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## RESEARCH ARTICLE

# Coronavirus disease (COVID-19) Pandemic and Pakistan; Limitations and Gaps

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### Abstract

**Background:** The 2019 novel coronavirus disease (COVID-19) has spread to more than 213 countries and as of 17 April 2020, 1,995,983 confirmed cases and 131,037 deaths have been reported globally. Pakistan sharing border with China and Iran, having a high frequency of travel and trade, has been at risk of viral transmission.

**Methods:** We examined the current state of the COVID-19 epidemic and Pakistan's preparedness, using publicly available data and documents on the COVID-19 government dashboard.

**Results:** Pakistan reported its first 2 confirmed cases on 26 February 2020, linked to Iran's travel history. The number of confirmed cases nationwide rose to 7,025 on 17 April 2020 with 135 deaths, and 3276 confirmed cases in Punjab, 2008 cases in Sindh, 993 in Khyber Pakhtunkhwa, 303 in Baluchistan, 237 in Gilgit Baltistan, 154 in ICT and 46 in Azad Jammu Kashmir. To date, 7000 Pakistani pilgrims have returned from Iran and have been placed in quarantine in Taftan. The directing of pilgrims back to their cities without testing at the border resulted in introduction of the virus in country. Pakistan's weak healthcare system, with 0.6 beds for 1000 people and less than 0.75% of the GDP allocated to health spending, is doubtful to bear the COVID-19 shock if there were to be an exponential increase in cases.

**Conclusion:** Low literacy rates and a general lack of awareness is leading to people not seriously adopting social distancing and hand hygiene. The high population density in major cities of Pakistan can facilitate the spread of virus. The three-pronged approach of trace, test and treat needs to be aggressively implemented to halt the community transmission leading to exponential increases in cases.

**Key words:** COVID-19, Preparedness, Three-pronged approach, community transmission.

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### Introduction & Background

The 2019 novel coronavirus (SARS-CoV-2), which emerged in China, Wuhan, has spread to more than 213 countries and territories. As of 17th April 2020, 1,995,983 cases and 131,037 deaths have been reported globally (1). It is an emergent global threat, and now a pandemic declared by the World Health Organization (WHO), posing multi-pronged challenges to nations globally. The WHO has warned about the acceleration of pandemic, as it took 67 days to reach 100,000 cases from the first reported case, 11 days to reach the 2<sup>nd</sup> 100,000, 4 days for the 3<sup>rd</sup> 100,000, and just in a matter of 2 days figures reached to the 4th 100,000 (2). Asymptomatic patients have also become a valid source of spreading infection. China and South

Korea have been successful in containing the virus, evident by their rapid decrease in numbers of new cases (3). Exponentially worse increases in numbers of cases in other parts of the world has forced several governments to put 1.7 billion people (almost 20 percent of world's population) under lockdown. Sealing borders and shutting down markets, schools and institutions are among the drastic measures taken in an attempt to contain the virus (4).

COVID-19 is a high-stakes test of public health and health care systems around the world. WHO initially gave a Strategic Preparedness and Response Plan (SPRP) with the overall goal to stop further transmission of SARS-COV-2. The plan outlines the three pronged approach of identification, isolation and early care of

patients, risk communication, minimization of social and economic impact through multisectoral partnerships, and addressing the crucial unknowns regarding clinical severity, extent of transmission and infection, treatment options, the acceleration of the development of diagnostics, therapeutics and vaccines through priority research and innovation. These objectives can be achieved through a multi-faceted approach of public health measures, including swift identification, diagnosis and management of the cases, identification of contacts with testing and following up, infection prevention control protocols being implemented in health care settings, implementation of health measures for travelers, awareness-raising in the population, and risk communication (5). Interim guidelines on critical preparedness, readiness and response action for four different transmission scenarios were issued on 7 March 2020, segregating the countries into four types. The first one is countries with no cases, the second is countries with sporadic cases, the third is countries with clusters and the fourth is countries with community spread (6). The WHO pledges the world to fight, unite and rout COVID-19. A Global Humanitarian Response Plan for the most vulnerable countries with an appeal of two billion dollars has been launched by the WHO recently for laboratory testing materials, protective supplies to health workers and medical equipment (2).

