

THE INCIDENCE OF COVID-19 IN PAKISTAN: AN OVERVIEW OF THE BEGINNING OF THE PROBLEM AND THE COMBAT AGAINST IT

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Abstract

Pakistan has seven provinces or regions namely Punjab, Sindh, Khyber Pakhtunkhwa, Baluchistan, Gilgit-Baltistan, federal capital territory (Islamabad), Azad Jammu and Kashmir), which has about 216.5 million population. Pakistan is one of the Southern Asian countries and, same as other countries of the world, is not immune to COVID-19. The country continues struggling to control pandemic. This paper reviews how this deadly virus was spreading across the country and how the government copes with the pandemic. Secondary data was observed from 10th March to 31st August, and simple descriptive analysis was utilized. The findings show that the virus is quickly spreading across the country and the government is struggling to control COVID-19 infection. Looking into a province wise cases, a significant difference in death and recovered was noticed. From the point of view of the region's population, present healthy and medical services are not sufficient. At this stage of the virus, it is both difficult and early to judge and forecast its future trajectory.

Keywords: COVID-19 (SARS-COV-2), Cope with Corona Virus, Pandemic, Pakistan, pandemic management.

Introduction

Coronavirus is related to a coronaviridae family. The COVID-19 was first recorded in Wuhan, China at the end of December 2019 [1, 9]. Within the first five days of the corona outbreak, around 1800 people died and more than 70.000 other were infected with the virus. Since the out breaking of the coronavirus, scholars believed that the coronavirus is caused by wild animals [10]. Earlier coronavirus was variously named by scholars; Chinese scholars named it as a novel coronavirus pneumonia (2019-nCOV or NCP) and the Chinese media also used the same term for coronavirus [9]. On the other hand, the international committee on taxonomy of viruses (ICTV) has named the virus as SARS-COV-2 and the disease as COVID-19. Coronavirus is small in size (65-125 nm) in diameter and contains a single-stranded Ribonucleic acid (RNA) as nuclide material size ranging from 26 to 32 Kilobyte/s (KBS) in length (Figure 2) [9].

World Health Organization (WHO) officially announced the disease as a pandemic on March 11th [2]; which was rapidly spreading across China, and then spread around the world. After China, coronavirus spreads into 216 countries in six continents namely North America, South America, Europe, Africa, Oceania, and Asia, including Pakistan [1]. Until late August, 2020, more than 842,633 are dead, and more than 25.1 million people suffer of corona virus worldwide while these numbers are rapidly growing (Date of visit 08/31/2020) [5]. Since February 26, 2020, when the COVID-19 pandemic arose in Karachi City of Pakistan and speedily spread all over in the country, more than 296000 people are infected, and more than 6200 deaths are reported till August 31[10].



Figure 1: Location of the study (Pakistan), and COVID-19 cases.

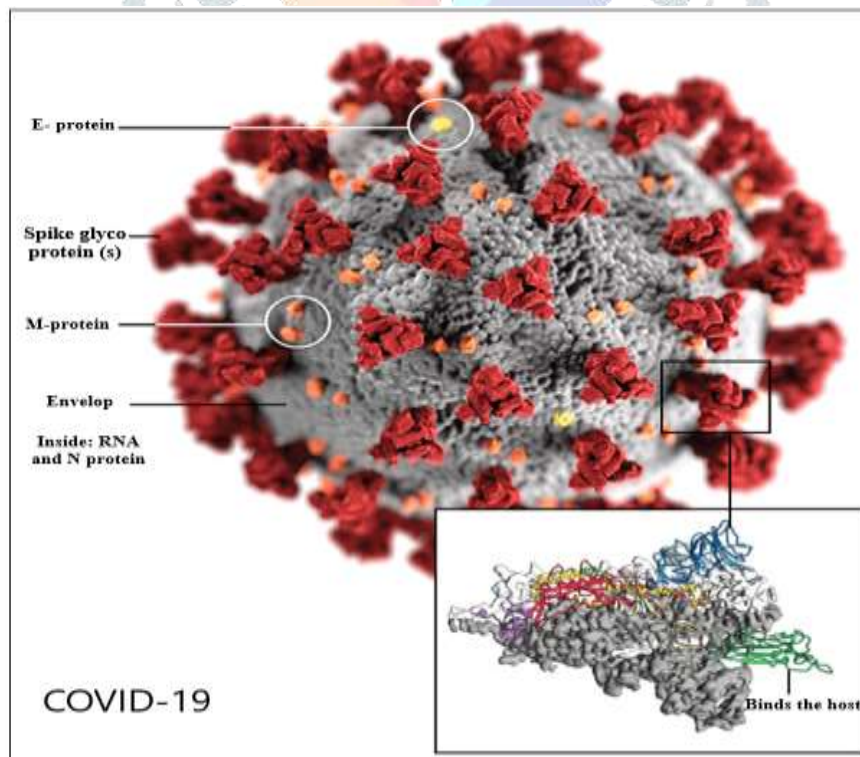


Figure 2: Structure of Respiratory Syndrome Cause COVID-19. (Source; CDC)

Monthly Statistic of COVID-19 in Pakistan

Data from the relevant official sources make it possible to estimate the COVID-19 in Pakistan. On March 10, 2020, the Ministry of Health confirmed only 19 cases of COVID-19 across the country. Table 1 reveals the infection rate of COVID-19 from March 10th to August 31st [7].

Table 1: Shows the absolute incidence of COVID-19 in the population for each month.			
No	Months	The absolute number of infected people at the beginning of the month	The absolute number of infected people at the end of the month
1	March	19	2039
2	April	2289	16817
3	May	18114	72460
4	June	76332	213470
5	July	217809	279146
6	August	279699	296149

As of 31/08/2020, overall 2642028 people have been tested in six months and 296149 people were infected of COVID-19 (Figure 4) [7]. Table 2, shows statistics of COVID-19 in Pakistan's provinces from March 10th to August 31st, 2020 [7].

