is a really challenging point in time because people are tired of the restrictions on their activity; people are tired of not being able to socialize, not being able to go to work.

The response to the coronavirus pandemic has varied widely, and in some parts of the world, both developed and developing nations have brought it under control. Proper planning in some countries did affect the outcome. South Korea did extensive testing, identifying the infected people and their contacts and putting them in quarantine spread. Vietnam practiced extensive quarantining measures which helped in limiting the number of cases. Taiwan's success was a result of early response by way of border controls and wearing of mask. It has become one of the most effective countries in arresting the spread of the pandemic. Singapore and Hong Kong also managed the pandemic effectively. Some countries have not done enough to contain the spread of Disease. The USA, UK, and India were initially slow that resulted in fast spread. There have also been problems of supply chain (inadequate PPEs, ventilators, oxygen and drugs) and shortage of health facilities like ICUs, beds, etc [5-7]. As the virus spreads, even the higher testing capacity has been strained, and state and local governments are hitting their limits and running low on supplies. The higher positive rates are an indication the virus is spreading more rapidly.

Impact & Implications

Although climate change may have greater long-term consequences, the SARS-CoV-2 pandemic has had more immediate effects on the global economy. The pandemic is regarded as one of the largest concurrent public health and economic crises in modern times, culminating in sharp decline in consumption and consumer confidence. It is a major exogenous shock that has altered the competitive landscape for business ecosystem. It has led to a collapse in demand, and disruption of supply of many products. It has gravely wounded the world economy with serious consequences impacting all communities and individuals. SARS-CoV-2 has been paralyzing our societies and our economies, derailing global efforts to achieve sustainable development goals. This scenario reflects the immense challenges and human suffering caused by this pandemic.

Recovery from the pandemic can help reshape global production networks and reset multilateral cooperation for the better. Better recovery can sow the seeds of a healthier, fairer and greener globalization that can be nourished by a more resilient approach to multilateralism.

The global economy is contracted by a staggering 4.3 per cent. Millions of jobs have already been lost, millions of livelihoods are at risk, and an estimated additional 130 million people will be living in extreme poverty if the crisis persists. The unprecedented economic shock generated by the global health emergency has already sharply exposed the global economy's pre-existing weaknesses, severely setting back development progress around the world [5-7].

The pandemic has created disruptions on an unprecedented scale and uncovered the vulnerability of many already disadvantaged households and sectors. The realization that the economic costs of a pandemic can be huge resulting in trillions of dollars in economic losses, loss of life, and loss of livelihoods for millions of poor people all over the world will be averted. Each country has discovered further its fragility, reflected in the dependence on the rest of the world to satisfy the maintenance of the way of living, and at the same time, the isolation and loneliness when attempting to respond to a major exogenous shock.

Challenge of Change

The coronavirus pandemic is a crisis unlike any in the world during the last eighty years history. COVID-19 is a fast-evolving pandemic. COVID-19 is emerging as a major public health threat leading to a global crisis that is unprecedented and extraordinary [6,7]. Around the world, more than 1.5 billion children are impacted by school closures. Hundreds of millions of them are in low- and lower-middle-income countries. There is a risk that the poorest and most marginalized girls will never return to school. Hard-earned development gains will be lost.

The pandemic has revealed the need to manufacture health commodities and strengthen supply chains closer to where materials are needed domestically and globally. The pandemic reminds world leaders that under-investment in public health of one country is a threat to global health security everywhere. If we get the good governance, we will be successful in the global response to future pandemics and achieving global health security for the future. The school closures have resulted in significant learning losses to the affected cohort of students. Affected students face long-term losses in income and national economies that go forward with a less skilled labour force face lower economic growth which subtracts from the overall welfare of society.

2021 and Beyond

SARS-CoV-2, is here to stay, and the future depends on a lot of unknowns, including whether people develop lasting immunity to the virus, whether seasonality affects its spread, and the choices made by governments and individuals. The future will very much depend on how much social mixing resumes, and what kind of prevention we do. Behavioural changes can reduce the spread of SARS-CoV-2 people comply.

If immunity to the virus lasts less than a year there could be annual surges in SARS-CoV-2 infections through to 2025 and beyond. The pandemic is not playing out in the same way from place to place. Countries such as China, New Zealand and Rwanda have reached a low level of cases and are easing restrictions while watching for flare-ups. Elsewhere, such as in the United States, India, Brazil, Russia, France and UK, cases are rising fast after governments lifted lockdowns quickly or never activated them nationwide.

Personal behavioural changes, such as hand-washing and wearing masks, are persisting beyond strict lockdown, helping to stem the tide of infections. If 50-65% of people are cautious in public, then stepping down social-distancing measures every 80 days could help to prevent further infection peaks over the next two years. There is a need to change the culture of how we interact with other people.

