

Reasons behind declining of cases during the COVID-19 wavelets in Pakistan: public healthcare system or government smart lockdown policy?

Razões do declínio de casos durante as ondas de COVID-19 no Paquistão: sistema público de saúde ou política de bloqueio inteligente do governo?

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Abstract *The latest statistics show that COVID-19 is still very active, and cases are on the rise across various countries and regions. On the other hand, statistics from Pakistan show a declining trend, especially during the first wave of the COVID-19 pandemic. To understand this declining trend and answering our established question, “What are the reasons behind the decline of the COVID-19 cases in Pakistan – public healthcare facilities or government smart lockdown policy?” narrative literature-based evidence collected from government official websites, reports and also Google Scholar. Our findings suggest that the government’s innovative smart lockdown strategy and its execution at the right time with the consensus of all stakeholders accompanied with the observing of COVID-19 standard operation procedures resulted in controlling the pandemic. Effective smart lockdown policy allows the government to identify shortcomings of and improve the capabilities of healthcare for the continuation of balanced socio-economic activities to avoid future spread-out of the pandemic in the time of crisis under national and World Health Organization guidelines.*

Key words COVID-19, Educational innovation, Public healthcare facilities, Public policy, Smart lockdown policy

Resumo *As últimas estatísticas mostram que a COVID-19 ainda está muito ativa, e os casos estão aumentando em vários países e regiões. Por outro lado, as estatísticas do Paquistão mostram uma tendência decrescente, em especial durante a primeira onda da pandemia de COVID-19. Para compreender esta tendência decrescente e responder à nossa pergunta estabelecida, “Quais são as razões por detrás do declínio do caso COVID-19 no Paquistão – instalações públicas de saúde ou política de encerramento inteligente do governo?” – foi compilada evidências narrativas baseadas em literatura recolhida de websites oficiais do governo, relatórios e também no Google Scholar. As nossas conclusões sugerem que a estratégia inovadora de encerramento inteligente do governo e a sua execução no momento certo, com o consenso de todos os interessados acompanhados pela observação dos procedimentos de operação padrão da COVID-19, resultou no controle da pandemia. Uma política eficaz de encerramento inteligente permite ao governo identificar deficiências e melhorar as capacidades dos cuidados de saúde para a continuidade de atividades socioeconômicas equilibradas, a fim de evitar a propagação futura da pandemia em tempo de crise, sob as diretrizes nacionais e da Organização Mundial de Saúde.*

Palavras-chave COVID-19, Inovação educacional, Instalações públicas de cuidados de saúde, Política pública, Política de encerramento inteligente

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Introduction

Severe Acute Respiratory Syndrome – Coronavirus 2 (SARS-CoV2 or COVID-19) is considered one of the biggest global threats to all human beings in recent times. Since the outbreak of coronavirus in Wuhan city of China in December 2019, it has spread out all over the world in a very short period¹. At the beginning of the coronavirus outbreak, most of the countries around the globe ignored the warnings of the World Health Organization (WHO) in February 2020². One of the consequences of this ignorance was the mishandling of coronavirus at its early stage, where no one was familiar with the suspicious symptoms of this deadly disease and its harmful effects on humans. Due to initial uncertainty and ambiguity, some academic works initially are accepted for publications in prestigious journals and later retracted due to falsification of results. According to Retraction Watch³, 33 papers related to COVID-19 are permanently and 3 papers are temporarily retracted due to various reasons. Initially, coronavirus breakdown was termed as an epidemic, but later due to the rapid surge of infections and reported death, WHO declared the coronavirus as SARS-CoV-2 or COVID-19 pandemic².