Pakistan, with a unique challenge of highly porous borders, is sandwiched between two epicenters of Corona - China and Iran. Pakistan has a weak health infrastructure. The country recently strengthened their preparedness against COVID-19 by policy formulation and the implementation of national emergency preparedness, mandatory thermal screenings at all points of entries, and surveillance and contact tracing through data collection (7). Testing and diagnostic capacity has been strengthened by importing Polymerase Chain Reaction (PCR) kits for SARS-COV-2 diagnostics (8). Resources have been mobilized to set up quarantine facilities for suspected cases at several cities and hospitals (9), and surveillance units have been activated to trace contacts of confirmed cases, as recommended by the WHO.

Pakistan, being a resource-limited country with a lack of existing emergency preparedness mechanisms in place, needs to reinforce national public health capabilities, infrastructures, aggressive disease

surveillance systems and laboratory networks, and trained human capacities. With the available resources, the country has sufficiently raised levels of preparedness. However, there is a lot of room to develop robust strategies for effective surveillance mechanisms supported by aggressive institutional support with a strong efficient diagnostic capacity and case management system. The aim of this paper is to assess the current state of COVID-19 epidemic in Pakistan by addressing the limitations and challenges faced in emergency preparedness and responses.

## Methods

We used publicly available data to examine the current state of the COVID-19 epidemic and preparedness in Pakistan. We reviewed the documents on the websites of the Ministry of National Health Regulation, Services and Coordination (Covi-19 dashboard) and the National Institute of Health (NIH) daily situation report (10).

## Results

Pakistan being a close ally and sharing borders with China and Iran, with high frequencies of travel and trade, has been at risk of viral transmission. The increased influx of travelers through air, land and sea facilitated the importation of the virus. Pakistan reported its first two confirmed cases amongst religious pilgrims on 26 February 2020. These were linked to travel history in Iran (11), and later from other countries, primarily from the Kingdom of Saudi Arabia (KSA), United Kingdom and Italy (12). The number of confirmed cases nationwide has risen to 7,025 on 17 April 2020, after Sindh and Punjab reported more cases amongst clusters of pilgrims from Iran and Tablighi Jamaat with 135 deaths. Sindh was the worst-affected province in the outbreak initially, but now Punjab is the epicenter with 3276 confirmed cases as of 17 April 2020 (13). So far 2008 cases in Sindh, 993 in Khyber Pakhtunkhwa, 303 in Baluchistan, 245 in Gilgit Baltistan (GB), 154 in Islamabad Capital Territory (ICT), and 46 in Azad Jammu and Kashmir (AJK) have been reported (13). The situation is emerging and quite alarming, with increases in daily cases at a rapid pace. As elsewhere in the world, the exact number of cases in the country is likely to be far higher than recorded because of limited testing capacities (14)-(15).

