

A Webinar Training on From AIDS to COVID: The Rocky Road of Public Health

Priyakanta Nayak¹, Anil Purohit², Nikita Joshi³, Bhawna Sati⁴

¹Associate Professor, ²Founder & Chairperson, Jodhpur School of Public Health (JSPH), ³Intern, Prin. L. N. Welingkar Institute of Management Development & Research, Mumbai, ⁴Head of the Department, Jodhpur School of Public Health (JSPH)

Abstract

Background : Poornima University, in collaboration with Jodhpur School of Public Health, hosted an insightful and interactive live global webinar on the topic of “From AIDS to COVID: The Rocky road of Public Health” on August 8, 2020.

Findings: This report provides information about the coronavirus, the good and bad impact of COVID-19, and some of the major challenges that were faced all across the globe. Many questions are it the origin of the virus or the route of transmission of the virus remains unclear. But the good thing is that there were many innovations in the field of testing, repurposing of drugs, and rapid development of vaccines to reduce the spread of the pandemic.

Conclusion: The findings show that a lot of questions are yet to be answered and that there is a need of focusing on public health. There were many learnings from this pandemic and one of the most important lessons was that the involvement of communities is a key step to face such global challenges. The pandemic is not going anywhere soon, and therefore, it becomes necessary to bring in change and sustain it for the future. The challenges faced during this pandemic have served as valuable lessons and it is vital to focus on the shortcomings to avoid such negative impacts around the world.

Keywords: COVID-19, Coronavirus, Challenges

Background

The COVID-19 was declared a pandemic on 11 March 2020, by the World Health Organization¹. The COVID-19 jammed the world unprepared with no medical preparedness. At the end of 2019, emerging from Wuhan, China, the novel coronavirus was diagnosed across eight other countries: Nepal, Japan, South Korea, Thailand, Taiwan, Singapore, the United States, and Vietnam by the end of January 2020. Many countries adopted measures such as geographical border closer, preparation of isolation centres, nation-wide lockdown except for medicines, foods, and essential services, promotion of basic hygiene and social distancing practices, and arrangement of welfare packages for the vulnerable population. The WHO supported the

pandemic battle by issuing patient monitoring guidance, coordinating for the development of diagnostics, treatment, providing COVID-19 updates, and collection of specimens².

Procedure:

Coronavirus is single-stranded RNA containing enveloped viruses that have the potential to infect a wide range of animals and humans. Their morphology is spherical virions that have a core-shell and projections on their surface which resembles a solar corona. The genome size varies between 26 kb to 32 kb. There are four subfamilies, i.e. alpha□, beta□, gamma□ and delta□ coronaviruses. The alpha- and beta- coronaviruses seemingly originate from mammals, especially from

bats, while the origin of gamma- and delta- coronaviruses is from birds and pigs. The alpha-coronaviruses cause asymptomatic or mild symptomatic infection, while beta-coronaviruses might cause severe complications. SARS-CoV-2 is from the B lineage of the beta-coronaviruses and at the whole-genome level is 96% identical to a bat coronavirus. SARS-CoV-2 has seemingly succeeded in transmission from animals to humans in Wuhan, China but the exact route of transmission is still not clear.

Based on the intensity and time of occurrence of symptoms, the infection has been classified as a mild, severe, and critical stage. At a mild stage, the symptoms such as mild fever, sore throat, malaise, nasal congestion, mild/no pneumonia, muscle pain, and headache are observed. In the case of severely affected individuals, symptoms such as cough, oxygen saturation below 93% (hypoxia), and tachypnea (shortness of breath) are observed. At the critical stage, there is severe pneumonia, respiratory failure, septic shock, multiple organ failure, and/or cardiac arrest, which might lead to patient death. Also, research studies have shown that individuals with comorbidities such as severe obesity, diabetes mellitus, and hypertension are at a higher risk of complications and death from COVID-19 infection³.

The development of specific, sensitive, rapid, and accurate diagnostic tests was one of the important steps to curb the pandemic. The conventional testing methods were replaced by the molecular RT-PCR assays, which were specific, rapid, and highly sensitive. There were breakthrough innovations such as the Xpert® Xpress SARS-CoV-2 test (an RT-qPCR test), Abbott ID NOW. COVID-19 test, IgM-IgG-combined antibody test (developed by Biomedomics), a CRISPR-based Specific High Sensitivity Enzymatic Reporter Unlocking (SHERLOCK) technique, etc. in the field of testing. As per the data by the Foundation for Innovative New Diagnostics (FIND), one of the WHO's associates for the evaluation of diagnostics, there are at least 143 COVID-19 molecular diagnostic kits that are commercially used across the globe⁴. Also, technology such as Artificial Intelligence (AI) has been implemented for the preliminary screening of early infections of SARS-CoV-2. AI is an important tool

that can help in understanding the risk involved and transmission dynamics between the diverse population groups. Similarly, the use of telehealth was seen to rise in several regions of the world^{5,6}.

Another interesting surprise was the rapid development of vaccines. Around 200 vaccines were present in different stages of clinical trials. The vaccines were developed by using different methods such as viral vector vaccine, mRNA vaccine, DNA vaccine, peptide-based, recombinant protein-based vaccine, virus-like particles, live-attenuated vaccine, and killed vaccine⁷. Until the availability of licensed vaccines and antiviral drugs, the most promising option was the repurposing of the available drugs. Favilavir, the first drug tested, by the National Medical Products Administration of China, is used for the treatment of influenza infection. Other drugs such as remdesivir, a combination of lopinavir and ritonavir, hydroxychloroquine in combination with azithromycin, are also some of the repurposed drugs used for the treatment of COVID-19 patients.