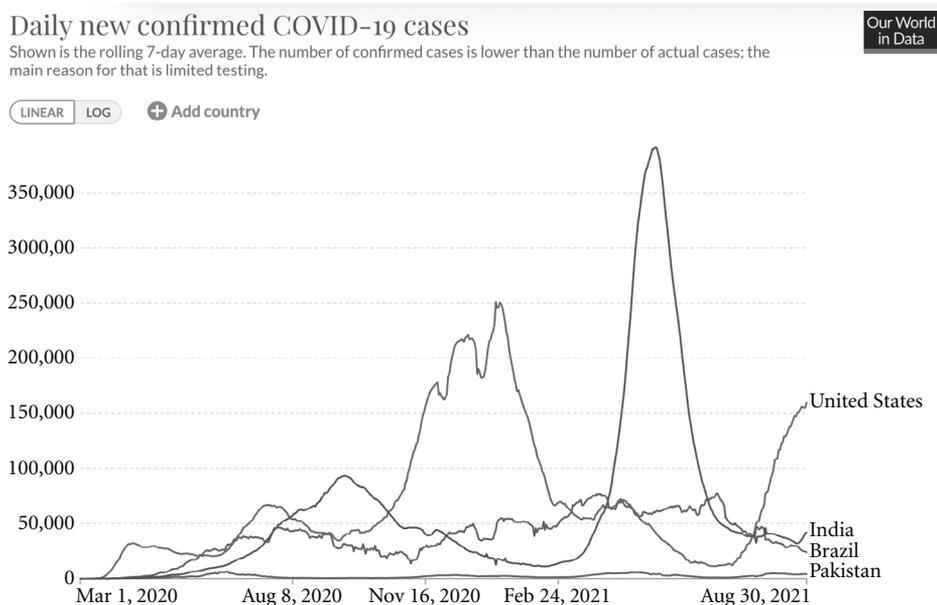
The scientific research community, including medical scientists and academic researchers, worked diligently to identify the symptoms of COVID-19⁴, including medical histories or records such as fever, dry cough, and tiredness, and then sorted out possible supportive treatment options for COVID-19 patients. After the identification of COVID-19's earlier symptoms, the World Health Organization (WHO) issued an advisory to all nations around the globe to follow a set of guidelines to avoid the spread of COVID-19⁵. These set of parameters or guidelines included maintaining a social distance of at least 6 feet, using face mask, frequent hand washing and sanitizing, avoiding touching nose, mouth, and eyes, and refraining from gatherings, etc.⁵

According to the WHO health emergency dashboard (2021), 216,867,420 confirmed cases of COVID-19 and 4,507,837 deaths have been reported⁶. According to Global Change Data Lab⁷ daily report of new confirmed cases COVID-19, confirms that coronavirus is still very active all over the world and is rapidly spreading in countries with large populations such as the USA, India, and Brazil, but in the case of Pakistan ratio of the active case is still very low (Graph 1). For developing countries with a large population, en-

forcing a full lockdown, and implementing standard operation procedures (SOPs) is very tough for the governments because a large percentage of the population is engaged in daily wages and labor-intensive jobs⁴. Therefore, during such a critical situation's government need to come up with innovative strategies to control the spread of the pandemic while maintaining the socioeconomic activities within the country.

While active cases are still high across many countries, the cases in Pakistan are steadily declining. To understand this declining trend of COVID-19 cases in Pakistan during the first wave, we asked a question "*What are the reasons behind the declining trend of COVID-19 cases in Pakistan – public healthcare facilities or government smart lockdown policy?*". To address the research question, narrative literature-based evidence collected from government official websites, reports and also Google Scholar. The narrative literature review is a powerful tool since it helps explaining the current events that may not have been previously observed and still on-going⁷. This type of surveying method reflects upon the dynamic progress of the investigated phenomenon in multitude of layers and enables the scholars to develop new perspective through illustrating the current state of a phenomenon. In other words, it helps an investigated topic to be expand in time and across the geography for a bettering the current understanding⁸. As a result, this type of literature review plows the path for future literature developments and converts inductive reasoning a building block for theory building^{9,10}. Besides, it enables cross disciplinary research and shape new research avenues¹¹, as it is in this case. The narrative literature review is utilized in this study to conduct cross disciplinary perspective among policymaking, ethics, and management fields.

As this study intends to investigate the COVID-19 pandemic and how Pakistan has been handling the adverse effect of the pandemic, it is ultimately necessary to investigate secondary data. This is especially beneficial to provide the narratives of all stakeholders and the government's perspective while the pandemic related events are unfolding. Since the narrative literature review method works as a bridge the existing literature with the current events in a critically acclaimed way^{12,13}, we employ this technique to provide a critical insight in this study. This manuscript provides insight about ongoing COVID-19 prevention methods while drawing parallel with previous and current studies. It explores critical COVID-19 prevention points through the bioeth-



Graph 1. COVID-19 data explorer. Daily new confirmed COVID-19 cases per million people, showing is the rolling 7-days average. The number of confirmed cases is lower than the number of actual cases, the main reason for that is limited testing.

Source: Johns Hopkins University CSSE COVID-19 data, August 30, 2021: <https://ourworldindata.org/coronavirus>.

ical standpoint and draws relation with previous and contemporary research in a dynamic manner.