Social distancing could be required intermittently for years to suppress SARS-CoV-2 peaks. Contact tracing must be rapid and extensive - tracing 80% of contacts within a few days. To end the pandemic, the virus must either be eliminated worldwide or people must build up sufficient immunity through infections or a vaccine. About 55-80% of a population must be immune for this to happen, depending on the country.

The pandemic's course in 2021 will depend greatly on the availability of a vaccine, and on how long the immune system stays protective after vaccination or recovery from infection. The total incidence of SARS-CoV-2 through 2025 will depend crucially on this duration of immunity.

Researchers will need to follow a large number of people over a long time. We have to wait and watch. If infections continue to rise rapidly without a vaccine or lasting immunity, we will see regular, extensive circulation of the virus. In that case, the virus would become endemic. If the virus induces short-term immunity then people can become re infected and there could be annual outbreaks. Another possibility is that immunity to SARS-CoV-2 is permanent. In that case, even without a vaccine, it is possible that after a world-sweeping outbreak, the virus could burn itself out and disappear by the

end of 2021. However, if immunity is moderate, lasting about two years, then it might seem as if the virus has disappeared, but it could surge back as late as 2024.

Covid19 Vaccine: Concerns & Constraints

Vaccines for SARS-CoV-2 are now being rolled out, but in some parts of the world. The next three or so months will be challenging. Some things may not return to how they were before. Due to the respiratory spread of SARS-CoV-2 and to inconsistent adherence to effective public health measures, including wearing masks and maintaining social distancing, several countries have lost control over the Covid19 pandemic. Persons infected with SARS-CoV-2 are frequently asymptomatic, yet they have high respiratory viral loads, and they are major purveyors of viral spread. These factors have led to the current explosion of Covid-19 hospitalizations and deaths, with Covid-19 now a major cause of death in the United States. Our only hope is safe and effective vaccines that can be widely deployed [8].

2020 has seen 58 vaccines against Covid19 be developed and in clinical trials [9] with some vaccines reportedly having more than 90% efficacy against COVID-19 in clinical trials. This remarkable achievement is much-needed good news as COVID-19 cases are currently at their highest daily levels globally [10]. With a range of manufacturers, a very large global investment in production, it seems likely that 2021 will see COVID-19 vaccines made available to all countries in the world—at least for their priority groups [11].

AstraZeneca-Oxford coronavirus vaccine results of phase 2 clinical trials reveal that the AZD1222 or ChAdOx1 nCoV-19 vaccine candidate has triggered a robust immune response in adults aged 56-69 and over 70. "ChAdOx1 nCoV-19 appears to be better tolerated in older adults than in younger adults". Investigators of four randomised, controlled trials report pooled results of an interim analysis of safety and efficacy against COVID-19 of the Oxford-AstraZeneca chimpanzee adenovirus vectored vaccine ChAdOx1 nCoV-19 (AZD1222) in adults aged 18 years and older [11,12].

Vaccine efficacy for the prespecified primary analysis (combining dose groups) against the primary endpoint of COVID-19 occurring more than 14 days after the second dose was 70.4% (95.8% CI 54.8 to 80.6; 30 [0.5%] of 5807 participants in the ChAdOx1 nCoV-19 group vs 101 [1.7%] of 5829 participants in the control group) [12]. Pfizer Inc claims that final results from the late-stage trial of its Covid-19 vaccine, developed with German partner BioNTech SE, show it was 95 per cent effective. Primary efficacy analysis demonstrates BNT162b2 to be 95% effective against COVID-19 beginning 28 days after the first dose [13].

US biotechnology company Moderna, whose vaccine uses the same mRNA technology as Pfizer's, claimed its experimental Covid-19 shot showed 94.5 per cent efficacy. The mRNA-1273 vaccine showed 94.1% efficacy at preventing Covid-19 illness, including severe disease [14].

The urgency of developing vaccines being fundamental to health is supported by the scientific explosion in structural and genomic biology that facilitates the urgent development of an ideal COVID-19 vaccine, using new pathways to facilitate its large-scale development, testing, and manufacture. Researchers and Scientists are working tirelessly to understand the virus at a molecular level; how it survives, mutates, spreads and infects humans. Such purposeful efforts enhance our ability to develop both preventive and therapeutic strategies against COVID 19. It is argued that a more stable formulation of the vaccine will likely be available during the fall of 2021. What is crucial for the global community is efficacy, safety, affordability and accessibility of vaccine. Equity is of paramount importance.