Table 2: Shows the absolute number of COVID-19 cases in each month at the seven main and major provinces or regions of Pakistan.			
No	Provinces	The absolute number of cases and infected people on March 10	The absolute number of cases and infected people by the end of August
1	Punjab	0	96832
2	Sindh	14	129469
3	Islamabad	2	15649
4	Balochistan	1	12879
5	Gilgit-Baltistan	2	2903
6	Khyber Pakhtunkhwa	0	36118
7	Azad Jammu and Kashmir	0	2299

Province-wise dynamic situation of COVID-19 in Pakistan

According to the ministry of health of Pakistan, from the mentioned cases, 8881 were active, 6298 people died and 280970 other were recovered [7]. Provinces-wise confirmed cases are included by 15649 in Islamabad, 96832 in Punjab, 129469 in Sindh, 12879 in Baluchistan, 36118 in Khyber Pakhtunkhwa, 2903 in Gilgit-Baltistan, and 2299 other in Jammu and Kashmir. Accordingly, the most affected province of COVID-19 pandemic was Sindh, followed by Punjab. Figure 3, shows this result [7].

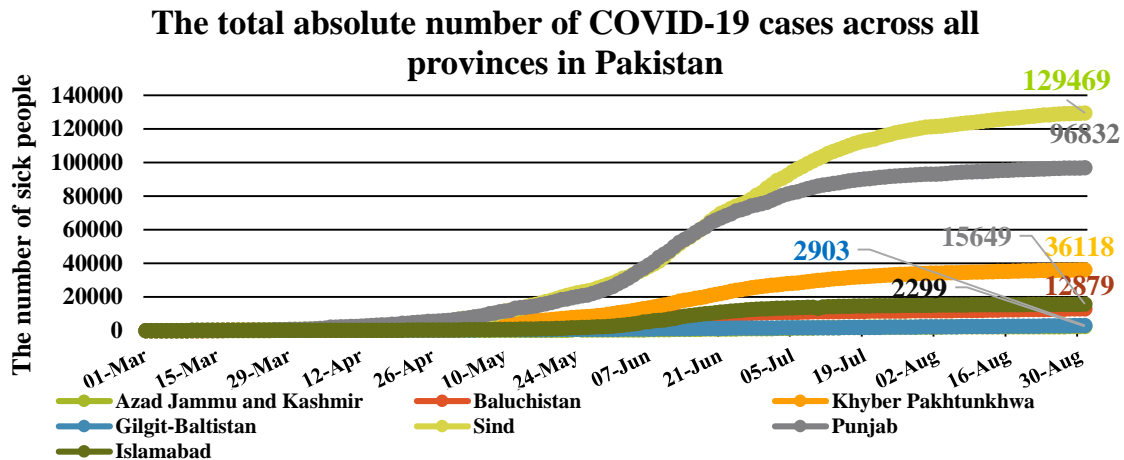


Figure 3: The daily new total absolute number of COVID-19 cases, across all provinces in Pakistan from 10 March to 31 August 2020 [7].

Total and daily dynamic situation of COVID-19 cases across the country

The dynamic of registration of new cases of coronavirus in Pakistan from March 10 to August 31, 2020, can be seen in Figure 4 and Figure 5. Until then, new cases of COVID-19 were reported daily. During this period of time, the highest peak was in June 13 - the Ministry of Health announced 6825 new cases [7].

Total cases of COVID-19 in Pakistan.

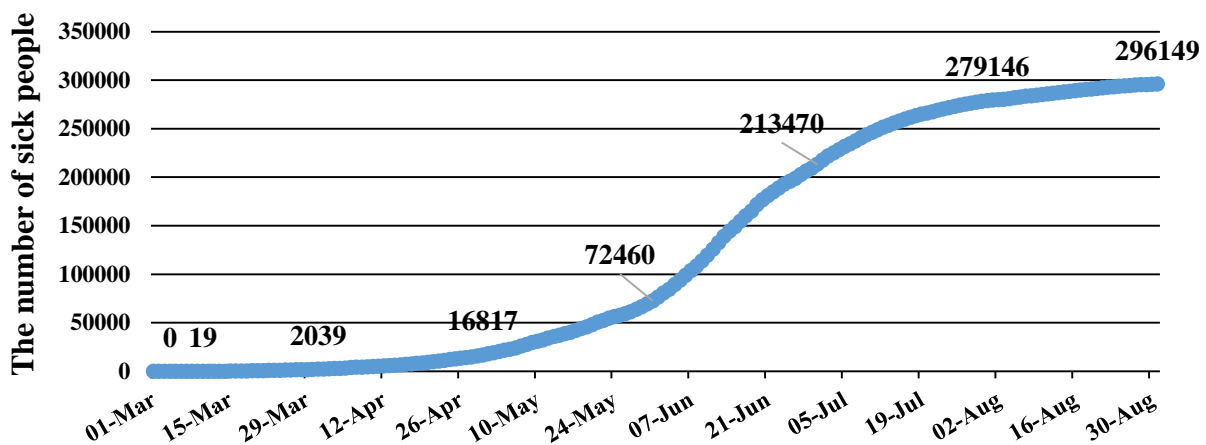


Figure 4: The absolute number of COVID-19 cases in Pakistan from March 10th to August 31st, 2020 [7].

Daily new cases of COVID-19 in Pakistan.