Background

In March 2020, the very first case of COVID-19 was diagnosed in Karachi city, which is the largest and most populous city of Pakistan, with an approximate population of 20 million. The first COVID-19 patient had traveled recently to Iran, from where most likely have contracted the virus^{1,14,15}. Over the next few weeks, COVID-19 cases in Pakistan showed a gradual rise with a simultaneous rise in death toll¹⁶. At that time, the Federal and provincial governments realized that the health infrastructure in the country lacked polymerase chain reaction (PCR) machines required to conduct PCR based test (gold standard to detect COVID-19 virus) on samples collected from patients with COVID-19 symptoms, and hospitals were suffering from capacity shortages for basic health facilities, especially ventilators for COVID-19 patients^{17,18}. At the same time,

the economic circumstances of the country were not favorable to enforce a strict lockdown in the country. The government of Pakistan, therefore, immediately established a new policy and executed “The National Action Plan for the Coronavirus (NAPC)”⁴ to prepare healthcare facilities and enforce smart lockdown policies. This NAPC initiative helped the healthcare sector in identifying their needs and requirements while also allowing for socio-economic activities through a hotspot-oriented lockdown i.e., smart lockdown, to minimize the spread of the virus in the general population.

This case study is based on narrative literature with objective to fills the gap in existing literature by highlighting the impact and developed policies related to COVID-19 in the emerging economies and developed countries. This study explains the successful strategies adopted by the government of Pakistan such as implementation of smart lockdown policy to rectify existing issues in the health infrastructure to combat against COVID-19 pandemic.

Public healthcare facilities versus Government smart lockdown policy in Pakistan

Public healthcare facilities

After the outbreak of the COVID-19 pandemic, governments around the world struggled to establish their policies within their available resources while following the WHO guidelines to slow down the spread of COVID-19^{19,20}. For Pakistan, the latest official COVID-19 statistics of first wave of COVID-19 reported 306,886 confirmed cases with 293,159 (95.5%) recoveries, 6,424 deaths (2.1%), and 7,303 (2.4%) active cases. With 134,243 confirmed cases and 2,463 death cases, Sindh is the most affected province, whereas Azad Jammu and Kashmir reported the least number of confirmed cases (2,550), with (207) active cases and 69 deaths (Figure 1).

Waris et al.¹ reported that initially, 35 designated hospitals were providing COVID-19 facilities across Pakistan. The statistics also demonstrate that Baluchistan has the highest number of hospitals i.e., 10, and the largest quarantine facilities i.e., 63. On the other hand, Punjab has 10,948-bed facilities and has the highest number of ventilators to support COVID-19 patients suffering from breathing problems and real-time polymerase chain reaction (RT-PCR) testing facilities (i.e., 68) (Table 1). These healthcare facilities are in no way adequate for a country as pop-

ulous as Pakistan. The biggest reason behind the limited public healthcare facilities in the country is the insufficient allocation of financial budget to the health sector^{21,22} and there existed no national health policy prior to the COVID pandemic for dealing with the crisis²³.

The government introduced a new health policy during the first COVID-19 wave, helping to maximize the number of ventilators as well quarantine facilities in the public healthcare system. Currently, 2,200 ventilators are operational in public hospitals and there is an expectation for this number to increase between 1,000 to 3,000 through a donation from friendly countries. There was an increase in beds to 162,000 through contingency quarantine facilities²⁴. The aim of their contingency facilities was to battle coronavirus in an emergency under District Health Authority (DHA) such as rooms in hotels and hostels, school buildings, mosques, and community centers²⁵. During the third wave, the existing healthcare facilities are going through immense pressure because of the rapid increase in COVID cases on daily basis and this has caused a large number of patients to be waiting for beds in public hospitals' emergency wards^{26,27}. Amidst the current crisis, the National Institute of Health²⁸, established a contingencies plan and Federal and provincial governments were issued guidelines for home-based quarantine at both divisions and sub-divisions level regarding disinfectants,

