

# COVID-19 Pandemic: the crisis and the longer-term perspectives

## Abstract

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. The pandemic is moving like a wave. Some countries have effectively contained the pandemic, while others have been slow and the consequences of delay in responding to the challenge are obvious. Every day, people are losing jobs and income, with no way of knowing when normality will return. Nations need to act immediately to prepare, respond, and recover. Nations must focus on the procurement and supply of essential health products, strengthening crisis management and response, and addressing critical social and economic impacts. Researchers are working tirelessly to discover new life-saving medical innovations. The strategy is to develop diagnostic tools to quickly and effectively detect the disease in the first place, alleviating symptoms so that people who have disease experience milder symptoms, and lowering the overall mortality rate. One of the most promising leads on a COVID-19 vaccine is mRNA-1273. This vaccine, is being developed with extreme urgency, skipping straight into human trials before it was even tested in animals. The aftermath is likely to be something we have never witnessed. A new social order will emerge, a new structure of the society, a paradigm shift in human relationships and above all a new economic adjustment.

**Keywords:** coronavirus, pandemic, COVID-19, infectious diseases, social distancing, vaccine, contact tracing, testing

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## Introduction

The COVID-19 or severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic is affecting **209 countries** around the world and two international conveyances affecting everyday life, disrupting modern society on a scale that most living people have never witnessed. The virus is highly transmissible spreading exponentially all over the globe. People infected with SARS-CoV-2 might be spreading virus without recognizing, or prior to recognizing, symptoms. "COVID-19 is transmitted quite efficiently. The average infected person spreads the disease to two or three others — an exponential rate of increase. There is also strong evidence that it can be transmitted by people who are just mildly ill or even presymptomatic".<sup>1</sup> The virus is detectable in aerosols for up to three hours, up to four hours on copper, up to 24 hours on cardboard and up to two to three days on plastic and stainless steel. SARS-CoV-2 disproportionately affects older people with underlying conditions. The insufficient testing or of a delay between the onset of virus and its manifestation makes the exact numbers of infected cases opaque. In EU/EEA countries, 30% of diagnosed SARS-CoV-2 cases were hospitalised and 4% had severe illness. Hospitalisation rates were higher for those aged 60 years and above. The older people are much more vulnerable to SARS-CoV-2.

Clinical presentations of SARS-CoV-2 range from no symptoms to severe pneumonia; severe disease can lead to death. The basic reproductive number (R0) of 2019-nCoV is estimated to be 1.4–3.9. The R0 of SARS-CoV-1 in the absence of interventions was 2.3–3.7.

The SARS-CoV-2 may have jumped from bats to human. SARS-CoV-2 is primarily transmitted from symptomatic people to others who are in close contact through respiratory droplets, by direct contact with infected persons, or by contact with contaminated objects and surfaces. Shedding of the SARS-CoV-2 virus is highest in upper

respiratory tract early in the course of the disease. People may be more contagious around the time of symptom onset as compared to later on in the disease.

The incubation period for SARS-CoV-2, is on average 5-6 days, however can be up to 14 days. Transmission from a pre-symptomatic case can occur before symptom onset.

This Pandemic has broken health-care systems and adversely affected economies. Health facilities and empty spaces are overcrowded. This is a human tragedy that affects hundreds of thousands of people. Nations are facing an enormous challenge to contain widespread community transmission. SARS-CoV-2 has a case fatality risk around 1%; this rate would make it many times more severe than typical seasonal influenza, putting it somewhere between the 1957 influenza pandemic (0.6%) and the 1918 influenza pandemic (2%).<sup>2</sup>

Some countries like China, South Korea, Singapore and Hong Kong have effectively managed the pandemic. There is a lot to learn from their successes. However, countries like the USA and India have not done enough to prevent and control the community spread. The USA has not responded promptly to the pandemic. The initial response of the USA has been inadequate. It could have accurately tracked the spread of the virus; hospitals could have executed their pandemic plans, girding themselves by allocating treatment rooms, ordering extra supplies, tagging in personnel, or assigning specific facilities to deal with SARS-CoV-2 cases. Hospitals exceeded the maximum handling capacity. There was obvious shortage of basic protective equipment. There is shortage of hospital beds and the ventilators. The result is, America was not prepared to manage COVID Pandemic.

The USA has maximum ventilators per 34 per 1000 population and decided not to lock down; South Korea has minimum ventilators

(10/1000) but decided to lock down and strict testing and quarantine. Italy too has minimum ventilators but did not quarantine strictly. It is argued that it has mishandled the COVID-19 crisis to a substantially worse degree. It may end up with the worst outbreak in the industrialized world. Italy and Spain have been struggling to cope with little success. Health infrastructure, essential medical supplies and human resource being overstretched, rationing care to patients who are most likely to survive, while letting others die, is being practiced. America has fewer hospital beds per capita than Italy. ICU beds will fall short to accommodate those who need it most.

