

COVID-19 PAST AND FUTURE—HISTORY REPEATS ITSELF UNTIL THE LESSON IS LEARNT

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The world is under the chaos of a pandemic that is unfolding as one of the greatest public health challenges of the 21st century. The new disease emerged in December 2019 in Wuhan, China, and was initially associated with a local fish and live animal market.¹ This new coronavirus was a spillover event, and it not only selectively kills the older people and the ones with underlying chronic conditions but is also capable of efficient person-to-person transmission. Respiratory features which predominate in infected persons are pneumonia and acute respiratory distress syndrome. These symptoms resemble those of the severe acute respiratory syndrome (SARS) coronavirus of 2002–2003, which, leads the scientists to believe that a virus of zoonotic origins is responsible. On December 31, 2019, the Chinese health ministry informed the World Health Organization (WHO) of the outbreak, putting the organization on emergency alert. The WHO subsequently issued warnings and technical advice to all the countries on how to detect, test, and manage this infection based on previous experience

¹ “Novel Coronavirus (2019-nCoV),” Situation Report - 1 (World Health Organization, January 21, 2020), <https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200121-sitrep-1-2019-ncov.pdf>.

with SARS and the Middle East Respiratory Syndrome (MERS) outbreak of 2012.² In mid-January, Chinese scientists extracted the virus and did genome sequencing of the virus. Later on, they announced that this was a new coronavirus with genetic structure similar to SARS (80%) that had origins in bats.³ The virus was then officially named the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the disease the Coronavirus Disease 2019, or COVID-19.⁴

In the first few months of the outbreak, majority of the infected persons did not show any symptoms. The person-to-person transmission that took place through asymptomatic carriers of COVID-19 infection

² “Listings of WHO’s Response to COVID-19,” *World Health Organization*, June 29, 2020, <https://www.who.int/news/item/29-06-2020-covid-timeline>.

³ Peng Zhou et al., “Discovery of a Novel Coronavirus Associated with the Recent Pneumonia Outbreak in Humans and Its Potential Bat Origin,” *BioRxiv*, January 23, 2020, <https://doi.org/10.1101/2020.01.22.914952>.

⁴ “SARS-CoV-2 Genetics,” Fact Sheet (Johns Hopkins Center for Health Security, April 16, 2020), <https://www.centerforhealthsecurity.org/resources/COVID-19/COVID-19-fact-sheets/200128-nCoV-whitepaper.pdf>; Zunyou Wu and Jennifer M. McGoogan, “Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72 314 Cases From the Chinese Center for Disease Control and Prevention,” *JAMA* 323, no. 13 (April 7, 2020): 1239–42, <https://doi.org/10.1001/jama.2020.2648>.

accounted for 79% of the documented infections.⁵ In less than two months, SARS-CoV-2 went from an outbreak to a disease of pandemic status, as declared by WHO on March 11, 2020.⁶ At that time, there were 118,000 cases and 4291 deaths worldwide. Over 90% of cases then were in four countries only: China (80,955 cases and 3162 deaths), Italy (10,149 cases and 631 deaths), Iran (8042 cases and 291 deaths), and South Korea (7755 cases and 60 deaths).⁷ The virus spread rapidly affecting the population with no immunity, claiming lives, and collapsing the unprepared health-care systems. Although, less lethal than the influenza pandemic of 1917 (mortality risk of 2%) and SARS (case fatality rate of 10%), the COVID-19 appeared to be more deadly than seasonal influenza (0.1% mortality risk).⁸ Scientists estimated that the mortality rate for COVID-19 was substantially higher for people above 60 years

(6.38%) as compared with those under 60 years (0.318%). The highest case death rates were seen in people in their 70s (8.61%) and 80s (13.4%).⁹ However, a number of other factors such as chronic debilitating diseases such as obesity, diabetes, respiratory and cardio vascular disease, and hypertension, emerged as risk factors for COVID-19 infectivity and mortality.¹⁰

Since its emergence, the new coronavirus has resulted in 81.2 million infections and over 1.77 million deaths as of December 28, 2020, globally. Of these, 20% of deaths are in the United States followed by Brazil (14%), India (10%), Russia (7.8%), and France (4%). Whereas, in Pakistan total cases till the end of December 2020, were 475000 with 425000 recovered and approximately 10 thousand deaths.¹¹

The health and economic consequences of the new disease were far more complex than initially understood. It would be appropriate to assume that COVID-19 would become the

⁵ Ruiyun Li et al., “Substantial Undocumented Infection Facilitates the Rapid Dissemination of Novel Coronavirus (SARS-CoV-2),” *Science* 368, no. 6490 (May 1, 2020): 489, <https://doi.org/10.1126/science.abb3221>.