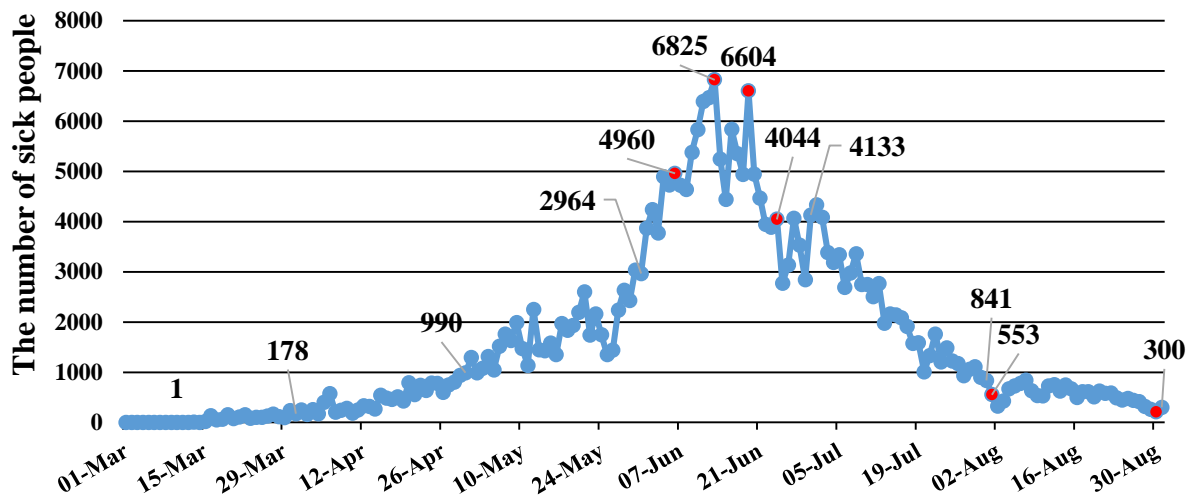


Figure 5: Daily new cases of COVID-19 in Pakistan from March 10th to August 31st, 2020 [7].

Total and daily mortality of COVID-19 cases all over of Pakistan

Pakistan confirmed the first two cases of coronavirus infection on February 26. Zafar Mirza, special assistant to the prime minister of health of Pakistan, wrote on his Twitter account: “I can confirm the first two cases of coronavirus in Pakistan. Both patients are being treated according to standard clinical protocols, both are stable” [4]. The first patient was a student from the University of Karachi in Sindh province, the second one was from the federal territory - Islamabad. Both patients had recently returned from Iran; these were the first positive cases in Pakistan. During the week, Pakistan has confirmed three more new cases, including the case in the capital Islamabad, and in Rawalpindi of Punjab [4]. The trajectory of deaths of COVID-19 in Pakistan from March 10 to August 31, 2020, is shown in figure 6 [7]. According to the ministry of health of Pakistan, during this particular time, 6,298 deaths due to coronavirus were confirmed. They were from different regions of Pakistan. They include 175 in Islamabad; 2,199 in Punjab; 2,403 in Sindh; 141 in Baluchistan; 1,250 in Khyber Pakhtunkhwa; 67 in Gilgit-Baltistan; and 63 in Jammu and Kashmir [7].

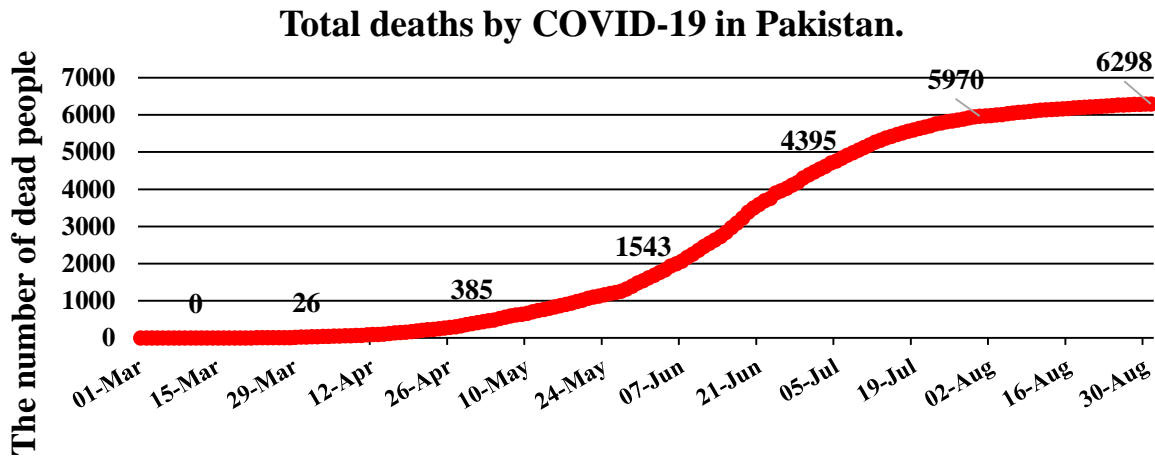


Figure: 6. Total cases of deaths from COVID-19 in Pakistan from 10th March to 31st August 2020 [7].

Daily new deaths in Pakistan from 10 March to 31 August 2020 are shown in figure 7 [7]. On March 20, the first death was reported in Sindh, and a 77-year-old patient had contracted the virus through the local transmission. He had already recovered from cancer and suffered from hypertension and diabetes. At the same time, the number of new cases in other provinces was 34, which was less than a few days before and the infection rate was rapidly increasing as the number was significantly increased to 495 cases within a few weeks. On March 22, a third death was reported in Khyber Pakhtunkhwa, as well as the first deaths in Gilgit-Baltistan and Baluchistan, which increased the number of deaths to 6. Among the dead, there was a doctor at the DHQ hospital in Gilgit, who became infected while examining pilgrims returning from Iran [4].