A recent study<sup>3-5</sup> suggests that “80% of those infected either are asymptomatic or have mild symptoms, a finding that implies that demand for advanced medical services might apply to only 20% of the total infected. Of patients infected with Covid-19, about 15% have severe illness and 5% have critical illness”. Overall mortality ranges from 0.25% to as high as 3.0%.<sup>3,5</sup> “Case fatality rates are much higher for vulnerable populations, such as persons over the age of 80 years (>14%) and those with coexisting conditions (10% for those with cardiovascular disease and 7% for those with diabetes)”.<sup>3</sup> SARS-CoV-2 is substantially deadlier than seasonal influenza, which has mortality of roughly 0.1%.<sup>4</sup>

According to a study “even if social-distancing measures can reduce infection rates by 95 percent, 960,000 Americans will still need intensive care. There are only about 180,000 ventilators in the U.S. and, only enough respiratory therapists and critical-care staff to safely look after 100,000 ventilated patients”.<sup>5</sup> The risk of severe disease associated with SARS-CoV-2 for people in the EU/EEA and the UK is currently considered moderate for the general population and very high for older adults and individuals with chronic underlying conditions. Focus should be on protecting the most vulnerable population groups from severe illness and fatal outcome by reducing transmission in the general population and enabling the reinforcement of healthcare systems.<sup>6</sup> To contain the further spread of virus and to mitigate the impact, some workable actions are required that include slow the demand for ICU beds; safeguard risk groups; protect healthcare workers; and minimise the export of cases to other healthcare facilities and the community.

Critical care needs can be required for up to 15% of hospitalised patients with SARS-CoV-2. Health professionals need proper training on PPE use. Patients with mild clinical presentation, particularly those who are not in a recognised risk group for developing severe disease, can be managed at home with instructions to follow up if symptoms deteriorate. “Patients presenting with respiratory distress with increased need for oxygenation require management in hospital. Patients in critical condition need specialised care, on average for more than two weeks”.<sup>6</sup> What the USA needs is social distancing, large scale testing, aggressive contact tracing, PPE, it may halt the wave of spread of pandemic.

## Concerns & constraints

According to an analysis, “the government of India is showing how not to handle a pandemic. The lockdown puts responsibility for containing the outbreak on citizens, instead of instituting a robust official support system. It is to the greater disadvantage of the most vulnerable in society. The government is offering little in the way of a safety net. Governments in Britain, Spain, and Germany have offered stimulus plans of up to 20 percent of GDP, India’s amounts to less than 1 percent of its GDP. It provides no help for day laborers or other workers in similar unorganized sectors. It contains no measures

for migrant workers. For the poor, work has dried up entirely, and so those migrant workers who could seek to beat the lockdown by heading home in huge numbers”. Proper planning ought to have been done before ordering lockdown of 1.37 billion people. Safety measures (social security) for poor, disadvantaged and weaker sections of society should have been in place prior to lockdown. Hunger can kill more people. Other diseases that kill millions a year also need attention. Immunization programme cannot be delayed for a long time. Food, Shelter, Cash to sustain life is an inescapable necessity.

India has not been testing enough people at just 10.5 per million residents as compared to South Korea, that has conducted more than 6,000 tests per million residents. That private laboratories are allowed to charge \$60 per test—remember, just \$7 a month has been offered as income support for some residents—means significant barriers to confirmation and treatment remain in place. Contact tracing has been slow. “Measures such as self-quarantines and social distancing are impractical in a country where much of the population lives in dense clusters in overcrowded megacities. Whereas the WHO recommends a ratio of one doctor for every 1,000 patients, India has one government doctor for every 10,000, according to the 2019 National Health Profile. A 2016 Reuters report noted that India needed more than 50,000 critical-care specialists, but has just 8,350. India’s health-care system is in no position to cope with an avalanche of patients with a contagious respiratory infection in the manner that China and Italy have been doing”.<sup>7</sup>

Aggressively testing, isolating confirmed cases, and performing contact tracing is absolutely essential if India wants to prevent further spread of SARS-CoV-2 in the community.

Another priority area is the most vulnerable population groups from severe illness and fatal outcome by reducing transmission in the general population and enabling the reinforcement of healthcare systems. To mitigate the impact of the pandemic some important measures need to be taken: social distancing should be implemented meticulously and with active community engagement, can contribute to decreasing the spread of SARS-CoV-2 in the community. Layered application of social distancing measures like closure of, workplaces and educational institutions; restrictions in movement and social gatherings) can play a significant role in reducing community transmission if strictly adhered to.