An Unparalleled Mobilization of Science

Vaccines, therapeutics and diagnostics have been developed and rolled out, at record speed. Vaccines offer great hope to turn the tide of the pandemic. But to protect the world, we must ensure that all people at risk everywhere are immunized. The level of immunity across the population needed to stop the virus spreading is thought to be between 60% and 80%. We are currently nowhere near that – meaning billions around the world will need to be vaccinated to stop the virus spreading. Vaccines are not a silver bullet. In areas where the highly infectious strain is rampant, high-level restrictions may last until vaccine roll-out has finished. Fully eradicating the virus will be extremely difficult and will require a global effort. If SARS-CoV-2 mutates regularly and significantly, we may need to take new vaccines periodically. In the long term, we would also need to vaccinate children to maintain herd immunity.

Retrospect and Prospect

2020 was a devastating year for global health. A previously unknown virus raced around the world, rapidly emerging as one of its top killers, laying bare the inadequacies of health systems. In 2021, countries around the world will need to continue battle against SARS-CoV-2. They will need to move swiftly to repair and reinforce their health systems. Future pandemics are likely to happen more frequently, spread more rapidly, have greater economic impact and kill more people if we are not extremely careful about the possible impacts of the choices we make today. Science must save humanity from this pandemic. To end this pandemic, we must act in solidarity. Nations will have endemic SARS-CoV-2

infection for the foreseeable future. A structured and well-coordinated approach is critical for success. Global crisis needs global action. Nations have to build a healthier world by focusing on the shared good health of human and nature [15].

The spread of a new and more transmissible variant of the coronavirus from the United Kingdom has triggered concerns around the world. Looks like the new variant is more contagious and scarier. But it may not be deadlier and may not escape the vaccines. The variant suggests the virus is able to produce significant mutations, and further mutations could change the course of outbreak. Suppressing the pandemic quickly, therefore, has become an inescapable necessity. The SARS-CoV-2 variants identified so far are an early warning that the virus could evolve to escape vaccine protection. The way to prevent that is to both ramp up vaccinations and control spread. There is a need to evaluate each one to better understand any changes in transmission, severity and impact. Nevertheless, the interventions in place can break chains of transmission.

Looking Ahead

Globally, these are the unprecedented times, unimagined and unthought-of. The deadly virus around is forcing people all over the world to make unexpected and drastic shifts in their way of life to keep themselves safe. One vital one is staying indoors, a self-quarantine measure [15]. Our world is fragile. We are living on the edge. Let us work together to preserve, enrich, and enlighten it. The COVID-19 pandemic highlights the need to protect people from health emergencies, as well as to promote universal health coverage and healthier populations to keep people from needing health services through multisectoral interventions like improving basic hygiene and sanitation. Perhaps life will never return to what it was before [5-7].

The SARS-CoV-2 pandemic has forever changed how every healthcare stakeholder approaches disease. Global health is taking a central stage and is evolving at a greater speed. Such forces create a perfect storm for making 2021 a crucial year for precision health, when new strategies to tackle illness through asymptomatic testing and early detection will emerge. There is an urgent need to tackle the fragilities and gaps exposed by the pandemic. In the post-pandemic era, comprehensive policies are essential to rekindle robust, sustainable, and equitable growth.

Conclusion

Covid19 will not be the last pandemic, and epidemics are a fact of life. All countries should invest in preparedness capacities to prevent, detect and mitigate emergencies of all

kinds, and called for stronger primary health care provision. Vaccine development has been extraordinary. They must be accessible to everyone, no matter where they live. Moreover, it is highly desirable to develop appropriate technologies that respond swiftly to control the current COVID-19 pandemic. Nations must ensure equitable access to safe and effective vaccines, tests, and treatments and to ensure that health systems are strong enough to deliver them. The deep disparities that persist between and within countries must be addressed. The crisis, if not managed by a substantial and coordinated global response, will highlight and deepen the divide between North and South, challenging the multilateral system and global solidarity on an unprecedented scale. We should make it safer by being better prepared for future pandemics. Let us rise to the responsibilities of the New World – a world our children and their children inherit - a safer, more resilient and more sustainable.

Article Summary

- Stepping into the year 2021 is not without burden of inheritance. During the first half of 2020 SARS-CoV-2 rendered the entire human population speechless, motionless and helpless.
- It exposed the weak public health systems, fragile disaster management mechanisms, complacency of governments and lack of effective leadership in many countries.
- The COVID-19 pandemic highlights the need to protect people from health emergencies, as well as to promote universal health coverage and healthier populations to keep people from needing health services through multisectoral interventions like improving basic hygiene and sanitation. Perhaps life will never return to what it was before.
- Vaccine is probably the only hope to contain and prevent SARS-CoV-2 virus. What is crucial for the global community is efficacy, safety, affordability and accessibility of vaccine.
- Global solidarity, one humanity, one world is crucial to be better prepared for future pandemics.

Strengths: A scholarly interpretation of events as a consequence of COVID 19 pandemic during 2020 and emerging perspectives in 2021

Weaknesses: COVID 19, its implications, diagnostic and the routing modalities are evolving. More scientific studies are required to have robust data available regarding herd immunity.

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