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# Facing the Threat of COVID-19 in Pakistan: A Nation's Dilemma

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## ABSTRACT

*Objectives:* In this article, we assess the resources, strategies, laboratory testing, awareness campaigns, and different treatment plans initiated by the government of Pakistan.

*Methods:* A comprehensive literature search was performed using Medline/PubMed, Embase, Web of Science, and Google Scholar and official websites of Government of Pakistan and international organizations to identify empirical literature published in English from 2019 to June 2020.

*Results:* It was not until the end of December 2019 that the first case of coronavirus disease 2019 (COVID-19) was discovered in Hubei province, China, with Wuhan the epicenter of it, sending the nation into an 11-week lockdown. It was the first of its kind and never seen before; hence, based on its novelty, the Chinese authorities named it novel coronavirus (2019-nCOV). Until January 23, 2020, there were only 17 cases in Wuhan, which surged to around 60,000 on February 16, 2020, with 2000 deaths. The World Health Organization declared it a global pandemic on January 30, 2020. Pakistan reported its first case of severe acute respiratory syndrome coronavirus 2 in February in Karachi. At the time, we did not realize the threat we were facing, and with even fewer resources at our disposal, it would turn out to be a major disaster in the coming days in Pakistan.

*Conclusion:* The COVID-19 crisis will likely have both short-term and long-term consequences for the general population, healthcare workers, and patients alike. But we need to get ahead of ourselves and come out on top for only not our survival, but also the survival of our population and healthcare system.

*Keywords:* COVID-19, pandemic, Pakistan SARS-COV-2, WHO, Wuhan.

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## Introduction

Coronavirus is derived from the Latin word *corona*, which means resembling the shape of a crown, as spikes are anchored in such a way that they give the typical outlook of a crown on microscopic imaging (Fig. 1).[1] They can further be subdivided into alpha, beta, gamma, and delta. The family also includes severe acute respiratory syndrome (SARS), Middle East respiratory syndrome (MERS) coronavirus, and coronavirus disease 2019 (COVID-19), which are the most virulent forms and cause severe symptoms in human beings by getting logged into the respiratory and digestive system.[1] They proliferate, thereby attacking the type 2 epithelial cells of the respiratory tract.[2] When attached to the human organism, they are replicated by the RNA polymerase system and released into the surrounding cells through exocytosis. Once achieved, they attach to angiotensinogen converting enzyme 2 receptors, hence typical spread occurs via lungs.[3]

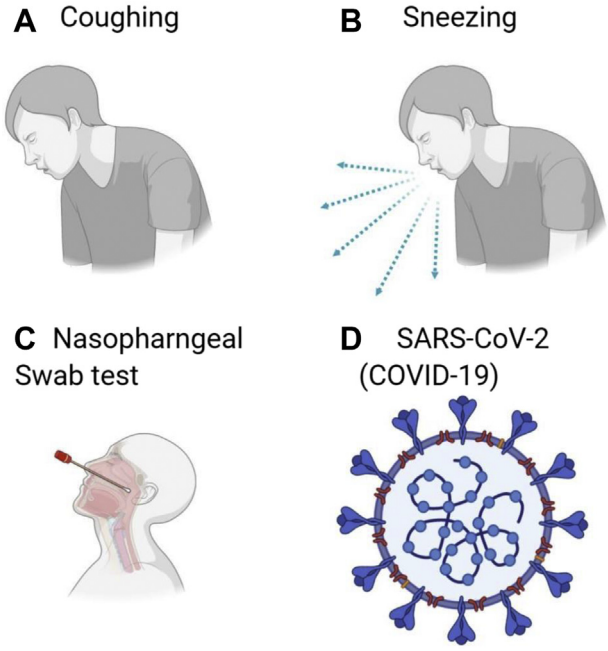
COVID-19 was not the first outbreak of the coronavirus family; MERS had already affected parts of the Middle East in 2012, infecting 2519 people and killing 866 people, with a fatality rate of 34.3%, mostly affecting Saudi Arabia followed by United Arab Emirates.[4]