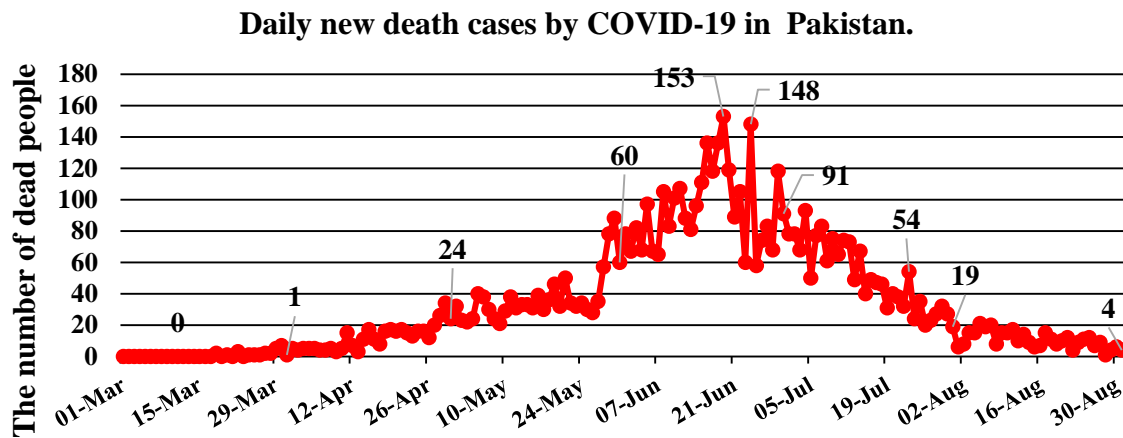


Figure 7: Daily new death cases by COVID-19 in Pakistan from March 10th to August 31st, 2020 [7].

Total and daily recovery dynamic situation of COVID-19 all over the country

According to the Ministry of the Health of Pakistan, as of August 31, 280970 people have recovered from COVID-19. Total number can be seen in figure 8 [7].

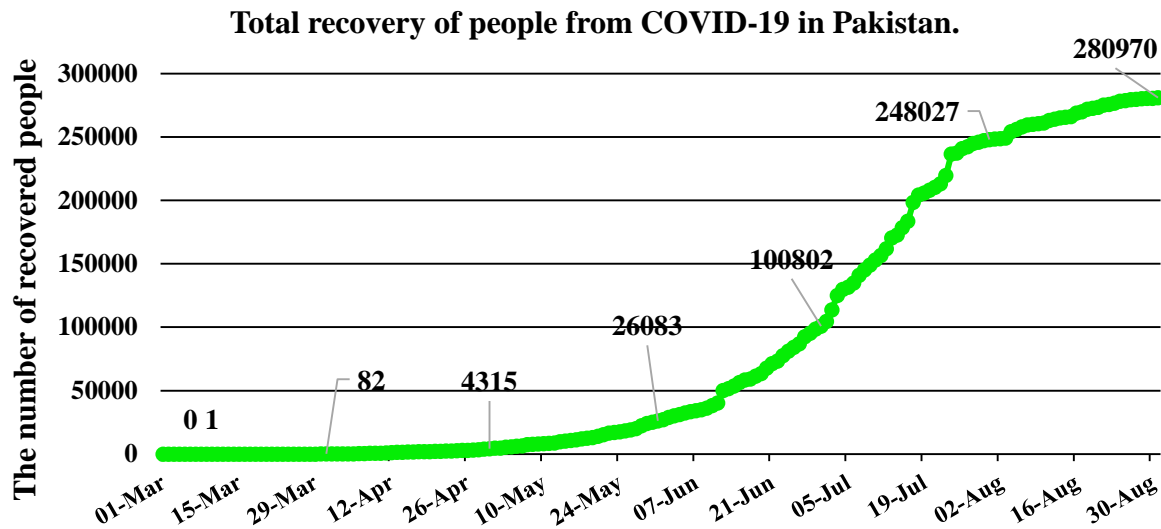


Figure 8: Total recovery from COVID-19 in Pakistan from 10th March to 31st August 2020 [7].

Daily based new recovery from March 10 to August 31, 2020, in Islamabad 15,000; Punjab 92,499; Sindh 123,074; Baluchistan 11,794; Khyber Pakhtunkhwa 33,978; Gilgit-Baltistan 2,503; and in Jammu and Kashmir 2,122 people have been recovered from coronavirus, as is shown in figure 9 [7].

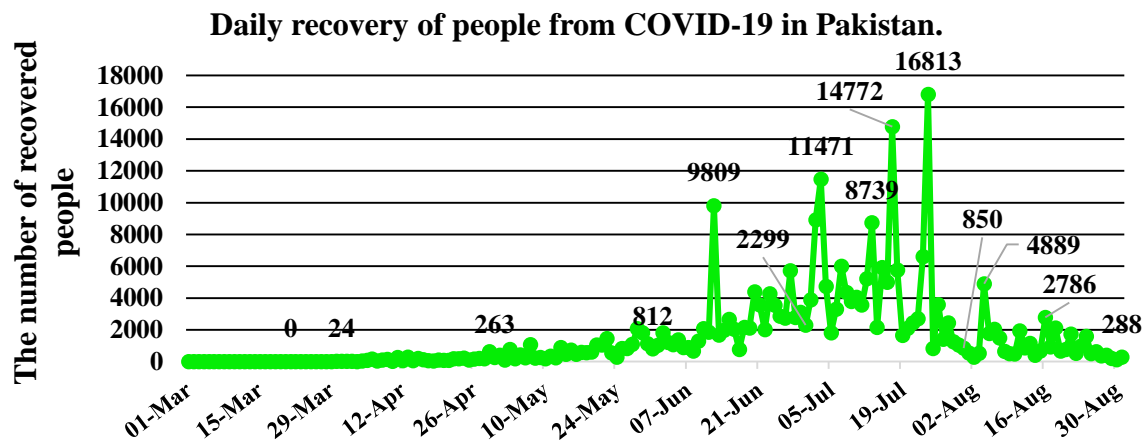


Figure: 9. Daily new recoveries from COVID-19 in Pakistan from 10th March to 31st August 2020 [7].

