

Special Article

Future of COVID-19

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Indian Scenario :

After the second wave, the daily average of COVID-19 cases in India is spiraling down, even though there still are isolated outbreaks and a rising positivity rate recorded in some states. However, despite this, there's some positive silver lining, which is the growing pace of vaccination in the country. While we may not be able to bid goodbye to COVID-19 as yet, it might be the time the viral outbreak may have reached a state of 'endemicity' in the country, given the rather low levels of transmission right now and the already largely exposed population in the country. But, with the virus very much an active threat and possibilities of a potentially threatening third wave looking like an imminent threat, what does endemicity mean, in terms of COVID-19 spread and how concerned should we be?

Ever since mutant variants of the virus have wreaked havoc and lowered the efficacy of vaccines, experts have pinpointed that achieving herd immunity or removing COVID-19 from the World, altogether may not be actually possible. While we do know that certain mandates, such as testing, mask hygiene, distancing would still need to be followed till we know there's a low-graded risk, living while knowing that there's a virus forever could be very well a reality to acclimatize ourselves too.

While learning to live with COVID-19 forever does mean that the virus may never ever go away, however, it does mean that the virus, over time, may become less threatening and as higher rates of immunization are achieved, the virus would have fewer chances of spreading or spell severe outcomes, as we are seeing today. Several experts have also stressed that instead of trying for a zero-COVID-policy, transitioning from a pandemic to an endemic is the best probable scenario we may have currently.

High immunization rates and vaccination speeds are needed to provide peak protection and limit COVID from spreading. As we move into the future course of months, where there's a possibility of seeing more mutations coming up, the current vaccines may be

upgraded, or subjected to changes, which could help them offer more protection and efficiency than we currently have. There's also talk of booster shots right now, which may be suggested for those who are immuno-compromised.

In the future, COVID vaccination may also become an annual affair, much like flu vaccination and thus, with added immunity, it would our best shot of defense to mitigate the risks of COVID-19.

Global Scenario :

The COVID-19 pandemic has been met by unequal responses in different countries and led to unequal impacts with populations in Europe, the USA and Latin America disproportionately impacted.

Science has uncovered much about SARS-CoV-2 and made extraordinary and unprecedented progress on the development of COVID-19 vaccines but there is still great uncertainty as the pandemic continues to evolve. COVID-19 vaccines are being rolled out in many countries but this does not mean the crisis is close to being resolved. We are simply moving to a new phase of the pandemic.

What emerges next will partly depend on the ongoing evolution of SARS-CoV-2, on the behaviour of citizens, on Governments' decisions about how to respond to the pandemic, on progress in vaccine development and treatments and also in a broader range of disciplines in the sciences and humanities that focus both on bringing this pandemic to an end and learning how to reduce the impacts of future zoonoses and on the extent to which the International Community can stand together in its efforts to control COVID-19. Vaccines alone, unless they achieve high population coverage, offer long-lasting protection and are effective in preventing both SARS-CoV-2 transmission and COVID-19, will not end the pandemic or allow the World to return to "business as usual". Until high levels of global vaccine-mediated protection are achieved across the World, it could be catastrophic if measures such as mask wearing, physical distancing and hand hygiene are relaxed prematurely.

Countries, communities and individuals must be prepared to cope in the longer-term with both the demands and the consequences of living with such essential containment and prevention measures.

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Many factors will determine the overall outcome of the pandemic. A Nationalistic rather than Global approach to vaccine delivery is not only morally wrong but will also delay any return to a level of “normality” (including relaxed border controls) because no country can be safe until all countries are safe. SARS-CoV-2 could continue to mutate in ways that both accelerate virus transmission and reduce vaccine effectiveness.

Vaccine hesitancy, misinformation and disinformation could compromise the global COVID-19 response.

Naive assumptions about herd immunity, given the appearance of new and challenging SARS-CoV-2 variants, could seriously risk repeated outbreaks and recurrences. SARS-CoV-2 can probably never be Globally eradicated, because of its presence in many animals (including cats and dogs) and because of incomplete vaccine coverage and variable degrees of immunological protection.

Hence, ongoing strategies to deal with the endemic presence of SARS-CoV-2 in populations over the long term will be needed. Furthermore, we do not yet know if and when, revaccination with current or new COVID-19 vaccines will be required since the duration of immunological protection and the efficacy against emergent SARS-CoV-2 variants remain unknown. With such uncertainties, we should not assume that recent scientific progress on COVID-19 diagnostics, vaccines and treatments will end the pandemic. The world is likely to have many more years of COVID-19 decision making ahead—there is no quick solution available at present.