On January 12, COVID-19 was confirmed by the World Health Organization (WHO) to be the cause of spread.[5] On January 30, it had affected more than 1 million people worldwide, causing 60 000 deaths and spreading to at least 187 countries, giving it the status of a grade 5 pandemic.[6] With its proximity to China, Pakistan still did not realize the threat and decided to stay open. Within no time the virus spread from China to Taftan to Iran to Saudi Arabia to Qatar, India, and other parts of the world. It was not until March 21 when the federal government imposed a lockdown in Pakistan.[7]

## Methods

A literature search was performed on Medline/PubMed, Embase, Web of Science, and Google Scholar by using all identified keywords associated with COVID-19 situation in Pakistan. In addition, a comprehensive search of secondary information sources was also carried out through official government websites, such as the National Institute of Health and COVID Pakistan (www.covid.gov.pk) as well as international organizations, such as WHO, the US Food and Drug Administration (FDA), the Centers for Disease Control and Prevention, ClinicalTrials.gov, and the Chinese

**Figure 1.** COVID-19 (novel coronavirus). (A) Patient coughing. (B) Patient sneezing. (C) Nasopharyngeal swab test. (D) Structure of COVID-19.




COVID-19 indicates coronavirus disease 2019.

Clinical Trial Registry. This review considered articles of any design (experimental, epidemiological, or mixed) published in English in peer-reviewed journals or grey literature from December 2019 to June 2020. The core search terms of (2019-nCoV, OR SARS-COV-2 OR COVID-19) AND (Pandemic) AND (Pakistan) were used. The detail search strategy of literature review is presented in the Appendix 1 in the Supplemental Materials found at https://doi.org/10.1016/j.vhri.2020.10.005.

## Global Pandemic Overview of COVID-19

On May 27, 2020, the WHO laid out new guidelines for clinicians around the world and divided COVID-19 into mild, moderate, and severe based upon its symptoms.[5] As of May 29, 2020, more than 5.5 million cases have been confirmed globally, and the death toll has passed 325 000 (Table 1).[8] Countries around the world have started to relax lockdown restrictions, but are being urged to continue widespread testing. The pandemic has put health systems under severe strain, and there have been shortages of critical supplies. There is currently no treatment for the disease, and research teams worldwide have joined the race to develop a safe and effective vaccine.[8] More than 30 countries and multiple international partners and institutions have signed up to support the COVID-19 Technology Access Pool an initiative aimed at making vaccines, tests, treatments, and other health technologies to fight COVID-19 accessible to all.[5]

## Timeline of COVID-19 in Pakistan

The first cases of SARS-COV-2 appeared in Pakistan on the February 26: 2 spontaneous cases in both Karachi and Islamabad.[9-11] On March 15, there were 52 confirmed cases in Pakistan and 100 on the March 16. Within the next week, there were 1000 cases, which rose to 1600 on March 30 and 2000 within the next 3 days. Soon there were 5000 cases almost double within 1 week.[10] The government started a nationwide campaign via news, print, and social media urging people to stay at their homes, follow social distancing protocols, wash hands for 20 seconds, and wear masks and gloves if going outside. A dedicated hotline 1166 was formed at the command and control center in Islamabad for information and to report anything related to SARS-COV-2. A global positioning system was also used to track the positive cases. Later in April an app was also launched.[11,12]

As of May 29, 2020, Pakistan's official tally stands at 64 027 cases, with 2636 in the past 24 hours. The highest number of cases appeared in Sindh (25 309), followed by the Punjab province (22 964), Khyber Pakhtunkhwa (KPK) (8862), Balochistan (3928), Islamabad capital territory (2100) Gilgit Baltistan (658), and Azad Jammu and Kashmir (AJK) (227). The mortality rate of SARS-COV-2 in Pakistan is 2.1%, causing a total of 1317 deaths. KPK was most effected (432), followed by Punjab (410), then Sindh (396), Balochistan (43), Islamabad (22), Gilgit Baltistan (9), and AJK (5; Fig. 2A).[11,12]