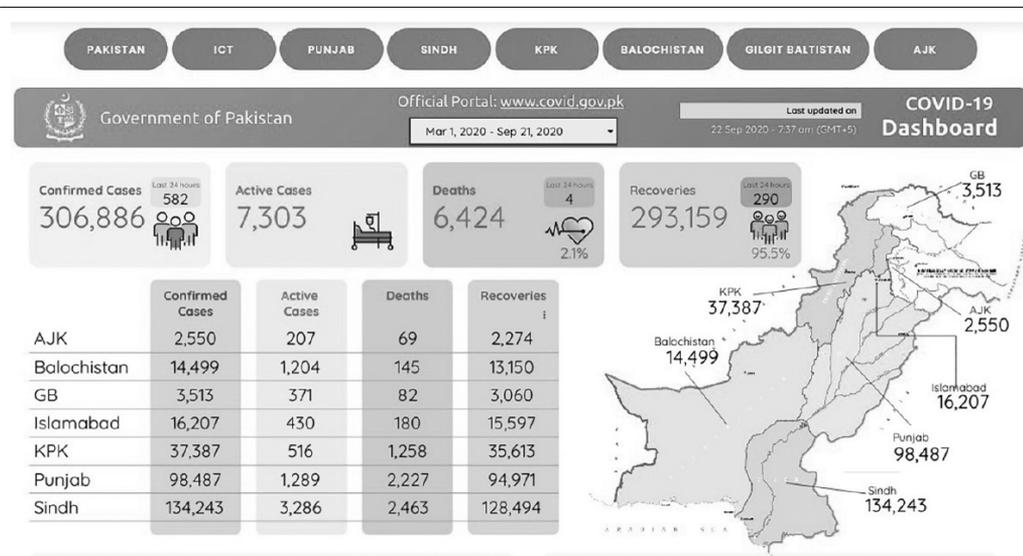


Figure 1. Government of Pakistan, COVID-19 Dashboard.

Table 1. Province-wise healthcare facilities (COVID-19 hospitals, number of beds, quarantine facilities, and testing facilities) for COVID-19 patients in Pakistan.

Provinces	COVID-19 hospitals	Number of beds	Quarantine facilities	Testing facilities
Islamabad capital territory (ICT)	1	350	2	34
Punjab	6	10948	6	68
Sindh	4	2100	2	41
Khyber Pakhtunkhwa (KPK)	7	2760	52	11
Baluchistan	10	5897	10	6
Gilgit-Baltistan (GB)	4	972	63	3
Azad Jammu and Kashmir (AJK)	3	530	4	4
Grand total		23,557	139	156

Source: Authors, with data from National Command and Operation Control (NCOC)³².

protective clothing, disposal of waste, medicine supplies, communication with the outer environment, care of children, and care of caregivers. Reducing the burden on the existing healthcare system is the aim behind this contingency plan, which remains crucially unimproved during the first two COVID waves. Thus, consent was required for patients showing mild symptoms for home-based quarantine, and they also required approval from Home Isolation Committee (HIC). HIC retains local authorities like district deputy commissioners, assistant commissioners, deputy district health officers, and chief officers of relevant regions. The implementation of the isolation checklist given by the government has been ensuring by HIC in regard to home-based quarantine. The checklist includes assessment of home isolation, doctors' assessment, comply with PCR repeat testing on day 10 during home quarantine. The patient is allowed to come out of quarantine in case there are 2 negative PCR reports within 24 hours. Otherwise, patients were taken to emergency and then hospitalized for further COVID treatment^{25,28}.