Critical care needs can be required for up to 15% of hospitalised patients with COVID-19. Long-term care facilities should implement infection prevention and control measures. Patients in critical condition need specialised care, on average for more than two weeks. Capacity for nCoV laboratory testing at high levels is essential. Shortages in testing capacity need to be anticipated and addressed, taking the needs for testing of other critical diseases into account.

To prevent the scarcity of medical resources, supplies like personal protective equipment or high-filtration N-95 masks for health care workers have to be arranged on a top priority basis. “Interventions like testing, PPE, ICU beds, ventilators, therapeutics, and vaccines should go first to front-line health care workers and others who care for ill patients and who keep critical infrastructure operating, particularly workers who face a high risk of infection and whose training makes them difficult to replace. These workers should be given priority not because they are somehow more worthy, but because of their instrumental value: they are essential to pandemic response”.<sup>8</sup> If physicians and nurses are incapacitated, all patients will suffer greater mortality and years of life lost.

## Is rationing justified?

Rationing of care is currently being debated to make it justifiable to give priority to maximizing the number of patients that survive treatment with a reasonable life expectancy and to regard maximizing improvements in length of life as a subordinate aim. “Operationalizing the value of maximizing benefits means that people who are sick but could recover if treated are given priority over those who are unlikely to recover even if treated and those who are likely to recover without treatment. Because young, severely ill patients will often comprise many of those who are sick but could recover with treatment, this operationalization also has the effect of giving priority to those who are worst off in the sense of being at risk of dying young and not having a full life”.<sup>9</sup>

Governments must protect health professionals in a fragile health system. Without them nothing significant can be achieved so for health of the nations is concerned.

## Socio-economic impact

It is argued that most countries are not able to achieve the same rapid control that China managed. “A global slowdown would affect small and mid-size companies more acutely. Less developed economies would suffer more than advanced economies. Given the relatively quick economic restart in China, many companies are focused on temporary stabilization measures rather than moving supply chains out of China moving supply chains out of China. COVID-19 is also serving as an accelerant for companies to make strategic, longer-term changes to supply chains—changes that had often already been under consideration”.<sup>6</sup> Poor, and particularly the migrant workers are worst-hit. In India, they are struggling for food, shelter and money. Many who left metro cities are stranded at borders and this is emerging as a humanitarian crisis. Lockdown without planning adds to the miseries that is otherwise avoidable. A perfect strategy to deal with the pandemic is possible. According to the analysis by the UN Department of Economic and Social Affairs (DESA), the global economy could shrink by up to 1 per cent in 2020 due to the corona virus pandemic Fitch Ratings on 3 April, 2020 has slashed India’s growth forecast for the current fiscal to a 30-year low of 2 per cent, from 5.1 per cent projected earlier, as economic recession gripped global economy following the lockdown.

## The psychology of pandemics

The potential of the pathogen to spread is represented by  $R_0$  pronounced as “R naught” and referred to as the Reproductive number. It is defined as the number of people who will get the infection from one infected person in a susceptible population not protected by vaccination or intervention.  $R_0$  of more than one leads to an epidemic when  $R_0$  equal to one the disease is alive and stable while  $R_0$  of less than one leads to the decline of disease and control of infection.  $R_0$  is calculated from the Force of infection and the infectious period of the pathogen. All our efforts today (lockdown, social distances, hand washing, masks, etc) are interventions to alter  $R_0$  of the SARS-CoV-2 so that epidemic curve flattens or declines. SARS-CoV-2 infection has  $R_0$  of around 2.0-2.5, meaning one COVID-19 patient can infect a maximum of 2 to 3 persons. The reasons why somebody becomes a Super-spreader are many and ill-understood. It may be related to his or her viral load, her social activities while infected or other unknown factors.

It is becoming obvious in certain countries that after the pandemic, people who recover from COVID-19 infection might be shunned or

stigmatized. Health-care workers will take time to heal. People who went through long bouts of quarantine will carry the scars of their experience. Communities are finding new ways of coming together, even as they must stay apart. A new social order may emerge after the pandemic is over. The Covid-19 pandemic has flattened the world like never before. The pendulum has swung away from nuclear arsenal to life saving equipment’s. Attitudes to health may also change for the better. History may have to be re-written.

Diseases have destabilized cities and societies many times over. The socio-economic aspects have to be addressed. Whether through accumulating herd immunity or the long-awaited arrival of a vaccine, the virus will find spreading explosively more and more difficult. To contain such a pathogen, nations must develop a test and use it to identify infected people, isolate them, and trace those they have had contact with. That is what South Korea, Singapore, and Hong Kong did to tremendous effect.