The decisions of global agencies and governments, as well as the behaviors of citizens in every society, will greatly affect the journey ahead. There are many possible outcomes. At one extreme is the most optimistic scenario, in which new-generation COVID-19 vaccines are effective against all SARS-CoV-2 variants (including those that may yet emerge) and viral control is pursued effectively in every country in a coordinated effort to achieve global control. Even with International Cooperation and adequate funding, this scenario would inevitably take a long time to achieve. The COVAX initiative is just an initial step towards addressing vaccine equity and global coordination for vaccine access, especially for lower income countries.

At the other extreme is a pessimistic scenario, in which SARS-CoV-2 variants emerge repeatedly with the ability to escape vaccine immunity, so that only high-income countries can respond by rapidly manufacturing adapted vaccines for multiple rounds of

population re-immunization in pursuit of National control while the rest of the world struggles with repeated waves and vaccines that are not sufficiently effective against newly circulating viral variants. In such a scenario, even in high-income countries, there would probably be repeated outbreaks and the path to “normality” in society and business would be much longer and there are many other intermediate or alternate scenarios.

Countries that have kept SARS-CoV-2 in check and countries where there are high levels of viral transmission will in time all probably reach a similar destination, even though their paths to arrive there will be quite different, because no countries can remain permanently isolated from the rest of the World. Unfortunately, countries working in isolation from each other and from Global Agencies will prolong the pandemic. A nationalistic rather than a global Approach to COVID-19 vaccine availability, distribution and delivery will make a pessimistic outcome much more likely. Additionally, unless countries work together to scale up prevention efforts, the risk of other pandemics, or other trans boundary disasters with similar consequences, including those fuelled by climate change, will remain a constant threat.

The International Science Council (ISC), as the independent, Global voice for science in the broadest sense, believes it is crucial that the range of COVID-19 scenarios over the mid-term and long-term is explored to assist our understanding of the options that will make better outcomes more likely. Decisions to be made in the coming months need to be informed not only by short-term priorities but also by awareness of how those decisions are likely to affect the ultimate destination. Providing such analyses to policy makers and citizens should assist informed decision making.

In developing its COVID-19 Scenarios Project, the ISC has consulted with WHO and the UN Office for Disaster Risk Reduction. The ISC has established in February, 2021, a multidisciplinary Oversight Panel made up of globally representative world experts in relevant disciplines to work with a technical team to produce the scenario map. The Oversight Panel will report within 6–8 months to the Global Community on the possible COVID-19 scenarios that lie ahead over the next 3–5 years and on the choices that could be made by Governments, agencies and citizens to provide a pathway to an optimistic outcome for the World.

There is a realistic expectation that the global effort in vaccination will bring the pandemic caused by Severe

Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) under control. Nonetheless, uncertainties remain about the type of long-term association that the virus will establish with the human population and in particular, whether Corona Virus Disease 2019 (COVID-19) will become an endemic disease. Although the trajectory is difficult to predict, the conditions, concepts and variables that influence this transition can be anticipated. Persistence of SARS-CoV-2 as an endemic virus, perhaps with seasonal epidemic peaks, may be fuelled by pockets of susceptible individuals and waning immunity after infection or vaccination, changes in the virus through antigenic drift that diminish protection and re-entries from zoonotic reservoirs. Here, we review relevant observations from previous epidemics and discuss the potential evolution of SARS-CoV-2 as it adapts during persistent transmission in the presence of a level of population immunity. Lack of effective surveillance or adequate response could enable the emergence of new epidemic or pandemic patterns from an endemic infection of SARS-CoV-2. There are key pieces of data that are urgently needed in order to make good decisions; we outline these and propose a way forward.

Main Three Possible Scenarios of the Future of COVID-19 :

The first—and most worrisome—scenario is that we will not gain rapid control of this pandemic and thus will face a future with ongoing manifestations of severe disease combined with high levels of infection that, in turn, could foster further evolution of the virus. Vaccinations and previous infection could achieve long-term herd immunity but we will need a very broad application of vaccines Worldwide combined with comprehensive disease surveillance by accurate and readily available diagnostic assays or devices.