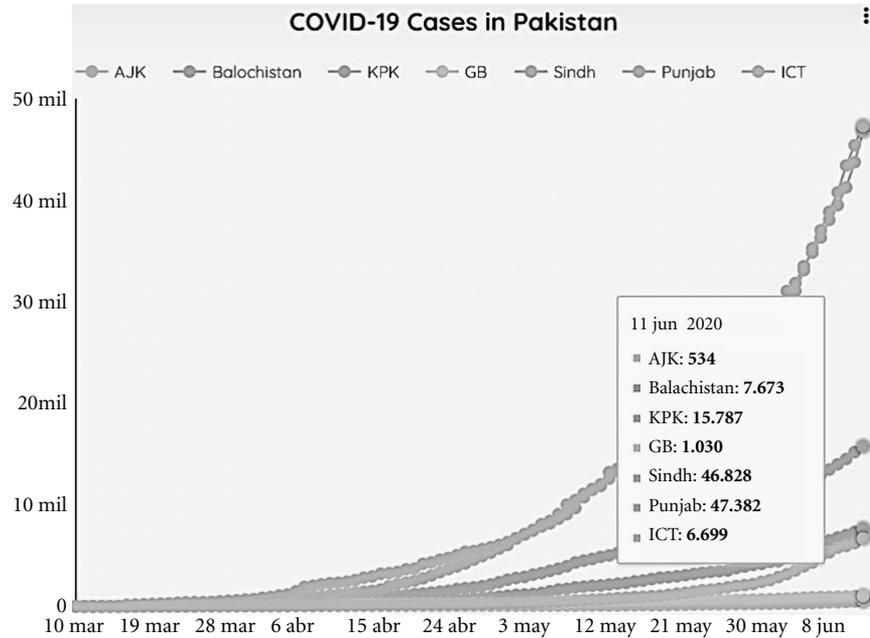
Government smart lockdown policy

In March 2020, due to the increased number of COVID-19 cases in Pakistan, the debate started among different circles of the country to decide about whether to go for a full or a partial lockdown. Lockdown, whether full or partial, follows strict measures to restrict the movement of people and fully or partially halt socio-economic activities²⁹.

The Federal government of Pakistan took prompt action and started to establish cohorts of national policies in collaboration with provin-

cial governments to combat the pandemic while also continuing the economic activities in the country¹⁴. During the first wave of COVID-19, the pandemic cases continued to increase rapidly both in rural and urban areas of the country between March and June 11th, 2020. The COVID-19 first wave cases' trend has been illustrated in Graph 2 after the first case of Covid got reported in March 2020. On the 10th of March 2020, there was a report of 10 new COVID cases, afterward, Covid cases picked high pace in all Pakistani provinces, and on June 11, 2020, the new active cases of COVID touched 125,933, in Punjab province the highest number of cases were recorded that is 47,382 and least cases reported in AJK that is 534¹⁴.

Following multiple discussions between policymakers, public health officials, and other stakeholders, the Prime Minister of Pakistan announced a smart lockdown both at the Federal and provincial level on June 13th, 2020. The concept of smart lockdown is based on an innovative strategy of "trace, track, and quarantine". The healthcare workers identify high-risk areas through surveys and testing, and in case of a positive test report, healthcare workers collect detailed information from the patient such as recent contacting persons and travel history of the previous two weeks. The patient is also moved to a government-designated nearest quarantine center or hospital for quarantine. Sometimes, due to the identification of a high number of cases in certain areas of the city, local government authorities mark them as a hotspot, and residents of hotspot areas went to quarantine for two weeks. After continued testing and upon satisfying results, people would come out of quarantine



Graph 2. Province-wise cases.

Source: Government of Pakistan¹⁴.

facilities and resume their normal life activities. Under the smart lockdown policy, the Federal government also announced an emergency financial support program known as “Ehsaas Emergency Cash” to support low-income families who are suffering from financial constraints due to income or job losses due to COVID-19^{30,31}.

The most important aspects that differentiates how Government of Pakistan approach to the establishing smart lockdown from others is the ethical and compassionate motive behind it. The smart lockdown is created to reach the most vulnerable and marginalized groups of people in the society in the most transparent, ethical, and caring way possible. The government implemented legislations and structures that can provide immediate relief to those who are in need in the best way possible while preventing any ethical misconduct. People who are asked to quarantine received financial support from the government’s Ehsaas Emergency Cash program, while uninfected individuals be able to continue their livelihood with mitigated COVID-19 risk. In addition, the program gives the nation much needed time to establish COVID-19 related infrastructures, testing sights, and associated facilities. While neighboring countries like India

has been struggling with stricter “Hammer and Dance” like approach to succeed curbing the spread of the virus^{32,33}, because of the smart lockdown measures, Pakistan manage the COVID-19 phases in more humane and less restrictive way possible.

Some other nations struggle with COVID-19 preventative measures as well. For instance, in the UK, initially the government was in denial of the seriousness of the disease and was downplaying the pandemic. Thus, hesitant to implement preventative measures against the virus³⁴. It was not up until after the increase in number of COVID-19 patients got very high the UK government decided to follow a strict lockdown. Similarly, Sweden long shunned restrictions on its citizens up until the later waives of COVID-19. However, the country also took action in the later stages of COVID-19 in favor of some restrictions³⁵. The later three approaches, however, has resulted in the loss of millions of livelihoods and/or thousands of deaths COVID-19^{33,36-38}, thereby raising the ethical aspects of these approaches. Importantly, disproportionate impact of COVID-19 pandemic on the loss of lives and livelihood among the marginal fractions of the society^{39,40} and reviewed in Dine⁴¹, ethically de-

mands for a balanced approach where different aspects including socio-economic factors are also kept in mind. On the contrary, the smart lockdown measurements got appraisal from neighboring countries and its own citizens⁴².