## Testing Facilities in Pakistan

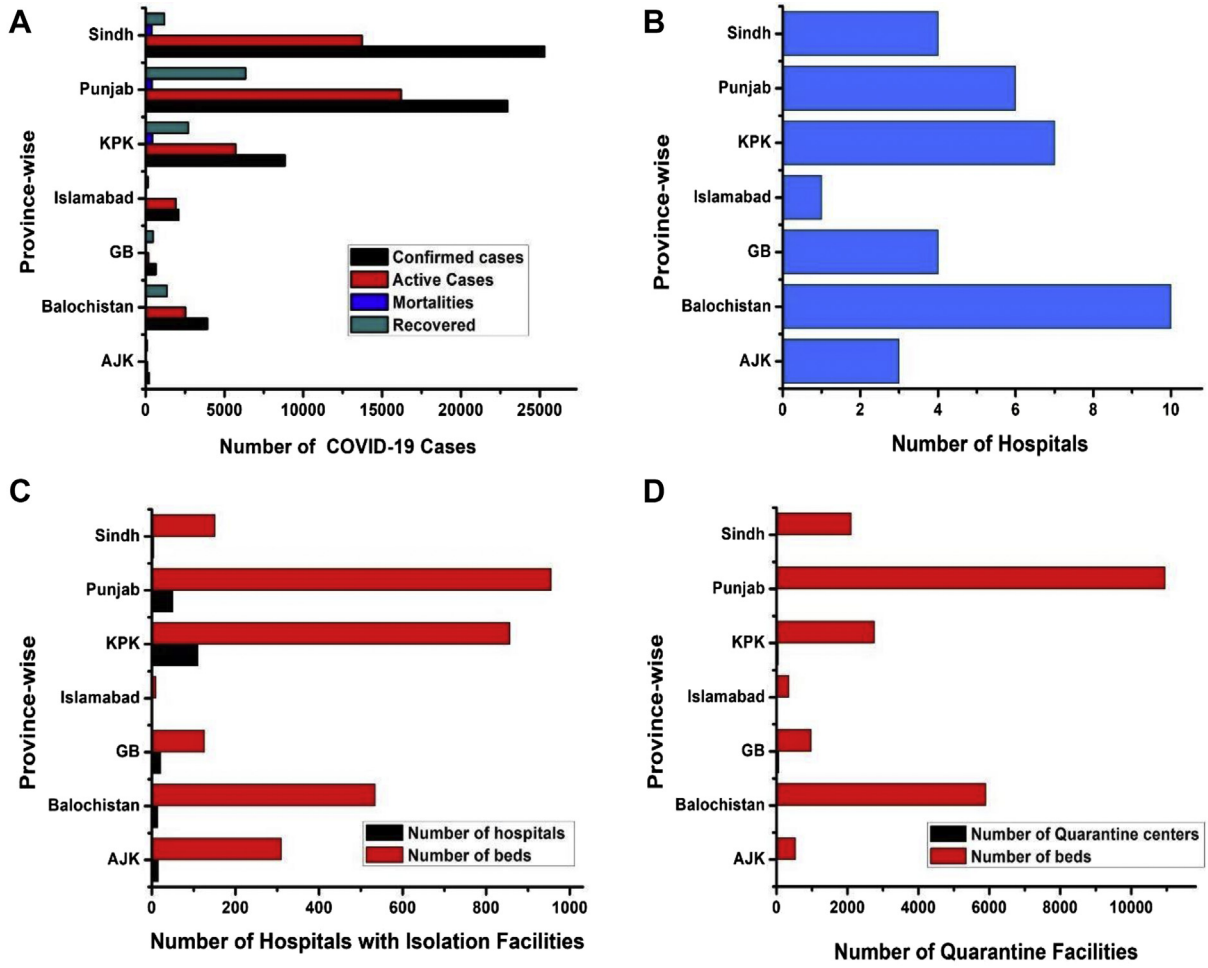
With all these measures in place, the real challenge was budget allocation and infrastructure. Pakistan, being a poor county, could not afford it; 25% of the population lives below the daily wages. Because polymerase chain reaction (PCR) test was