Scientists can develop antiviral drugs. Hospitals can stockpile the necessary supplies. Testing kits can be widely distributed to catch the return of virus as quickly as possible.

## Research

Presently no definite treatment for SARS-CoV-2 is available. A few drugs like chloroquine and hydroxychloroquine are being used (in India) but they are not evidence-based. Similarly scientists are pinning hope on PrEP and PEP (Pre- and Postexposure Prophylaxis) to reduce infections. Drug discovery is of paramount importance for the researchers. Trials of drugs to prevent SARS-CoV-2 infection have started in health care workers in the USA, Spain and some other countries.

Blood from infected and recovered SARS-CoV-2 patients (Convalescent sera) is being explored as a possible means to fight this human python. Possibility should be explored and it needs to fulfil several conditions and has been tried in the past for several infections.<sup>10</sup> Recent modelling of the basic reproductive number ( $R_0$ ) from Italy estimate  $R_0$  between 2.76 and 3.25. Researchers from Lombardy who analysed the early phase of the outbreak in their region reported a reduction in  $R_0$  shortly after the introduction of mitigation measures. A recent review of 12 modelling studies reports the mean  $R_0$  at 3.28, with a median of 2.79.  $R_0$  is proportional to the contact rate and will vary according to the local situation. Further research is needed to get a more accurate estimate of  $R_0$  in the various outbreak settings.<sup>11</sup>

Nations need to build a system that can develop safe, effective vaccines and antivirals, get them approved, and deliver billions of doses within a few months after the discovery of a fast-moving pathogen.

Surge capacity plans must be up-to-date in health facilities and launched in expectation of the high demand for care of patients with moderate or severe respiratory distress. Designating and establishing treatment facilities for sub-intensive and intensive care needs is a necessity.

“Cohorting may help conserve PPE and reduce the risk of transmission. The minimum requirements for units designated for the management of confirmed SARS-CoV-2 patients include staff adequately trained in infection prevention and control and safe diagnostic evaluation and management of SARS-CoV-2 patients, the availability of appropriate PPE, adequate laboratory support, and appropriate cleaning and waste management procedures.”<sup>16</sup> An estimated 10–15% of mild cases progress to severe, and 15–20% of

severe cases become critical according to data from China. Home care could also be considered for symptomatic patients no longer requiring hospitalisation, or in a case of informed refusal of hospitalisation.<sup>12,13</sup>

The recommended diagnostic test for SARS-CoV-2 infection is by viral RNA detection with nucleic acid amplification tests (NAAT), such as RT-PCR. In areas with widespread community transmission of SARS-CoV-2 and when laboratory resources are limited, detection by RT-PCR of a single discriminatory target is considered sufficient. Confirmatory testing should be performed only for specimens if the first result is technically not interpretable.

Laboratory staff should get proper training in laboratory diagnosis of SARS-CoV-2. Point-of-care testing (POCT) represents a set of technologies that can lead to the rapid detection of infectious diseases and influence the way patients are treated for suspected infections.

## Conclusion

The SARS-CoV-2 pandemic has the potential to create devastating social, economic and political crises that will leave deep scars. It will require all of society to limit the spread of SARS-CoV-2 and to cushion the potentially devastating impact it may have on vulnerable people and economies. A global response now is an investment in our future. Widespread testing is the most important diagnostic tool to for prevention and control of virus in the community. Inexpensive test kits that offer quick results will be key to curbing the outbreak.

Action plan should include: provide food, shelter and some cash to poor labourers, migrant workers, daily wagers. Requisition all private spaces, community halls, vacant school buildings, stadia, private Hospitals and Nursing Homes etc for isolation and/or housing migrant workers. Mobile health teams should be deployed to those areas while health facilities are non-existent or weak. Public Distribution System has to be made effective and responsive. Reassure people a stable environment. Train basic health workers in SARS-CoV-2 (in areas where testing facilities are not available) so that they can report concerned authorities, a case as and when they notice it for proper treatment. Manufacture Rapid Testing tools, Ventilators and PPE at a large scale. We need to save lives now while also improving the way we respond to outbreaks in general in future. It needs a methodological and human response. Moreover, special attention must be paid to people living in conflict zones. The aftermath of this once-in-a-century pandemic is likely to change the global order. Life will not be same after the pandemic is over. Changes in perceptions, beliefs, values, and human understanding will make an altogether new world. New roles and responsibilities in changing world will emerge.

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## Conflicts of interest

There were no conflicts of interest during the study.

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