This translates into bioethics field as well. The earlier work by Mithani et al.⁴³ stated that COVID-19 preventative methods should be equally equitable among all the socio-economic classes and should not only mitigate the COVID-19 related problems but also preserve the livelihood of citizens. It should not serve as “window dressing” but aims to ease the struggle born due to the preventative methods during the health crisis and remedy inefficiencies in health system⁴⁴. The main achievement the Pakistan’s government has with the smart lockdown and Ehsaas program is the ability to succeed this goal, the lowest impact possible in daily life with creating equity to majority of the population in a higher success rate than most of them other countries.

After the implementation of the *smart lockdown* strategy at the Federal and provincial level, the government ramped up the testing facilities, reflected by the number of official testing reports increased due to a more streamlined process. At the same time, after the implementation of smart lockdown, new positive cases of COVID-19 started to decline from mid of June 2020 (Graph 3), and overall trends increased testing continued. By September 21st, 2020, Pakistan had conducted a total of 3,230,472 COVID-19 tests (Graph 4).

During the initial phase of COVID-19 in Pakistan, the testing capacity in the nation was only 500 per day; however, it drastically is increased over the time through the government initiatives⁴⁵. The government reports disclose that, in April 2021, the number of testing kits were increased and reached 68,000 per day in contrast to April 2020¹⁴.

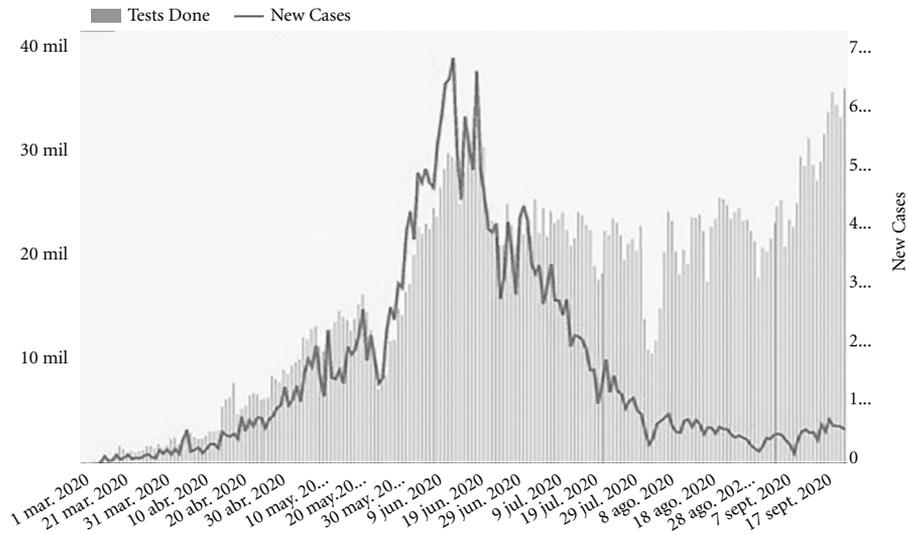
Government smart lockdown policy and different COVID-19 waves in Pakistan

Till now COVID pandemic is unstoppable, and many countries have faced more than one wave. In Pakistan, during the first wave, the implementation of smart lockdown policies proved to be effective due to a 6.59% reduction in pandemic cases comparatively before lockdown⁴⁶. Due to economic constraints, the government of Pakistan step wisely opened different sectors to start business activities, so daily wagger can start their jobs and support their families. In the second wave, COVID-19 cases are still considered in

control due to improved healthcare systems such as ventilators to support COVID-19 patients and RT-PCR facilities to increase testing.