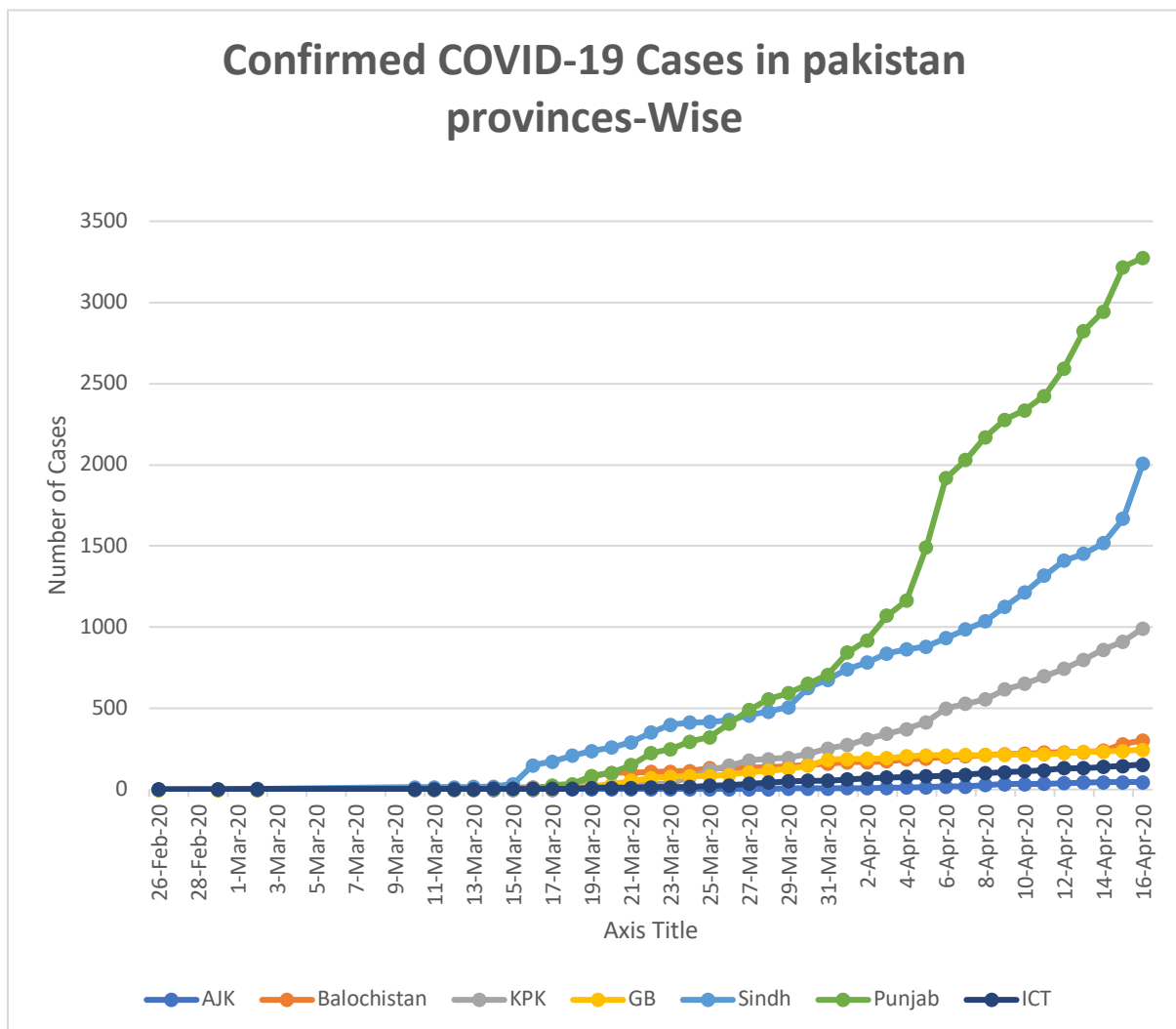
**Table 1:** Summary statistics of COVID-19 Pakistan-17<sup>th</sup> April, 2020(10):(13)

<b>SUMMARY STATISTICS (16<sup>th</sup> April,2020)</b>	
<b>Confirmed Cases</b>	7025
<b>Active Cases</b>	5125
<b>Deaths</b>	135
<b>Recoveries</b>	1765
<b>CFR</b>	1.9 %
<b>Number of passengers Screened at Point of Entries To-date</b>	1,102,383
<b>Cumulative tests performed</b>	84,704
<b>Tests performed per day</b>	6264
<b>Total Suspects in Hospitals</b>	334,778
<b>Total Suspects at POE's</b>	240

Pakistan has recorded its first biggest single-day spike of 134 confirmed cases of coronavirus infections on 17 March 2020, taking the overall tally to 184 (16). This raises concerns on ineffective quarantine procedures as all these cases were from quarantine camps at the

country's Taftan border crossing with Iran. So far the highest number of daily cases was 577 cases on 6 April 2020 (17). The graph below (Figure 1) shows details of province-wise confirmed cases to date (17 April 2020).