As it has been revealed during this study, the biggest daily jump in total number of infections, caused by COVID-19 infection among the population of Pakistan during the whole period of pandemic observation, was registered on June 13. Ministry of health of Pakistan announced 6825 new cases (fig. 5). Totally recovered people were 280970 (fig. 8), and 6298 people died because of this pathogen (fig. 6). Daily cases of recovery from coronavirus infection varied, and significant increases was noticed in June, July (fig. 9), which reflects the overall positive dynamics of overcoming the crisis. During the study period, in August, daily cases with coronavirus infection were fluctuating; from 553 to 300, a detailed explanation is shown in fig. 5 [7]. On average 548.4839 ± 28.7435 people were infected daily (Table. 3). This index is lower than the average rate of disease in May, June, and July. This can be translated into a positive trend towards overcoming the epidemic

of COVID-19 in Pakistan. Also, the number of daily death caused by the pathogen varied; from 6 to 328 (Table. 3), on average it equaled 10.5806 ± 0.9049 people per day (Table. 3). The average index of daily deaths during the period from August 1 to 31/2020 was lower than the other months but higher than March and April; but the biggest daily jump in total number of deaths, caused by COVID-19 infection among the population of Pakistan during the whole period of pandemic observation, was registered on June 19. Which the Ministry of health of Pakistan announced 153 mortality cases (fig. 7) [7]. A more comprehensive and detailed explanation and analyzed data can be seen in Table 3 below. However, a significant decrease in infections of coronavirus among the population was observed in August, a daily average is shown in figure 10. Therefore, looking into to the current trend based on the data observed, a more optimistic scenario can be implied and predicted in the future for overcoming the pandemic in Pakistan [7].

Table 3: Shows the daily total limit, average, and percentage of COVID-19 cases, in the population of Pakistan for each month.

Months	Days accounted	Daily disease rate*, people/day		Daily death rate*, people/day		Daily recovery rate*, people/day		Death cases / percent	Recovery cases / percent
		limits	average index	limits	average index	limits	average index		
March	31*	1-2021	65.19355 ± 12.65713	0 - 26	0.8387 ± 0.2899	0 - 82	2.6451 ± 1.158	2.19%	97.81%
April	30	250-14760	492 ± 45.07182	5 - 359	11.9666 ± 1.4129	25 - 4233	141.1 ± 22.1641		
May	31	1297-55643	1794.935 ± 98.95785	32 - 1158	37.3548 ± 2.7398	400 - 21786	702.1935 ± 85.8874		
June	30	3872-141010	4700.333 ± 195.7861	78-2852	95.0666 ± 4.7722	1027 - 74719	2490.633 ± 332.6942		
July	31	4339-65676	2118.581 ± 177.1807	78 - 1575	50.8064 ± 3.8589	3892 - 147225	4749.194 ± 698.5514		
August	31	553-17003	548.4839 ± 28.74358	6 - 328	10.5806 ± 0.9049	550 - 32943	1062.677 ± 175.4477		

Dynamic of average daily indexes of COVID-19 in Pakistan during the period March-August 2020.

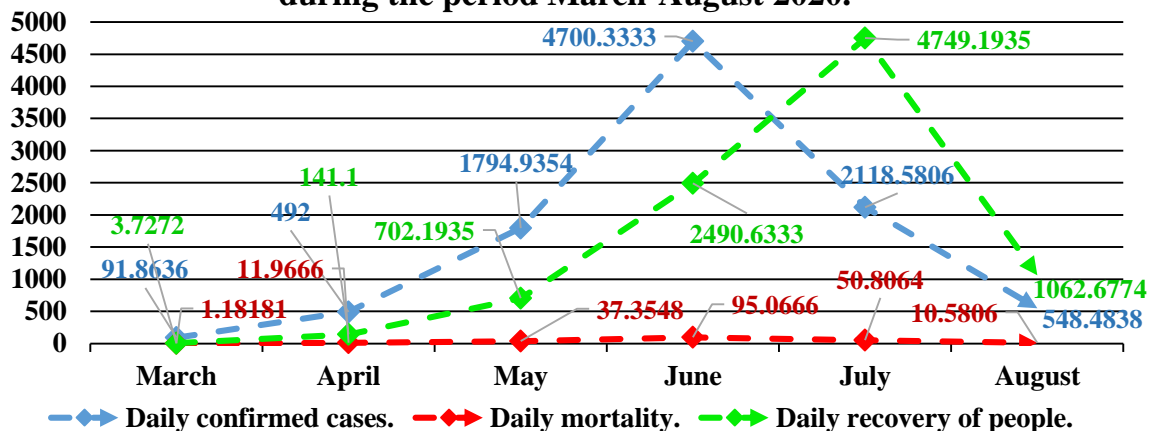


Figure 10. Dynamics of the daily average of COVID-19 indices in Pakistan, in the period from March to August 2020 [7].

COVID-19 infection leads to respiratory illness and has symptoms such as increased fever, headache, sneezing and coughing, sore throat, myalgia, decreased appetite, and dyspnea [2]. It is highly contagious and is transmitted through body or skin contact and respiratory tract from infected patients. The duration of the virus to stay alive is between 12 hours to two days on the contact surface [2]. According to the Ministry of National Health Services, Regulation, and coordination, the Government of Pakistan, the female rate is lower than two-thirds of the male rate. The male and female rates in Pakistan are 6.7% and 3.6%, respectively [10].