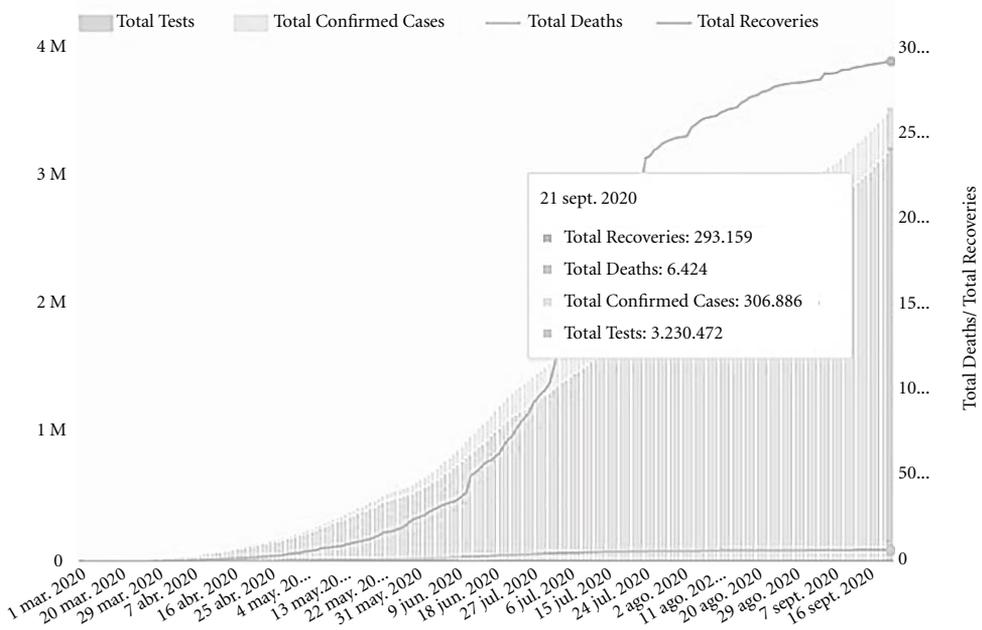
When the first wave of COVID-19 hit Pakistan, the COVID-19 cases reached 6,825 a day on June 14th, 2020, the time when a smart lockdown in the country was announced by the Government of Pakistan. The COVID-19 cases started declining in Pakistan within a week of targeted smart lockdown. This trend remained active till the drop in daily cases of COVID-19 to a few hundred by August 2020¹⁴. Nevertheless, one thing must be kept in mind that during the first COVID-19 wave in Pakistan, more people were seen following the WHO guidelines, involving wearing masks, and maintaining a social distance of ~6 feet. During that time, the COVID-19 restrictions were lifted by the Pakistani Government, including the ones of schools. With the reduction in COVID-19 restriction and reviving the economy, the COVID-19 standard operating procedures resulted in the second COVID wave at the end of October 2020, when new cases of COVID-19 surged to ~800 daily in contrast to the 400-500 cases coming some weeks back in Pakistan. This could also be witnessed in the increased positivity rates from 2% to 3% and in the increased deaths due to COVID-19. Unlike the first COVID-19 wave, the second wave stayed longer, and the daily cases remained nearly 1,000. Currently, Pakistan is battling the third COVID-19 wave, with the new confirmed cases reaching ~5,000 daily¹⁴. Even though a smart lockdown has been announced by the Pakistan government in hotspot areas and new restrictions have been imposed, including weekend curfew in few cities, reduction in business hours, the closing of schools and universities; the daily new confirmed COVID-19 cases have not decreased significantly. In Pakistan, most weddings took place from January to April because of the relatively moderate and pleasant weather. This point towards the fact that markets became crowded on daily basis by people going shopping and the congestion in the marriage halls, which increased the likelihood of contacting COVID-19. The persistence of the third COVID wave in Pakistan is explained through this. Now with the announcement of marriage hall closure, there is a likelihood for cases to reduce progressively over the next couple of weeks.

As witnessed worldwide that COVID-19 waves would not cease to occur when COVID related mini and macro lockdowns are relaxed but would slowly diminish with the implementation



Graph 3. COVID-19 – Daily testing and new cases distribution.

Source: Government of Pakistan¹⁴.



Graph 4. COVID-19 – Overview (testing, confirmed cases, total deaths, total responses).

Source: Government of Pakistan¹⁴.

of such restrictions. Thus, the most anticipated outcome is that COVID might stay in the world for a very long time or might remain forever like seasonal flu if both the public and the government fail to learn lessons. Making the general population immune successfully using mass vaccination is probably the most favorable method in the future to reduce community transmission and hospitalization. In summary, observing the COVID-19 guidelines along with imposing smart lockdown appears to be a very effective policy in terms of economically weak countries if they wish to suppress the pace of viral spread. Nevertheless, immunization of the general population seems to be the only way forward for normalization.