**Figure 1:** Number of confirmed COVID-19 cases Province wise (13).



The next two weeks are very critical for Pakistan. The continued exponential increase in numbers of cases in coming days have led the authorities to impose an overall complete and strict lockdown in many cities. In Pakistan it is very hard to implement a lockdown like China. Pakistan being on the verge of explosive cases of Coronavirus trajectory needs immediate clear headed and bold steps to safeguard its nation and economy.

### State of Preparedness and Response

After the declaration of the corona outbreak as a Public Health Emergency of International Concern (PHEIC) by the WHO, the Government of Pakistan issued a National Preparedness and Response Plan for COVID-19 as a blueprint for Pandemic Preparedness for Pakistan under the Global Health Security Agenda (GHSA). This included Guidelines/SOPs for international flights inbound to Pakistan for authorities and health officials (18). Policy frameworks were drafted for federal, provincial and regional stakeholders to build capacity to prevent, detect and respond to the confirmed cases of COVID-19 in Pakistan. The government is struggling on war footings to contain rapidly spreading cases. Community engagement is required on serious note. A responsible and determined nation like China is an example and success story. Effective measures by the government and concrete steps need to be taken at the individual level so that the public can protect themselves. The country can face a huge catastrophe if authorities don't act wisely. The provinces of Sindh and Punjab are under complete lock down after sudden increases in numbers, with the army called to curb the crisis.

After a review of the emergency situation in the country by the National Security Council, Pakistan's government has adopted risk mitigation measures such as closures of all educational institutions for three weeks and banning public gatherings to control the further spread of COVID-19. The western borders have been closed and temporary suspension of all international flights has been implemented with effect from 21 March 2020 (19). The public has been advised to practice social distancing and hand hygiene frequently. Multiple private offices have established the protocol of working-from-home for their employees. A Coronavirus Relief Fund of three billion rupees has been created by the Sindh government (20). A National Coordination Committee on Coronavirus has been established to review this emergency under the chairmanship of the Special Advisor to Prime Minister (SAPM), and the Prime Minister himself is reviewing the situation on daily basis. Being the first and worst effected province, the Sindh Government acted wisely with timely imposition of medical emergency and risk mitigation measures along with intense public awareness drives. This has been lauded at all forums, with Punjab and other provinces following their footsteps in combating Coronavirus in respective provinces. Strict and complete lockdown has been imposed with effect from 22 March 2020 in Sindh, Punjab, Baluchistan and KPK with penalty on violation.

A ten thousand bedded field hospital has been established in expo centers of Karachi by the Pakistan army, along with the maintenance of quarantine facilities in DG Khan and Multan for pilgrims from Iran coming via the Taftan crossing (21).

Since the devolution in 2011, health was declared as a provincial subject. One of the factors contributing to poor response is the lack of coordination between federal government and provinces.

### Quarantine facilities

Several places have been designated as quarantine facilities, in line with recommendations of the World Health Organization (WHO), and this is looked after by the National Disaster Management Authority. At the Taftan-Zahedan border, three large halls of Pakistan houses have been declared as quarantine facilities having the capacity for 2000 people (22). To date, 7000 Pakistani pilgrims have returned from Iran and were placed in quarantine in Taftan for a brief period of three days. They were released on 28 February 2020 and were sent to their respective provinces. The provincial government along with the Directorate of Central Health Establishments' (DOCHE) focal point for point of entries in Pakistan is looking after the screening operations. In addition to current procedures, those released from the Taftan camp are being held for a further 14 days in their home provinces in separate quarantine facilities, established at various places like Sukkur Sindh, Quetta, Dera Ghazi Khan Punjab and Dera Ismail Khan at Khyber Pakhtunkhwa (KPK), where the pilgrims are tested in case they display symptoms. There is a lack of doctors and other basic facilities, with squalid living conditions at camps. Close contact conditions during quarantine, due to the lack of enough space, resulted in multiplied infections at the Taftan facility.

### Mishandling of pilgrims

The directing of pilgrims back to their cities without proper screening and testing at the border resulted in slippage and the introduction of virus in country. The challenges of dealing with a large influx of pilgrims in a desert area overwhelmed the government of the poorest province in Pakistan with a neglected healthcare system, which has remained under-resourced and understaffed (23).