With the increasing risk of the spread of the COVID-19 pandemic, many measures were implemented to control the spread of infection. The measures were as follows:

- **Control of cross-country travel and international trade:** The refusal of visa, restrain the entry of selected foreign country individuals based on health status, nationality, or travel history. The unexpected spread of the virus had provided a reality check on the availability of resources and there was a huge demand for personal protective equipment, active pharmaceutical ingredients for drug manufacturing, and ventilators. During these challenging times, it is also important to understand the social, legal, ethical, and economic impact the cross-border measures can have if not given sufficient attention. The cross-border measures could restrict the movement of health professionals and essential supplies and can also cause economic stress and poor health outcomes in some affected nations.

- **Implementing entry and exit controls at the country border:** There was a strong focus on things such as filling the questionnaire, body temperature

check, testing, health certifications, and vector control while traveling to another country. Travelers from other affected countries were quarantined.

- **Use of sanitizers or soaps:** There was a drastic increase in the demand for sanitizers. Sanitizers made up of 70% isopropanol or 60–70% ethanol are effective against SARS-CoV-2. Several health organizations and governments had been focusing on spreading awareness regarding the importance of hand hygiene among the public. The use of sanitizers to clean hands while the use of soap and water for 20 s were important measures promoted to limit COVID-19.

- **Use of masks and spread of awareness:** Another important area of focus was the implementation of the use of masks and creating awareness. The WHO had recommended the use of N95 masks at all times for the infected patients and healthcare professionals only when in close proximity of the infected patients. Bringing in awareness about the routes of transmission, symptoms, and preventive strategies such as social distancing were necessary.

Challenges

With the widespread of COVID-19, multiple challenges were faced by nations across the globe⁸. The danger was not limited to the contraction of the virus but had its indirect impact on various industrial sectors. Be it logistics or healthcare, every sector had to hold back and think of new ways to survive the ongoing pandemic. Some of the challenges caused by the COVID-19 pandemic are as follows:

- **Restrictions on Basic Human Rights:** Soon with the spread of COVID-19, a lockdown was implemented in many countries. This caused restriction on movement, closing of educational institutes, social distancing, ban on visiting religious places, etc. The visit to restaurants, clubs, cinemas, weddings, etc. was also prohibited. Also, many developing countries faced unemployment and hunger issues.

- **Mental Health:** The future uncertainty, a severe shortage of resources for diagnosis and treatment, restrictions on personal freedom, rising economic

problems, and ambiguity in the information provided by the authorities are some of the major reasons that have affected mental health. Such public health emergencies affect safety and health at both individuals as well as at the community level⁹. The feeling of insecurity, emotional isolation, confusion, and stigma might arise and also may translate into unhealthy behaviours, a variety of emotional reactions, and noncompliance with public health professionals.

- **Healthcare System:** The lack of healthcare infrastructure, healthcare professionals, and medical resources was evident during the pandemic across various countries across the world. The front-line healthcare workers were at a very high risk of infection and death¹⁰. The shortage of healthcare professionals coupled with increasing COVID-19 cases caused a lot of stress on the workforce. Further, the shortage of personal protective equipment in many nations increased the problems of the health service providers. Also, the intense focus on COVID-19 impacted the prevention, monitoring, and treatment of other diseases, which lead to increased complications related to diabetes, cardiovascular diseases, HIV, TB, malaria, etc.

- **Social-Economic:** There was an intense socio-economic impact across the globe. The pandemic caused the closing of schools and universities, cancellation of sports events, decline in the stock market and crude oil prices, restrictions on tourism and entertainment industry, etc. The pandemic severely affected to lower socio-economic stratum¹¹. In India, there were distressing visuals of migrant laborers walking from cities to their hometowns during the lockdown. The global GDP loss is estimated to be in the range of 1.0 to 2.7 trillion US dollars. It was a big challenge for various countries across the globe to revive the GDP and improve the economic status of the communities.

Conclusion

With the emergence of the pandemic, a lot of gaps were identified be it the knowledge about transmission of the virus from animals to humans, or the preparedness to deal with such pandemic. The knowledge about factors causing the virus to cross the species barriers, the exact

origin of the virus, mutation differences, recurrence of infection in few individuals, and reasons for some remaining asymptomatic while some having severe complications remains unclear. Several questions were raised on implementing effective safety measures and fulfilment of vaccines and other resources to such a large population across the globe. One of the good things that this pandemic has given is the breakthrough innovations in testing. Many companies came up with rapid, sensitive, and specific COVID-19 molecular diagnostic kits. Also, scientists are working hard on vaccines and therapies for the treatment of COVID-19 infection. The use of technology and social media platforms have also played an important role in science and communication.

Starting from Wuhan, China the outbreak had reached around 85 countries/areas/territories as of 5 March 2020. An extensive study was done by the scientists on the characterization of the novel coronavirus and repurposing of available drugs. The pandemic has caused many direct as well indirect impacts on the healthcare ecosystem. With the increasing focus on the prevention and treatment of COVID-19 patients, the care of other patients with non-communicable diseases such as hypertension, diabetes, etc. was neglected. People had the fear to visit the hospitals, and thus, avoided going for detection and treatment. All these factors have increased the complications of diseases and raised the burden of healthcare professionals. Though there has been a rise in telehealth still the utilization has been disproportionate and will require time to gain global acceptance. The pandemic also had a negative impact on the supply chain, social life, economy, mental health, etc. It taught us that community involvement is essential to deal with such global challenges.

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