Generally, one of the most important differences is that females have stronger innate, humeral, and cell-mediated immune responses than males, which leads to the acceleration of clearing or decreasing the viral/antigen/pathogen load. In the medical field, sex refers to the biological and genetic status of an organism, such as whether it has the XX or XY genotype. Both of these factors play an important role [10]. The different sexes (male and female) respond differently to viral pathogenesis. Women have greater anti-viral, inflammatory, and cellular immune responses. Different human illnesses affect males and females differently. Susceptibility to viral infections is much lower in females than in males because females typically mount high immune responses [10]. Across Pakistan, according to a recent report from United Nations Office for the Coordination of Humanitarian Affairs (OCHA) on May 30, 2020, of all 69,496 positive cases, 78% are men and 22% are women, and 30% of them are men aged between the ages of 20 and 39, 13% are between the ages of 40 up to 49 years old and 12% of them in the age group from 50 to 59 years old [8, 6]. COVID-19 is rapidly spreading around the world and it is too early to predict the future. Within a few months, the level of mortality and morbidity reached more than 25.1 million people. Physicians are working to find treatments and vaccines to prevent infection [3].

However, if all citizens take one step towards self-isolation, it can save the entire community, and the risk is immediately reduced. This is a situation where everyone should take steps to minimize risk by staying in the house and immobilizing themselves. Airborne, contact transmission can be disinfected only if the distance is maintained and hands are washed with soap; each person takes precautions to protect others from this debilitating virus. To achieve this goal, it is necessary to work together in society and adhere to international medical recommendations and guidelines [3].

Prevention and assistance of the Pakistani government against COVID-19:

The government of Pakistan is taking all measures against COVID-19 to guarantee and ensure that the state is accountable to its people. From the first day when the first case of the disease in the country was confirmed, all services and measures have been used with emergency capabilities to ensure the safety of life in the region [1]. So far, the government of Pakistan has taken various steps against the COVID-19 outbreak. In this review, we have highlighted the various steps taken by the Pakistani government against CoVID-19, they include allocating special hospitals; quarantine centers; test centers; treatment; also in seven local languages, a nationwide campaign was launched in social networks and local media to raise public awareness and local community response to the COVID-19 outbreak [1].

Hospitals for COVID-19 in Pakistan:

With regard to measures and to defeat COVID-19, the government of Pakistan has taken many measures to combat the outbreak and help its people. There were many hospitals working in this case, to bring back life and fight against the deadly outbreak of COVID-19 in the country [1]. Isolation wards were built all over Pakistan to prepare for the COVID-19 pandemic, a regional/provincial wise number of designated hospitals; which are equipped with information and communications technology (ICT), only one hospital operating in the capital Islamabad. While in Baluchistan there were 10 hospitals for COVID-19, in Khyber Pakhtunkhwa 7, Punjab 6, Sindh 4, Gilgit-Baltistan 4, and Jammu and Kashmir 3 hospitals are functioning, as shown in figure 11[1,11].

The total number of beds in isolation wards all over the country was 23,557. On the capital territory (Islamabad) of Pakistan 350 beds; Punjab 10,948; Sindh 2,100; Baluchistan 5,897; Khyber-Pakhtunkhwa 2,760; Gilgit - Baltistan 972; Azad - Jammu and Kashmir 530 beds have been created insulators, as shown in figure 13 [1,11]. Given the region's population of about 216.5 million, these health and medical services are not sufficient [8].

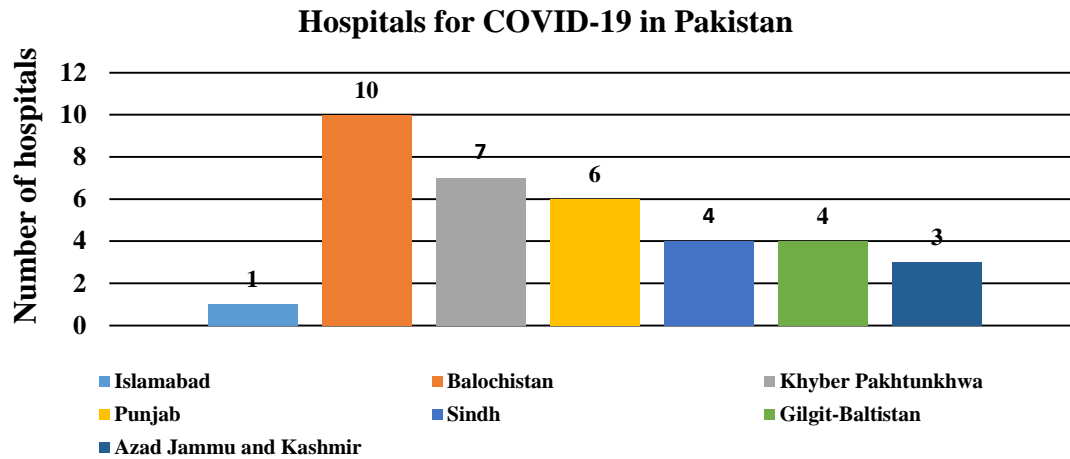


Figure: 11. Number of provincial-wide hospitals for COVID-19 In Pakistan from March 10th to August 31st, 2020 [11].

Isolation is different from quarantine and is the separation of sick or infected persons from others in order to prevent the spread of infection or contagion, the allocation of hospitals used for isolation based on the area. As can be seen from Table 4, and figure 12, the number of isolation hospitals for patients with COVID-19 IN Pakistan until the end of August 2020 [12].

Table 4: Shows the number of isolation hospitals for CAVID-19 in seven main and major regions in Pakistan.