## **Discussion**

### Socio-Economic impact of Coronavirus outbreak on national economy

The initial economic losses in different sectors have been estimated at 5 billion rupees, as assessed by the Asian development Bank (ADB) (24). Drops in Gross Domestic Product (GDP) growth is observed because of the reduction in services sectors like airline businesses, revenue losses, sharp decline in imports and exports, reduction in remittances, and disruption in food supplies. The country's GDP expected loss is 10 %, which is around 1.1 trillion rupees due to disruptions caused by

corona. Karachi, a major financial hub with a population of around 20 million people, is expected to face a major revenue loss due to the lock down of up to 380 billion rupees (25).

At present, the Federal government is not in favour of a complete lock down because of the social impacts. Of the Pakistani population, 24.3% live below poverty line (26). The most vulnerable populations, with regard to enforcement of lockdown, are the daily wage vendors and the labour class. However, there are mechanisms in place for supporting vulnerable people in society. Social protection programmes in Pakistan like EHSAAAS, Zakat and Baitul Maal, Langar Khanna, Social Security, and Shelter Homes need to be utilized for supporting the vulnerable class. Poverty is rampant in the country, with poor people unable to make both ends meet, considering coronavirus as the least of their issues.

Other countries that imposed complete lockdowns had higher income per capita than Pakistan. It is important to keep the economy afloat with the priority of keeping people safe from the pandemic. In order to dilute the economic impact of the current outbreak, the government has decided to announce a comprehensive economic plan offering protection and incentives to industries and relief packages for the vulnerable and poor. The Sindh government has given a relaxation of three months in submission of utility bills below 5000 Rupees.

#### Responsible role of media

Now is the time to show a responsible attitude and avoid rumors. The media should be playing a responsible role by avoiding spreading panic, chaos and anarchy amongst the public.

#### Lack of awareness and education

The government has issued directives on risk mitigation strategies to the masses for prevention by avoiding public gatherings, regular hand washing, social distancing, and maintaining at least a distance of two meters or six feet. Many people are still ignorant and do not abide by the government's directives despite the propagation of these messages through mainstream media. Polio also had a similar fate in Pakistan. Poor knowledge and negative attitudes regarding polio and immunization among populations has led to an exceptional prevalence of polio in Pakistan in a global context. Several myths and rumors regarding COVID-19 are being spread regarding the treatment and prevention

of the virus, leading to panic and anxiety amongst the public.

Pakistan's overall literacy rate remains at 59%, with the literacy rate of male's at 71 % and female's at 49 % (27). Low literacy rates and a general lack of awareness has led to people not being serious towards the adoption of risk mitigation measures like social distancing, and the health seeking behaviors of the general population are mosaic. Serious efforts are required to increase the awareness level of the public, especially in rural areas, to strive against myths and superstitions associated with health-seeking behavior and the non-serious attitude of the general public regarding the severity of COVID-19 and its precautionary measures.

#### Role of religious scholars, Ulemas

Islamic countries like the Kingdom of Saudi Arabia, Kuwait and Qatar have imposed restrictions on congregational prayers at mosques amid the current COVID pandemic through fatwa (28). The Pakistani government has yet to decide about the imposition of a ban on mosque prayers and large religious gatherings, due to fear of a backlash from Islamist groups. Prominent religious clerics need to be taken in confidence to pursue people intellectually about the health measures and precautions. Pakistan has requested Egypt's Al-Azhar institution for an edict (Fatwa) regarding permitting the suspension of Friday's prayers to prevent the spread of disease.

#### Health infrastructure and human resources

The health care delivery system in Pakistan is primarily the state responsibility, and consists of public and private sectors. The state provides healthcare through a three-tiered healthcare delivery system comprising of primary, secondary and tertiary care facilities (29). The Coronavirus disease provides a painful reminder of the vulnerable and weak healthcare system. The table below (Table 2) states the latest figures related to health care delivery and trained human resources according to economic survey 2019 (30).