**Table 1.** Global pandemic statistics of COVID-19.

| Countries | Total infections | Active infections | Recoveries | Deaths |
|---|---|---|---|---|
| Russia | 379 051 | 223 916 | 150 993 | 4142 |
| Turkey | 160 979 | 32 149 | 124 369 | 4461 |
| India | 165 799 | 89 982 | 71 106 | 4711 |
| Germany | 182 452 | 10 682 | 163 200 | 8570 |
| Brazil | 438 812 | 218 867 | 193 181 | 26 764 |
| Spain | 284 986 | 60 909 | 196 958 | 27 119 |
| France | 186 238 | 90 385 | 67 191 | 28 662 |
| Italy | 231 732 | 47 986 | 150 604 | 33 142 |
| UK | 269 127 | N/A | N/A | 37 837 |
| USA | 1 768 461 | 1 166 406 | 498 725 | 103 330 |
| Total (worldwide) | 5 909 081 | 2 964 912 | 2 582 078 | 362 091 |

COVID-19 indicates coronavirus disease 2019.

**Figure 2.** Coronavirus disease 2019 (COVID-19) statistics in Pakistan. (A) COVID-19 cases overview in Pakistan (May 29, 2020). (B) COVID-19 designated tertiary hospitals province-wise. (C) Number of hospitals province-wise with isolation facilities. (D) Number of quarantine facilities province-wise.




Source: www.covid.gov.pk, and www.nih.org.pk.[11,12]

accepted worldwide for diagnosing COVID-19.[13] The first testing facility was inaugurated at National Institute of Health in Islamabad[11] and was followed by Sindh and Punjab. At present there are 35 testing facilities in Pakistan (Islamabad capital terriority (ICT)-01, KPK-07, Punjab-06, Sindh-04, Balochistan-10, Gilgit Baltistan (GB)-04, AJK-03). The daily testing capability started at 1000 cases per day and is now at 11 000 cases per day, with a total of 520 017 tests conducted (Fig. 3).[14]

## COVID-19 Treatment and Quarantine Facilities in Pakistan

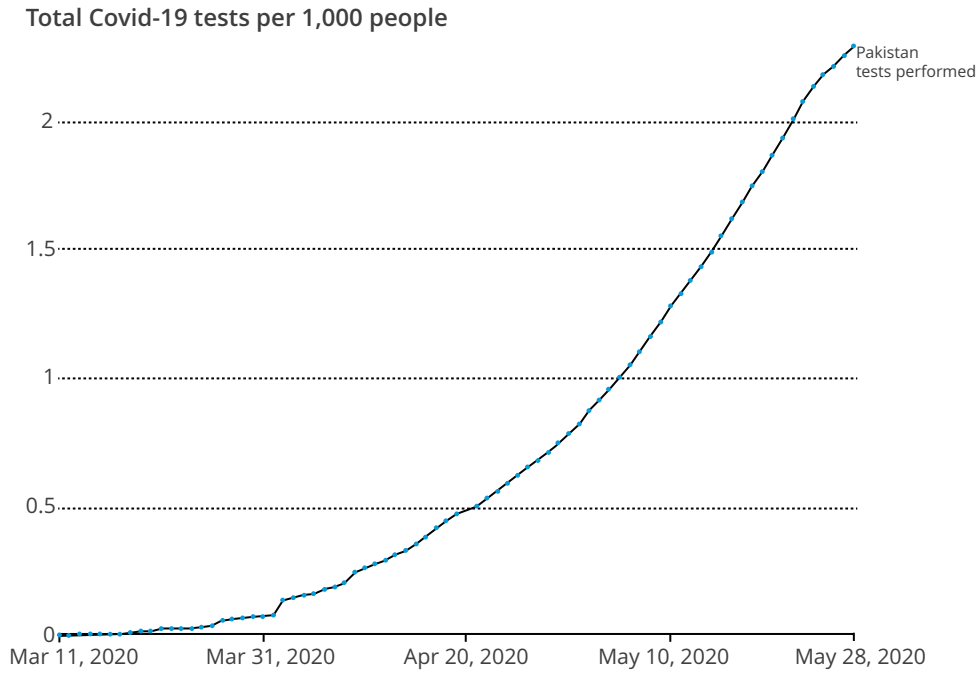
Because Pakistan lacks facilities at basic health unit and Tehsil health quarter, it was decided to convert all the smaller units to a quarantine zone, thus shifting all the burden to tertiary care hospitals and increasing their workload.[12] At that time, there was only one hospital functioning in the federal capital. The healthcare staff was trained to prevent disinfection,[15] decontamination, and hospital waste management; standard operating procedures were outlined; and a COVID-19 response unit[12] was created with a dedicated task force under the supervision of District Health Office Islamabad. To overcome this pandemic, there was a need for isolation facilities to be created around the country so the infected patients would not have to travel long distances. In this regard, province wise data with several hospital facilities and the number of beds is given. The number of hospitals in ICT-01, Punjab-50, Sindh-04, Baluchistan-14, KPK-110, GB-21, and AJK-15. The total number of medical facilities in Pakistan are 215. The total number of isolation beds in the whole country is 2942. In ICT-10 beds, Punjab-955, Sindh-151, Baluchistan-534, KPK-856, GB-156, and AJK-151 beds were established in isolation wards, illustrated in Figure 2B,C,D.[12]