⁶ “WHO Director-General’s Opening Remarks at the Media Briefing on COVID-19,” *World Health Organization* (WHO), August 10, 2020, <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---10-august-2020>.

⁷ “Coronavirus Disease 2019 (COVID-19),” Situation Report - 51 (World Health Organization, March 11, 2020), <https://apps.who.int/iris/handle/10665/331475>.

⁸ Eskild Petersen et al., “Comparing SARS-CoV-2 with SARS-CoV and Influenza Pandemics,” *The Lancet Infectious Diseases* 20, no. 9 (September 1, 2020): 238–44, [https://doi.org/10.1016/S1473-3099\(20\)30484-9](https://doi.org/10.1016/S1473-3099(20)30484-9).

⁹ Robert Verity et al., “Estimates of the Severity of Coronavirus Disease 2019: A Model-Based Analysis,” *The Lancet Infectious Diseases* 20, no. 6 (June 1, 2020): 669–77, [https://doi.org/10.1016/S1473-3099\(20\)30243-7](https://doi.org/10.1016/S1473-3099(20)30243-7).

¹⁰ Fei Zhou et al., “Clinical Course and Risk Factors for Mortality of Adult Inpatients with COVID-19 in Wuhan, China: A Retrospective Cohort Study,” *The Lancet* 395, no. 10229 (March 28, 2020): 1054–62, [https://doi.org/10.1016/S0140-6736\(20\)30566-3](https://doi.org/10.1016/S0140-6736(20)30566-3).

¹¹ “COVID-19 Map,” Johns Hopkins Coronavirus Resource Center, <https://coronavirus.jhu.edu/map.html>.

greatest global public health challenge since World War II.¹²

Spanish Flu-A Pandemic revisited

The Spanish Flu occurred in 1918 and is considered as one of the most powerful examples of a global pandemic.¹³ During its brief occurrence, it infected 500 million people and claimed an estimated 50 million lives. A unique feature of that pandemic was the mortality rate, which was high in people younger than 5 years, those between 20 and 40 years, and also among those above 65 years. The virus behaved notoriously and had waves between February 1918 and April 1920. The first wave commenced in March 1918 and spread across the world because of immunologically incompetent population, overcrowding, intercity travel of people, poor hygiene and sanitary conditions, and soldiers traveling to and from the battlefields. In the first wave, the disease was mild with relatively few symptoms, but as significant number of soldiers fell sick, it led to the disruption of war

efforts. In August 1918, the virus mutated, and the second wave of the disease left a far deadlier outcome. The disease pattern followed a perfect transmission design with soldiers bringing back more virulent versions to their countries from battlefields and causing otherwise healthy persons to suffer from lethal pneumonia. Later analysis showed that the deaths were not a result of the mutated virus but the “cytokine storm” (a protective measure by the body designed to promote healthy inflammation).

The Influenza Pandemic of 1918–1919 occurred at a time when very little was known about the microbiology of diseases as the science to see microbial world was still evolving. Presumptively, the human-to-human transmission took place through respiratory droplets. There was no treatment of any kind available either at that time since antivirals or antibiotics such as penicillin were not discovered until 1928. The physicians found out that the use of convalescent sera reduced the risk of death and utilized it judiciously. Community extenuation strategies depended on the nonpharmaceutical interventions which included improved hygiene measures, wearing of face masks, isolation or quarantine orders, school closures and bans on public

¹² Chaolin Huang et al., “Clinical Features of Patients Infected with 2019 Novel Coronavirus in Wuhan, China,” *The Lancet* 395, no. 10223 (February 15, 2020): 497–506, [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5).

¹³ “Pandemic Influenza—Past, Present, Future: Communicating Today Based on the Lessons from the 1918–1919 Influenza Pandemic,” Workshop Proceedings (Washington, D.C., USA: U.S. Department of Health and Human Services Centers for Disease Control and Prevention, October 17, 2006), <https://espanol.cdc.gov/flu/pandemic-resources/pdf/workshop.pdf>.

gatherings.¹⁴ With these measures in place to stop the spread of the virus the pandemic ended by 1920.

The horrible story of the 1918 Influenza Pandemic holds a few lessons for the current COVID-19 pandemic which include: Understanding pathways of transmission, implementing control measures, and eliminating the virus. Knowing the etiology and pathophysiology is critical for treating the disease. Moreover, protecting the high-risk vulnerable populations versus those that are relatively safe, and recognizing that any measures described are probably insufficient is also essential. The current COVID-19 pandemic is, moreover, a pointer to what might happen in the future. It would have long-term consequences for public health, health services delivery, social policies, global economy, and international politics. It has already affected the social security of people, besides having a deep sociological and psychological impact. This pandemic is not likely to remain a unique entity, and there is a strong prediction of more waves of pandemic diseases battering the world. For example, a new G4 virus, genetically modified form of H1N1 swine flu, has all the essential hallmarks