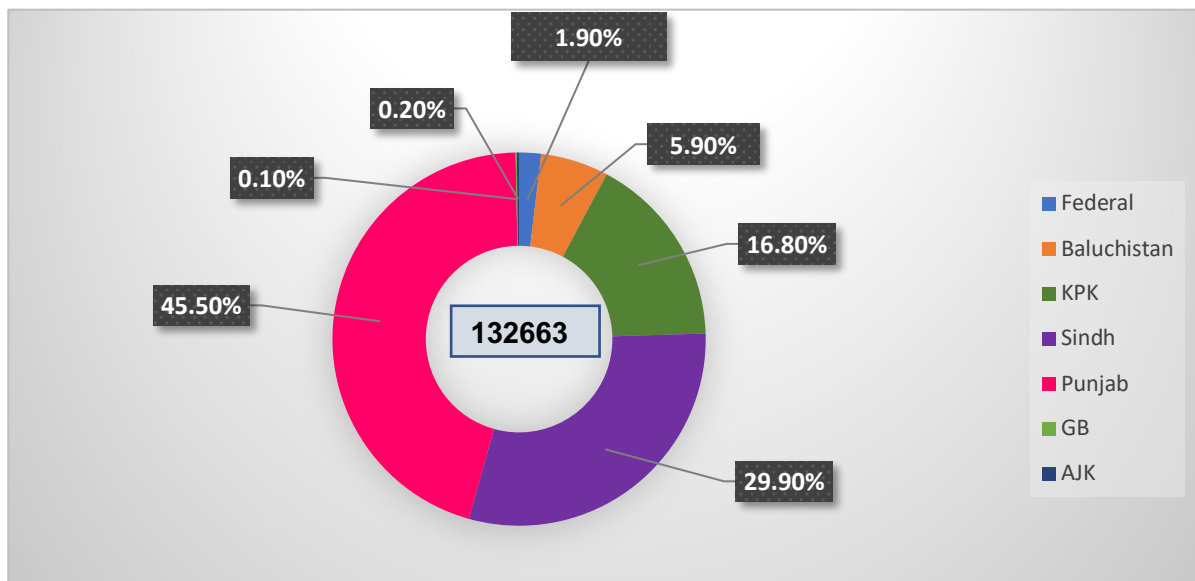
**Table 2:** Summary statistics of Health care facilities and trained human resource in Pakistan (30).

Health facility and human resource for health	Figures/Indices
Public Sector Hospitals	1279
Basic Health Units	5527
Rural Health Centers	686
Dispensaries	5671
Registered Doctors	220,829
Registered Dentists	22,595
Registered Nurses	108,474
Population per doctor	963
Population per dentist	9,413
Population per nurse	1962
Population per bed	1,608

The above mentioned figures are insufficient in portraying the ill capacity of the health system for a population of 212.82 million (30). Another challenge underpinning national preparedness is insufficient human capital- doctors, nurses and paramedics. Augmentation of health care human resources who are at the forefront of the epidemic is required. Engagement

of medical students and nurses is needed to increase the capacity of current health staff. The total capacity of the public sector’s hospitals and dispensaries across Pakistan is 132,663 beds, with Punjab having the highest percentage (45%). The figure (Figure 2) is a graphical presentation of percentages of available hospital beds province-wise (31).

**Figure 2:** Percentage of Hospital Beds in Provinces of Pakistan (31).



The management of severe cases requires assisted ventilation and support. Both public sector and private hospitals have a very small number of ventilators, which will be deficient in the case of an exponential surge in new cases of coronavirus. The hospital capacity and factors within the hospitals, such as the number of available beds for complicated COVID-19 patients and ventilators in intensive care units, are crucial factors in mitigating strategies and efforts of any country. Unfortunately, the statistics are quite poor in this. The

total number of working ventilators, according to sources, is 1650 for a population of 212.8 million with the picture varying from province to province (32). Ventilator requirements is a huge stress on health systems of developed and resource rich nations. Pakistan, being a resource poor country with a weak health system, is subject to catastrophic impacts in case of an outburst of cases, like in Iran and Italy. All affected countries worldwide are doing an urgent stocktaking of ventilators in their health system records. Provision of

ventilators in proportion to numbers of serious and complicated patients is even challenging for the well-resourced health systems of world, as in the United Kingdom's National Health System and in Italy.