The status of COVID-19 vaccination in Pakistan

Pakistan was among the countries taking part in the clinical trials on the COVID-19 vaccine from China and has approved COVID-19 vaccines for emergency use. AstraZeneca's COVID-19, COVAX, vaccine had been the first vaccine that Pakistan approved in January 2021⁴⁷. By February 13th, 2021, China's Sinopharm, CanSino, AstraZeneca, and Russia's Sputnik V COVID-19 vaccines have been approved by Pakistan for emergency use⁴⁸. Irrespective of surging cases and hospital beds getting filled fact during the third wave of COVID-19, the progress of the vaccination program is very slow amid short supplies and delayed deliveries. By April 16th, 2021, Pakistan has administered free 1.3 million doses of coronavirus vaccines to health workers and senior citizens. In Pakistan, the Chinese COVID-19 vaccine was first received by health workers at end of 2020 in Pakistan⁴⁹. Currently, the vaccination is being given to citizens over the age of 65 in Pakistan⁵⁰. Following the next phase, Pakistan is all set to start a mass vaccination program for senior citizens who are older than 50 years of age⁵¹. In order to get yourself registered, people are required to send their Computerized National Identity Card (CNIC) number from their mobiles to 1166, and information regarding the date and vaccine centers is sent on their mobiles through SMS⁵². Only the Chinese vaccine has been administered by Pakistan so far. Now it is anticipated that Pakistan will receive six to seven million doses of Oxford-AstraZeneca's AZD1222 by the end of April 2021 under the umbrella of COVAX, a global vaccine-sharing initiative with discounted or free doses for lower-income countries⁵⁰.

In Pakistan, there is a reluctance when it comes to taking COVID vaccines due to the conspiracy theories claiming coronavirus vaccinations to be of low quality as well as religious prohibitions, linking COVID with the campaign of western nations against Islamic countries, and insertion of nano-chip through vaccine in the body to control the movement of peoples through telecommunication technology^{53,54}. When COVID vaccination registration began the vaccination centers had lesser rush due to existing conspiracy theories. Recently, the coronavirus pandemic crisis in neighboring country India⁵⁵ has forced people to change their perception about the vaccination and protecting their life against the pandemic. In August 2021, the COVID vaccination trend has been steadily increasing to 1.4 million coronavirus doses per day in Pakistan. According to the latest COVID-19 vaccination statistics, a total of 55,178,137 doses are administered by the Pakistani government where 16,866,627 fully vaccinated and 42,720,675 are waiting for the second dose⁵². These numbers correspond to 7% and 19%, respectively, of the total population of Pakistan.

Pakistan is now being counted in those few countries that involved the private sector in importing and selling COVID-19 vaccines. While few private companies and hospitals are in the process of applying for approval and placing orders, the pharmaceutical company AGP Pharma has already received 50,000 doses of the two-shot Sputnik vaccine⁵⁶. Summarizing this, irrespective of the rise in COVID-19 cases in Pakistan, the vaccine roll-out is progressing at a slow pace partially because of the lack of adequate funding, limited COVID-19 vaccine supply. As the private sector is involved now, there is an expectation for the Pakistan COVID-19 vaccination program to pick up pace increasingly over the next few months.

Conclusion, limitations, and suggestion for future work

Based on evidence from available literature, it has been proposed by our findings that the initiative of government into imposing smart lockdown policy during the first COVID wave followed by the consensus of all stakeholders along with the willingness of people to observe COVID-19 SOPs had been the driving force behind the decline of COVID-19 pandemic cases in Pakistan. In regards to the insufficient nationwide health-care system lacking basic PCR testing machines

and quarantine facilities, the smart lockdown policy and observing of basic COVID-19 SOPs provided a solution for stopping the pandemic spread, and the government was provided the opportunity to ramp up testing facilities and enhance the availability of ventilators and associated facilities at the hospitals. Through these effective government policies, within a short time, the public healthcare system reduced the burden on existing hospitals through track, trace, and quarantine, hotspot, and home-based quarantine strategies. These said strategies not only restricted the activities of infected people to stay at home (as quarantine) during pandemic without extra burden on the existing healthcare system but also reduced the financial cost of quarantine. This effective lockdown policy allowed the

government to identify requirements, improve healthcare capabilities, and continue and balance socioeconomics activities to avoid the spread of the pandemic while keeping the economy afloat.

Our research has few limitations. Firstly, period of data collection of last two years between 2020 and 2021, and secondly data collection approach. To overcome this, we propose some future work directions, firstly to expand time duration and also used systematic literature review study based on PRISMA approach to highlight new variants of coronavirus such as Omicron, and their impact on the society. Future research study highlights impact of new variant of COVID on the society and also government national and international strategies to control COVID for reducing impact on socio-economic activities.

Collaborations

A Abbas: conceptualization, literature review, research design, data collection and analysis, validation, and writing. A Mannan: literature review, validation, writing – review, editing and comments.

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