## Challenges Faced by the Government

The government of Pakistan is hampered in its ability to deal with COVID-19 by the social, political, and cultural context of the country. The resistance created by community dynamics, local and religious beliefs, political instability, economic fragilities, and a lack of trust in government and institutions has caused Pakistan to struggle with far less infectious diseases such as polio. Pakistan is now facing the same obstacles with COVID-19.[11,12]

Mosques were shut down in most Muslim nations, including Saudi Arabia, to combat this deadly foe. However, Pakistani

**Figure 3.** An overview of Coronavirus Disease 2019 testing capacity in Pakistan.




Source: www.ourworldindata.org.[14]

policymakers did not adopt such constraints in the beginning for fear of a backlash from the religious wing. They have so far only restrained congregational prayers on Fridays. It is, nonetheless, vital to explore ways of working with religious-based organizations and leaders to influence outcomes and behavior.[11,12,16]

On top of the challenge from religious institutions, within government there are cooperation obstacles that must be overcome. There is a lack of coordination between the federal and provincial governments. Well-coordinated governance structures are critical for a quick and efficient response to such a crisis. As most essential services, including health and social protection, are now the responsibility of the provinces, each province is making decisions independently. However, border control and aviation remain with the federal government, and provinces lack jurisdiction to tighten surveillance at airports.[16]

The people of Pakistan are passing through a period of great uncertainty and deprivation. The current economic slowdown is likely to have a dual impact on the economy in Pakistan. First, there could be a surge in inflation, as people often resort to panic buying, creating a shortage in the market although there are ample supplies.[17] In addition, because the demand cannot be predicted during lockdowns, this creates supply shortages, thus putting further pressure on the economy.[11,12,] However, inflation may fall as a result of big declines in prices of imported goods. The international price of oil has fallen by more than 60%, and there has already been a 12% to 15% reduction in prices of petroleum products in Pakistan, with perhaps more declines to follow shortly. This economic slowdown started even before the Covid-19 primarily owing to short fall in revenues to miss the target. Overall, the fiscal deficit in 2019 to 2020 is estimated at over PKR 4.1 trillion.[11,12,18]

## *Advances in Clinical Trials*

Although the government had limited resources, they exported chloroquine to different parts of the world, including the United States, which lauded the Pakistani effort, as it was just a month ago when the FDA approved 2 antimalarial drugs, chloroquine and hydroxychloroquine, as possible treatments for COVID-19.[19,20] In this regard, a laboratory was created at Ayub Medical Institute in Abbottabad, with the help of America's National Library of Medicine.[21] The United States approved a team of 20 members to work on delivering a cure. The subjects were divided into 3 groups of 25 patients each, with a total of 75 patients. The first group were given 2 medicines, azithromycin and chloroquine, the second batch was given chloroquine only, and the third group was be treated with traditional medicines. [21]

Another breakthrough came from Dow University of Health Sciences Karachi,[22] where a team of scientists prepared intravenous immunoglobulin with plasma obtained from a recovered patient of COVID-19. This method is also a type of passive immunization and uses purified antibodies rather than the whole plasma. This treatment is considered safer and more efficient. It is approved by the FDA because a similar strategy has been used previously in epidemics like SARS, MERS, and Ebola.[23] The team was able to collect blood samples, isolate antibodies chemically, purify them, and later concentrate them using ultrafiltration techniques, which remove the unwanted components. This is the first global report of isolation, formulation, and safety demonstration of immunoglobulin purified from a recovered patient with COVID-19 and can be a ray of hope.