The ability of existing surge capacities of the health system to absorb the shock due to COVID 19's exponential spread is quite doubtful. In case of an increase in the number of severely ill patients requiring assisted ventilation, there would be a shortage of ventilators nationally. If hospitals continued to be overwhelmed, tough decisions regarding who gets access to ventilators would be the choice left with health care professionals, as has happened in Italy(33). Decisions are made on the basis of age and health status, with a preference given to younger patients with a better chance of survival (34).

As a part of the government's policy on COVID 19 for centralized procurement, 10,000 ventilators will be imported in coming months (35).

Pakistan, being signatory to the International Health Regulations(IHR) convention 2007, has not paid the due share of attention to point of entries in comparison to the pivotal role to prevent international spread of diseases. The lack of an effective quarantine facility at Taftan land crossing resulted in the importation of the virus in the country.

#### Health budget

Pakistan has one of the lowest Public Health Expenditures as a percentage of GDP in the world, with less than 1% of the GDP for decades and only 0.6 beds per 1000 people. In 2019, 12,671 million rupees were allocated for development in the health sector (30). The health sector is facing tough challenges and is in dire need of enhancement of budget allocation. This is needed especially for development expenditure by federal and provincial governments for enhanced and better-quality health service availability across the country, with increased health coverage for the growing demands of the increasing population of Pakistan.

#### Population

Pakistan, with a population of 212.8 million, is among the top five most populated countries in the world, with a very high population density in several cities (36). Keeping in view Pakistan's population dynamics and demographics, the potential risk of the COVID 19 pandemic to Pakistan is quite high. Average social interactions in a day are much higher than compared to Italy / Europe due to social and cultural norms. In Pakistan, a large extended family system mostly living in crowded conditions is quite prevalent, favouring the spread of the deadly virus. The Pakistani population has the youngest population in the world, with 65% under 30 years of age (36). The high population density in major cities of Pakistan and higher than average social circles

can facilitate the spread of the virus. Karachi, the capital of Sindh, has a staggering population of 14.91 million and is the worst affected city so far, with the highest number of COVID 19 confirmed cases in the country and 87 cases of local transmission. An exponential increase in coming weeks can force the city's health system to fall into chaos. As per recent research, 80 % of the infections are mild with 18.5 % requiring hospitalization, out of which 4.7 % will be in need of critical ICU care (37).

#### Sustainability of health system and emergency preparedness

In 2005 after a natural disaster earthquake, emergency mechanisms were made effective and responsive, and the National Disaster management authority (NDMA) was constituted. Now, in wake of Coronavirus, emergency preparedness and health systems are equipped up with machinery, gadgets, diagnostic equipment, PPE, human resource, financial resources for Health training, development of SOPs, and guidelines for emergency preparedness and response, especially in infectious disease outbreaks. The stewardship of the government needs to continue and last afterwards too.

#### **Conclusions & Recommendations**

Despite high levels of political commitment by the government, the ongoing COVID-19 epidemic has exposed important obstacles and flaws in the emergency and health systems of Pakistan, with regard to the control of infectious diseases. Three areas need immediate priority, coordinated responses between federal and provinces, centralized procurement of Personal Protective Equipment (PPE) and medical equipment like ventilators, respirators etc., the responsible role of the media to avoid panic in public, safeguarding of our frontline workers and healthcare workers, and efficient use of information technology for contact tracing. A response to COVID-19 can exhaust country's healthcare system with a crippling impact on economy.

1. Immediate activation of the highest level of national response management protocols to ensure the all-of-government and all-of-society approach is needed to prevent COVID-19 with non-pharmaceutical public health measures; prioritize active, aggressive case finding with immediate testing and isolation, painstaking contact tracing and effective quarantine of close contacts. The three-pronged approach of trace testing and treating needs to be aggressively implemented like in South Korea. Health education and enhancement of awareness in the general public of the seriousness of COVID-19 and their role in preventing its spread; Expansion of surveillance to detect the

transmission chains, by inclusion of atypical pneumonia patients in the surveillance net, screening some patients with upper respiratory illnesses and/or recent exposure, in addition to testing for the virus existing surveillance systems (e.g. systems for influenza-like-illness and Severe Acute Respiratory illness-SARI); conduction of multi-sector scenario planning and simulations for the deployment of even more stringent measures to interrupt the transmission chains.