No.	Provinces	Number of districts	Number of isolation hospitals	Number of beds
1	Punjab	34	50	955
2	Sindh	4	4	151
3	Islamabad	1	1	10
4	Baluchistan	11	14	534
5	Gilgit-Baltistan	10	21	126
6	Khyber Pakhtunkhwa	33	110	856
7	Azad Jammu and Kashmir	9	15	310
Total number		102	215	2,942

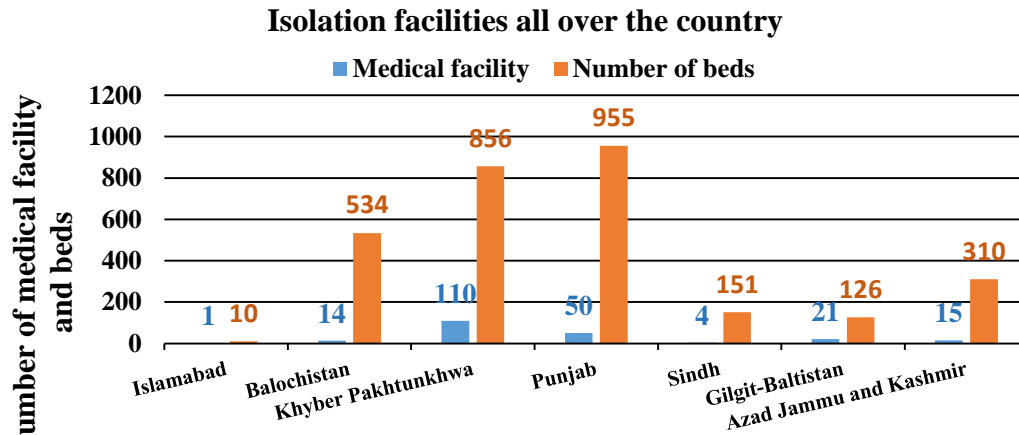


Figure: 12. Hospitals with isolation wards Province-wise for COVID-19 in Pakistan from March 10th to August 31st, 2020 [12].

Quarantine facilities across the province for COVID-19 in Pakistan:

Quarantine is used to restrict activities or isolate individuals who have not yet been ill, but who may have been exposed to an infectious agent or disease, such as COVID-19, in order to monitor symptoms and early detection of cases. Places used to quarantine COVID-19 people have been widely disrupted in the provinces. The total number of quarantine centers 23,557 in 139 districts of Pakistan, which is a good gesture that is being used in this case throughout Pakistan to control the outbreak of COVID-19. In Islamabad, the country's capital, two quarantine facilities have been allocated. There were 10 of them in Baluchistan, in the Khyber Pakhtunkhwa 52, Punjab 6, Sindh 2, and 63 quarantine facilities functioned in Gilgit-Baltistan, as shown in Fig. 13. In Azad Jammu and Kashmir, there were 4 quarantine facilities in different districts [1, 13].

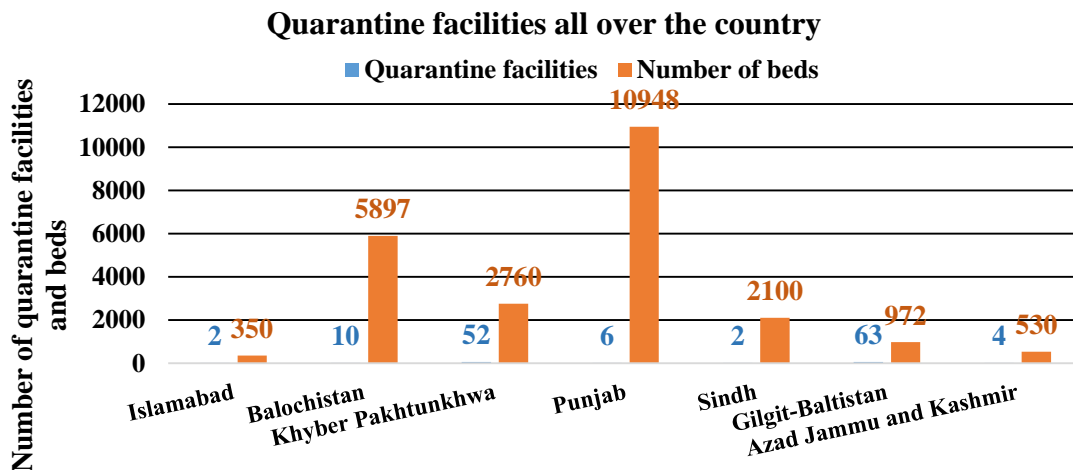


Figure 13. Province-wide quarantine facilities for COVID-19 in Pakistan from March 10th to August 31st, 2020 [13].

All over the world, polymerase chain reaction (PCR) is used for the COVID-19 test, which is the best and simplest method, therefore the government of Pakistan also recommends the PCR method [1]. All over the country in different regions, there have been 107 laboratories, in Baluchistan 4, Khyber Pakhtunkhwa 14, Punjab 30, Sindh 20, Azad Jammu and Kashmir 3, Gilgit-Baltistan 3 and the mobile testing laboratory (national institutes of health (NIH), deployed in Taftan) and laboratories have been equipped with free PCR systems for the COVID-19 test. Pakistan's testing

capacity has been increased from 30,000 to 280,000, and efforts are being made to increase it to 900,000 in the future. [1, 14].