A second and more likely scenario is the transition to an epidemic seasonal disease such as Influenza. Effective therapies that prevent progression of COVID-19 disease (for example, monoclonal antibodies that reduce hospitalization and death by 70–85%) may bring the burden of SARS-CoV-2 infection to levels that are equivalent or even lower than influenza. However, we should remember that the annual mortality burden of influenza, in non-pandemic years, is estimated to be between 250,000 and 500,000 deaths with up to 650,000 all-cause deaths globally, comprising around 2% of all annual respiratory deaths (two thirds among people who are 65 years and older). This is an extremely important health burden and equates to a relatively 'optimistic' view of the future of the COVID-19 pandemic.

A third scenario is the transition to an endemic disease similar to other human Corona Virus Infections that have a much lower disease impact than influenza or SARS-CoV-2. There is, however, limited data on the Global burden of disease by Common Human Corona Viruses and as noted in above, it is not possible to predict with confidence whether further adaptations of SARS-CoV-2 to humans will increase or decrease its intrinsic virulence.

To better predict which scenario is likely to emerge and to better equip the world with an appropriate response, we propose several key questions that need to be answered and critical tools that need to be developed. These comprise gaps in our knowledge in terms of epidemiology, immunology and virology and missing surveillance, prophylactic and therapeutic tools.

This pandemic has shown both the importance of initiatives in individual countries and the interdependence of the world and the necessity of Global Cooperation for pandemic control. It is the investment by a limited number of countries that has led to the biomedical discoveries that have brought forward the tools to interrupt the spread of the pandemic. Yet, the lack of International structures for the implementation of these tools has brought into focus the disparities between advantaged and disadvantaged groups both within countries and between countries. This highlights the current inadequacies in healthcare delivery systems and access to new biomedical interventions. Global health leaders will need to be vigilant with respect to the trajectory of SARS-CoV-2 in the near future while assessing the strategies and approaches used in the pandemic to develop more effective structures and processes to ensure a more effective and equitable response for the future.

The Next Pandemic :

The COVID-19 pandemic was not the first to devastate the World and will not be the last.

The COVID-19 pandemic felt for many of us like it came out of the blue but scientists have long been sounding the alarm about a potential pandemic from a Corona Virus.

We already had warnings with the SARS and MERS outbreaks, both caused by Corona Viruses and both spilled over from animals into humans. Given the way people continue to encroach on animal habitats, trade wildlife and eat bush meat, it is increasingly likely that zoonotic diseases that come from animals will cause future pandemics.

This already happens more often than you might

think. Since the 1940s more than 330 emerging infectious diseases have been identified, of which 60% were zoonotic. And when a new infectious disease does emerge, human migration, population growth, rapid global travel, climate change Urbanisation and dense Urban slums can all hasten its spread. Given that more people are living in closer proximity to each other than ever before and that normally more than a billion people cross international borders each year, it has never been easier for outbreaks to escalate and spread Globally.

With the current pandemic, research carried out in response to previous Corona Virus outbreaks and developments in vaccine technologies gave us a head-start that meant that COVID-19 vaccines could be developed rapidly. Even so, at the outset we had limited National Systems for case detection and tracking of epidemic spread. The complete lack of treatments or existing vaccines meant that in the year that it took to develop vaccines, millions lost their lives to COVID-19.

R&D tends to focus on immediate threats and often on drugs, vaccines or diagnostics that are most profitable, which explains why many diseases identified by World Health Organization (WHO) as having a high potential to cause future pandemics are currently being neglected. Many of these threats affect low- and middle-income countries and have little or no research and development ongoing. This is dangerous and means that if any of these diseases turn pandemic, we could once again be caught off guard. Millions of lives could be lost.

Future Potential Pandemics?

- Nipah virus ?
- Ebola ?
- Chikungunya ?
- H5N1 and H7N9 influenza ?
- Yellow fever ?
- Marburg ?
- Lassa fever ?
- Crimean-Congo Haemorrhagic Fever ?
- Hantavirus ?

Conclusion :

We need to recognize the close interactions between health and wellbeing of animals, humans and the environment.

COVID-19 pandemic and future pandemics are likely to emerge from ecological processes such as climate change, loss of biodiversity, anthropogenic social processes (eg, corporate interests, culture and globalization) and world population growth. Intervention would therefore require modifications or dampening these generators :

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