2. Travel is the single most important contributor to disease transmission. Reduced frequency of transport such as flights and trains with road route restrictions, along with community sensitization, can prove to be an effective measure in containment. Voluntary home quarantine and home isolation reduces the burden on the emergency healthcare system. The government needs to reinforce international mechanisms for leading, coordinating, and providing resources in this emergency situation.
3. The government needs to take five immediate steps. The first is a national lockdown to minimize unnecessary social interaction. Secondly, enhancing testing and relevant health care capacity on a priority basis and on war footings. Thirdly, repurposing buildings as isolation wards, field hospitals and quarantine facilities. Fourthly, ensuring smooth and steady flows of supply chains of food, medicines and logistics. The fifth is expansion of social protection programmes, like BISP, for protection the most vulnerable.
4. Flatten the curve with early containment measures like social distancing - the more we postpone the cases the better the healthcare system can function, with lower mortality rates. Social distancing has been an effective measure for reduced morbidity and mortality in past, such as the 1918 pandemic of Spanish flu.
5. Priority Research regarding the diagnostics, vaccines, and therapeutics to stop the virus spread, and improve treatment outcomes in most efficient ways.

Non-pharmaceutical interventions remain pivotal for the management of COVID-19 because there are no licensed vaccines or drugs yet. The situation is quite evolutive towards wider community transmission, with multiple international epicenters like Europe and United States of America going towards those figures. The WHO containment strategy needs to be adjusted with inclusion of stringent mitigation measures. Close monitoring of epidemiological transitions and changes, effectiveness of public health strategies and their social acceptance is required. Continued intensive source control is needed by isolation of patients testing positive for COVID-19 through intellectual counselling of patients. Contact tracing and health monitoring, strict health facility infection prevention and control protocols, and use of other active public health control interventions with continued active surveillance and containment activities needs strict implementation.

The COVID-19 pandemic is a test case for the world and Pakistan. It is important to learn lessons and takes action to improve preparedness planning for all infectious disease outbreaks in the future. Smarter use of technology and artificial intelligence in forecasting and modelling for spread of diseases may be used in future. Greater mandate for preparedness planning, ongoing surveillance, time to time scientific advisories, and responses to infectious disease outbreaks, accompanied by a substantial increase in funding is the need of the hour.

#### **Author's Contribution**

NN was involved in the conception and design of the study, literature review and wrote the manuscript. SUKN supervised in the study design and was involved in manuscript editing. SD was involved in editing the manuscript. All authors read and approved the final manuscript.

#### **Competing Interests**

The authors declare that they have no competing interests.

#### **Funding**

None.



### Abbreviations

<b>ICT</b>	Islamabad Capital Territory
<b>KPK</b>	Khyber Pakhtunkhwa
<b>AJK</b>	Azad Jammu & Kashmir
<b>ADB</b>	Asian Development Bank
<b>NHS</b>	National Health System
<b>UK</b>	United Kingdom
<b>BHU</b>	Basic Health Unit
<b>RHC</b>	Rural Health Centre
<b>KSA</b>	Kingdom of Saudi Arabia
<b>IHR</b>	International Health Regulations
<b>GDP</b>	Gross Domestic Product
<b>ICU</b>	Intensive Care Unit
<b>PPE</b>	Personal Protective Equipment
<b>COVID-19</b>	Coronavirus Disease-19
<b>SARS-COV-2</b>	Severe Acute Respiratory Syndrome Corona Virus-2
<b>GHSA</b>	Global Health Security Agenda
<b>SARI</b>	Severe acute Respiratory Infections
<b>BISP</b>	Benazir Income Support Programme
<b>USA</b>	United States of America
<b>WHO</b>	World Health Organization

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