¹⁴ Howard Markel et al., “Nonpharmaceutical Interventions Implemented by US Cities During the 1918-1919 Influenza Pandemic,” *JAMA* 298, no. 6 (August 8, 2007): 644–54, <https://doi.org/10.1001/jama.298.6.644>.

of a pandemic virus. Given the fascinating ability of evolution in genetics and immense variability of nature, it is clear that there will be other viral attacks. These viruses will have more dramatic and devastating impacts on society. The challenge for health professionals, therefore, is to ensure that all elements of international health systems are solicited so that these systems have the ability to swiftly identify and classify the nature of the disease. This will help in developing and reinforcing prevention and treatment strategies for the protection of the most vulnerable.

An effective response to COVID-19 is required to slow down the spread of the disease and prevent health systems from becoming saturated. Countries enforced travel restrictions in addition to enforcing full, partial, and selected lockdowns,¹⁵ which had devastating socioeconomic consequences leading to a global recession but slowed down the transmission.¹⁶ Other basic public health measures such as testing, tracing, isolation and

¹⁵ Juliana Kaplan, Lauren Frias, and Morgan McFall-Johnsen, “Our Ongoing List of How Countries Are Reopening, and Which Ones Remain under Lockdown,” *Business Insider* (blog), September 23, 2020, <https://www.businessinsider.com/countries-on-lockdown-coronavirus-italy-2020-3>.

¹⁶ “COVID-19 to Plunge Global Economy into Worst Recession since World War II,” Press Release, *World Bank*, June 8, 2020, <https://www.worldbank.org/en/news/press-release/2020/06/08/covid-19-to-plunge-global-economy-into-worst-recession-since-world-war-ii>.

quarantining; practicing good hand hygiene and respiratory etiquettes; and wearing facemasks were important interventions for reducing transmission and mortality.¹⁷ Over the past 6 months, existing and new antiviral drugs, their combinations, and the development of promising new vaccines have collectively helped manage the disease.¹⁸

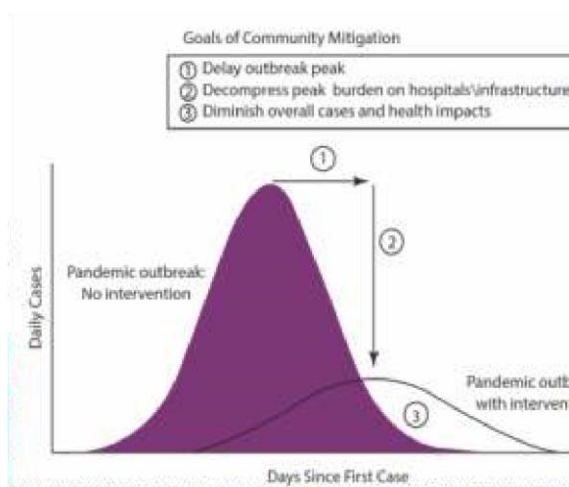


Figure: Flatten the curve: the goal is to reduce the incidence of cases. Center for Disease Control and Prevention, 2007.¹⁹

¹⁷ Emeline Han et al., “Lessons Learnt from Easing COVID-19 Restrictions: An Analysis of Countries and Regions in Asia Pacific and Europe,” *The Lancet* 396, no. 10261 (November 7, 2020): 1525–34, [https://doi.org/10.1016/S0140-6736\(20\)32007-9](https://doi.org/10.1016/S0140-6736(20)32007-9).

¹⁸ “COVID-19 Therapies and Vaccine Landscape,” *Nature Materials* 19, no. 8 (July 23, 2020): 809; Jennifer Tran, “COVID-19 Treatments: An Updated List of Drugs and Medications in Development,” *The GoodRx* (blog), December 22, 2020, <https://www.goodrx.com/blog/coronavirus-treatments-on-the-way/>.

¹⁹ Kaplan, Frias, and McFall-Johnsen, “Our Ongoing List of How Countries Are Reopening, and Which Ones Remain under Lockdown.” *Business Insider*, September 23, 2020,

COVID-19 pandemic has taken on the countries by surprise, forced people to sequester in their homes, and brought economies to a standstill. With no effective treatments available and many of the vaccines still in trial phases, efforts thus far have largely focused on nonpharmaceutical methods along with PCR testing, contact tracing, and quarantine. Some developed countries have managed to successfully control the SARS-CoV-2 transmission, and have implemented strategies to minimize the possibility of the re-emergence of infections. Other developing nations such as Pakistan are passing through the second wave of the pandemic.