Another study on experimental use of a convalescent plasma[24] for passive immunization in COVID-19 positive patients was undertaken in Karachi, Sindh, a province of Pakistan. The goal of the study was to achieve passive immunization involving the administration of antibodies against susceptible individuals. The general principle of passive antibody therapy is that it is more effective for prevention than for treatment of the disease. When used for treatment, the antibody is most effective when administered shortly after the onset of symptoms. The reason for temporal variation in efficacy is not well understood. It could reflect that

passive antibody works by neutralizing the initial inoculums, which is likely to be much smaller than that of established disease. As an example, passive antibody therapy for pneumococcal pneumonia was most effective when administered shortly after the onset of symptoms, and there was no benefit if antibody administration was delayed past the third day of disease.[24]

A randomized control trial to check the efficacy of ivermectin[25] was conducted at Combined Military Hospital Lahore. People between the ages of 15 and 65 years have been allocated into 2 groups. Group A will be administered ivermectin in a single dose of 12 g along with chloroquine, and group B will be given chloroquine alone. The outcome will be recorded by documenting polymerase chain reaction reports at 48, 96, and 144 hours. [25]

## Conclusion

In 2019 and 2020, Pakistan allocated Rs13 billion for the health sector, which is about 1% of its gross domestic product. The government needs to be vigilant in its response to COVID-19. As of now, more than 500 healthcare workers have been infected with COVID-19. This situation is exceedingly concerning for a country whose entire response to this pandemic is reliant on their healthcare force. If not handled aptly, it would place the burden on the government's shoulders. Things in Pakistan are not subtle. Because of poverty and weak economic growth, they need support from the international community. In his address, the prime minister urged both the United States and the United Nations to provide financial aid so the threat in Pakistan can be eradicated. Pakistan has a population of 220 million but only has 2900 beds and people being tested at a rate of 10 000 per day. Thus far, only 500 000 people have been tested, which is less than 1% of population. There should be a 10-fold increase in this testing capability at minimum.

We need to follow the example of countries like New Zealand. With a population of 4.8 million, they had 1497 cases, of which 1386 recovered and there were only 21 deaths. They closed off their boarders as early as March 19. Domestic and international flights were restricted, people were only allowed to enter if they were New Zealand nationals, and level 4 quarantine measures were implemented. Now they have successfully eradicated the SARS-COV-2 virus. South Korea, which is a 2-hour flight from China, was successful in their fight against COVID-19. In Vietnam they opened schools on May 4 and economic life began to return to normal. But we are no way near that stage, as cases continue to grow.

Pakistan is in a bit of deadlock right now. They have to continually reevaluate their strategies toward the betterment of people and sound economic growth, which is what stops us from moving in the right direction because, in the end, people are the government. The government needs to have a firm grip on economy and strategic implementation by imposing strict lockdown measures. In New Zealand, people were only allowed to have social interaction if they lived together. In Jordan, there was a curfew from 10:00AM to 6:00PM, and large gatherings and mosques were closed. In this regard we need to use our digital, print, and social media and let the people know the importance and consequences of their decision making. Instructions should be laid out, standard operating procedures followed, and campaigns run. Everything should be televised so that the spread can be stopped at community level.

Although interventions are possible and are likely to be helpful, this situation also highlights areas that need development. For instance, training for pandemic crises should be standard procedure in health settings. Institutes should have plans of action for various predicaments. Staff should be aware of necessary procedures and should maintain written records of such necessary procedures. These steps are likely to help in the management of future crises, should they arise. In summation, the COVID-19 crisis will likely have both short-term and long-term consequences for the general population, healthcare workers, and patients alike. We need to get ahead of ourselves and come out on top not only our survival, but also the survival of our population and healthcare system.

## Supplemental Material

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.vhri.2020.10.005.

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