Conclusion and Recommendations

In this study, it is still difficult to make an absolute estimation for the future about COVID-19 confirmed cases, deaths, and recoveries. Now the current situation until the end of August from all mentioned cases 8881 is active; 6298 people died; and 280970 recovered. Besides that, as was shown in Figure 2, the most affected province is Sindh 129469, followed by Punjab 96832. During the analyzed period a growth in disease rate with COVID-19 and rate of death to this pathogen among population of Pakistan from March to August were examined. In August a decrease in indexes of incidence rate and rate of death from SARS-CoV-2 has been registered, as well as an increase in number of patients that recovered from this disease. If medical recommendations are carefully considered across the country, there may be an absolute decrement of COVID-19 infection cases like what China did during the pandemic. Pakistan has a potential in public health, and different sectors can work together to address the challenges by the engagement of society and community along with policy initiatives. From the point of view of the population, more efforts are needed to be done to increase health services and capacity. One thing is obvious at the current stage: the most important measures are the prevention of the uninfected population and highly qualified care for the patients; another measure which is also a global one, a search for producing a vaccine.

References

1. A. Waris¹, U. K. Atta², M. Ali¹, A. Asmat³ and A. Baset⁴, COVID-19 outbreak: current scenario of Pakistan [Digital source] / A. Waris¹, U. K. Atta² ... // ScienceDirect: 14 April 2020. – 6p. [Web-site]. URL: <https://doi.org/10.1016/j.nmni.2020.100681>. (Date of visit 24.08.2020).
2. M. Yousaf, a Z. Samiha, a M. Riaz, a S. Muhammad Hussain, b and K. Shahc. Statistical Analysis of Forecasting COVID-19 for Upcoming Month in Pakistan [Digital source] / Muhammad Yousaf, Samiha Zahir, [и др] // ScienceDirect: 25 May 2020. - 5p. [Web-site]. URL: <https://doi.org/10.1016/j.chaos.2020.109926> (Date of visit 26.08.2020).
3. Abid. Khadijah, BS (Hons), MSc1, Yashfika. Abdul Bari, BDS, MJDF1, Younas. Maryam, BSc, MSc1, Sehar. Tahir Javaid, MS1, and Imran. Abira, BS (Hons), MSc2. Progress of COVID-19 Epidemic in Pakistan [Digital source] / Khadijah Abid, [и др] // Asia Pacific Journal of Public Health. – 19 May 2020. – 3p. [Web-site]. URL: <https://doi.org/10.1177/1010539520927259> (Date of visit 27.08.2020).
4. COVID-19 pandemic in Pakistan [Digital source] // Wikipedia. [Web-site]. URL: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Pakistan#February_2020 (Date of visit 27.08.2020).
5. Coronavirus Disease (COVID-19) Dashboard [Digital source] // World health organization (WHO): 29 July 2020 [Web-site]. URL: <https://covid19.who.int/> (Date of visit 26.08.2020).
6. Pakistan: COVID-19 – Situation Report (As of 30th May 2020), [Digital source] // OCHA, relief web: 30 May 2020. [Web-site]. URL: <https://reliefweb.int/report/pakistan/pakistan-covid-19-situation-report-30th-may-2020> or <http://www.unocha.org/> (Date of visit 25.08.2020).

7. COVID-19 Statistics [Digital source] // Ministry of National Health Services Regulations & Coordination, Government of Pakistan: 29 July 2020 [Web-site]. URL: <http://covid.gov.pk> (Date of visit 31.08.2020).
8. Learn how the World Bank Group is helping countries with COVID-19 (coronavirus). Population, total - Pakistan [Digital source] // The WorldBank:©2020[Web-site]. URL:<https://data.worldbank.org/indicator/SP.POP.TOTL?locations=PK> (Date of visit 24.08.2020).
9. Ilyas. Nasir, E. Azuine. Romuladus, Tamiz. Alina. COVID-19 Pandemic in Pakistan [Digital source] / Nasir Ilyas, Romuladus E. Azuine, AlinaTamiz // IJTR PH. – 8 May 2020. –13p. [Web-site]. URL: <https://ijtmrph.org/index.php/IJTMRPH/article/view/139/32> (Date of visit 25.08.2020).
10. AbdulWaris¹, Muhammad Ali¹, Atta Ullah Khan², Asmat Ali³, Bangash Arshad Khan⁴, Abdul Baset⁵. COVID-19 Incidence in Pakistan: Gender Disparity [Digital source] /AbdulWaris¹, Muhammad Ali¹, Atta Ullah Khan² [и др]// Iranian Journal of Psychiatry and Behavioral Sciences, Kowsar Medical Institute. –19 July 2020. – 7p. [Web-site]. URL: https://www.researchgate.net/publication/343058566_COVID-19_Incidence_in_Pakistan_Gender_Disparity (Date of visit 23.08.2020).
- 11.COVID-19 Statistics [Digital source] // Ministry of National Health Services Regulations & Coordination, Government of Pakistan: 29 July 2020 [Web-site]. URL: <http://covid.gov.pk/facilities/List%20of%20COVID-19%20Designated%20Tertiary%20Care%20Hospitals%20Pakistan.pdf> (Date of visit 27.08.2020).
12. COVID-19 Statistics [Digital source] // Ministry of National Health Services Regulations & Coordination, Government of Pakistan: 29 July 2020 [Web-site]. URL: <http://covid.gov.pk/facilities/List%20of%20Province-wise%20COVID-19%20Hospital%20Isolation%20Wards%20Pakistan.pdf> (Date of visit 27.08.2020).
- 13.COVID-19 Statistics [Digital source] // Ministry of National Health Services Regulations & Coordination, Government of Pakistan: 29 July 2020 [Web-site]. URL: <http://covid.gov.pk/facilities/List%20of%20Province-wise%20COVID-19%20Quarantine%20Facilities%20Pakistan.pdf> (Date of visit 28.08.2020).
- 14.COVID-19 Statistics [Digital source] // Ministry of National Health Services Regulations & Coordination, Government of Pakistan: 29 July 2020[Web-site]. URL: <http://covid.gov.pk/facilities/30%20Sep%202020%20Current%20Laboratory%20Testing%20Capacity%20for%20COVID.pdf> (Date of visit 28.08.2020).