Theoretically, there are three probable scenarios characterizing how the coronavirus pandemic might end: *The first scenario* is based on building up herd immunity. This means that most people will become infected with a few protective measures in place. Those who get infected and recover will begin to make up the immune population until the virus will find no more viable hosts. Herd immunity would only be possible if 70–90% of the population became permanently immune. However, it remains to be determined whether immunity with COVID-19 is long term. Such a proposition will be

<https://www.businessinsider.com/countries-on-lockdown-coronavirus-italy-2020-3>

disastrous for the health systems worldwide and many people would die.

The second scenario is to control the spread of the virus through precise and aggressive containment measures. Widespread testing would be required in order to identify all cases. A requirement to allow for this level of containment is strong cooperation between leadership, full compliance by the public, and availability of adequate resources. Finally, **the third route** is biological risk mitigation until a vaccine is produced. The disease will, therefore, remain among us as long as containment measures are imperfect and till the time a vaccine is produced and distributed.

What the future holds for COVID-19 Pandemic

Every day of the pandemic is a new learning curve as countries learn through the process of trial and error, and build upon experiences of other nations. It is important that new knowledge and accurate information must be shared with the public and scientific communities including health experts and public officials in a timely manner. It is worth emphasizing that now bio-risk mitigation strategies are actually proving to work due to persistent concerns about some of these measures. Both researchers and health officials agree that an extended period of

quarantine may not be reasonable. Multiple studies have concluded that a workable strategy can focus on intermittent social distancing with increased critical care capacity.²⁰ Economy can be balanced without burdening health-care capacities.²¹ At the same time, the development of vaccines and other new interventions is an urgent priority. Serological research would be helpful for understanding the long-term immunology and spread of the virus. The capacity of testing to identify asymptomatic carriers for breaking the chain needs to be enhanced. Moreover, tests should be performed at subsidized rates to incentivize general populace. This might involve the implementation of systems in

²⁰ Volodymyr V. Oberemok et al., “SARS-CoV-2 Will Continue to Circulate in the Human Population: An Opinion from the Point of View of the Virus-Host Relationship,” *Inflammation Research* 69, no. 7 (April 30, 2020): 635–40, <https://doi.org/10.1007/s00011-020-01352-y>; Calistus N. Ngonghala et al., “Mathematical Assessment of the Impact of Non-Pharmaceutical Interventions on Curtailing the 2019 Novel Coronavirus,” *Mathematical Biosciences* 325 (July 1, 2020): 108364, <https://doi.org/10.1016/j.mbs.2020.108364>; Laura Matrajt and Tiffany Leung, “Evaluating the Effectiveness of Social Distancing Interventions to Delay or Flatten the Epidemic Curve of Coronavirus Disease,” *Emerging Infectious Diseases Journal* 26, no. 8 (August 2020), https://wwwnc.cdc.gov/eid/article/26/8/20-1093_article; Alberto Aleta et al., “Modeling the Impact of Social Distancing, Testing, Contact Tracing and Household Quarantine on Second-Wave Scenarios of the COVID-19 Epidemic,” *MedRxiv* 1 (May 18, 2020), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7273304/>.

²¹ Stephen M. Kissler et al., “Projecting the Transmission Dynamics of SARS-CoV-2 through the Postpandemic Period,” *Science* 368, no. 6493 (May 22, 2020): 860–68, <https://doi.org/10.1126/science.abb5793>.

communities to streamline testing and periodic reopening and restriction of activities along with mass awareness campaigns.

Dealing with the Outcomes

The Govt should keep following the actions recommended by the WHO for addressing the long-term health and social impact of the pandemic. The government strategy must be multifaceted to include planning and coordination with continuous situation monitoring and assessment. This may help in reducing the spread of the disease.

Continuity of health-care provision is of utmost importance even after the pandemic ends. Moreover, public acknowledgement of the contributions made by communities and health care professionals is desirable. Lessons learnt must be communicated and incorporated into future healthcare policy planning for better preparation to handle the major public health crisis.

WHO chief Tedros Adhanom Ghebreyesus condemned the "dangerously shortsighted" cycle of throwing cash at outbreaks but doing nothing to prepare for the next one. For too long, the world has operated on a cycle of panic and neglect. The Global Preparedness Monitoring Board's first annual report on world readiness for health emergencies, which

was published in September 2019 a few months before the novel coronavirus broke out, had noted that the planet was woefully unprepared for potentially devastating pandemics. "History tells us that this will not be the last pandemic, and epidemics are a fact of life," said Ghebreyesus. "The pandemic has highlighted the intimate links between the health of humans, animals, and planet," he added. "Any efforts to improve human health are doomed unless they address the critical interface between humans and animals, and the existential threat of climate change that's making our earth less habitable," he said.

The COVID-19 pandemic is ill-fated, but its occurrence stipulates an opportunity to set up a different kind of world where health care can be delivered to all in a cost-effective manner.

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